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PHYSICIAN USE OF A MEDICAL LIBRARY

BY

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Submitted in partial fulfillment of the requirements for the
Degree of Doctor of Philosophy

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PHYSICIAN USE OF A MEDICAL LIBRARY

Abstract

by

Janet Friedlander

The use of a medical library by members of the faculty of a medical school was studied by questionnaire. An attempt was made to ascertain the part the library played, among the channels of communication, in work-related information searches. Generalizations of former use studies (suggesting that the choice of formal versus informal source was influenced by experience, type of work, task, and accessibility) were tested on a new population. The study attempted to describe the population of users and the kinds of sources they used in an information search, and to identify some of the factors which influenced their choice of kinds of sources. It was hoped that a study of the factors influencing the use of information sources would lead to the possibility of predicting use of kinds of sources once the characteristics of the users were known. The results refer mainly to the information searching of clinicians affiliated with a teaching hospital. Most frequently sought information was about a specific disease. The study showed high use of informal sources in seeking information. Talking to a man in the same

subject area as the respondent was the most common method used. The major source which provided the information was journal articles. More than half of these articles were used in Xerox copy form. The importance of personal collections as sources of information was pointed up. Most respondents found the information they sought themselves, rather than relying upon library services. The use to which the information was put v/as evenly divided between clinical and research, although the majority of the respondents were clinicians. A connection between experience and type of source used appears to exist. The high use of informal sources suggests that type of work may influence method of search. Research appears to lead to more information searches than teaching. The study brought out a high use of sources which are accessible and easy to use. The tabulations show the importance of co-workers in informal communication. Low delegation of documentation tasks to libraries is apparent. The main user of the library studied v/as a clinician in the area of internal medicine who used journal articles about diseases for information to use in the treatment of his patients. Most talked to men in their subject areas to find a source and did not use library services. Telephoning wa3 widely used as a means of contacting the library. The card catalog was little uced by the patron. Of those who went to the library, more than half used indexes or browsed on the shelf. The recommendations were made that journals

should be shelved accessibly, with Index Medicus nearby. Books might be shelved less accessibly. Telephone access to the library is of major importance as is the provision of adequate Xeroxing facilities.

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CHAPTER I

INTRODUCTION

> Perhaps the most important and least considered factor in the design of information storage and retrieval systems is the user of such systems. Regardless of what other parameters are considered in the development of a storage and retrieval mechanism, it is necessary to consider its potential use and mode of use by the persons or groups for whom it is intended; it is necessary either to fashion the system to suit the user's needs, habits and preferences, or to fashion the user to meet the needs, habits and preferences of the system. . . . A system designed for now should at least be able to serve the present user.[1]

Libraries are information storage and retrieval systems designed for now. They should at least be able to serve the present user. And indeed, they do. Librarians intuitively respond to perceived user needs and seek to acquaint the user with resources of which he may be unaware. User studies attempt to lessen the intuitive area in this interaction.

Users are one of the parameters of information storage and retrieval systems. Let's look at some of the other parameters. One would be economic. How much money is available? How will it be allocated? How much does each item within the system cost? This is studied in great

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[1]Saul Herner, The Relationship of Information-Use Studies and the Design of Information Storage and Retrieval Systems, RADC-TN-59-136, AD-213761 (New York: Rome Air Development Center, 1958), p. 1.

detail. It is measured with precision, examined and considered in the design of an information storage and retrieval system.

Another parameter is physical facilities. Shelf space is counted, floor space is measured. Buildings are designed to accommodate the collections they are expected to house. If a computer is to be used, its capacity is also a serious consideration in the design of an information storage and retrieval system.

And now let's look at the important parameter of users. In this area decisions about the design and functioning of an information retrieval system are made based on intuition, based on opinion, based on guesses.

It is easy to see why this is done. It is easy to count money and to measure physical facilities. It is very difficult to study the behavior of man in any quantifiable way. However, sociologists and psychologists have given us tools to use in this area. It is up to us to adapt them to our needs.

Users are one of the important parameters of information storage and retrieval systems. Libraries are information storage and retrieval systems. The next question which comes to mind is just what can libraries do with information about their users? How can they use it?

Libraries perform three main services; acquiring materials, organizing these materials, and facilitating

their use. Each library serves a specific population and all of its services are geared to that population.

The acquiring of materials is a complex activity which takes into account those items which are requested by users as well as how adequately the collection covers the subject areas which the library defines as its concern. Acquiring materials by following the requests of users, leads to a very uneven collection, overbalanced in one subject area, and lacking in another. A much better basis for acquiring materials would be, not to take the advice only of those users willing to request that material be bought, but to know the subject interests of all of the users and buy accordingly. A user study can get this information for the library.

If a collection is acquired to adequately represent the subject areas which the library defines as its concern, it is a well-balanced collection. But a library does not exist in a vacuum. It does not usually have enough money to buy all it would like. A detailed knowledge of the subject interests of its users and of what kinds of materials they use can aid in the efficient budgeting of this money. A user study can get this information for the library.

Once the materials are acquired, they are organized for use. Organizing for use is limited by the systems of classification available and by the physical facilities of the library. An already established library is hardly

likely to go through the expense and work load of changing its classification scheme unless it is found to be extremely ill-suited for its purposes. Adapting a classification scheme to the needs of an individual library would lose for it the ease of communication with other libraries which a standardized classification scheme allows.

However, when physical facilities are considered, there is much more room for adaptation. The building may be already occupied, but the use of the space within it can be adapted. How is the collection physically arranged? What factors affect physical arrangement? What is the best way to use the available floor space? Within the classification scheme how should the items be shelved? Accessibility and ease of use are important considerations in shelving. The material is to be used by the patron. Arrangements, therefore, should take into consideration how accessible and easy to use the collection is for him or for whoever gets the material from the shelf for him. An examination of the kinds of materials the user relies upon and of the subject areas he is concerned with, will aid in making decisions on the use of space and the arrangement of items on shelves.

The third major service which libraries perform is facilitating the use of its collection. With experience in serving them, librarians learn what users want and how to provide it. Users' comments on services, materials and facilities influence library policy. But this is a

haphazard method.

Mortimer Taube, in his 1958 evaluation of use studies of scientific information, makes distinction between the provision of consumer services and professional services. He concludes that

> . . . the organization and dissemination of scientific information is a professional activity, the value of which cannot be measured by consumer responses, and that such responses cannot supply directions for the design of more effective scientific information and reference systems.[2]

I would like to argue in a slightly different direction. The organization and dissemination of information is, indeed, a professional activity. The haphazard way in which libraries learn about their users, however, is reflective of a consumer activity. To professionally serve our user we must study his behavior, not gather his offhand comments. We do not need market surveys which are used in the study of consumers. We do need behavioral studies so that we will know the characteristics of our users and how they find information. We must find out what they use and what they use it for. Then we will be in a position to more effectively facilitate the use of the collection.

How would a user study help a library facilitate

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[2]Mortimer Taube, "An Evaluation of 'Use Studies' of Scientific Information," in Emerging Solutions for Mechanizing the Storage and Retrieval of Information, ed. by Mortimer Taube (Washington, D.C.: Documentation, Inc., 1959), p. 46.

the use of the collection? By finding out how the collection is used. Do patrons telephone the library and ask for information? If so, is the telephone service adequate? Do they come in and look for items themselves? If so, how do they look? Do they use the card catalog and is it providing them with the information they want? In what proportion do they use various kinds of material? There is no end to the questions. By asking the user how he actually searches for information, we may be able to find some of the answers.

> Whether or not it ever were so run, the modern research or public library certainly cannot be operated as though it were a passive repository for printed material. The opposed requirements of storing an increasing collection and of maintaining easy access to the most-used part of it can only be balanced by active and discriminatory planning. Whether the material be stored on shelves, in microfiles, or magnetically, the exponential increase in publication makes it uneconomical, and even undesirable, to have all items equally accessible. In spite of this, however, the library must be operated so that most of its users can find their way to the items of information they need, with a minimum of delay and frustration. To achieve a balance between these opposing requirements, the manager of an existing library, or the planner of a new one, must know in some detail what the user of the library does, how often he will use a catalog or other reference material, for example, what books or periodicals he will refer to, and how long he will need to use each item. As with any other organization in these rapidly changing times, the librarian should know, as accurately as possible, what is going on, and should be able to predict what probably will be going on in the future.[3]

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[3]Richard M. Dougherty and Fred J. Heinritz, Scientific Management of Library Operations (New York: Scarecrow Press, 1966), p. 225.

CHAPTER II

REVIEW OF THE LITERATURE

Definition of User Studies

Use/user studies have come to be defined as "studies of the flow of information",[4] more precisely "any study dealing with the information gathering and disseminating behavior of scientists."[5] This includes pure and applied scientists, basic and behavioral scientists.

Menzel[6] makes the following distinction in his definition of "empirical studies of scientific communication in process." When approached from the point of view of the individual scientist, these are studies of 'scientists' communication behavior." When approached from the point of view of any communication medium, they are "use studies." When approached from the point of view of the scientific communication system, they are studies in the "flow of information among scientists."

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[4]Herbert Menzel, Review of Studies in the Flow of Information Among Scientists (2 vols.; New York: Columbia University, Bureau of Applied Social Research, 1960), title.

[5]William Paisley, The Flow of (Behavioral) Science Information, A Review of the Research Literature (Palo Alto, Calif.: Stanford University, Institute for Communication Research, 1965), p. I-2.

[6]Menzel, Flow of Information Among Scientists, p. 1.

In user studies the information, rather than its institutional setting was most often the subject of investigation. The library environment as such was not importantly considered in the majority of use studies.

Bibliographies

The most comprehensive bibliographies in the area of user studies are the Davis and Bailey bibliography and the Auerbach Corporation bibliography. Published in 1964 and supplemented by the DeWeese bibliography in 1967, the Davis and Bailey bibliography is an uncritical list containing 438 items, its supplement, 547 items. The Auerbach Corporation bibliography, published in 1965, contains 676 items.[7] These figures give an idea of the large number of studies which have been conducted.

Fortunately, in view of the large number of studies, a series of carefully considered, selected bibliographies exist to guide the interested to the better conceived and executed studies. The earliest of these selected bibliographies is Herbert Menzel's Review of Studies in the Flow of Information Among Scientists (1960), prepared by the

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[7]Richard A. Davis and Catherine H. Bailey, Bibliography of Use Studies (Philadelphia: Drexel Institute of Technology, Graduate School of Library Science, 1964); Auerbach Corporation, DOD User Needs Study, Phase I, Final Technical Report 1151-TR-3 (2 vols., Philadelphia: Auerbach Corporation, 1965); L. Carroll DeWeese, "A Bibliography of Library Use Studies," in A Statistical Study of Book Use, by Aridaman K. Jain (Lafayette, Ind.: Purdue University, 1967), supplement.

Bureau of Social Research, Columbia University, for the National Science Foundation. This study presents tables comparing (as much as they can be compared) the measures of use in twenty-six pre-1960 studies, and is, in its author's own words, "a synthesizing review of completed studies of the behavior, habits, usages, experiences, and expressed needs of research scientists with regard to the obtaining of available scientific information."[8] This work includes Menzel's discussion of the shortcomings in methodology and analysis in studies in this area. His analysis and suggestions for future approaches is, in this writer's opinion, the most thorough available to date.

The second evaluative review of the research literature is The Flow of (Behavioral) Science Information done by William J. Paisley at the Stanford University Institute for Communication Research, in 1965 for the National Science Foundation. This review of the "current state of scientific information flow research"[9] reviews thirty-three studies, examining in depth two studies which the author considers "milestones on the road toward understanding scientific information flow."[10] These two studies

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[8]Menzel, Flow of Information Among Scientists, p. 1.

[9]Paisley, Flow of (Behavioral) Science Information, p. ii.

[10]Ibid., p. I-5.

are

> Menzel's study of information exchange among biochemists, chemists and zoologists (1958) . . . a pilot study with a small sample . . ./important because of/ the attention it focused on informal, unplanned episodes in scientific information flow. Its findings have enlarged the compass of subsequent information-flow research.[11]

> The second study . . . is the American Psychological Association's Project on Scientific Information Exchange in Psychology. This project marks a 'first' both in its coordination of many complementary substudies and in its concerted focus on the behavior of behavioral scientists. It is clear already that the challenge to other investigators in the field is to surpass the A.P.A. project both in scope and in methodological sophistication.[12]

The bibliographies mentioned above have been continued and kept up to date on a yearly basis by the chapters in the Annual Review of Information Science and Technology[13] which began publication in 1966. The chapter in the first volume was written by Menzel, in the second volume by Saul and Mary Herner, and in the third volume by William Paisley.

Criticisms of User Studies

It would seem, from the number of studies conducted, that we know a great deal about users and have a sizable data base on which to build. But some critics feel this is not the case.

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[11] Ibid., p. III-1. [12] Ibid., p. III-1.

[13] Carlos A. Cuadra, ed., Annual Review of Information Science and Technology (3 vols.; New York: Interscience Publishers Division of John Wiley & Sons, 1966-67. Chicago: Encyclopaedia Britannica, Inc., William Benton, Publisher, 1968).

> Studies conducted to date do not permit any great degree of generalization. For example, the populations surveyed are nebulous, ill-defined and drawn from many environmental contexts. The purposes for which information is required in each study remain unknown. The categorization of user group . . . has little meaning.[14]
>
> User needs are neither broadly known nor well understood, despite the fact that numerous scientific and technical use studies have been conducted and reported in the literature. . . . While a majority of these studies appear to have been well conducted and have provided valuable information for specific purposes, they do not, individually or collectively, provide sufficient general criteria. . . .
>
> There are a number of reasons for this:
> (1) A large number of studies were conducted for a specific purpose in unique environments; e.g., studies concerning the journal reading habits of various groups, the frequency of use of a particular library, the readership of specific publications, and the media or channel used to acquire information.
> (2) Many of them have been concerned only with scientists in a research atmosphere, usually in an experimental laboratory environment. . . .
> (3) Most of the studies have concentrated on users' information needs in terms of the types of packages they use, e.g., journal, rather than the information they need.
> (4) Wide differences exist in the sampling, interviewing, and data analysis techniques used, making correlation of results difficult or impossible.
>
> Consequently, few of the studies provide a reliable base for extrapolation to general conclusions.[15]

Rationale of this Study

In view of the large number of studies which have been conducted, and in spite of the criticisms outlined

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[14]Alan M. Rees, "Memo to: Panel on User Studies, Subject: Discussion to take place on May 30, 1966, Minneapolis, Minn.," p. 2. (Typewritten).

[15]Auerbach Corporation, DOD User Needs Study, Phase I, Final Technical Report 1151-TR-3 (2 vols., Philadelphia: Auerbach Corporation, 1965), pp. 1-2 and 1-3.

above, it was the contention of this writer that what was available in previous studies provided a great deal of information. However, the institutional setting of the information had not been emphasized. The library environment and its relation to use had not been an area of concern. If the conclusions of previous studies were collated and retested in a library environment, it would be possible to examine their generalizability.

This opinion was bolstered by the remark of Paisley, in the third volume of the Annual Review, that the area of user studies might be ready for the synthesis of existing results leading to the development and testing of middle-range hypotheses.[16]

Generalizations

What generalizations have the findings of user studies continually supported? One of these generalizations refers to an expected difference in the use of formal versus informal sources. This use appears to vary according to experience, type of work, and task.

Formal versus informal

The distinction between use of formal versus informal sources, or between printed and oral communication, is widely referred to in the literature. Since the importance of

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[16]William Paisley, "Information Needs and Uses" in Cuadra, Annual Review, III, p. 24.

informal communication was first realized, many studies have been conducted to delineate this area. Cutting across many fields such as pure versus applied science, science versus engineering, and medical research versus clinical practice, the findings seem to support the notion that those in applied fields, whatever they may be, rely on informal, oral communication to a much greater extent than do those in research or more theoretical scientific areas.

The studies from which this conclusion was drawn are of all kinds. Some are questionnaire or interview studies of the use of libraries. Some are diary studies of workers' information-gathering activities, some are case studies or research on a team of workers. The type of study does not seem to matter. The conclusions are similar.

A generalization of the breadth of this one, which does not seem to alter according to the subject field studies or the method used, and with the implications for libraries which this generalization has, needs to be retested as a beginning assumption.

What studies suggest a distinction between the use of formal versus informal sources? These may be divided into three groups; those which note variance in the use of formal versus informal sources according to experience, that is, the length of time a man has been in the field; those which note variance according to type of work, that is, whether the man works in a theoretical or applied area;

those which note variance according to task, that is, what kind of work the man is doing at the time he seeks information.

Experience

Three studies note an increased use of informal sources by more experienced workers, and higher use of formal sources by newer workers.

One was a study of a hundred and ten chemical and metallurgical faculty and graduate students at Lehigh University. They were asked to check the journals they regularly scanned and then state the channel most important in calling attention to current developments. "Workers of higher seniority in both fields rated channels involving personal communication outside the university higher than their juniors did."[17]

A second study consisted of interviews with twenty people who engaged in social science research at the State University of Ghent. Of the four man areas of examination, one was "the methods they use to keep abreast of the pertinent current literature." One of the findings was that "the more experienced literature users generally use

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[17]F.J. Wuest, Studies in the Methodology of Measuring Information Requirements and Use Patterns, Report No. 1: "Questionnaire" (Bethlehem, Penn.: Lehigh University, Center for the Information Sciences, 1965), cited by Herbert Menzel, "Information Needs and Uses in Science and Technology" in Cuadra, Annual Review, I, p. 49.

more informal techniques for gathering current and retrospective information than the less experienced."[18] While this does not directly relate to work experience, but rather to experience in literature use, it seems reasonable to assume that more experienced workers would also be more experienced literature users.

The third study was part of the large American Psychological Association study.

> A study of the effects of listing 'manuscripts accepted' in four core A.P.A. journals shows that the person who uses the listings to request preprints is a very young researcher, who is anxious to stay current in his field and who is unlikely to have access to invisible college channels.[19]

Assuming that invisible college channels are likely to be informal contact, this statement implies that more experienced workers have access to, and rely upon, those informal channels, while the newer research worker must rely upon formal sources.

Type of work

Type of work that is, whether a man is engaged in a theoretical or an applied area of his field, seems to affect

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[18] L. Uytterschaut, "Literature Searching Methods in Social Science Research: a Pilot Study," American Behavioral Scientist, IX (May, 1966), pp. 14, 25-26, cited by Saul Herner and Mary Herner, "Information Needs and Uses in Science and Technology" in Cuadra, Annual Review, II, p. 12.

[19] William D. Garvey and Belver C. Griffith, "Studies of Social Innovations in Scientific Communication in Psychology," American Psychologist, XXI (November, 1966), pp. 1019-1036, cited by Paisley, "Information Needs and Uses," p. 18.

his use of formal as opposed to informal sources. Those in theoretical fields are more likely to use formal sources; those in applied fields are more likely to use informal sources.

A 1954 study by Herner, who interviewed 606 professional staff members at Johns Hopkins University pointed out that pure scientists were much more literature-oriented than applied scientists. "To the pure scientist, research in the literature is likely to be as necessary and as routine as his researches in the laboratory."[20]

This is corroborated by a study by the British Advisory Council on Scientific Policy, a questionnaire study of 3,021 physicists and chemists. In criticizing this study, Herner says in the second volume of the Annual Review,

> . . . the 'discovery' is made that 'pure scientists are more dependent on the literature than industrial scientists and technologists . . .' This 'discovery' is at least thirteen years old (referring to his own 1954 study, just mentioned) and probably considerably older.[21]

A study by Allen of information use during research and development projects, conducted by an M.I.T. team, used 'matched' laboratories, two or more organizations working

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[20]Saul Herner, "Information Gathering Habits of Workers in Pure and Applied Science," Industrial and Engineering Chemistry, XLVI (January, 1954), p. 236.

[21]Great Britain Advisory Council on Scientific Policy, "Survey of Information Needs of Physicists and Chemists," Journal of Documentation, XXI (June, 1965), pp. 83-112, cited by Saul Herner and Mary Herner, "Information Needs and Uses in Science and Technology" in Cuadra, Annual Review, II, pp. 16-17.

on the same problem under contract to the same government agency. "Allen's chief conclusion, a well-documented one, is that scientists lean more heavily on literature sources while technologists depend on oral sources."[22]

Herner, in the second volume of the Annual Review, states that "practitioners of clinical medicine apparently constitute an exceptional case, in that they are inordinately dependent on verbal and other non-written sources of information."[23]

Weinstock, in a review of studies of physicians and scientists, lists eight studies of physicians, five of which found that they preferred oral communication over use of printed sources.[24]

Task

The task which a man is performing appears to be related to the material he will use. The studies which relate to task refer to the general fact that use influences choice of source. Two of these studies looked into perceived relevance.

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[22]Thomas J. Allen, "Managing the Flow of Scientific and Technological Information" (unpublished Ph.D. dissertation, Massachusetts Institute of Technology, 1966), cited by Paisley, "Information Needs and Uses," pp. 10-11.

[23]Saul Herner and Mary Herner, "Information Needs and Uses in Science and Technology" in Cuadra, Annual Review, II, p. 18.

[24]Melvin J. Weinstock, et al., A Recommended Design for the United States Medical Library and Information System - Volume II: Background Studies, PB 172 924 Washington, D.C.: Herner and Company, 1966), pp. V-7 to V-10.

The first is the 1967 study by Rees and Schultz which found that relevance judgments were related to research phase. This study obtained judgments of the relevance of a sample of biomedical documents to a diabetes research project. The judges were divided into five groups: medical experts, medical scientists, resident physicians, second-year medical students and medical librarians. Individual differences among judges was a highly significant variable. Only group membership was a significant correlate of judgment.[25]

The Cuadra-Katter studies also found that use strongly influences relevance judgments. This series of fifteen studies examined a complex of nineteen variables in relevance judgment. Each judge rated nine abstracts against eight information requirement statements according to how good an answer the article would be to the statement. The same seventy-two judgments were repeated under one of fourteen "implicit use orientations," such as "concern with terminology" and "methodological interest." It is this "implicit use orientation" which was found to strongly

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[25]Alan M. Rees and Douglas G. Schultz, A Field Experimental Approach to the Study of Relevance Assessments in Relation to Document Searching, Final Report (Cleveland, Ohio: Case Western Reserve University, Center for Documentation and Communication Research, 1967), cited by Paisley, "Information Needs and Uses," pp. 7-8.

influence relevance judgments.[26]

The study by Allen at M.I.T., mentioned earlier (p. 16) also showed evidence that channel selection is task-specific.[27]

Accessibility and Ease of Use

A second generalization supported by the findings of former user studies is that accessibility and ease of use of materials affects their choice as sources. Those channels which are most accessible and easiest to use are more likely to be used.

Two studies, in particular, relate to accessibility and ease of use. A questionnaire study by Rosenberg asked three basic questions of ninety-six respondents in six organizations. First, the respondents ranked eight media in the performance of three hypothetical information-seeking tasks. Then, they rated the same eight media on ease of use. Third, they rated the media on amount of information expected from them. There was a high correlation between rankings in the first question and ratings of ease of use, but no correlation between preferences and expected information. Rosenberg's conclusion was "the ease of use of an

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[26]Carlos A. Cuadra and Robert V. Katter, "The Relevance of Relevance Assessment," in Proceedings of the 30th Annual Meeting of the American Documentation Institute, New York, October 1967 (Washington, D.C.: Thompson, 1967), cited by Paisley, "Information Needs and Uses," pp. 7-8.

information-gathering method is more important than the amount of information expected . . ."[28]

A second study, by Allen and Gerstberger, involved nineteen engineers in two divisions of an electronics firm who kept fifteen-week records of the progress of research/development projects. They ranked nine information channels according to accessibility, ease of use, technical quality and previous use. The study found that "accessibility and ease of use are stronger correlates of channel use than is technical quality."[29]

Co-worker Versus Colleagues

A third generalization supported by the findings of earlier user studies is that technologists get most of their information from co-workers, men who work in their organization, men who are physically close to them. Researchers, on the other hand, rely more upon their co-professionals, men in the same subject area, although perhaps at a distant location.

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[28]Victor Rosenberg, Studies in the Man-System Interface in Libraries. Report No. 2: The Application of Psychometric Techniques to Determine the Attitudes of Individuals Toward Information Seeking, AD-837 713 (Bethlehem, Penn.: Lehigh University, Center for the Information Sciences, 1966), cited by Herner, "Information Needs and Uses," p. 21.

[29]Thomas J. Allen and Peter G. Gerstberger, Criteria for Selection of an Information Source, Working Paper #284-67 (Cambridge, Mass." Massachusetts Institute of Technology, Alfred P. Sloan School of Management, 1967) cited by Paisley, "Information Needs and Uses," p. 9.

This distinction is buttressed by Paisley's suggested 'middle-range hypothesis' stated in the third volume of the Annual Review.

> Mode of information transfer in technology is primarily oral. Scientists at the frontier of a specialty know each other and keep track informally. Technologists keep abreast by close association with co-workers in their own organization. They are limited in forming invisible colleges by organizational barriers.[30]

Two studies of work teams, the Auerbach and the North American Aviation studies,[31] both found the co-worker the first source of information and the local work environment accounting for sixty per cent of first sources for D.O.D. personnel and fifty-one per cent of first sources for defense industry personnel.[32]

The Rosenbloom and Wolek study was based on 2,000 "critical incident" questionnaires from engineers and scientists in thirteen divisions of four large corporations and from 1,200 members of the Institute of Electrical and Electronics Engineers. It found that engineers draw most of their information (63 per cent) from in-house sources, especially co-workers, and that scientists look outward for

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[30]Paisley, "Information Needs and Uses," p. 25.

[31]Auerbach Corporation, DOD User Needs Study; North American Aviation, Autonetics Division, DOD User Needs Study, Phase II, Final Technical Report, C5-2442/030 (Anaheim, Calif.: North American Aviation, 1966) cited by Paisley, "Information Needs and Uses," pp. 12-13.

[32]Paisley, "Information Needs and Uses," p. 13.

most of their information (67 per cent).[33]

Delegation of Documentation Tasks

A fourth generalization supported by the findings of former user studies is that technologists delegate their documentation tasks, while researchers are more likely to involve themselves in searches for information.

This goes back to the Uytterschaut study of twenty social science researchers at the State University of Ghent, which was mentioned earlier (p. 14). One of the findings of this study was that "heavy users of the literature do not generally delegate their documentation tasks, while persons who are less literature-dependent are more prone to delegate."[34]

This same conclusion was also reported in the 1954 Herner study of pure and applied scientists, mentioned earlier (p. 16).[35]

Four generalizations, then, which the findings of former user studies support, are as follows:

1. The use of formal versus the use of informal

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[33]Richard S. Rosenbloom and Francis W. Wolek, Technology, Information, and Organization: Information Transfer in Industrial R & D (Boston, Mass.: Harvard Graduate School of Business Administration, 1967), pp. 119-127, cited by Paisley, "Information Needs and Uses," p. 13.

[34]Uytterschaut, "Literature Searching."

[35]Herner, "Information Gathering Habits."

sources for obtaining information will depend on three main variables. The first is experience, the length of time the user has been working in his field. The second is type of work, whether the user is employed in a theoretical or applied area of his field. The third is task, whether the user is currently engaged in a task which is in the theoretical or in the applied area of his field.

2. The accessibility and ease of use of an information source will influence the amount of use it receives. Those items which are most accessible and easiest to use will be used most.
3. Technicians will get most of their information from co-workers. Researchers will get most of their information from colleagues.
4. Technicians delegate their documentation tasks. Researchers are more likely to discover and use sources themselves.

As mentioned previously, these generalizations come from many different kinds of studies. The populations, the size, the scope, the methodologies, and the purposes of these studies differ. But the conclusions are similar. If these conclusions hold in the various areas in which the original studies were done, they should also hold if used as a starting point for a new population.

If a population is chosen which contains the characteristics which appear to be important variables influencing information search, it should be possible to predict from the characteristics of the population, how information will be sought.

Prediction of patterns of information seeking and prediction of information sources used is now done in libraries on an intuitive basis. It is hoped that this prediction can be made more exact by basing prediction on empirically derived judgment.

If we go back to the reasons the Auerbach study lists for the failure of user studies to provide general criteria, mentioned on page eleven, we note that the first reason refers to the fact that "a large number of studies were conducted for a specific purpose in unique environments,"[36] that is, journal reading of a specific group, use of one library, etc. The studies referred to questioned a particular group, or looked at a specific library and, from this, drew conclusions which could not, then, be generalized to a different group or situation. If, however, we start with the generalizations, and check to see if they hold for a particular group or library, we have broadened the applicability of the conclusions of the original study beyond the confines of the specific group studied.

A second reason listed by the Auerbach study for the

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[36]Auerbach, DOD User Needs Study.

failure of user studies to provide general criteria is that "many of them have been concerned only with scientists in a research atmosphere, usually in an experimental laboratory environment . . ."[37] If we are looking for findings that can be applied to and used in libraries, a laboratory-confined study will have only limited applicability. However, if findings from this kind of study are retested on library users, their applicability to this different group can be evaluated.

A third reason listed by the Auerbach study for the failure of user studies to provide general criteria is that "most of the studies have concentrated on the users' information needs in terms of the types of packages they use, e.g., journal, rather than the information they need."[38] Studies which look at "packages" used are certainly limited by what is available rather than what information is being sought. However, if a connection can be made between type of package and information sought, this information should be useful for library planning.

To approach this in a slightly different way, we need to go back to the distinctions Menzel makes in his definition of studies of communication, mentioned on page seven. When approached from the point of view of the individual scientist, these are studies of "scientists'

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[37] Ibid. [38] Ibid.

communication behavior." When approached from the point of view of any communication medium, they are "use studies." When approached from the point of view of the scientific communication system, they are studies of the "flow of information among scientists."[39]

A library is one communication medium. It might seem, therefore, that a use study would be the most beneficial for applicability to library operation and planning. But a study of this kind gives us information only on past or present use. It does not permit prediction which is essential for planning. In order to predict, we must study the behavior of our users.

What is needed is a study of library users so that the findings will be applicable to library planning. But we cannot predict from a study of library use. We must study the "communication behavior" of our users so that we can tie the characteristics of the user to the character of the use. Then we may be able to predict use, knowing the user.

But we do not exist in a vacuum. Each occurrence of use is not an entirely separate entity. In order to understand the interrelations or patterns of use, we must look at the entire communication system within which our users exist; we must look at the "flow of information among

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[39]Menzel, Flow of Information Among Scientists, p. 1.

scientists.[40]

In other words, a study is needed which recombines the distinct types of studies mentioned by Menzel and which is designed to elicit information which will be of specific use in the operation and planning of a library.

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[40] Ibid.

CHAPTER III

BACKGROUND OF THE STUDY

The Medical Area

The problem of the dissemination of information is particularly acute in the medical area.

> The nation's investment in science and the scope of scientific knowledge have undergone an unprecedented expansion in the past twenty-five years. 'In medical research alone, national expenditures have risen twenty-fold -- from $45 million in 1940 to an estimated $890 million in 1961.' This increase in medical scientific activity has produced research findings that have substantially enlarged the reservoir of knowledge. It has further increased the problems of dissemination and utilization of this knowledge.[41]

Major Bibliography in the Medical Area

The major bibliography of use studies in the medical area is put out by the Institute for Advancement of Medical Communication. Entitled An Annotated Bibliography of Studies on the Flow of Medical Information to Practitioners, it was first compiled in 1961 by Dr. Walter Boek, and supplemented by him in 1962. The compilation was brought

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[41] William Goffman and V.A. Newill, Methodology for Test and Evaluation of Information Retrieval Systems, CSL: TR-2 (Cleveland, Ohio: Western Reserve University, Center for Documentation and Communication Research, 1964), p. 1.

up to date by Dr. Andrew M. Sherrington in 1965.[42] The references were selected on the basis of their availability and the inclusion of original data, systematically collected and analyzed. The first compilation included eighty studies; the second, seventeen; and the third, twenty-three; a total of 120 studies.

The Cleveland Area

The Cleveland area, because of its size, the number of hospitals it contains, the presence of a major medical school, and the amount of research conducted, represents an ideal location to look into the varied sources and uses of information in the medical area.

The Allen Memorial Branch of the Cleveland Health Sciences Library is the major medical library in the Cleveland area and was available for study.

Basic Assumption

The basic assumption of user studies is: "Specific kinds of users performing certain functions in specified subject areas for specified purposes within a specified environment and within a certain limited period in time

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[42] Walter E. Boek, comp., An Annotated Bibliography of Studies on the Flow of Medical Information to Practitioners (2 parts; New York: Institute for Advancement of Medical Communication, 1961-62); Andrew M. Sherrington, comp., "An Annotated Bibliography of Studies on the Flow of Medical Information to Practitioners," Methods of Information in Medicine, IV (March, 1965), pp. 45-47.

will behave reasonably consistently."[43]

Methodology

This study is concerned with the design and execution of a user study on a particular library which will:

1. Describe the population of users and the kinds of sources they use in an information search and
2. Attempt to identify some of the factors which influence their choice of kinds of sources.

It is hoped that a study of the factors influencing the use of information sources will lead to the possibility of predicting use of kinds of sources once the characteristics of the users are known.

Background of the Study Design

This study was designed in the following way:

First, the general area of user studies was examined to see (1) how they had been done and (2) what they had discovered about user needs.

Second, a more detailed review was made of user studies in the medical area with attention to (1) design and (2) conclusions in the general and medical areas.

Third, critical reviews of user studies in general and in the medical area were examined for suggestions for (1) the design of future studies and (2) areas needing

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[43]Rees, "Memo," p. 9.

examination.

This study attempts to:

1. Examine the recommendations of the critics and consider them in designing the study.
2. Incorporate the findings of previous studies as hypotheses to be tested.
3. Examine the information searching patterns of the users of a single library in an effort to see if these patterns can be predicted by the generalizations which previous studies suggest. How will the searching patterns of the users be examined? Not by studying library records. Not by asking about use of printed sources. These methods were not selected because they were considered too narrow and limited in the picture of information search they would elicit. Instead the searching patterns were examined by asking library users to delineate informal, oral searching as well as use of more traditional printed sources.

Framework of the Study

Use of information sources will differ according to some or all of the following variables:

I. The Man
   - A. Level of Education
   - B. Length of Time in Field
   - C. Subject Interest

II. His Environment

A. Type of Place now Working

B. Type of Work

III. His Task

A. Task now Engaged in

B. Use to Which Information Put

Framework in the Medical Area

I. The Man

A. Level of Education

B. Length of Time in Field

II. His Environment

A. Type of Place now Working

1. College, University or Medical School
2. Research Institute
3. Teaching Hospital
4. Non-university Associated Hospital
5. Private Practice

B. Type of Work

1. Clinical-principal concern lies in patient care
   a) Specialty
   b) Function
      i) Teaching
      ii) Administration

iii) Practicing Medicine

2. Research - prime involvement is in basic inquiry, laboratory-type research, etc.
   a) Specialty
   b) Function
      1) Teaching
      ii) Administration
      iii) Research

III. His Task
   A. Research
      1. Formulation
      2. Execution
      3. Interpretation
   B. Teaching
      1. Plan Course
      2. Prepare Lecture
      3. Prepare Examination
   C. Administration
      1. Planning
      2. Organizing
      3. Executing

D. Clinical Practice

1. Diagnosis
2. Prognosis
3. Treatment

The foregoing framework was derived from the articles of Rees (see bibliography). Within this framework fall the conclusions of former user studies in the general and medical areas.

Middle-range Hypotheses

In very general terms, the conclusions of former user studies suggest that:

1. Group membership, role, use, task, phase of task influence channel selection and relevance judgment.[44]
2. Among the sources of information available to an individual, he will choose (1) the easiest to use (2) the closest in time and space (3) the most familiar (4) the one he is most experienced in using and (5) the most informal.

Conclusions of Previous Studies

More specifically, the conclusions of former user studies suggest that the use of information will vary, according to the variables mentioned above, in the following ways:

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[44] Ibid.

Information Flow - General

1. Channel selection is task specific.[45]
2. Researchers favor print sources; clinicians favor oral sources.[46]
3. Use strongly influences relevance judgments.[47]
4. Scientists at the frontier of a specialty rely on informal communication; clinicians rely on informal communication with co-workers.[48]
5. Researchers look outside their organization for information; clinicians rely on inside sources and co-workers.[49]
6. Fifty per cent or more of information needs are filled by colleagues and the local work environment.[50]
7. The more commonly available types of information such as those dealing with procedures, techniques, materials and apparatus, are generally obtained

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[45]Allen, "Managing the Flow."

[46]Ibid.

[47]Cuadra, "The Relevance of Relevance Assessment."

[48]Paisley, "Information Needs and Uses," p. 25.

[49]Ibid.

[50]Auerbach, DOD User Needs Study; North American Aviation, Autonetics Division, DOD User Needs Study, Phase II, Final Technical Report, C6-2442/030 (Anaheim, Calif.: North American Aviation, 1966), cited by Paisley, "Information Needs and Uses," pp. 12-13.

by informal means such as querying colleagues, while less available types are obtained by more formal means such as the published literature.[51]

8. Heavy users of literature don't delegate document tasks; less literature-dependent people do.[52]

9. Experienced literature users use more informal techniques for gathering current and retrospective information.[53]

10. Workers of higher seniority use channels involving personal communication outside more than their juniors.[54]

11. Communication lines evolve in role-appropriate ways in an organization. Four factors account for most of the patterns: (1) organizational function (2) rank (3) academic discipline (4) work team.[55]

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[51]Herbert Menzel, Formal and Informal Satisfaction of the Information Requirements of Chemists, Interim Report (New York: Columbia University, Bureau of Applied Social Research, 1966), cited by Herner, "Information Needs and Uses" in Cuadra, Annual Review, II, pp. 7-8.

[52]Uytterschaut, "Literature Searching."

[53]Ibid.

[54]Wuest, Measuring Information Requirements.

[55]Alfred G. Smith, Communication and Status: The Dynamics of A Research Center (Eugene, Ore.: University of Oregon, Center for the Advanced Study of Educational Administration, 1963), cited by Paisley, "Information Needs and Uses," p. 13.

12. Relevance judgments are related to research phase. There is a drop in mean rated relevance from formulation to execution to interpretation.[56]

13. Only group membership is a significant correlate of judgment.[57]

Information Flow - Medical Area

14. Colleagues supply more references to English-language literature, cited references in papers and books supply more leads to foreign-language literature in general, and most references to Soviet medical literature, the least familiar, comes from abstracting and indexing publications.[58]

15. Clinicians read recent, most-used journals, basic scientists consult earlier years and less-commonly-used titles.[59]

16. Clinicians are smaller users of libraries than theorists.[60]

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[56] Rees, Study of Relevance Assessments.

[57] Ibid.

[58] Menzel, Information Requirements of Chemists.

[59] S.D. Truelson, "Some Shelving Practices in Medical School Libraries," Bulletin of the Medical Library Association, L (June, 1962), p. 420.

[60] W. Hardegg, C. Kohler, and G. Wagner, "Ergebnisse einer Umfrage zur Zeitschriften-Grundausstattung einer medizinischen Fakultatsbibliothek" ("Results of an Enquiry into the Basic Provision of Periodicals for a Medical Faculty Library"), Metho. Inform. Med., V (October, 1966), pp. 193-205, cited by Herner, "Information Needs and Uses," pp. 17-18.

17. Practitioners of clinical medicine are dependent on verbal and other non-written sources of information.[61]

18. Theorists read a considerably wider selection of medical literature and literature dealing with the natural sciences than the clinicians.[62]

Use of Libraries - General

19. Library will be used for the hardest to find, farthest away source, which user is least experienced in using, and which is the more formal.[63]

20. People in research environments are likely to discover and/or identify useful publications outside the library.[64]

21. Accessibility and ease of use are stronger correlates of channel use than is technical quality.[65]

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[61]Herner, "Information Needs and Uses," p. 18.

[62]Hardegg, Provision of Periodicals.

[63]Herner, "Information Needs and Uses," p. 8.

[64]Joan M.B. Smith, A Study of Reference Service at Wayne State University Medical Library January-June 1964, Report No. 14 (Detroit, Mich.: Wayne State University, School of Medicine Library and Biomedical Information Service Center, 1965), cited by Herner, "Information Needs and Uses," p. 24.

[65]Allen, Criteria for Selection.

22. Experience in using channels correlates with channel use.[66]

23. Ease of use of an information-gathering method is more important than the amount of information expected.[67]

Hypotheses of this Study

Combining similar findings and restating the conclusions to fit the variables which provide the framework for the study, the following general conclusions emerge:

1. Newer workers use more formal sources; more experienced workers use more informal sources.
2. Those affiliated with hospitals having functional libraries use the Allen Memorial Branch of the Cleveland Health Sciences Library less.
3. Clinicians use more informal sources; researchers use more formal sources.
4. Teachers and researchers use more formal sources; administrators and practitioners use more informal sources.
5. Clinicians get most information from men they work with and drug companies; researchers get more information from people in other subject areas and colleagues.

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[66] Ibid.

[67] Rosenberg, Studies in the Man-System Interface.

6. Clinicians are likely to ask libraries; researchers are likely to use library material themselves.
7. If information is used for research or teaching, more formal sources will be used; if for administration and treating patients, more formal sources will be used.

CHAPTER IV

DESIGN OF THE STUDY

Three things were discussed in the previous chapter. First, the framework, encompassing the characteristics of the man, his environment, and his task. These are the variables of the study. Second, the conclusions of previous user studies. These are the hypotheses of the study. And third, the library which provides the population for the study.

The Population

The population of the study is the 615 physicians who are on the faculty of the Case Western Reserve University School of Medicine and are members of the Cleveland Medical Library Association which runs the Allen Memorial Branch of the Cleveland Health Sciences Library, plus the fifty-five members of the Cleveland Medical Library Association who are not physicians. This group of 668 people comprise about half the faculty of the medical school and half the working membership of the library association. The working membership of the library association is about one-third of the total membership, which includes students, interns and residents as well as working physicians and others in related areas.

Reasons for Choice of Population

The population was chosen for the following reasons:

1. A combination of teaching and private practice is a common pattern among graduates of this medical school, who are a majority of the physicians in the Cleveland area. Preserving this pattern in the study makes the study group more characteristic of the general population.
2. Four of the hypotheses of the study are concerned with the use of formal versus informal sources; one is concerned with printed sources; and two more, with libraries. It was felt that physicians who were library-oriented to the extent that they paid a yearly membership fee in a library association, would be more likely to have experience in the whole range of informal and formal sources.
3. Further, the membership of this library association is a cooperative group, concerned with the process of communication. The sponsorship of the library was expected to, and did, indeed, increase interest and response.
4. The working membership of the library association was chosen for a study since it was more similar to the populations of the studies from which the hypotheses were drawn, than the student, intern or resident groups would have been.

5. The fifty-five members of the library association on the faculty of the School of Medicine who had degrees other than, or as well as, M.D.'s were included to see if their use of the library differed from that of those with M.D. degrees only.

Definitions

For the purposes of this study, the terms used are defined as follows:

INFORMAL SOURCES - sources formed to answer a specific request for information.

FORMAL SOURCES - sources completed prior to the formulation of the specific request for information.

CO-WORKERS - men who share a joint practice, are affiliated with the same hospital, or are employed by the same organization. This definition implies close physical proximity during working hours.

COLLEAGUES - specialists in the same subject area, unconnected by official work affiliation.

TYPES OF WORK:

Clinical - principal concern lies in patient care.

Research - prime involvement is in basic inquiry, laboratory-type research, etc.

Teaching - affiliated with a college, university or medical school.

Administration - self-defined by the respondent.

Instrument

The variables outlined in Chapter III, and the concern of the study with seeing whether these categories, singly or in combination influence choice of information source, allows the use of a questionnaire as an instrument. This is because the questionnaire provides a structure for the answers which will allow analysis according to the preset categories.

The questionnaire (see appendix) was designed to permit testing of the hypotheses listed in Chapter III within the framework of the categories listed there also.

Critical Incident Technique

The critical incident technique is a method of asking the respondent to think back to a specific incident about which he then answers questions.

The critical incident technique was used for two reasons. First, to tie the user to a concrete situation so that his answers would reflect how he actually searched for information rather than how he hypothetically thinks he should or might search for information. Secondly, the critical incident technique was used as a means of sampling searches over time.

Major Breakdowns in Questionnaire

The major breakdowns included in the questionnaire

are use of information, formal/informal sources, and type of work.

Use of Information

The use of information is divided into four main categories: research, teaching, administration, clinical. Each of these is further broken down as follows:

I. Research
   - A. Formulation
   - B. Execution
   - C. Interpretation

II. Teaching
   - A. Plan Course
   - B. Prepare Lecture
   - C. Prepare Examination

III. Administration
   - A. Planning
   - B. Organizing
   - C. Executing

IV. Clinical
   - A. Diagnosis
   - B. Prognosis
   - C. Treatment

Formal/Informal

Informal sources include talking, telephoning and writing. Formal sources are printed sources. Under this subdivision is the use of a library or libraries.

Each of the four main types of sources; talking, telephoning, writing, and using printed sources is further broken down into the same four categories, relating to who was most important in helping to locate the information. These four categories are: (1) man in your subject area (2) man in another subject area (3) salesman and (4) someone else.

Another breakdown under each of these categories is whether the men work together or not.

Type of Work

Type of work is broken down into four categories: (1) clinical, (2) research, (3) teaching, and (4) administration.

Other Breakdowns in Questionnaire

The other breakdowns in the questionnaire are information sought, academic degree, years since degree, and hospital affiliation.

Categories from Other Sources

Information on department of medical school, and rank in medical school was also collected.

Questionnaire

The questionnaire (see appendix) contains thirteen questions. The first asks what information was sought, the second asks if it was found and where. Questions one

and two are check questions for both the user and the questioner. They focus the user's attention on the information he sought. They also clarified some answers for the questioner and aided in interpretation. These two questions are open-ended. The answers were categorized after the questionnaires were completed.

Questions four, five and six refer to the informal sources; talking, telephoning and writing. These questions also ask about the man contacted with the preset categories mentioned above, and whether he was a co-worker.

Question seven deals with formal printed sources. Section A breaks the type of source into preset categories and asks if a xerox copy was used. Section B asks who was most important in locating the source and includes, with the same breakdown used in questions four, five and six, one further possibility, a library. The library was included in this way in an attempt to avoid oversuggesting use of a library, since the cover letter was on library stationery. Sections C, D and E refer to library use. C asks what library, D asks how the library was contacted, and E asks how the information was looked for.

Questions eight and nine are check questions which were added after the completion of the pilot study and will be explained when the pilot study is described.

Questions ten through twelve ask about the three categories mentioned above; specialty, year of degree and

main hospital affiliation.

The final question asks the respondent to estimate the number of hours per week which he spends in the following four types of work: clinical, research, teaching and administration.

Analysis of Data

The questionnaire divides the information collected into classes, the weakest level of measurement. Symbols used to represent each class constitute a nominal or classificatory scale.

Formal Properties

> The scaling operation is partitioning a given class into a set of mutually exclusive subclasses. The only relation involved is that of equivalence. . . . The equivalence relation is reflexive, symmetrical and transitive.[68]

Admissible Operations

> Since in any nominal scale, the classification may be equally well represented by a set of symbols, the nominal scale is said to be 'unique up to a one-to-one transformation.' The symbols designating the various subclasses in the scale may be interchanged, if this is done consistently and completely. . . . Such one-to-one transformations are sometimes called 'the symmetric group of transformations.'[69]

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[68] S. Siegel, Nonparametric Statistics for the Behavioral Sciences (New York: McGraw-Hill, 1956), p. 28.

[69] Ibid.

Descriptive Statistics

> Since the symbols which designate the various groups on a nominal scale may be interchanged without altering the essential information in the scale, the only kinds of admissible descriptive statistics are those which would be unchanged by such a transformation: the mode and frequency counts.[70]

Tests of Hypotheses

> Under certain conditions, we can test hypotheses regarding the distribution of cases among categories by using the nonparametric statistical test x^2. . . . These tests are appropriate for nominal data because they focus on frequencies in categories, i.e., on enumerative data. The most common measure of association for nominal data is the contingency coefficient, C, a nonparametric statistic.[71]

The answers to the questionnaire were counted within each category. These results were then correlated, to see if there was an association between them, as suggested by the hypotheses.

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[70] Ibid.

[71] Ibid.

CHAPTER V

PILOT STUDY

Questionnaires which seem clear and comprehensive to the writer may pose problems for the respondent. Therefore, the questionnaire was pre-tested on a smaller group.

Pilot Study Population

The population of the pilot study consisted of the seventeen members of the Board of Trustees of the Cleveland Medical Library Association plus the four PhD's who comprise the Division of Research in Medical Education of the Case Western Reserve University School of Medicine.

The seventeen M.D.'s were members of the library; the four PhD's were not. Three of the entire group were women. Of the seventeen M.D.'s, fourteen were on the faculty of the School of Medicine; twelve, part-time and two, full-time. Three were not on the faculty.

Eleven of the M.D.'s specialized in internal medicine; four, in surgery; and one each in urology and radiology. Nine had graduated from Ohio medical schools; eight from Western Reserve University Medical School, and one from Ohio State University Medical School. Eight had graduated from out-of-state medical schools; three from Harvard, and five from other schools in the United States.

From the characteristics mentioned above this appears to be a varied sample such as might be found in the general population. This group was chosen for two reasons. First, because its members were on the Board of Trustees partly because of their use of, and interest in, the library and, therefore, might be expected to be especially cooperative. This turned out to be the case. It had been a major concern of the investigator that response would be low. Secondly, this group was chosen in an effort to involve these men, who set up policy for the library, in a study of its users.

The four PhD's were chosen for similar reasons. They represented an entire division of the medical school. This was the Division of Research and they might, therefore, be more than ordinarily interested and cooperative in research. Since they were themselves involved in research, they might also be more than ordinarily helpful in reacting to and commenting upon the study. They were not members of the library association and would, therefore, seem to have no reason to be biased in its favor.

Conduct of the Pilot Study

Each of the twenty-one people in the pilot study group was contacted by telephone, and his cooperation was secured. One M.D. was out of town, so questionnaires were actually sent to twenty people. Of these twenty, eighteen were returned, all of the PhD's plus fourteen

of the M.D.'s.

Results of the Pilot Study

The pilot study showed that the questionnaire was, indeed, answerable, which was its main purpose. The group was too small to expect the results to point in any direction.

The second thing that was checked about the pilot study was that the responses showed the kind of variety that was expected in the larger study. To check this, profiles of the responses were made up.

Profiles

The eighteen profiles of the responses to the pilot study tell how each respondent searched for information and how he used the information.

1. Talked to a man in his subject area, telephoned the Allen Library and talked to a librarian at the desk, went to the Allen Library and used Index Medicus to locate material which he used for research formulation.
2. Went to his hospital library, asked librarian, and got a book which he used for diagnosing.
3. Went to the Allen Library, used Index Medicus to find material which he used for administrative planning.
4. Used his own copy of an index to locate a book in his own collection to use for teaching.

5. Went to Allen Library where he asked librarian who located a journal which he used for diagnosis.
6. Talked to and telephoned men in his subject area, went to Allen Library where he used Index Medicus. Did not find adequate information but used what he did find for treating patients.
7. Used own journal to prepare lecture.
8. Telephoned the Allen Library and received information from the Director of the Cleveland Health Sciences Library, which he used for research formulation.
9. Telephoned the Allen Library and received information which he used for research formulation.
10. Talked to a man in his subject area, went to his department library, browsed on the shelf, and found a textbook which he used for diagnosis.
11. Went to the Allen Library, used Index Medicus to find information which he used for research formulation.
12. Got a reference from a pathologist, secured reference from Allen Library by telephone, used information for treating patients.
13. Went to Allen Library, found book whose location he already knew, and used it for administrative planning.
14. Went to St. Luke's Hospital Library, used Index Medicus to find information which he used in

preparing a lecture.

15. Used his own copy of a journal to read article referred to in newspaper in order to discuss it with colleagues in research.
16. Went to Allen Library, browsed in journal collection and used information for research.
17. Talked to a man in another subject area, wrote to a man in his own subject area, used an unpublished manuscript located through a small circulating summary of on-going research and used the information for research formulation.
18. Talked to the Director of the Cleveland Health Sciences Library and used the information in preparing a book.

Analysis of Pilot Study

These profiles contain a great variety of searching methods, as was hoped. There were eleven instances of the use of informal sources and fifteen instances of formal source use. Under this larger breakdown, there were five instances of formal source use. Under this larger breakdown, there were five instances of talking; five, of telephoning; one, of writing; and fifteen of using printed sources. Under use of printed sources, five people used books; four used journals; and five used Index Medicus. Four people used their own sources.

Use of Libraries

The area that pointed out the largest problem of the pilot study is use of libraries. Nine people referred to use of the Allen Library. This is half of the entire group. Twelve people referred to using a library. This was unexpectedly large use of the Allen Library and of libraries in general. It was believed that this was caused by the cover letter, declaring sponsorship by the Allen Library. This sponsorship elicited 'helpful' responses which caused some of the respondents, when they were thinking of which incident of information searching to use, to think of the last time they used the library, instead of the last time they searched for information, as asked.

Check of Library Use

To check whether this was unusually heavy library use, the circulation records of the respondents were examined. The four PhD's were not members of the library and did not have circulation records, but their responses showed no library emphasis.

Circulation records, of course, do not reflect total use of library sources but they are available for a rough gauge of use. Four of the sixteen M.D.'s had material currently checked out. The other twelve had checked out no material in the past six months, January through June 1969. Ten had checked out material in 1968. Two had not checked out material in the last eighteen months.

These figures seem to reflect normal library use by interested, active library members. But these men are also interested, active physicians and it would be expected that they would need and search for information more often than the circulation figures reflect. It was, therefore, concluded that the pilot study did, indeed, show an overemphasis on Allen Memorial Branch Library use.

Changes in the Questionnaire

The original hope had been that the wording of the questionnaire would suggest to the respondent that the study was concerned with all kinds of searching and that he would respond accordingly. When the pilot study showed that this was not enough, the following changes were made:

1. An explanation of what was being asked was added in capital letters at the beginning of the questionnaire. The wording is: "This is not a survey of library use only. We want to find out how you get information you need for your work -- whether from libraries, from colleagues or from other sources.
2. Question eight was added, asking if the search described is typical of how most of the respondent's information is gotten, and if not, how it differs from his usual searches.
3. Question nine was added, asking for what percent of information searches the respondent used a

library.

It was hoped that the additional explanation would clarify what was being asked for and that the additional questions would provide a check on how representative the answers were.

CHAPTER VI

CONDUCT, DESCRIPTION OF ANALYSIS, AND RESULTS OF THE STUDY

First Mailing

On May 1, 1969, questionnaires were mailed to 655 people. This included the 600 doctors who are members of the Allen Memorial Branch of the Cleveland Health Sciences Library and are on the faculty of the Case Western Reserve University School of Medicine, but were not included in the pilot study. Also included are the fifty-five members of the library on the faculty who have degrees other than, or as well as, M.D.'s.

This group is divided as follows:

Ph.D.	24
M.D./D.Sc.	4
M.D./Ph.D.	13
D.D.S.	4
Ph.D./Sc.D.	2
M.D./M.Sc.D.	1
Ph.D./D.D.S.	1
M.D./D.P.H.	1
M.D./Ph.D./Sc.D.	1
R.N./Ph.D.	1

M.D./D.Med.Sc.	1
D.D.S./M.D.	2
	55

Returns

The largest amount of returns came in rapidly. Five per cent came back the first day, another 5 per cent were returned the second day, and the largest return, 7 per cent, occurred on the third day. By the fourth day, 25 per cent of the questionnaires had come back and returns started dropping off. At the end of two weeks only two or three came back a day, and 36 per cent had been received.

Second Mailing

A second mailing of 425 questionnaires was sent out on May 15, 1969, two weeks after the first mailing. Once again, early returns were heavy. Three per cent were returned the first day; 8 per cent, the second day; 6 per cent, the third day; and 4 per cent, the fourth day. By the fifth day, 23 per cent had been returned.

Total Returns

From the fifth day after the second mailing, on, a dwindling number of returns came in until a total of 418, or 62 per cent of the total was received.

Preparation for Analysis

When all the returns were in, the answers to the

questions were coded on coding sheets and punched into I.B.M. cards.

Categorization of open-ended questions

The first question was the open-ended one, "What information did you seek?" On examination, these answers seemed to fall into six groups. The largest was information about a specific disease. Another group referred specifically to the treatment of a disease. General physiological information was also sought. Aside from specifically medical information, some people answered more generally that they were doing a literature review, or that they were seeking a specific article. The five categories used to tabulate responses to the first question are: (1) disease, (2) physiology, (3) treatment, (4) literature review, (5) specific article and (6) other.

The other open-ended question was question eight, "If the search you described above is not typical of how you get most of the information you want for your work, how does it differ from your usual searches?" The answers to this question fell into nine large categories as follows:

Usually - 1. use Index Medicus
2. ask librarian
3. use own sources
4. look up specific references
5. find literature myself
6. use journals or books

7. use library more
8. more specifically medical
9. other

Two of these nine categories refer to what the source was, two more refer to where the source was located, another three refer to how the source was found, and one refers to the subject matter of the search.

Frequency count

When the punched cards were completed, a frequency count was done. The answers to each question were counted within each category and the percentages within the total were calculated.

Testing of Hypotheses

After the frequency count, the original nine hypotheses were statistically tested for significance of difference.

The first hypothesis [illegible] use more formal sources; those longer at [illegible] l sources" was the only hypothesis [illegible] d by a parametric statistic. The date used to [illegible] hypothesis was the years since degree which is a [illegible] with an interval scale. This measure was compared with the dichotomy, a yes/no response on use of formal and then on use of informal sources. The statistical test used was a biserial correlation.

The other hypotheses, as explained in Chapter IV were tested by the chi-square test since the data fell into independent classes, a nominal measure.

Results of Testing of Hypotheses

The results of the testing of the hypotheses were that no significant difference was found by the tests in any of the seven hypotheses. This means that the responses to the questions did not differ significantly from what might be expected in chance variation.

The seven hypotheses and the results of the test are given below:

Experience

1. Newer workers use more formal sources; those longer at work use more informal sources.

Sample Size	358
Mean	21.7263
Variance	97.8464
Standard Deviation	9.8917

Item	Formal Sources Variable 1	Informal Sources Variable 2
Total Count	358	358
0 Mean	21.809	20.94
1 Mean	21.317	22.549
0 Count	298	183
1 Count	60	175
R	- .0186	.0813
Y Ordinate	.257	.3988
Biserial R	- .027	.1019

Found a correlation of -.02 for the first variable and .08 for the second variable. The z scores for these are .2 and 1.2 respectively and are not significant at the .05 level.

Accessibility and ease of use

2. Those affiliated with hospitals having functional libraries use the Allen Memorial Branch of the Cleveland Health Sciences Library less.

Affiliation		Used Allen Library	Did Not Use Allen Library
Affiliated With Hospital Having Functional Library	Yes	96	153
	No	4	2

The chi-square value is .942 with a probability of .332 and is not significant at the .05 level.

Formal versus informal

3. Clinicians use more informal sources; researchers use more formal sources.

Source	Clinicians	Researchers
Formal	84	25
Informal	12	5
Both	78	23

The chi-square value is .378 with a probability of .828 and is not significant at the .05 level.

4. Teachers and researchers use more formal sources; administrators and clinicians use more informal sources.

Source	Clinicians and Administrators	Teachers and Researchers
Formal	96	34
Informal	12	5
Both	85	23

The chi-square value is 1.014 with a probability of .602 and is not significant at the .05 level.

Co-workers versus colleagues

5. Clinicians get most of their information from co-workers; researchers, from colleagues.

Source	Clinicians	Researchers
Co-worker	1	1
Colleague	4	0

The chi-square value is .150 with a probability of .699 and is not significant at the .05 level.

Delegation of documentation tasks

6. Clinicians ask librarians for information; researchers use library material themselves.

Method	Clinicians	Researchers
Asked Librarian	44	6
Did not Ask Librarian	92	33

The chi-square value is 3.485 with a probability of .062 and is not significant at the .05 level.

Use

7. If information is used for research or teaching, more formal sources will be used; if for administration and treating patients, more informal sources will be used.

Source	Research And Teaching	Administration And Clinical
Formal	78	49
Informal	11	6
Both	61	48

The chi-square value is .944 with a probability of .624 and is not significant at the .05 level.

Further analysis of data

The influence of the remaining variables was tested

next. These variables and the results of the chi-square tests upon them are as follows:

Use

1. Use, divided into five areas; (1) research, (2) teaching, (3) administration, (4) clinical work and (5) paper writing.

Source	Research	Teaching	Administration	Clinical	Paper Writing
Formal	70 (69%)	43 (68%)	3 (43%)	77 (64%)	18 (69%)
Informal	32 (31%)	19 (32%)	4 (57%)	43 (36%)	8 (31%)

The chi-square value is 2.573 with a probability of .632 and is not significant at the .05 level.

Work

2. Work, divided into four areas; (1) clinical, (2) research, (3) teaching, and (4) administration.

Source	Clinical	Research	Teaching	Administration
Formal	140(68%)	39 (71%)	11(100%)	15 (71%)
Informal	65(32%)	16 (29%)	0(0%)	6 (29%)

The chi-square value is 5.055 with a probability of .168 and is not significant at the .05 level.

Degree

3. Degree, divided into two areas; (1) clinical

(M.D., D.D.S., D.O.), and (2) academic (Ph.D., D.Sc., Ph.S.).

Source	Clinical	Academic
Formal	184(67%)	34 (68%)
Informal	89(33%)	16 (32%)

The chi-square value is .007 with a probability of .936 and is not significant at the .05 level.

Department of School of Medicine

4. Department of School of Medicine; six as follows: (1) Medicine, (2) Pathology, (3) Pediatrics, (4) Psychiatry, (5) Reproductive Biology and (6) Surgery.

Source	Medicine	Pathology	Pedi-atrics	Psychiatry	Repro-ductive Biology	Surgery
Formal	71(66%)	13 (72%)	15 (52%)	5 (28%)	12(71%)	52(79%)
Informal	36(34%)	5 (28%)	14 (48%)	13 (72%)	5(29%)	14(21%)

The chi-square value is 25.180 with a probability of .00145 and is significant at the .01 level.

Type of Position

5. Type of position on faculty of medical school, whether a clinical or an academic position.

Source	Clinical	Academic
Formal	92 (70%)	83 (60%)
Informal	39 (30%)	55 (40%)

The chi-square value is 2.579 with a probability of .108 and is not significant at the .05 level.

Specialty

6. Specialty; five as follows; (1) Internal Medicine, (2) Surgery, (3) Pediatrics, (4) Pathology, and (5) Psychiatry.

Source	Internal Medicine	Surgery	Pediatrics	Pathology	Psychiatry
Formal	39(75%)	29(74%)	14(54%)	11 (69%)	4 (27%)
Informal	13(25%)	10(26%)	12(46%)	5 (31%)	11 (73%)

The chi-square value is 16.154 with a probability of .02375 and is significant at the .05 level.

Faculty Time

7. Faculty time; whether part-time, full-time, or not on the faculty of the medical school.

Source	Part-time	Full-time	Not on Faculty
Formal	138(67%)	62(65%)	24(80%)
Informal	68(33%)	34(35%)	6(20%)

The chi-square value is 2.532 with a probability of .282 and is not significant at the .05 level.

Type of Information Sought

8. Type of information sought; divided into five groups; (1) disease, (2) treatment, (3) physiology, (4) literature review, and (5) specific article.

Source	Disease	Treatment	Physiology	Literature Review	Specific Article
Formal	85 (64%)	27 (69%)	24 (69%)	22 (81%)	16 (80%)
Informal	47 (36%)	12 (31%)	11 (31%)	5 (19%)	4 (20%)

The chi-square value is 4.727 with a probability of .45 and is not significant at the .05 level.

Comparison of Major Work Area With Use of Information

9. Comparison of major work area (clinical or research) with use of information (clinical or research).

Comparison		Work	
		Clinical	Research
Use	Clinical	117	4
	Research	47	49

The chi-square value is 90.272 with a probability of .00000 and is significant at the .001 level.

Results of Further Analysis

Six of the nine variables showed no significant influence on the use of formal versus informal sources. The three which did significantly influence the use of formal versus informal sources are department of the medical school, specialty and major work area.

Department of the School of Medicine

Psychiatry and surgery appear to account for most of the variance. Psychiatrists appear to use significantly fewer formal sources and more informal sources. Surgeons appear to do the opposite; use significantly more formal sources and fewer informal sources.

Specialty

Once again the main variance appears to be accounted for by psychiatrists, who use significantly more informal sources, and fewer formal sources.

Major work area

Both clinicians and researchers make their main use of information in their major work area. However, researchers almost always use information for research and very seldom for clinical purposes. Clinicians, on the other hand, while they usually use information for clinical

purposes, are much more likely to use information for research than are researchers likely to use information for clinical purposes.

Tabulations

The answers to the questions were counted within each sub-category and percentages figured. These tabulations follow:

Population Distribution of Returns

Clinicians	62%
Researchers	18%
Teachers	4%
Administrators	6%

Tabulations

1. What information did you seek?

	Percent	Cumulative Percent
Disease	39%	39%
Physiology	13%	52%
Treatment	11%	63%
Literature Review	8%	75%
Specific Article	7%	82%
Other	18%	100%

2. Did you find the information? Yes 97% No 3%
What specific person or publication gave you the information?

	Percent	Cumulative Percent
Journal Article	44%	44%
Book	19%	63%
Library or Librarian	16%	79%
Abstract or Bibliography or Index other than Index Medicus	5%	84%
Index Medicus	4%	88%
Another Doctor	4%	92%
My Own Resources	3%	95%
Other	5%	100%

3. For what did you use this information?

Treating patients		35%	35%
Diagnosis	40%		
Prognosis	5%		
Treatment	55%		
Research		33%	68%
Formulation	34%		
Execution	15%		
Interpretation	51%		
Teaching		18%	86%
Plan Course	3%		
Prepare Lecture	97%		
Prepare Examination	---		
Administration		2%	88%
Planning	71%		

	Percent	Cumulative Percent
Organizing	29%	
Executing	---	
Writing Paper	8%	96%
Other	4%	100%

4. Talk to someone face-to-face? Yes 38% No 63%

If yes, who?

	Percent	Cumulative Percent
Man in Your Subject Area	60%	60%
Librarian	18%	78%
Man in Another Subject Area	11%	89%
Other	11%	100%

Does this man work with you? Yes 48% No 51%

5. Telephone someone? Yes 25% No 75%

If yes, who?

	Percent	Cumulative Percent
Man in Your Subject Area	40%	40%
Librarian	39%	79%
Man in Another Subject Area	11%	90%
Other	10%	100%

Does this man work with you? Yes 22% No 78%

6. Write to someone? Yes 12% No 88%

If yes, who?

	Percent	Cumulative Percent
Man in Your Subject Area	69%	69%
Librarian or Library	11%	80%

	Percent	Cumulative Percent
Man in Another Subject Area	6%	86%
Other	14%	100%

Does this man work with you? Yes 5% No 95%

7. Use a printed source? Yes 91% No 9%

A. If yes, what kind?

	Percent	Cumulative Percent
Journal	44%	44%
Index Medicus	18%	62%
Book	17%	79%
Index other than Index Medicus	7%	86%
Bibliography	7%	93%
Other	7%	100%

Use a xerox copy? Yes 52% No 48%

B. If printed source used, who helped locate it?

	Percent	Cumulative Percent
Library	68%	68%
Own Resources	16%	84%
Man in Your Subject Area	9%	93%
Journal or Book	3%	96%
Other	4%	100%

4.-7.	Talk	Phone	Write	Printed Source
Man in Your Subject Area	60%	40%	69%	9%
Library or Librarian	18%	39%	11%	68%

	Talk	Phone	Write	Printed Source
Man in Another Subject Area	11%	11%	6%	--
Own Resources	--	--	--	16%
Journal or Book	--	--	--	3%
Other	11%	10%	14%	4%

7. C. If you used a library, what library?

	Percent	Cumulative Percent
Allen Memorial	41%	41%
Own Library	11%	52%
University Hospital	8%	60%
Mt. Sinai	7%	67%
Cleveland Metro. General	6%	73%
Cleveland Clinic	5%	78%
Medical School	4%	82%
St. Luke's	4%	86%
V.A. Hospital	3%	89%
C.W.R.U. Libraries	2%	91%
Other	9%	100%

D. How did you look for information in the library?

	Percent	Cumulative Percent
Went to Library Myself	68%	68%
Telephoned Library	19%	87%
Sent Someone to Library	7%	94%
Used Own Resources	2%	96%
Other	4%	100%

7. E. How did you look for information in the library?

	Percent	Cumulative Percent
Asked Librarian	28%	28%
Used Index Medicus	27%	55%
Browsed on Shelf	27%	82%
Used Card Catalog	7%	89%
Used Another Index	4%	93%
Other	7%	100%

8. Is search described typical? Yes 78% No 22%

If no, how does it differ?

	Percent	Cumulative Percent
Usually:		
Use Index Medicus	24%	24%
Asked Librarian	15%	39%
Use Own Sources	14%	53%
Look up Specific References	11%	64%
Find Literature Myself	11%	75%
Use Journals or Books	9%	84%
Use Library More	5%	89%
More Specifically Medical	3%	92%
Other	8%	100%

9. For what percent of your information searches do you use a library?

	Percent	Cumulative Percent
0 - 25%	24%	24%

	Percent	Cumulative Percent
25 - 50%	25%	49%
51 - 75%	16%	65%
76 -100%	35%	100%

10. What is your specialty?

	Percent	Cumulative Percent
Internal Medicine	25%	25%
Surgery	13%	38%
Pediatrics	9%	47%
Psychiatry	5%	52%
Obstetrics/Gynocology	4%	56%
Pathology	4%	60%
Radiology	4%	64%
Neurology	3%	67%
Urology	3%	70%
Chemistry	3%	73%
Physiology	3%	76%
Dermatology	2%	78%
Opthalmology	2%	80%
Endocrinology	2%	82%
Dentistry	2%	84%
Other	16%	100%

11. Years Since Degree.

	Percent	Cumulative Percent
0 - 10	10%	10%

	Percent	Cumulative Percent
11 - 20	39%	49%
21 - 30	29%	78%
31 - 40	18%	96%
41 - 50	4%	100%

12. Hospital Affiliation.

	Percent	Cumulative Percent
University Hospitals	37%	37%
Mt. Sinai	13%	50%
Cleveland Metro. General	9%	59%
St. Luke's	8%	68%
Cleveland Clinic	5%	73%
Highland View	3%	76%
Cleveland V.A. Hospital	3%	79%
St. John's	2%	81%
Lakewood	2%	83%
Euclid General	2%	85%
Lutheran	2%	87%
Deaconess	2%	89%
Other	11%	100%

Member of Faculty

Part-time	60%
Full-time	28%
Not on Faculty	11%

Degree

M.D.	80%
Ph.D.	11%
M.D./Ph.D.	4%
D.D.S.	3%
Other	2%

Department of Medical School

	Percent	Cumulative Percent
Medicine	34%	34%
Surgery	22%	56%
Pediatrics	9%	65%
Reproductive Biology	5%	70%
Psychiatry	5%	75%
Pathology	5%	80%
Radiology	4%	84%
Physiology	2%	86%
Other	14%	100%

Rank on Medical School Faculty

	Percent	Cumulative Percent
Academic	54%	54%
Associate Professor	13%	13%
Assistant Professor	13%	26%
Demonstrator	7%	33%
Professor	6%	39%
Senior Instructor	6%	45%

	Percent	Cumulative Percent
Director of Division	3%	48%
Fellow	3%	51%
Instructor	3%	54%
Clinical	46%	100%
Assistant Clinical Professor	21%	75%
Clinical Instructor	15%	90%
Senior Clinical Instructor	5%	95%
Associate Clinical Professor	4%	99%
Clinical Professor	1%	100%

CHAPTER VII

INTERPRETATION AND CONCLUSIONS OF THE STUDY

The study described in the previous chapters differs from former user studies in three ways. First, it was not limited to the use of libraries. Second, it attempted to test middle-range hypotheses. Third, it studied a large group of clinicians, who have not been looked at in just this way before.

Use of Libraries

Going back to the distinction Menzel makes in his definition of "empirical studies of scientific communication" (Chapter II), the approach of this study crosses over two of his distinctions. Menzel distinguished between studies of individual scientists, which look at the different ways in which a single man communicates; studies of one communication channel, or "use studies," which look at the variety of ways varied individuals use a single communication channel; and studies of the communication system, which look at the flow of information, all the media and how they interrelate to serve many individuals.[72]

The present study is not a straight use study since

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[72] Menzel, Flow of Information Among Scientists, p. 1.

it did not use current use of the library as a criterion in choosing respondents. Questionnaires were not handed to people as they came in to use the library, nor sent to people who had items currently checked out. Circulation records were not studied nor were any other measures of library use. Instead, the basis of choice in this study was enough interest in the library to join the association and pay a yearly membership fee. Since the study did not look at library use only, it is not a study of a single communication channel.

Neither was it a study of the varied ways a single man communicates because, although it questioned individuals, it did not attempt to find out all of the ways in which any one of them communicated. Rather, it concentrated upon one important communication and asked the various media that were used.

What the study did was to take a population of known library users and ask them about how they searched for information, that is, about the various media they used in a particular search. As such, it was not a straight use study, nor was it a study of scientists' communication behavior. Rather, it was a cross between the two, stressing one communication channel, the library, and looking at other media which were used by individuals instead of, or in conjunction with, this channel.

The population chosen was loaded toward libraries.

All were library association members and faculty members. As faculty members they might be expected to be more than ordinarily interested in scholarship, printed sources, and libraries. Since the School of Medicine is in close proximity to the library, the faculty had good physical access to the library. Library Association members might be expected to show greater use of, and more interest in, printed sources and libraries. Sponsorship of the study by the library might also cause respondents to think of libraries.

To recapitulate, then, this was not a study of library use, but it was expected that library use would be well represented. The interest lay in looking into other channels of communication used, as well, by strongly library-oriented people.

Tests of Middle-Range Hypotheses

As explained in Chapter III, the study attempted to test middle-range hypotheses synthesized from the conclusions of former user studies.

Libraries are one channel in the flow of information from originator to user. In order to understand the part they play as one channel in the larger system of information flow, libraries need to know what the larger system consists of. They need as clear and complete a picture as possible of the total communication pattern of their users for two

reasons. First, in order to be able to delineate their part in the total picture to better understand what they are now doing for the user. Secondly, in order to delineate what parts of the total they are not fulfilling to see how their facilities might be adapted to increase their services to the user.

The findings of previous user studies show that the principle of least effort applies. People use the easiest source of information which may be an oral or informal source. They give heaviest use to sources of information they are experienced in using. They use the closest source they can find. These general conclusions have implications for libraries, particularly in the areas of acquisitions, shelving, and education in the holdings and use of the library.

Further user studies point to different patterns of use by basic versus applied scientists, younger versus more experienced workers, organizational function, rank, academic discipline, work team, experience, seniority, educational level, professional activity, and professional orientation. There is evidence that channel selection is task specific and that use strongly influences relevance judgments. Therefore, if a library wants to have in its collection material relevant to its users, the library must know the background of its users and the tasks they perform.

Large Group of Clinicians

The medical area, vital as health is to all individuals, easily arouses interest and support. Dramatic breakthroughs such as the wiping out of poliomylitis, heart and other organ transplants, and the hope of future breakthroughs, has kept this interest high and active. The growth of publications in the medical area reflects this interest. The way in which doctors keep up with new information, as well as how they find information they want, is an area of active interest to libraries.

Membership of the Cleveland Medical Library Association has remained fairly constant over the past four years. However, attendance at the Allen Memorial Branch (members sign a book upon entering) has almost doubled in the last two years. It is assumed, since attendance has increased, that the library is being used more. 'Use' is here defined as putting in an appearance at the library. A change in use has occurred although library services and membership have remained constant. One variable has changed and others, which would be expected to vary with it, have not. To better understand the errant variable it is necessary to set beyond the library to the larger system of information flow of which both the library and the use of information are a part. An examination of the use of information by members of the library and a study of that part of their total information needs which the library fills, may

provide insight into the use of the library so that it can adapt its services to best encourage the continuance and expansion of the increased use noted above.

This study looked into the information-searching habits of a large group of doctors. As such, it hopes to add to the existing knowledge of the information-searching methods of clinicians.

Interpretation - Tests of Hypotheses

As reported in Chapter VI, the seven statements which were selected as middle-range hypotheses, when tested statistically, were not upheld at a significant level. Hypotheses are not disproved by a finding of no significance, so we are left with the question, why did the findings fail to support these generalizations which the findings of other user studies have supported?

An outline of the areas covered by the hypotheses, helpful in fitting the hypotheses into a larger conceptual framework, is given below:

I. Source of Information, Formal Versus Informal
   The three variables listed below were expected to influence the formality of the source used.
   A. Experience
   B. Type of Work, Theoretical Versus Applied
   C. Task, Use to Which Information Put

II. Material Used, Accessibility and Ease of Use

III. Individual Providing Information, Co-Workers Versus Colleagues

IV. Delegation of Documentation Tasks

Formal Versus Informal

A major distinction in the questionnaire was between the use of formal versus the use of informal sources. As documented in Chapter II, user studies have shown this to be an important distinction. Three hypotheses refer to this distinction.

The first hypothesis stated that "Newer workers use more formal sources; those longer at work use more informal sources." This hypothesis was not upheld at a significant level. Two factors may have affected this.

First, each respondent was asked about a single information search. It may be that a distinction between the habits of newer and more experienced workers would need to be studied by getting a more detailed picture of sources used in many searches by each individual.

Secondly, interns and residents were not included in the study. It may be that these two groups comprise the actual newer workers in the field who might be expected to rely on formal sources. By including only working physicians who have completed their residencies, the group studied may include only those who are more experienced as defined by other studies.

The third and fourth hypotheses refer to the differing use of formal versus informal sources according to type of work. In the study administrators and practitioners were equated with the applied scientist, or technician, since they are the ones who are applying the findings of their fields to the practice of their disciplines. Researchers and teachers are expected to be more literature oriented because they are involved in studying and extending the theoretical findings in their fields.

The third hypothesis states that "Clinicians use more informal sources, researchers use more formal sources. The fourth hypothesis states that "Teachers and researchers use more formal sources; administrators and clinicians use more informal sources." The problem here was twofold.

First, as had occurred in the pilot study, and in spite of the rewording of the questionnaire, use of formal sources was the main use reported. The sponsorship of the questionnaire by a library undoubtedly contributed to this. Another factor may be that, when asked about information searches, most people think of formal research, as they were introduced to it in school, and discount, even before thinking about it, the importance of oral communication as an information-gathering technique. In choosing a critical incident on which to report, the respondents may, therefore, have chosen, instead of the most recent

search, as asked, one which they considered a typical, traditional information search involving printed sources.

Secondly, the distinction between clinician and researcher may have been too finely drawn to have shown a difference in use of formal versus use of informal sources. Most of the men in the study were clinicians. But they were all on the faculty of the medical school and most reported either part-time teaching, which would mean they must be familiar with the research in their areas, or that they were engaged in part-time research themselves. It is very likely that these clinicians were more research-oriented than the majority of clinicians. This may be reflected in their use of formal sources.

As for the researchers, only sixty-four men reported that they spent most of their time doing research. Of this group most also did some clinical work and some teaching. Of the fifty-five members of the library association on the faculty of the School of Medicine who have degrees other than, or as well as, M.D.'s, only twenty-eight did not have an M.D. It becomes doubtful, therefore, whether these men can be equated with pure scientists, and can be expected to act accordingly, since they seem to work at the applied end of research.

To sum up, the group of clinicians and the group of researchers may have been too homogeneous to show the differentiation expected.

The group who spent most of their time in administration numbered only twenty-two and the group who spent most of their time teaching numbered only fourteen. These two groups also spent part-time in the other areas and this, combined with their small number, may have made differentiation impossible.

Accessibility and Ease of Use

The second hypothesis states that "those affiliated with hospitals having functional libraries use the Allen Memorial Branch of the Cleveland Health Sciences Library less. This hypothesis would seem to be less general than the rest; however, it related to more general conclusions. But it needs some explanation.

"Functional libraries are defined as libraries reporting personnel actually performing library tasks."[73] Personnel is considered essential to a library. Those hospitals which do not have library personnel may have a collection of books and journals but do not have a library. If a library is not available to physicians at their hospitals, they are more likely to use a central medical library. Stated the other way around, if a physician's hospital has an adequate library, he is less likely to use the central medical library directly. This related to

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[73]Allen M. Rees, Hospital Library Planning Data for the Northeastern Ohio Regional Medical Program, Interim Report No. 3 (Cleveland, Ohio: Western Reserve University, Center for Documentation and Communication Research, 1968), p. 33.

accessibility and ease of use which have been studied.

The findings of these studies relate to accessibility and ease of use of different channels. If these two factors are important between channels, they should also affect the use of two different libraries. Those physicians whose hospitals have adequate libraries may be expected to use a large central medical library less.

The problem here was the small number of physicians affiliated with hospitals having non-functional libraries. Only six physicians reported this affiliation. The reason for the small number of physicians affiliated with them is the small number of hospitals in the Cleveland area with non-functional libraries. Of the forty-one hospitals in greater Cleveland, only six have non-functional libraries. Of the thirty-four hospitals to which physicians reported affiliation, only four had non-functional libraries. The majority of the physicians in the study had access to functional libraries at their hospital.

However, in spite of the small number, twice as many physicians affiliated with hospitals with non-functional libraries used the Allen Memorial Branch as opposed to those who did not use it. In the larger group, 61 per cent did not use the Allen.

Co-workers Versus Colleagues

The fifth hypothesis states that "Clinicians get most of their information from co-workers; researchers,

from colleagues."

This hypothesis could not be tested because the questions relating to it were not answered. Only six people answered these questions. They were not answered for two reasons.

First, these questions related to use of informal sources and were only asked in the sections recording use of informal sources. As mentioned earlier, reports of the use of informal sources were much lower than expected. Therefore, these questions were answered by many fewer people than had been expected.

Secondly, it is probable that the question seemed meaningless to the respondents and, not seeing its relation to the rest of the questions, they did not answer it. The purpose of this question was not explained in the questionnaire, nor was it obvious, and this probably accounts for the poor response.

Delegation of Documentation Tasks

The sixth hypothesis states that "Clinicians ask librarians for information; researchers use library material themselves."

Two reasons may account for lack of significant findings to support this hypothesis. One is that the clinicians were not as completely applied scientists as a group of physicians who spend all their time practicing medicine would be. This was mentioned previously (p. 87-88).

A second reason for the failure to find a significant difference between the two groups may be that the number of researchers was small. Only thirty-nine men in this group reported that they spent most of their time doing research.

When the actual figures are examined, we see that only 16 per cent of the researchers asked a librarian for help, while 32 per cent of the clinicians did so. Eighty-five per cent of the researchers found information in the library themselves, while only 68 per cent of the clinicians found information in the library themselves.

Use

The seventh hypothesis refers to the use to which the information was put, the task the man was performing when he searched for the information. It states "If information is used for research or teaching more formal sources will be used; if for administration and treating patients, more informal sources will be used."

The data did not support this hypothesis when tested statistically. The reasons for this are probably the same as those mentioned earlier in connection with the other hypotheses related to the use of formal versus the use of informal sources.

These reasons are:

1. The respondents failed to consider an informal search a typical one.

2. The group of respondents comprised a fairly homogeneous group instead of a sharp division between clinician and researcher.
3. The group reporting their major work area to be research was quite small in comparison with the clinicians.
4. The groups reporting their main work area to be either teaching or administration were very small.

However, if we look at the number of people falling within each group (p. 65) we notice that 150 reported use for research and teaching, while only 108 reported use for administration and clinical work. Since the group of clinicians was so much larger than any of the others, it appears that clinicians used their information in a different area than their major work area. This shift was examined in the further analysis of the data.

Further Analysis of Data

As stated previously, the major breakdown in the questionnaire was whether formal or informal sources were used in searching for information. The seven hypotheses failed to point out factors affecting choice of type of source. Information on eight more variables was included in the questionnaire. These eight variables are (1) use, (2) work, (3) degree, (4) department, (5) type of position, (6) specialty, (7) family time, and (8) type of information

sought. These eight variables were tested to examine their influence on choice of type of source. A final test was done comparing major work area with the use to which the information was put.

Use

Use was divided into five areas, the four which were preset categories in the questionnaire; research, teaching, administration and clinical, and a fifth, paper writing, which eight per cent of the respondents wrote in. The chi-square test on this variable showed no significant difference on choice of type of source between the five groups. An examination of the actual number in each group (p. 66) shows that the group reporting use in the area of administration was too small to be meaningful. Of the other four groups, all showed much heavier use of formal sources than informal in all groups. This reflects the emphasis on use of formal sources which was explained earlier.

Work

Work was divided into the four areas which were preset categories on the questionnaire; clinical, research, teaching and administration. The chi-square test showed no significant difference between choice of formal or informal source based on type of work. An examination of the actual numbers in each group (p. 66) shows, once again,

much heavier use of formal as compared to use of informal sources.

Degree

Type of degree was divided into two groups; a clinical degree, either M.D., D.D.S., or D.O., and an academic degree; either Ph.D., D.Sc., or Ph.S. Those respondents with more than one doctoral-level degree were not included since most had a combination of one clinical degree and one academic degree. The chi-square test showed no significant difference between the two groups in use of formal versus informal sources. An examination of the actual figures (p. 67) shows heavy use, by clinicians, of formal sources.

Department

The departments of the School of Medicine with which enough respondents were affiliated to allow testing, are the following six; medicine, pathology, pediatrics, psychiatry, biology and surgery. The chi-square test showed a significant difference between department affiliation and use of formal or informal source. The test was significant at the .01 level, a very high degree.

Psychiatry and surgery appear to account for most of the variance. Psychiatrists appear to use significantly fewer formal sources and more informal sources. This seems reasonable in view of the primarily oral nature of their specialty. Surgeons appear to use significantly more

formal sources and fewer informal sources, the opposite of the psychiatrists. This also seems reasonable in view of the emphasis upon techniques which is a major part of their specialty.

Type of Position

Type of position on the faculty of the School of Medicine was also tested. The bulletin of the School of Medicine lists faculty within each department according to whether they have clinical or academic appointments. This division provided another opportunity to look at the use of formal or informal sources by clinicians as opposed to academicians, using a different criteria than had been used previously. The test showed no significant difference in the use of type of source between the two groups. A look at the actual numbers in each group (p.68) shows that both groups used more formal sources than informal. This may be explained by the heavy use of formal sources reported throughout the study, as well as the assumption that men involved in teaching are more likely to use formal sources.

Specialty

Specialty, as reported by the respondents, was divided into the five groups which contained large enough numbers to test. These five groups are; internal medicine, surgery, pediatrics, pathology, and psychiatry. The chi-square test showed a difference among the five groups, in

their use of formal versus informal sources, which was significant at the .05 level.

The breakdown by specialty appears to be related to the other significant finding, department of the School of Medicine, since the departments are broken down, to some extent although not entirely, by specialty. Once again, the main variance appears to be accounted for by psychiatrists, who use significantly more informal sources, and fewer formal sources.

Faculty Time

Faculty time divides into three groups; part-time, full-time, and not on faculty. Most were employed part-time, fitting the pattern mentioned earlier for Case Western Reserve School of Medicine graduates; dividing their time between practicing and teaching. The group who were not on the faculty are those members of the library association who have degrees other than M.D.'s and were included to see if their search for information differed from the main study group.

The results of the chi-square test on this variable showed no significant difference between the groups in their use of formal versus use of informal sources. A look at the actual numbers (p. 68) shows heavy use of formal sources by all three groups. The percentages of use of formal and informal sources is almost exactly the same for

part-time and full-time faculty members. In the part-time group, 67 per cent used formal sources, 33 per cent used informal sources. In the full-time group, 65 per cent used formal sources, 35 per cent used informal sources. Those not on the faculty showed a higher proportionate use of formal sources. Of this group, 80 per cent used formal sources, 20 per cent used informal sources. This higher use of formal sources by this group may be accounted for by the fact that the group consists mainly of the Ph.D.'s from other schools of the university. As mentioned earlier, Ph.D.'s might be expected to use more formal sources than M.D.'s.

Type of Information Sought

The open-ended question which asked what information was sought elicited many kinds of responses from very vague and general to particular and specific. The answers seemed to fall into five large, general groups, three related to the subject of the question and two related to the kind of information required. The five groups are; disease, treatment, general physiology, literature review and specific article. These groups were tested to see if the type of information sought influenced choice of formal or informal source. No significant difference was found in choice of source based on type of information sought. A look at the actual numbers in each group (p. 69) reveals heavier use of formal than informal sources, particularly

in the two groups where it would be most expected, literature review and search for specific article.

Comparison of Major Work Area with Use of Information

The final area to be tested statistically was a comparison of major work area with use of information. Of the original four work areas listed on the questionnaire; clinical, research, teaching and administration, only two, clinical and research were checked as major work area by enough of the respondents to be tested. The same occurred with answers to the question, "For what did you use the information?" Of the four-part breakdown, only two, clinical and research, contained large enough numbers to be tested. Therefore, a four-part table was set up to test whether the major work area in which the respondent listed himself was related to the use to which he put the information. It would be expected that major work and use of information would be in the same area. And this was, indeed, the case. The chi-square test showed a difference between the two groups, which was significant at the .001 level, an extremely high level. Most men used information in the same area as their major work.

As mentioned previously in connection with the seventh hypothesis, which also referred to use, it appeared that more respondents reported use in the areas of research and teaching, than in the applied areas of administration

and clinical work, in spite of the fact that the group studied contained many more clinicians than researchers (p. 93).

A look at the actual numbers in each group in the comparison of work and use which we are discussing now, shows that while each group used information primarily in their major work area, many clinicians used information in the area of research but very few researchers used information in the clinical area.

Tabulations

After the testing was completed, the answers to the questionnaire were counted within each category and percentages figured.

Major Work Area

A majority, 62 per cent of the respondents, listed their major work area as clinical. Eighteen per cent were primarily researchers; 4 per cent teachers; and 6 per cent administrators. The results, which follow, therefore, refer mainly to the information searching of clinicians affiliated with a teaching hospital.

Type of Information Sought

Most frequently sought was information about a specific disease. Thirty-nine per cent of the searches fell into this category. The two other subject categories were

physiology with 13 per cent, and treatment with 11 per cent. In all, 63 per cent sought information about a disease or its treatment or about physiology in general. The next two categories are particularly related to services which libraries are well able to provide. These are literature review with 8 per cent, and search for a specific article which 7 per cent sought.

Information Found

The vast majority, 97 per cent found the information sought. The remaining 3 per cent either did not find the information sought or did not find as much information as they wanted.

Type of Source

As expected in a field where current information is essential, the major source which provided the information was journal articles, where 44 per cent found what they sought. Nineteen per cent found the information sought in books. A total of 63 per cent of the respondents, therefore, found the information they sought in either journals or books, which are the mainstay of a library's collection. When we add to this the 16 per cent of the respondents who received the information they sought from a library or librarian, we have a total of 79 per cent who found the information they sought from sources that are the main concern of libraries. Nine per cent of the

respondents found the information they sought in indexes, 4 per cent in Index Medicus and 5 per cent in another index. These were probably searches for a specific article or literature searches, or the article referred to would have been listed as providing the information. Seven per cent of the respondents got the information sought from personal contact, 4 per cent from another doctor, and 3 per cent from their own resources.

Use of Information

The use to which the information was put was about evenly divided between the two main areas of clinical, with 35 per cent, and research, with 33 per cent, a total of 68 per cent. Within the clinical area, 44 per cent used the information for treatment, and 40 per cent for diagnosis. Within the research group, 51 per cent used the information for interpretation and 34 per cent for formulating research. The other two areas, teaching and administration accounted for a much smaller proportion of the use. Teaching had 18 per cent with 97 per cent of it used to prepare lectures. Administration had only 2 per cent, most of it, 71 per cent, used for administrative planning. Eight per cent wrote in a further category, paper writing, as differentiated from research, so this category was added in the analysis of the data.

Method of Searching

The questionnaire contained three informal breakdowns; talking, telephoning, and writing. None of these were used by a majority of the respondents. The one most often used was the easiest, talking to someone face-to-face, which 38 per cent of the respondents checked. Telephoning was next frequently used, with 25 per cent; and writing, least used, with 12 per cent. Printed sources were used by a large majority of the respondents, 91 per cent.

When we look at who was most important in helping the respondent locate the source of the information, we find that men in their subject area were most important for those who used informal sources. This was listed as most important by 60 per cent of those who checked talking, 40 per cent of those who checked phoning, and 69 per cent of those who checked writing. Those who used printed sources, on the other hand, received most help in locating these sources from a library or librarian, 68 per cent listing this as most important.

When asked if the man who was most helpful in locating the information worked with the respondent, almost half (48 per cent) of those who checked talking to someone face-to-face, the most-used of the informal sources, did work with the man they talked to. Of those who telephoned, 25 per cent phoned a man who worked with them, pointing up the importance of co-workers in informal communication.

As opposed to the other informal sources, those who telephoned called a library almost as often (39 per cent) as they called a man in their subject area (40 per cent). Although 68 per cent of those who used printed sources used a library to locate these sources, it is interesting to note that as many as 16 per cent located printed sources in their own office or personal collection.

There is a close correspondence between the responses to question seven, which asks what kind of printed source was used (p. 74) and answers to question two, which asks what person or publication gave the respondent the information (p. 71). Question seven, of course, leaves out all persons, and asks only about printed sources. But the responses are similar; 44 per cent checked journal, and 17 per cent checked book, as compared to 44 per cent and 19 per cent on question two. The main difference was the larger use of Index Medicus, 18 per cent, as compared to 4 per cent. When informal sources were not included in the question, and when only printed sources were asked about, there was a jump in listed use of indexes from 9 per cent to 25 per cent. The 16 per cent listing use of libraries in the earlier question may be reflected in the 18 per cent use of Index Medicus in the later question.

Xerox Use

The importance of xeroxing today is reflected in the

52 per cent of respondents who used xerox copies of the printed sources.

Library Use

Those who listed using a library, listed heavy use of the Allen Memorial Branch of the Cleveland Health Sciences Library (41 per cent). Somewhat surprisingly, the next most frequently used library was the respondent's own, used by 11 per cent of the respondents. This relates to the 16 per cent who used their own resources in locating printed sources, mentioned earlier, and reflects the importance of personal collections, particularly in specialized areas. Other libraries were used by 8 per cent or less of the respondents.

Method of Library Search

Sixty-eight per cent of those who used libraries went to the library themselves and 19 per cent telephoned the library. When asked how they looked for information in the library, those who went to the library themselves used three main methods. Twenty-eight per cent asked a librarian, 27 per cent used Index Medicus, and 27 per cent browsed on the shelves. Only 7 per cent used the card catalog, reflecting the fact that the catalog is probably used more by librarians than by patrons, particularly in special libraries.

Typical Search

When asked if the search described was a typical one for them, 78 per cent of the respondents answered yes. Twenty-two per cent did not consider the search they described typical. Those whose searches were not typical were asked to write in how the search differed from their usual searches. Twenty-four per cent said they usually used Index Medicus; 15 per cent usually asked librarian; 14 per cent usually used own resources, a large proportion, to fulfill most of their information wants with their own materials; and 11 per cent usually looked up specific references, meaning they had discovered what they wanted to refer to outside the library and used the library as a place where the items were stored. Another 11 per cent usually found literature themselves, which, when added to those who used their own sources or looked up specific references, totals 36 per cent, more than a third, who discovered the item containing the information they wanted without using the searching services provided by libraries.

Percentage of Library Use

All the respondents were asked for what per cent of their information searches they used a library. Only 35 per cent said that they used a library for more than three-fourths of their searches. Only 51 per cent use a library for more than half their searches. On the other hand, 24 per cent of the library members filling out the questionnaire,

use a library for one-fourth or fewer of their information searches.

Specialties

Fifteen specialties were represented, but exactly one-fourth of the respondents specialized in internal medicine. There were half as many surgeons, the next largest group, as there were internists. Pediatricians comprised the next largest group (9 per cent) followed by psychiatrists (5 per cent).

Experience

The largest group of respondents (39 per cent) had been practicing from eleven to twenty years. The next largest group (29 per cent) were older, having practiced from twenty-one to thirty years. This 68 per cent represents the most active years of practice, from eleven to thirty years after receiving their medical degrees. Ten per cent of the group were younger than these, 22 per cent were older.

Hospital Affiliation

Thirty-seven per cent of the study group listed their main hospital affiliation as University Hospitals, the teaching hospitals connected with the School of Medicine of Case Western Reserve University and near which the Allen Memorial Branch Library is located. This group, with the

second largest (13 per cent) affiliated with Mt. Sinai Hospital, made up 50 per cent of the study group. When we add the next three largest groups, Cleveland Metropolitan General (9 per cent), St. Luke's (8 per cent) and Cleveland Clinic (5 per cent), we find that these five hospitals represent the affiliation of almost three-fourths of the study group (73 per cent).

Faculty Time

Sixty per cent of the respondents were part-time faculty members of the School of Medicine. Another 28 per cent were full-time faculty members, totaling 88 per cent of the study group who were on the faculty of the School of Medicine. Eleven per cent of the study group was not on the faculty of the School of Medicine. This includes most of the Ph.D.'s in the group and most of the membership of the library association who had degrees other than M.D.'s.

Degree

Eighty per cent of the study group had an M.D. degree only, making the study mainly one of physicians. Eleven per cent had Ph.D.'s only. Four per cent had both M.D. and Ph.D. degrees and 3 per cent had D.D.S. degrees.

Department

The percentages of respondents in the different departments of the School of Medicine (p. 79) correspond

fairly closely to the percentages of respondents in the various specialties (p. 77). Thirty-four per cent of the respondents were in the Department of Medicine, compared with 25 per cent who specialize in internal medicine. Twenty-two per cent were in the Department of Surgery, compared to 13 per cent specializing in surgery. Medicine and surgery are the two largest departments of the School of Medicine, together comprising more than half of the faculty.

Position

The respondents represent all levels of the academic and clinical faculty hierarchy. Thirteen per cent were Associate Professors, another 13 per cent were Assistant Professors, the largest two groups. The other levels, from Division and Department Directors through Fellows, were represented by smaller percentages.

The clinical faculty was similarly represented. Twenty-six per cent of the respondents were Assistant Professors, 15 per cent were Clinical Instructors and the other levels were represented by smaller percentages.

Further Points

There are several points to remember in considering the information brought out by the testing of the hypotheses, further analysis of the data, and tabulations.

First, it must be kept in mind that this was not a

study of library use. The tabulations reflect high use of printed sources and high use of libraries. This is in spite of the fact that the respondents were asked about information search, not localized in any one channel.

Second, the study did not attempt to tap the range of sources used in information searches by an individual. Instead, the respondents were asked to concentrate on a recent search and to check, in each area, what was most important in their search. Therefore, the responses must receive the added emphasis of having been selected, in the judgment of the respondent, as the most important sources in that area.

Index Medicus

The need to pick out the most important source in each area may have led to lower reflected use of Index Medicus, for example, than actual use. An index is less likely to be listed as a final source than is an article or book. Index Medicus is listed by only 4 per cent of the respondents as being the specific publication which gave them the information they sought. When asked what was the most important printed source used, there is a jump to 18 per cent who list Index Medicus. When asked how they looked for information in the library, 27 per cent used Index Medicus. And when asked how the search described differed from their usual searches, 24 per cent wrote in

that they usually used Index Medicus.

Informal Use

One important area that needs to be pointed out is the high use of informal sources reported. In spite of the fact that the majority of the responses referred to formal sources, and in spite of the fact that the hypotheses were not upheld in their division between use of formal and informal sources, the actual figures reflect high enough informal information search to dictate increased attention to this area. In the further analysis of the data (pp. 66-70) use of informal sources was reported in the different groups by from 19 per cent to 73 per cent of the respondents.

Use of Own Resources

Another area of interest is the reported use of their own resources by the respondents. Three per cent listed their own resources as the publication which gave them the information. Sixteen per cent said their own resources were the most important in helping them locate the printed source they used. Eleven per cent said their own library was the most important one they used. Two per cent used their own resources to look for information in a library. Fourteen per cent said the search described differed from their usual searches because they usually used their own resources. These figures point up the importance of

personal resources and collections in fulfilling information requirements.

Libraries

Another area which needs pointing up is the references to the use of libraries throughout the study. When asked what information was sought, 15 per cent listed either literature review or a specific article as what they wanted. These types of requests libraries are specifically geared to fulfill. When asked what person or publication gave them the information, 16 per cent specified a library or librarian.

Of those who talked to someone, 18 per cent talked to a librarian. Of those who telephoned someone, 39 per cent telephoned a librarian. Of those who wrote to someone, 11 per cent wrote to a librarian or library. Of those who used a printed source, 68 per cent were helped in locating that source by a library.

Delegation

The study seems to support the fact that patrons do library searching themselves rather than delegating that task. Seventy-one per cent of the clinicians and researchers who used a library did not ask a librarian for help. As already mentioned, 68 per cent of those who used a library went to the library themselves. Only 19 per cent telephoned the library, and only 7 per cent sent someone to the library.

Only 28 per cent of those who went to a library asked a librarian for help. Seventy-two per cent used the resources themselves. However, when asked if the search described was typical, 15 per cent said they usually asked a librarian for information. This adds up to a large use of libraries, but a small use of the personal services offered.

Xerox

The final point which should be emphasized is the high use of xerox copies. Fifty-two per cent of those who used printed sources used xerox copies of those sources. This is an area which has been growing in use in libraries and needs to be considered to see if service is adequate.

CHAPTER VIII

RECOMMENDATIONS AND SUGGESTIONS BASED ON FINDINGS OF THE STUDY

In the process of studying past user studies and designing and conducting a user study on a particular library, the author has learned a great deal. In this chapter an effort will be made to communicate some of that learning. An attempt will be made to relate the present study to past user studies, make suggestions for future user studies, and make recommendations for the Allen Memorial Branch of the Cleveland Health Services Library on which the study was done.

Relation of this Study to Past User Studies and Recommendations for Future Studies

Chapter II reviewed the literature in the area of user studies. Mention was made of the large number of studies which have been conducted. The major criticism of user studies is that they are not generalizable. Reasons for this are given on page ten. The present study attempted to avoid the four pitfalls mentioned there, in the following ways:

1. Many studies were done for a single purpose in a particular place and looked at only part of

the information searching habits of its participants. The present study attempted to discover all methods used in searching.

2. Many studies looked at only scientists in a research environment. The present study looked at practitioners in many areas of medical work.
3. Most studies concentrate on the packages used (i.e., journal, etc.). The present study included informal as well as formal searching.
4. Sampling and analysis in the studies varied, so results were difficult to compare. The present study attempted to eliminate sampling and to use standard techniques of analysis.

Generalizations

In spite of the difficulty of comparing past user studies, generalizations can be drawn from their results. These generalizations were also discussed in Chapter II. The present study attempted to test these generalizations in a new environment. These generalizations relate to the following variables: 1) use of formal versus informal sources based on A) experience, B) type of work, and C) task; 2) accessibility and ease of use; 3) co-worker versus colleague as source of information; and 4) delegation of documentation tasks. These four variables will now be discussed individually in an effort to relate the findings

of previous user studies to the findings of the present study and to make suggestions for further studies.

Experience

Three studies backed up the belief that more experienced workers rely on informal sources while newer workers rely on formal sources. One was a study of journals scanned. The subjects were asked to state what channel was most important in calling attention to current developments. Those with higher seniority rated channels involving personal communication higher than their juniors did.[74] It may be that current awareness is an area where personal communication is particularly important.

The second study involved only twenty people. When asked how they kept abreast of current literature, it was found that experienced literature users generally use more informal techniques than the less experienced. This was an interview study, in depth, of a small group.[75] It may be that a connection between experience and use of informal sources can best be studied by in depth studies of individuals.

The third study showed that the person who requests preprints of articles to be published in four American Psychological Association journals is a young researcher,

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[74]Wuest, Measuring Information Requirements.

[75]Uytterschaut, "Literature Searching."

anxious to stay current in his field.[76] It may be that the present study, by excluding interns and residents, did not actually include the young researcher.

To sum up, a connection between experience and type of source used appears to exist. In order to study this area meaningfully, it may be necessary to look at experience in relation to what kind of information is wanted (i.e., current awareness) as well as in relation to type of source used (i.e., formal or informal). Secondly, a meaningful picture in this area may need to be based on an in depth look at each individual's information searching habits to get a broad enough range to be able to pick out what is meaningfully related from the complex influences acting upon an individual. And, finally, it may be necessary to clearly define the boundary between young and more experienced so as not to miss a distinction which may exist for only a few years in the life of the researcher.

Type of Work

Many studies have linked type of work to type of source. Those in theoretical areas are believed to use more formal sources and those in applied areas, and medical practitioners in particular, are believed to rely more upon informal sources. Herner has been active in looking into this distinction. His study at John Hopkins found research

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[76] Garvey, "Communication in Psychology."

in the literature routine for the pure scientist. His review of studies of physicians lists five studies which found they preferred oral communication over use of printed sources. A very large study of British physicists and chemists found more literature dependence among pure scientists than among technologists. Allen's 'matched' laboratory study's chief conclusion was that scientists use more literature sources and technologists, more oral sources.[77]

This distinction was not upheld in the statistical testing of hypotheses in the present study. Possible reasons for this are discussed on pages 87-88.

The present study was mainly one of clinicians who would represent the applied part of the distinction and would be expected to favor oral, informal sources. When we look at the tabulations we see that much informal use was reported. Talking was listed by 38 per cent of the respondents; telephoning, by 25 per cent (p. 104). Use of informal sources was reported, in the different breakdowns, by from 19 per cent to 73 per cent of the respondents (p. 110).

This informal use was reported in spite of the fact that the clinicians in the study were affiliated with a

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[77]Herner, "Information Gathering Habits;" Weinstock, Design for the United States Medical Library; Great Britain Advisory Council on Scientific Policy, "Survey of Information Needs;" Allen, "Managing the Flow."

medical school and were, therefore, more research and teaching oriented than totally applied. Further, this informal use was reported in spite of the fact that the study was sponsored by a library; which apparently caused the respondents to think of library use to a greater extent than of informal communication.

To gain a clearer picture of the use of oral sources by clinicians, it is suggested that a broader range of clinicians be questioned, including those isolated from teaching hospitals and from easy physical access to substantial libraries. A study which emphasized oral sources, as the present study emphasized printed sources and library use, might balance the picture.

Task

Three studies relate task to choice of source. Reese and Schultz found that relevance judgments were related to research phase. Judges were divided into groups by type of work and only group membership was a significant correlate of judgment.[78]

The Cuadra-Katter studies found that use influences relevance judgments. Judges rated abstracts against information requirement statements tied to "implicit use orientations." The use orientation was found to strongly influence

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[78]Rees, Study of Relevance Assessments.

relevance judgments.[79]

Allen's 'matched' laboratory study also showed evidence that channel selection is task-specific.[80]

The present study looked at the relationship between use of information and choice of formal or informal source. A significant relationship was not found. Possible reasons for failing to find a relationship are explained on pages 92-93.

It does appear that research leads to more information searches than teaching, administration or clinical work, since the information found was used for research to almost the same percentage as was listed for treating patients (p. 72) although most of the respondents were engaged mainly in clinical work. Teaching also seemed to lead to more information search. Sixty-two per cent of the respondents were mainly clinicians but only 35 per cent used information in this area. Eighteen per cent were mainly researchers, but 33 per cent used information in this area. Only 4 per cent were mainly teachers but 18 per cent used information for teaching. Six per cent were mainly administrators but only 2 per cent used information in this area. Therefore, it would appear that the task a man is doing, even if it is not his major work area, may have more relevance to his information searches than

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[79]Cuadra, "The Relevance of Relevance Assessment."

[80]Allen, "Managing the Flow."

what he considers his primary work area. The different kinds of work a man is doing and the relation of each to his information searching needs to be examined more specifically in future studies.

Accessibility and Ease of Use

Two studies point up the importance of ease of use on choice of source. Both asked respondents to rate various channels on ease of use. The Rosenberg study compared these ratings with ratings of the same media on performance in information seeking and amount of information expected. The conclusion was that ease of use was more important than amount of information expected.[81]

The Allen and Gerstberger study compared rankings on ease of use with rankings of the same channels on accessibility, technical quality and previous use. The conclusion was that accessibility and ease of use correlated more highly with channel use than did technical quality.[82]

The present study attempted to look into this area by comparing affiliation with hospitals having functional libraries with use of the central medical library. It was expected that physicians whose hospitals had adequate libraries would use the central library less. But too few physicians in the study were affiliated with hospitals having non-functional libraries to make this comparison

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[81] Rosenberg, Studies in the Man-System Interface.

[82] Allen, Criteria for Selection.

meaningful.

What the study did bring out, however, was the high use of sources which common sense tells us are accessible and easy to use. *In searching for information* 33 per cent of the respondents talked to someone face-to-face, 25 per cent telephoned. Seven per cent of the respondents got the information they sought from personal contact, either from another doctor or their own resources. Forty-one per cent of those who used a library used the Allen Memoiral which is in close physical proximity to the medical school. The next most used library was even easier to use, the respondent's own.

This is an area which needs to be looked into further. Libraries base selection mainly on technical quality. Libraries select material for use. It is the place of research to examine the part ease of use plays as compared to technical quality.

The studies mentioned above asked for rankings of channels according to quality and ease of use. Future studies could look into the actual behavior of the patron when faced with choice of source as opposed to asking for ratings removed from actual use.

Co-worker versus Colleague

Three studies support the contention that technologists get most of their information from co-workers, that

is, men who are physically near them at work; and researchers rely on their colleagues, co-professionals in their subject area, although perhaps at a distant location.

Two studies of work teams, the Auerbach and North American Aviation studies, found that the co-worker and local work environment accounted for from 51 per cent to 60 per cent of first sources of information. The Rosenbloom and Wolek study found that engineers draw 63 per cent of their information from in-house sources, especially co-workers, and that scientists look outward for 67 per cent of their information.[83]

Too few people responded to the questions which asked if the person from whom they got information worked with them to allow meaningful statistical testing. The possible reasons for this are explained on page 91.

A better picture of this distinction can be gotten by looking at the tabulations of the answers to the questionnaire. Of those who talked to someone face-to-face, 48 per cent talked to a co-worker. Sixty per cent talked to a man in their subject area. This drops to 40 per cent those

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[83]Auerbach, DOD User Needs Study; North American Aviation, Autonethic Division, DOD User Needs Study, Phase II, Final Technical Report, Co-2442/030 (Anaheim, Calif.: North American Aviation, 1966), cited by Paisley, "Information Needs and Uses," pp. 12-13; Rosenbloom, Technology, Information, and Organization.

who telephoned a man in their subject area. This drop is accounted for by a corresponding increase in use of libraries by telephone. The per cent rises to 69 per cent for those who wrote to a man in their subject area. Of those who used printed sources, only 9 per cent got these from a man in their subject area, the drop being accounted for by increased use of libraries for locating printed sources.

The above gives a picture of interaction with co-workers, colleagues and libraries. The study was mainly of clinicians, who are at the practical end of their discipline. They show a high use of co-workers in the most informal communication, talking to someone face-to-face. When it came to writing, a high per cent wrote to colleagues. In locating printed sources, libraries played a major role.

The pattern described above suggests an interrelationship between the three types of sources; co-workers, colleagues and libraries, which related these sources to the method of search and, possibly, the type of information wanted. Further studies looking into this area may be able to pinpoint the variables affecting use of these three sources.

Delegation of Documentation Tasks

Two studies, one of social scientists and one of pure and applied scientists, found that technologists dele-

gate their documentation tasks, researchers involve themselves in searches for information.[84]

When tested statistically, this distinction did not hold. However, the trend is apparent in the figures. Eighty-five per cent of the researchers found information in the library themselves; only 68 per cent of the clinicians did so. Thirty-two per cent of the clinicians asked a librarian for help, only 16 per cent of the researchers did so.

When the entire group of respondents are examined, low delegation of documentation tasks to libraries is apparent. Sixty-eight per cent of those who used libraries went to the library themselves. Only 28 per cent asked a librarian for help. The rest used the collection themselves.

The low delegation of tasks to libraries and librarians, when contrasted with findings that technologists prefer to delegate tasks, raises questions about the reasons for the lack of delegation to libraries. This is a pregnant area for further investigation.

Recommendations for Libraries

As discussed in Chapter I, libraries perform three main services; acquiring materials, organizing these materials, and facilitating their use. This section will

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[84] Uytterschaut, "Literature Searching;" Herner, "Information Gathering Habits."

try to use the information gathered in this study as a basis for suggestions in the three main areas of library service.

Acquisitions

Materials are purchased either because they were requested by an individual or because they fit into the subject area a library considers its concern. But budget considerations limit the amount which can be bought and make it important to do efficient purchasing. User studies can help in this area by delineating the work areas of the users as an aid in deciding what to buy.

The present study was limited to one type of user, the working physician who also teaches at the School of Medicine. This group consisted of 62 per cent clinicians, 18 per cent researchers, 4 per cent teachers, and 6 per cent administrators. The main specialties represented were internal medicine (25 per cent), surgery (13 per cent), pediatrics (9 per cent), and psychiatry (5 per cent). The information they requested fell into three main areas; disease (39 per cent), physiology (13 per cent), and treatment (11 per cent). They used this information 35 per cent for treating patients, 33 per cent for research, 18 per cent for teaching and 2 per cent for administration.

It is not known whether these breakdowns represent the membership as a whole, since the categories were self-

defined by the respondents and similar information is not available from the membership as a whole. This is one of the weaknesses of a questionnaire study. However, the rate of return of the questionnaires was high. The sample was half the membership. Therefore, it is hoped that the respondents fairly represent the total membership.

The above breakdowns give us a picture of the main user from the group of practicing physicians on the faculty of the School of Medicine. He is a clinician in the area of internal medicine who uses information about diseases in the treatment of his patients. The next step, outside the scope of this study, is to examine the collection to see how adequately it can fulfill the demands of this user.

Another area, important to acquiring material, is the type of material used. The present study found that journal articles were the most used sources (44 per cent). Books were next most used (19 per cent). When asked about use of printed sources only; 44 per cent used journals; 18 per cent Index Medicus; and 17 per cent books.

If we examine the Allen Memorial Library statistics for 1967, we find the total number of volumes was 109,852. This includes both books and journal volumes. In order to distinguish between books and journals, we must look at additions to the library. Book additions were 1,456 volumes, journal additions were 1,297, about 50 per cent of each.

The 44 per cent use of journals mentioned earlier, corres-

ponds closely to 50 per cent addition of journals.

The total number of serials currently received is 1,097. Since the total collection is 109,852, this represents 10 per cent of the collection. There is no way to meaningfully relate these figures since earlier volumes of serials are counted in the total volume figure. Forty-five new serial titles were added, a 4 per cent increase in number of serials received. This represents a healthy growth in the type of material which receives much use.[85]

Organization

Are the physical facilities of the library well used? Is the space within it adapted to the library's user? Is the collection arranged for his convenience? What factors affect physical arrangement? What is the best way to use available floor space? How should items be shelved?

The present study emphasizes that it is important to consider accessibility and ease of use for the patron when answering these questions. A discussion of this can be found on pages 122-123.

In addition to the factor just mentioned, an examination of the kinds of materials users rely upon and of the subject areas he is concerned with, aid in making decisions on use of space and arrangement of items on the shelves.

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[85] "Summary of Library Statistics -- 1967," Bulletin of the Cleveland Medical Library, XV (April, 1958), p. 59.

The proportion of use of journals, books and Index Medicus has already been mentioned. Obviously, journals to be shelved accessibly, and Index Medicus, a key to articles, nearby. Books are less used and can be less accessible.

Within the journal and book collections account should be taken of the major users, their specialties, the kind of information they request, and the purpose for which they use this information as discussed on page 127. It is probable that a straight alphabetical arrangement of journals, many of them in the stacks, will not make the most used journals the most accessible. It is also probable that a straight arrangement of books on the shelves by classification number will not make the most used books the most accessible.

The next step, outside the scope of this study, is to look at the library and see where those items most likely to be used are actually located. It will be an administrative decision to balance the arrangement of materials by users' interests against its arrangement by logical order, to see which will actually make materials most accessible to users.

Facilitating Use

As mentioned in Chapter I, the study described in this paper was a study of the characteristics of the users

of the Allen Memorial Branch Library and of how they find information, what sources they use and for what they seek information. The question then arises, what can the Allen Memorial Branch do with this information about their users in the area of facilitating the use of the library?

A great deal of library use, and use of the Allen Memorial Branch in particular, was mentioned in the responses to the questionnaire. But first let's look at the characteristics of the user.

Characteristics of the User

This study looked at a group of working physicians who comprise about one third of the total membership of the Cleveland Medical Library Association. The other two-thirds of the membership are interns and residents.

The largest number of users within this group are clinicians. The main specialty is internal medicine. Most had been practicing from eleven to twenty years. The largest number were affiliated with University Hospitals. Most were part-time faculty members of the School of Medicine and had an M.D. degree only.

Profile of Typical Search

Most information searches were for information on diseases and was used for treating patients. Almost all respondents used printed sources. However, within the various groups between twenty per cent and seventy-five per

cent of the respondents used informal sources. Of these, the most often used was talking to someone face-to-face. Telephoning was next. Some used their own resources exclusively.

Most of those who used informal sources found men in their subject area most important in helping them locate these sources. Journal articles were the main printed source used. More than half used xerox copies.

Of those who used a library, most used the Allen Memorial Branch Library and went there themselves. Their method of search was evenly divided between asking a librarian, using Index Medicus, and browsing on the shelves.

Use of the Library

Now let us go back to the questions we asked in Chapter I. How would a user study help a library facilitate the use of the collection? By finding out how the collection is used.

Use of Libraries in General

First of all, how much are libraries used by members of the Cleveland Medical Association? Thirty-five per cent said they use a library for more than three-fourths of their searches. Fifty-one per cent use a library for more than half their searches. Twenty-four per cent use a library for less than one-fourth of their searches. This leaves a fertile area for examination of ways to expand

services to fill a larger proportion of information needs.

How Library is Used

The next question asked was how do patrons use the library? Do they telephone and ask for information? Twenty-five per cent of the respondents used a telephone in their search. Of these, 39 per cent called a library, almost as many as called a man in their subject area. This means that libraries play an important part in telephone searches and telephone searches account for a quarter of the searches made. Nineteen per cent of those who used a library telephoned the library. The great majority of users went to the library themselves. But telephoning was an important secondary method of search, used by a fifth of the patrons.

Do patrons come in and look for items themselves? Yes, the vast majority (68 per cent) of those who used a library went to it themselves. Seven per cent sent someone to the library and two per cent used their own resources there.

If so, how do they look? The three main ways were asking librarian (28 per cent), using Index Medicus (27 per cent), and browsing on the shelves (27 per cent).

Card Catalog

Do they use the card catalog? Only seven per cent used the card catalog, making it a minor method of search

for the patron. It would be interesting to find out the proportion of card catalog use by the staff of the library, which would probably be high.

Kinds of Materials Used

In what proportion do they use various kinds of material? This, of course, has been discussed throughout the paper and is present in the profile discussed above. Materials used were journals (44 per cent), books (17 per cent), Index Medicus (18 per cent), other indexes (7 per cent), and bibliographies (7 per cent).

Services

The next step, for the Allen Memorial Branch, is to examine the findings of this study in terms of the services they provide. The characteristics of the user need to be considered in the area of acquisition of materials. The method of search of the user needs to be considered in the area of providing services for him. Information on diseases was most requested. Printed sources were most often used. Journals were the most frequently used of the printed sources and xerox copies of these materials were used by more than half of the respondents.

Photoduplication

Photoduplication services were first provided by the Allen Memorial Branch in 1958. In that year 471 pages were duplicated for 35 members. The service grew rapidly

as follows: 2,933 in 1959, 3,042 in 1960, 10,559 in 1961, 15,879 in 1962. In September 1962, a Xerox was installed at the library and rapid growth continued as follows: 46,196 in 1963, 55,178 in 1964, 46,857 in 1965, 37,533 in 1966, and 26,594 in 1967.[86] This recent area of service, because of the convenience it provides for the patron, and because of the large per cent who use this service needs constant reexamination and reevaluation.

Telephoning

Telephoning appears to be a much used method of search. However, most patrons went to the library themselves. An examination of the telephone service provided by the library may lead to discoveries of how it may be extended since it is an easier means of access to the library than going there in person.

Use of Library by Patron

Of those who went to the library, more than half used indexes or browsed on the shelf. Only a quarter asked a librarian. It would be worthwhile to look into the reasons patrons prefer to find material themselves since it would appear to be easier to ask someone who was more familiar with the material, its arrangement, and use than they are themselves.

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[86] "Summary of Library Statistics," Bulletin of the Cleveland Medical Library, XVI-XXV (1959-68).

Card Catalog

Only seven per cent of the respondents used the card catalog. This entire area needs further examination. Why do patrons not use the catalog to a higher degree? Is it highly used by the staff of the library? The percentage of use of the catalog should be considered in relation to the cost of maintaining it.

To sum up, this study has pinpointed, for the library, the characteristics of one group of its users and outlined their methods of searching for information. It is hoped that this information may be used as a base for further studies, and will be useful in making administrative decisions within the library.

APPENDIX

In order to serve you better, we at the Allen Memorial Library are trying to find out more about how you, our members, get the information you want for your work.

You can help us by filling out this short questionnaire, and returning it to us in the enclosed envelope.

Please cooperate.

Sincerely,

Robert G. Cheshier

Robert G. Cheshier

Director
Avenue

THIS IS NOT A SURVEY OF LIBRARY USE ONLY. WE WANT TO FIND OUT HOW YOU GET INFORMATION YOU NEED FOR YOUR WORK -- WHETHER FROM LIBRARIES, FROM COLLEAGUES, OR FROM OTHER SOURCES.

PLEASE THINK BACK TO THE LAST TIME YOU WANTED AN ITEM OF INFORMATION IMPORTANT TO YOUR WORK.

1. What information did you seek? (i.e., what question were you asking or what specific thing did you want information about?)

_____

2. Did you find the information? ___yes ___no

   If YES, what specific person or publication gave you the information?

_____

3. For what did you use this information? Please check the one which was most important to you.

Research	Teaching
☐ formulation	☐ plan course
☐ execution	☐ prepare lecture
☐ interpretation	☐ prepare examination
Administration	**Treating patients**
☐ planning	☐ diagnosis
☐ organizing	☐ prognosis
☐ executing	☐ treatment

☐ other, please specify:_____

FROM THE TIME IT FIRST OCCURRED TO YOU THAT YOU WANTED THE INFORMATION, DID YOU:

4. Talk to someone face-to-face? ___yes ___no

   IF YES, please check the one most important in your search (not necessarily the last step).

☐ a man in your subject area

☐ a man in another subject area

☐ a salesman

☐ someone else, please specify:_____

Does this man work with you? ___yes ___no

5. Telephone someone? ___yes ___no

IF YES, please check the one most important in your search (not necessarily the last step).

☐ a man in your subject area

☐ a man in another subject area

☐ a salesman

☐ someone else, please specify:_____

Does this man work with you? ___yes ___no

6. Write to someone? ___yes ___no

IF YES, please check the one most important in your search (not necessarily the last step).

☐ a man in your subject area

☐ a man in another subject area

☐ a salesman

☐ someone else, please specify:_____

Does this man work with you? ___yes ___no

7. Use a printed source? ___yes ___no

IF NO, please skip to question 8.

IF YES, what kind of printed source was most important in your search (not necessarily the last step)? Please check one of the following:

A. ☐ commercial brochure ☐ handbook
☐ journal ☐ encyclopedia
☐ Index Medicus ☐ dictionary
☐ another index ☐ book or textbook
☐ abstract ☐ other, please specify:
☐ bibliography _____

Did you use a xerox copy? ___yes ___no

B. IF YOU USED A PRINTED SOURCE, which one of the following was most important in locating the printed source?

☐ a man in your subject area
☐ a man in another subject area
☐ a salesman
☐ a library
☐ other, please specify:_____

C. IF YOU USED A LIBRARY, what library was most important in your search?

_____

D. How did you look for information in the library? Please check the one which was most important in your search.

☐ telephoned library
☐ sent someone to library
☐ went to library yourself
☐ other, please specify:_____

E. IF YOU WENT TO THE LIBRARY YOURSELF, how did you look for information in the library? Please check the one most important in your search.

☐ asked librarian

☐ used Index Medicus ☐ browsed on shelf

☐ used another index ☐ reference collection

☐ used abstract ☐ journal collection

☐ used card catalog ☐ other, please specify:

_____

8. Is the search you described above typical of how you get most of the information you want for your work?
___yes ___no

IF NO, how does it differ from your usual searches?

_____

9. For what percent of your information searches do you use a library? _____per cent

10. What is your specialty or subject area? _____

11. Year M.D. or Ph.D. earned: 19__

12. If you are affiliated with a hospital, at what hospital do you spend most of your time?

_____

13. Please estimate the amount of time you spend per week in each of the following activities:

CLINICAL (principal concern lies in patient care)
____ hours per week

RESEARCH (prime involvement is in basic inquiry, laboratory-type research, etc.)
____ hours per week

TEACHING (affiliated with a college, university or medical school)
____ hours per week

ADMINISTRATION ____ hours per week

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