

CHARLES A. BUNGE

Professor
School of Library and Information Studies
University of Wisconsin-Madison

Gathering and Using Patron and Librarian Perceptions of Question-Answering Success

ABSTRACT

This paper discusses the strengths and weaknesses of patrons and reference librarians as sources of data for the evaluation of reference question-answering effectiveness, along with ways to enhance the usefulness of data from each source. It describes the Wisconsin-Ohio Reference Evaluation Program and discusses some illustrative statistics from the project, including data on relationships between patron-perceived answering success and factors such as staffing patterns, effort spent on answering questions, types and sources of questions, and collection size.

INTRODUCTION

The two most frequently used sources of data on reference question-answering success are the librarian who answers the question and the patron who asks it. Both *Output Measures for Public Libraries* (Van House et al., 1987, pp. 65-71) and *Measuring Academic Library Performance* (Van House et al., 1990, pp. 95-108) suggest these as basic sources. This paper will discuss briefly the strengths and weaknesses of each of these sources, as well as ways to enhance the usefulness of each. Within this context, the Wisconsin-Ohio Reference Evaluation Program will be described, and some illustrative statistics from the project will be discussed.

The Reference Librarian as Data Source

Undoubtedly, the most widely used measure of reference effectiveness is the librarian's perception of how successfully questions are answered. Many reference staffs record such perceptions, albeit often quite informally. Public libraries that follow the recommendations of *Output Measures for Public Libraries* (pp. 69-71) record the number of questions for which the users receive requested information on the same day they are asked, and staffs in various types of libraries record unanswered reference questions in one way or another.

One advantage of librarians as a source of data for reference evaluation is ease of data collection. Recording librarian perceptions of answering success can be fit into the normal work flow of the reference desk, without the additional staffing or special efforts required for patron surveys and other approaches. Using staff perceptions can be considerably less costly than hiring outside observers or proxy patrons. Staff motivation to provide full and accurate data can be higher than that of patrons, due to the staff's desire to improve service, or to pressure from peers and administrators.

Librarians can be a unique or especially valuable source of certain types of data. For example, librarians can provide information on factors that might be related to question-answering success, such as the number and type of sources consulted or collection weaknesses.

On the other hand, serious reservations have been raised regarding data from reference librarians. Librarians usually report a higher success rate than do independent observers or researchers. It is difficult for a librarian to report a reference encounter as unsuccessful when he or she has given it the best possible effort and when the information produced seems at least partially responsive to the question. Also, the librarian may not understand the real information need represented by the question and may feel that this need has been met when it has not. Gathering data on reference transactions can be intrusive to the reference process, causing reference librarians to be selective regarding the questions on which data is gathered, thereby raising concerns about the reliability and validity of the data produced.

Rather than reject the reference librarian as a source of data on question-answering success because of such reservations, reference evaluators should attempt to overcome or reduce the problems while taking advantage of the strengths. For example, one way to reduce the inflation of reported success is to avoid forcing a choice between "answered" and "not answered." Librarians are more likely to report less-than-complete success if they are allowed to choose options such as "partially answered" and "don't know." Librarians are also more likely to report less-than-successful results if they are given an

opportunity to record reasons for lack of success. Providing such an opportunity also takes advantage of one of the potential strengths of the librarian as data source and provides fuller information for use in evaluation. The problems caused by the intrusiveness of data gathering can be addressed through sampling and by simplifying the data recording process.

The Reference Patron As Data Source

Like the librarian, the patron as a source of data on answering effectiveness has both strengths and weaknesses. Obviously, patrons are the most important source of data on their satisfaction with the information and service they receive. Because patron perceptions play a crucial role in their decision to use the information they receive and their inclination to use the reference service again, data on their perceptions are of great importance to reference evaluation.

On the other hand, patrons, too, have a tendency to report higher levels of satisfaction than the success rates found using outside observers or unobtrusive approaches. Conventional wisdom holds that, because patrons appreciate any attention and help they receive, they will report satisfaction even when the information they receive is less than completely useful. Also, patrons often are not knowledgeable about the information that could and should be provided to answer their questions and will report satisfaction with information that is inaccurate, incomplete, or out-of-date.

While reference patrons are an easily available source of data, they are frequently in a hurry and may be unwilling to be interviewed or to fill out survey forms to record their perceptions. Patrons who feel most strongly might be most likely to take the time and effort to respond, raising concerns about the reliability of the data gathered in this approach.

Patrons are too valuable as a source of evaluative data to reject because of potential reliability and validity problems, and steps can be taken to reduce these problems. For example, the problem of low response rate and patron reluctance to report perceptions can be addressed by making the survey forms as simple and quick to complete as possible. Patron response rate can be improved by having reference staff members exhibit a positive, upbeat attitude as the forms are handed to patrons, by emphasizing the survey's potential for improving service, and by using attractive signs to remind patrons to complete and return forms.

Patrons' tendency to overrate answering success can be addressed in a number of ways (Murfin & Gugelchuk, 1987, pp. 317-19). First, not forcing a choice between "answered" and "not answered" (or some

equivalent dichotomy) is important. Patrons, like librarians, are more likely to report less than completely useful answers if options like "partially" are provided. Also, allowing patrons to report their reactions to particular aspects of the answer can increase validity and the richness of the data. Examples include the amount of information provided, the depth or complexity of the information, and the point of view or approach of the information in relation to the patron's need.

The conventional wisdom regarding reference patrons' inability to distinguish between the usefulness of the information they receive and the quality and extent of the service they receive is not necessarily true. If these two important aspects are carefully separated and addressed with focus, users can report one level of satisfaction with the information or materials received and another for the extent and nature of the service provided by staff members.

To summarize, reference librarians and their clients can provide valuable and unique data for the evaluation of question-answering effectiveness. It is important that evaluators take advantage of the strengths of such data, while recognizing their limitations and the need to take care to reduce problems with validity and reliability. It is most important to recognize that librarians and patrons can provide only their perceptions. The degree to which these perceptions accurately reflect reality is an issue to be addressed in the design and use of data-gathering instruments and in the interpretation of data. One way to address this issue is to use data from a variety of sources, including both librarians and patrons, to check, balance, and reinforce each other.

THE WISCONSIN-OHIO REFERENCE EVALUATION PROGRAM

Concerns such as these led Marjorie Murfin and this author to develop forms and associated computer programs for gathering and analyzing data from reference librarians and their patrons. The researchers' intent was to develop and provide a service that could be used by reference staffs to evaluate their question-answering effectiveness and to provide information that would suggest ways in which such effectiveness could be improved. It was also expected that the data gathered by participating libraries would accumulate into a national database that could be used for research and for the establishment of national norms that would be useful for various purposes. The result of these efforts is the Wisconsin-Ohio Reference Evaluation Program.

Several objectives guided the development of the data-gathering forms for the program. The first was to provide a means by which reference staffs could gather reliable and valid data from librarians and

patrons regarding the degree to which reference questions are answered effectively. Second, data should be gathered from patrons and librarians on various environmental or situational factors that might be related to or used to explain answering success. Third, data from the two sources should relate to each other at the question-by-question level. Fourth, the data should be gathered and analyzed in the least intrusive and time-consuming manner possible.

The result of addressing these objectives is a set of forms that are called Reference Transaction Assessment Instruments (RTAI) (see Appendices A-F). Basic to the accomplishment of several of the researchers' objectives is a set of forms that are computer readable and the generation of data that can be analyzed by computer. The forms can be completed by librarians and patrons by simply filling in small circles with a pencil, thereby making them easy and quick to complete. Librarian and patron data can be related question-by-question through the use of computer-readable coding that allows the data from the patron's form and the librarian's form for each question to be brought together by the computer for comparison and analysis. To make sure that correctly coded forms are completed by librarian and patron for each question, the two forms for each question are attached to each other until they are torn apart at the time the question is asked.

It was anticipated that most libraries using the RTAI would sample their reference questions using cluster samples based on selected periods of time. Within a sample period, every question asked at the service point by walk-in patrons should be included in the sample, thus cutting down on choices and decisions that might affect the representativeness of the sample. This meant that directional questions should be included, as well as reference questions, even though data on answering success and environmental factors are not as important for directional questions. Very brief directional-question forms for patrons and librarians were designed that gather data on question type and patron characteristics (see Appendices D-F).

The patron form for reference questions asks for information about the patron (academic status and area of study or teaching for academic library patrons; occupation, age, gender, and source of the question for public library patrons). A group of questions at the top of the patron form asks about the patron's satisfaction with the information or materials that were provided or suggested in answer to the question. A group of questions on the bottom portion of the form asks about the patron's perception of the librarian and the service received. Other questions ask whether or not the patron feels that he or she learned about reference sources or library use (see Appendices B and C).

The librarian form for reference questions (Appendix A) gathers data about the type of information or materials that the question asks

for, including its subject area. The librarian's perception of answering success is recorded, as are several items concerning how the librarian went about answering the question. These include whether the librarian searched with the patron or only directed or suggested sources, the amount of time taken, and the number and type of sources consulted or recommended. The librarian is also asked to indicate factors about the patron, the question, and the situation that apply to the encounter. These include, for example, indications that the patron had special characteristics such as difficulty communicating, that the collection was weak in the area of the question, or that the librarian was busy at the time the question was asked. The staff member is asked to indicate whether he or she is a professional or paraprofessional.

Guided by the objectives mentioned above, several drafts of the RTAI were prepared and were reviewed by practicing reference librarians and managers. A penultimate draft of the academic library version was field tested in the reference departments of fifteen academic libraries of various sizes in the fall of 1983, using a sample of fifty questions in each library.

A primary purpose for consultation with practicing librarians and for field testing was to improve the reliability and validity of the data gathered with the forms. The reference librarians who reviewed the forms attested to their high face validity. Using statistical cluster analysis on the field test data, it was determined that the questions relating to patron satisfaction with the information received and those related to satisfaction with the quality of the service do measure two different factors, further adding to the researchers' confidence in the validity of the form. Data from the field test were also used to assess the reliability of the forms, using Cronbach's alpha and an extension of this estimator, the theta statistic (Murfin & Gugelchuk, 1987, pp. 323-29).

Questions regarding patron and question-source categories for the public library version of the patron form were developed and field tested with the cooperation of reference librarians. Thus, the RTAI set consists of librarian forms for directional and reference questions that are used in both academic and public libraries (Appendices A and D) and patron forms for directional and reference questions that have different patron categories for academic and public libraries (Appendices B, C, E, and F).

Libraries that wish to use the service obtain copies of the RTAI from the project office for samples ranging from 100 reference questions upward (and for an equal number of directional questions), along with instructions regarding the use of the forms. For each question in the sample, the librarian quickly ascertains the patron's willingness to participate (participating libraries have experienced nearly 100 percent willingness), and the question is answered in the normal fashion. At

the end of the encounter, the librarian and patron forms for the question are detached from each other, the patron is handed his or her form for completion, and the librarian completes the librarian form (or at least enough of it to allow completion later).

At the end of the survey, completed forms are returned to the project office for reading and analysis of the data. The response rate from patrons (i.e., the percentage of sample reference questions for which both patron and librarian forms are available for analysis) averages 93 percent for public libraries and 85 percent for academic libraries.

The data from each library is analyzed using a complex program on an IBM mainframe computer, and a detailed report is prepared and sent to the library. The report provides information on the library's question-answering success, as perceived by reference librarians and patrons, on the question-answering behavior of answering librarians, and on factors present in the reference situation at the time the questions were asked. The report compares the library's data with data from other participating libraries (either public or academic) of similar size, with all public or academic libraries that have used the service, and with the most successful participating public or academic library so far.

The data are also accumulating in a continually growing database, from which national norms and other useful information can be obtained. Other researchers can have access to this database for their own analysis as well. The participating libraries are a self-selected sample rather than a random sample. However, there is no reason to believe that they are unrepresentative of academic and public libraries in general.

The data on directional questions have not received much analysis. Participating libraries receive frequency counts and percentages for patron categories and types of directional questions. The data on patron categories, taken together with those from reference questions, can give a library a pretty good picture of who is asking questions at the reference desk.

Demographic Information

The forty-two public libraries that have participated in the program through September 1990 include libraries in six states. While there is a concentration of suburban libraries, there are also large urban libraries and libraries serving rural populations. Library collections range from 23,000 volumes to over 2,000,000 volumes, and populations served range from 7,500 to over 600,000. For purposes of comparison, libraries have been categorized as small (twelve libraries of under 50,000 volumes), medium (fifteen libraries of 50,000-99,999 volumes), and large (fifteen libraries of 100,000 volumes or more). There are data on some 6,000 reference questions from these libraries.

Table 1 shows the proportion of various patron categories and question sources for reference questions in the public libraries. In interpreting these figures, readers should be aware that some patrons marked responses in both the occupation and student categories and some in only one or the other. Figures for occupation categories are percentages of only those patrons who marked an occupation, while figures for student categories represent percentages for all patrons.

TABLE 1
PERCENTAGE OF PUBLIC LIBRARY PATRONS AND
QUESTIONS BY CATEGORY

<i>Category</i>	<i>Percentage of Questions</i>
OCCUPATION (% of total responses for occupation)	
Homemaker	22.79
Skilled labor/ trades/services	14.97
Secretarial/ clerical/office	10.30
Sales/marketing	10.74
Professional/ technical/management	27.71
Unemployed	10.77
Retired	7.00
AGE (% of total responses for age)	
Under 18	21.79
18-40	45.76
41-64	26.96
65+	5.69
GENDER (% of total responses for gender)	
Male	39.74
Female	60.35
STUDENTS (% of total patrons)	
High School	19.61
College	20.67
Graduate School	7.74
Continuing Education	7.21
SOURCE OF QUESTION (% of total responses for source)	
Work related	19.66
School/education related	40.82
Recreation related	10.75
Other personal project	33.34

General reference departments in forty-eight public and private academic libraries in twenty-five states and Canada have participated in the Wisconsin-Ohio program through September 1990, and have provided data on over 5,000 reference questions. Participating libraries include twenty-three with collections of fewer than 500,000, thirteen with between 500,000 and 1,000,000 volumes, and twelve with collections

of over 1,000,000 volumes. Table 2 shows the proportion of various patron categories among those who asked reference questions in the academic libraries. In interpreting these figures, readers should be aware that a few patrons marked responses for more than one "status" or "major" category, so that the figures add up to slightly over 100 percent.

TABLE 2
PERCENTAGE OF ACADEMIC LIBRARY PATRONS BY
STATUS AND SUBJECT AREA

<i>Status or Subject</i>	<i>Percentage of Questions</i>
STATUS	
Freshman	18.80
Sophomore	17.61
Junior	17.13
Senior	21.16
Graduate student	12.82
Continuing education/nondegree	2.82
Faculty	3.05
Alumna/us	1.35
Unaffiliated with college	5.45
MAJOR OR TEACHING/RESEARCH AREA	
Arts or Humanities	18.29
Business/Management	24.73
Education	7.98
Law	1.76
Other Social Sciences	11.50
Agriculture/Biological Science	5.49
Medicine/Health	7.78
Mathematics/Physical Sciences	2.79
Technology/Engineering	7.12
Interdisciplinary/Other	6.40
Major not declared	6.91

Reference Question-Answering Success

The main figure used to indicate question-answering success, and the figure in which reference librarians and managers seem most interested, is the patrons' perception of whether or not their questions were answered. A stringent criterion for patron-perceived answering success has been established. In order to be counted as successful transactions, the patrons must have reported that they obtained just what was wanted and that they were completely satisfied with the information or materials found or suggested. When the terms *success score* or *success rate* are used for a library or group of libraries, the terms refer to the percentage of questions on which patron responses meet this criterion. By a "significant" relationship is meant that the

relationship has been tested statistically (usually with the chi square test for independence) using the .05 probability level to indicate significance.

The success rate across all forty-two public libraries is 60.01 percent. When patrons reporting finding approximately what was wanted are added, the percentage is 71.00. Comparable figures for the forty-eight academic libraries are 56.25 and 67.85. (The success rate in public libraries for higher education students with school-related questions is 61.57 percent.) While the difference between public and academic libraries is small (though statistically significant), one is tempted to look for reasons for it. Two factors on which the two types of libraries differ and that are related to patron-perceived success might be partial explanations. One is the percentage of questions for which the librarians reported simply directing the patron to a potential answering source, rather than searching with the patron. For academic libraries, the percentage of such responses is 22.02, while for public libraries it is 15.24. Also, in academic libraries the percentage of questions on which the librarian reported being busy when the question was asked is 25.72, while in public libraries the percentage is 21.25.

Because data on librarian-perceived answering success is easier to collect than that for patron-perceived success, it is interesting to know how close these perceptions are to each other when both are measured for the same questions (so that one might judge the usefulness of substituting the easier measure for the harder one). In most participating libraries, the librarians reported that the answer was found for a higher percentage of questions than that reported by patrons. The average librarian-perceived success rate across the forty-two public libraries is 72.05 (compared to a patron-perceived success rate of 60.01). For the forty-eight academic libraries, the librarian-perceived success rate is 68.45 (compared to a patron-perceived success rate of 56.25). The overall agreement between librarians and their patrons on "found," "partly found," and "not found" responses is 67.68 percent for public libraries and 64.98 percent for academic libraries.

Factors Associated with Success or Failure

In order for reference staffs and managers to make wise decisions to improve reference question-answering success, they need information on factors that are related to variations in success. Such relationships have been looked at across the participants in the Wisconsin-Ohio program.

Staffing

One important set of factors in the reference situation is staffing patterns. In this area, one factor that is consistently associated with question-answering success is whether or not the librarian is busy at the time the question is asked. On average, the public libraries lost 6.11 percentage points in their success scores when the librarians reported being busy when questions were asked, as compared to when they were not busy. For academic libraries, there was a loss of 4.82 percentage points on average.

Another staffing issue is the involvement of paraprofessional staff in answering reference questions. Analysis of data from twenty academic libraries that used both paraprofessionals and professionals to answer reference questions (among the first thirty-three academic library participants) showed that, overall, professional staff members were more successful (Murfin & Bunge, 1988). However, the same analysis showed that, with appropriate training and effective policy and procedure backup, paraprofessionals can effectively answer reference questions. While the public library data has not been analyzed with the same detail, the data indicates that, across all public library reference questions, paraprofessionals have been just as successful as professionals. However, some participating libraries have paraprofessionals answer only simple or apparently easy questions, while others have them answer the full range of questions, so that overall findings here must be interpreted with caution.

Time and Effort Spent on Questions

Another group of factors relates to the time and effort spent on questions by reference librarians. The RTAI collects data on whether the librarian searches for information with the patron or merely directs or suggests a strategy. For the public libraries, success scores are on average 9.45 points lower for questions where the librarian directed patrons to a potential source, rather than searching with the patron. For the academic libraries, this difference averages 18.05 percent.

To help reference staffs assess their potential for answering reference questions successfully, the report form that is sent to participating libraries includes the patron-perceived success rate for questions on which the patron was served by a professional staff member who was not busy and who searched with the patron. This allows the staff to see how its success under various conditions compares with its success under these "ideal" conditions (what is called the "potential" success rate). For the forty-two public libraries, this potential success rate averages 66.61 percent (compared with 60.01 overall); for the forty-eight academic libraries, it is 67.79 percent (compared with 56.25 overall).

The number of sources used or suggested in answering a question is of interest, as well. In academic libraries, the data indicates that there is a positive relationship between the number of sources consulted or suggested and patron-perceived answering success (at least up to a point of diminishing return). For example, Table 3 shows the average figures for all academic libraries and those for the library with the highest success rate (65.63 percent) among the forty-eight libraries. This relationship does not show up in the same way for public library participants. However, analysis of the data on time spent per reference question in the first thirty-six public library participants showed that, in the nine most successful libraries, the proportion of questions on which librarians reported spending less than three minutes (26.38) is significantly lower than for the nine least successful ones (31.47 percent) (Bunge, 1990).

As an aid to reference staffs in interpreting their data from the Wisconsin-Ohio program, Marjorie Murfin has constructed some indexes based on similar factors. Comparative figures for these indexes are reported to participating libraries. For example, she analyzed the data from the thirty-three earliest participating academic libraries to see if patron-perceived success is related to the amount of time and effort that is provided by the answering librarian. An "effort index" for a given library is based on the percentage of questions for which the librarians direct or suggest only (rather than search with the patron), the percentage of questions on which the librarians report working for under three minutes, and the percentage of questions for which only one source was used or suggested. Table 4 shows the percentage of such questions for the eleven libraries with the highest success rates and the eleven with the lowest success rates, along with a column combining what might be called the "negative effort" factors. From this table it is clear that library staffs who spend more effort on questions have higher patron-perceived success rates.

TABLE 3
NUMBER OF SOURCES CONSULTED OR SUGGESTED PER
QUESTION ANSWERED

<i>Number of Sources</i>	<i>Percentage of Questions</i>	
	<i>All Academic Libraries</i>	<i>Most Successful Academic Library</i>
1 Source	37.90	25.00
2 Sources	30.12	17.86
3 Sources	17.68	32.14
4 Sources	7.40	14.29
5 or More Sources	6.90	10.71

These "effort" factors are related to how busy the reference staff is, of course. It is interesting to note, however, that the percentage of reference questions on which the librarian searched with the patron, even though busy (again, based on data from the thirty-three earliest participating academic libraries), is 73.85 for the most successful eleven libraries, 47.06 for the least successful eleven libraries, and 63.52 for those in the middle range.

TABLE 4
ANSWERING EFFORT RELATED TO ANSWERING SUCCESS

Success Rate (%)	Percentage of Questions			Average: 1,2,3
	1 Directed Only	2 Under 3 Min.	3 Used 1 Source	
MOST SUCCESSFUL				
69.74	18.42	37.33	37.50	31.08
69.59	14.62	15.79	21.74	17.38
68.75	6.25	16.67	23.53	15.48
68.52	11.11	26.32	33.33	23.59
65.63	9.38	38.71	25.00	24.36
63.51	27.03	30.14	33.93	30.37
61.54	15.38	18.42	38.46	24.09
60.78	12.42	20.39	22.38	18.40
60.53	31.58	36.84	47.06	38.49
60.53	28.95	32.43	40.00	33.79
60.26	13.46	34.67	30.28	26.14
Average	17.15	27.97	31.11	25.74
LEAST SUCCESSFUL				
53.08	25.38	46.51	45.00	38.96
52.05	38.36	51.05	50.00	46.47
51.43	22.86	48.57	37.14	36.19
51.35	37.84	37.84	53.84	43.17
50.00	22.22	33.33	50.00	35.18
49.28	26.09	32.84	46.97	35.30
47.17	18.87	48.08	52.00	39.65
45.00	20.00	48.72	32.35	33.69
44.83	27.59	35.71	52.00	38.43
41.67	16.67	44.44	45.71	35.61
34.48	25.86	45.28	24.53	31.89
Average	25.61	42.94	44.32	37.62

Communication

Effective communication between the reference librarian and the patron is crucial to question-answering success. One measure of communication effectiveness is the percentage of questions on which the librarian and the patron agree in their assessment of whether or not the question was answered. For example, across all forty-eight academic libraries, this agreement rate is 64.98 percent, while in the library with the highest patron-perceived success rate it is 77.42 percent.

An analysis of the data from the earliest thirty-three participating public libraries shows that in the nine most successful libraries the agreement rate is 78.95 percent, while in the nine least successful libraries it is 63.77 percent. These and other data from the RTAI indicate that there is a greater communication gap between librarians and patrons in less successful libraries.

Type and Source of Questions

One of the most frequently studied sets of factors is the type and source of reference questions. Data on success rates for patrons and questions in various categories are provided in Tables 5 and 6. These figures might be used by individual libraries as norms against which to compare local results. For example, participants in the Wisconsin-Ohio program can use such comparison to identify areas for collection and staff development attention.

The librarian portion of the RTAI asks librarians to categorize questions using some fifteen categories. Table 7 shows the percentage of questions recorded in the most frequently used categories (based on all transactions and adjusted by choosing one category per transaction). Some interesting differences between academic and public libraries appear in Table 7. Types of questions that have been hardest for public libraries to answer to their patrons' satisfaction are ones asking for criticism and reviews (51.78 percent success), ones asking for trends, pro and con, how-to-do-it, etc. (51.86 percent), and explanation of the library, its catalog, or another tool (56.46 percent). For academic libraries, types of questions where patron-perceived success has been lowest are ones asking for trends, pro and con, how-to-do-it, etc. (46.85 percent success), for just something or anything on a topic (48.80 percent), and for facts or statistics (49.08 percent).

The data on the "just something or anything" on a topic type of question are interesting. Such questions have been much more prevalent in public libraries (23.43 percent of all reference questions, versus 14.02 percent in academic libraries). Public librarians seem to have been more successful at ascertaining the real information needs behind these questions and at providing satisfactory answers, achieving a 59.60 percent success rate. In academic libraries, significantly more patron-librarian communication difficulty is associated with these questions than is true for public librarians, and the success rate on them is only 48.80 percent.

TABLE 5
PUBLIC LIBRARY SUCCESS RATE BY CATEGORY OF PATRONS
AND QUESTIONS

<i>Category</i>	<i>Patron-perceived Success Rate (%)</i>
<i>ALL QUESTIONS*</i>	60.01
<i>OCCUPATION</i>	
Homemaker	59.90
Skilled labor/trades/services	63.72
Secretarial/clerical/office	63.01
Sales/marketing	49.15
Professional/technical/management	60.92
Unemployed	59.54
Retired	63.47
<i>AGE</i>	
Under 18	56.07
18-40	59.74
41-64	61.98
65+	64.42
<i>GENDER</i>	
Male	58.10
Female	60.80
<i>STUDENTS</i>	
High School	54.55
College	58.16
Graduate School	64.88
Continuing Education	59.11
<i>SOURCE OF QUESTION</i>	
Work related	58.75
School/education related	59.68
Recreation related	60.60
Other personal project	61.34

*Excluding questions asking for a specific book, serial, etc.

TABLE 6
ACADEMIC LIBRARY SUCCESS RATE BY PATRON STATUS AND
QUESTION SUBJECT

<i>Status and Subject</i>	<i>Patron-perceived Success Rate (%)</i>
<i>ALL QUESTIONS*</i>	56.25
<i>STATUS</i>	
Freshman/Sophomore	56.55
Junior/Senior	54.76
Graduate Student	51.74
<i>SUBJECT AREA OF QUESTIONS</i>	
Arts and Humanities	58.84
Social Sciences	51.94
Science and Technology	52.25

* Excluding questions asking for a specific book, serial, etc.

TABLE 7
TYPES OF QUESTIONS ASKED

<i>Type of question</i>	<i>Percentage (of all questions)</i>	
	<i>Public Libraries</i>	<i>Academic Libraries</i>
Specific book, serial, etc.	19.09	14.09
Smaller item in larger publication	1.78	2.46
Anything by a particular author	2.36	0.78
Short answer, verification, etc.	4.49	9.71
Facts or statistics	13.42	12.41
Explanation of library, catalog, or particular source	2.28	9.29
Something/anything on a topic	22.43	14.02
Certain type of format of material	7.90	11.35
Criticism, reviews, interpretation, etc.	2.45	6.05
Analysis, trends, how-to, pro/con	3.73	5.37

Collection Size

Collection size is another factor of interest. Simple correlation indicates no significant difference in patron-perceived success rate by collection-size category in either public or academic libraries. More detailed analysis of the data does indicate that there is a positive relationship between library collection size and success rate. However, this relationship is obscured by the fact that larger libraries tend to be busier and to receive more complex questions, both of which are associated with lower success rates. For example, when one looks at questions for which the librarian does not report being busy, the larger libraries have a much higher success rate than smaller libraries. This and other evidence suggest that larger collections have a greater potential for success, but that this success can be negated by being overly busy.

The size of the reference collection seems to have a curvilinear relationship to answering success. Not all libraries can provide accurate data on reference collection size, and the research team's analysis and interpretation of the data on this relationship have been somewhat impressionistic. However, success rate does seem to go up as reference collection size increases, up to an optimum size (around 4,000 volumes for public libraries and around 15,000-20,000 volumes for academic libraries), after which success rate seems to fall off. Evidence on other factors leads to the speculation that larger collections invite (or require) relatively more directing (rather than going with the patron to the shelves) and that it is harder for reference staff members to gain the mastery over larger collections that is required for quick and effective access to the information in them.

Bibliographic Instruction

One measure of the success of a reference encounter might be whether or not the patron learns anything about information sources as a result of it. The patron RTAI asks patrons whether they became acquainted with any reference sources that had not previously been known as a result of consulting the reference librarian. In academic libraries, 37.41 percent of the patrons who asked reference questions reported learning about two or more sources, 48.54 percent learned about one source, and 14.05 percent reported "No, none." For public library patrons, the figures are 30.04 percent, 44.16 percent, and 25.81 percent, respectively, indicating that more one-to-one bibliographic instruction is occurring in academic libraries than in public libraries. Likewise, when asked if they learned something about the use of the library or reference sources as the result of consulting the reference librarian, academic library patrons responded "Yes" more frequently (76.93 percent) and "No" less frequently (6.76 percent) than did public library patrons (70.01 percent and 12.45 percent).

CONCLUSION

This paper has tried to show that the reference librarian and the patron can both be valuable sources of data on which to base evaluation of question-answering effectiveness if appropriate care is taken in gathering and interpreting this data. Each of these sources is especially valuable for certain perceptions, including perceptions regarding important environmental or situational factors that are related to reference effectiveness. Each also has real or potential weaknesses that need to be minimized in the data collection process and accounted for in interpretation of the data.

The paper discusses the ways in which the Wisconsin-Ohio Reference Evaluation Program has addressed these concerns, including the development and use of the Reference Transaction Assessment Instruments. Data from forty-two public libraries and forty-eight academic libraries that have participated in the program are presented and discussed, including data on relationships between patron-perceived answering success and factors such as staffing patterns, effort spent answering questions, types and sources of questions, and collection size.


The long-range intent of the Wisconsin-Ohio Reference Evaluation Program is to improve the reference services that library patrons receive. This paper is presented in the hope that it will be of value to reference librarians and managers who have the same intent and who wish to evaluate their success at answering reference questions.

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APPENDIX C

Patron's RTAI for Reference Questions—Public Libraries

FILL IN DOT LIKE THIS  ●



The Reference Department is doing a survey of reference use and would appreciate it if you would mark the following brief checksheet. Thank you!

(Deposit checksheet UNFOLDED in container on leaving this area or on leaving the library.)

THANKS AGAIN FOR YOUR HELP!



<p>OCCUPATION (Mark one)</p> <p><input type="radio"/> Homemaker</p> <p><input type="radio"/> Skilled labor/trades /services</p> <p><input type="radio"/> Secretarial/clerical /office</p> <p><input type="radio"/> Sales/marketing</p> <p><input type="radio"/> Professional/technical /management</p> <p><input type="radio"/> Unemployed at present</p> <p><input type="radio"/> Retired</p> <p>AGE</p> <p><input type="radio"/> Under 18</p> <p><input type="radio"/> 18-40</p> <p><input type="radio"/> 41-64</p> <p><input type="radio"/> 65+</p> <p>SEX</p> <p><input type="radio"/> Male</p> <p><input type="radio"/> Female</p> <p>STUDENT</p> <p><input type="radio"/> High School</p> <p><input type="radio"/> College</p> <p><input type="radio"/> Graduate school</p> <p><input type="radio"/> Continuing education</p> <p>SOURCE OF QUESTION</p> <p><input type="radio"/> Work related</p> <p><input type="radio"/> School/education related</p> <p><input type="radio"/> Recreation related</p> <p><input type="radio"/> Other personal project (hobbies, self-development, charity, etc.)</p>	<p>1. Did you locate what you asked about at the reference desk?</p> <p style="text-align: center;"> <input type="radio"/> Yes, just what I wanted <input type="radio"/> Yes, with limitations <input type="radio"/> Yes, not what I asked for, but oth information or materials that will be helpful <input type="radio"/> Yes, but not really what I wanted <input type="radio"/> Only partly <input type="radio"/> No </p> <hr/> <p>2. If yes, how did you find the information or materials?</p> <p style="text-align: center;"> <input type="radio"/> Librarian found or helped find <input type="radio"/> Followed suggestions and found on my own <input type="radio"/> Didn't follow suggestions but found on my own </p> <hr/> <p>3. Were you satisfied with the information or materials found or suggested?</p> <p style="text-align: center;"> <input type="radio"/> Yes <input type="radio"/> Partly <input type="radio"/> No </p> <hr/> <p>4. If partly or not satisfied, why? MARK ALL THAT APPLY.</p> <p style="text-align: center;"> <input type="radio"/> Found nothing <input type="radio"/> Too much <input type="radio"/> Went different viewpoint <input type="radio"/> Not enough <input type="radio"/> Need more in-depth <input type="radio"/> Couldn't find information in source <input type="radio"/> Need more simple <input type="radio"/> Not relevant enough <input type="radio"/> Not sure if information given me is correct </p> <hr/> <p>5. How important was it to you to find what you asked about?</p> <p style="text-align: center;"> <input type="radio"/> Very important <input type="radio"/> Important <input type="radio"/> Moderately important <input type="radio"/> Somewhat important <input type="radio"/> Not important </p> <hr/> <p>6. Was the librarian busy (e.g., phone ringing, others waiting)?</p> <p style="text-align: center;"> <input type="radio"/> Yes <input type="radio"/> Partly <input type="radio"/> No </p> <hr/> <p>7. Did the librarian understand what you wanted?</p> <p style="text-align: center;"> <input type="radio"/> Yes <input type="radio"/> Partly <input type="radio"/> No </p> <hr/> <p>8. Did you get enough help and explanation?</p> <p style="text-align: center;"> <input type="radio"/> Yes <input type="radio"/> Partly <input type="radio"/> No </p> <hr/> <p>9. Were the explanations clear?</p> <p style="text-align: center;"> <input type="radio"/> Yes <input type="radio"/> Partly <input type="radio"/> No </p> <hr/> <p>10. Did the librarian appear knowledgeable about your question?</p> <p style="text-align: center;"> <input type="radio"/> Yes <input type="radio"/> Partly <input type="radio"/> No </p> <hr/> <p>11. Was the service you received courteous and considerate?</p> <p style="text-align: center;"> <input type="radio"/> Yes <input type="radio"/> Partly <input type="radio"/> No </p> <hr/> <p>12. Did the librarian give you enough time?</p> <p style="text-align: center;"> <input type="radio"/> Yes <input type="radio"/> Partly <input type="radio"/> No </p> <hr/> <p>13. Did you learn something about reference sources or use of the library as a result of consulting the reference librarian?</p> <p style="text-align: center;"> <input type="radio"/> Yes <input type="radio"/> Partly <input type="radio"/> No </p> <hr/> <p>14. Did you become acquainted with any reference sources you hadn't previously known about, as a result of consulting the reference librarian?</p> <p style="text-align: center;"> <input type="radio"/> Yes, one <input type="radio"/> Yes, more than one <input type="radio"/> No, none </p>
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 <p>MAKE NO MARKS IN THIS AREA</p>	14454	<p>FOR OFFICE USE ONLY</p> 
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APPENDIX D

Librarian's RTAI for Directional Questions
Public and Academic Libraries

MAKE NO MARKS IN THIS AREA

0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9

FOR OFFICE USE ONLY

Librarian
 Library Assistant
 Other Assistant

DIRECTIONAL QUESTIONS

- 1. Location of Reader's Guide, Atlases, Dictionaries, Encyclopedias, College Catalogs, Phone Books, Zip Code Directory, City Directory, Periodical Directory
- 2. Asks for book kept on ready reference and gives recognizable title
- 3. Has call number and wants location
- 4. Location of areas and collections within the building
- 5. Request for use of supplies (stapler, phone, pencil, etc.)
- 6. Location of persons within the building
- 7. Library hours and rules
- 8. Help with machines
- 9. Locate periodical title in library's directory or union list
- 10. Other

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REFERENCES

- Bunge, C. A. (1990). Factors related to output measures for reference services in public libraries: Data from thirty-six libraries. *Public Libraries*, 29(1), 42-47.
- Murfin, M. E., & Bunge, C. A. (1988). Paraprofessionals at the reference desk. *The Journal of Academic Librarianship*, 14(1), 10-14.
- Murfin, M. E., & Gugelchuk, G. M. (1987). Development and testing of a reference transaction assessment instrument. *College and Research Libraries*, 48(4), 314-338.
- VanHouse, N. A.; Lynch, M. J.; McClure, C. R.; Zweizig, D. L.; & Rodger, E. J. (1987). *Output measures for public libraries*. Chicago: American Library Association.
- VanHouse, N. A.; Weil, B. T.; & McClure, C. R. (1980). *Measuring academic library performance: A practical approach*. Chicago: American Library Association.