Probably editors have this power. If so, authors should be made aware of it.

A corollary of these proposals is that current restrictions on the length of abstracts must be relaxed. The abstract should be long enough to summarize both the experimental work and the interpretation. If anything must be slighted it should be the latter. (There is some evidence that there has been a *de facto* relaxation of length restrictions. What is needed is a formal statement that will encourage authors to write more precise, complete abstracts.) A longer abstract is a small price to pay for a better interchange of information.

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Systems Requirements for Primary Information Systems

Utilization of *The Journal of Organic Chemistry**

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A selected sample of 281 readers of *The Journal of Organic Chemistry* has been interviewed personally to obtain data on their reading patterns of the November 1968 issue. Approximately 35% of the individual subscribers to JOC had read or looked through the journal within the first seven days of receipt. The average reader claims to have read part or all of 14 articles out of the 81 available. At least 75% of every one of the 81 articles was read, ranging from a low of 0.7% to a high of 10.2%. Structures or equations rated high as a "noted" segment of an article. In addition to data on amount of reading of the issue, respondents were asked about amount of time spent reading, other journals read, and journals subscribed to. Correlations have been developed between subject interest as stated by respondent and his actual reading pattern.

Studies of the scientist's use of information are based on the premise that if we know what the scientist does with existing means, we can design new and better systems to serve him.[1,2,3] But with some few exceptions,[4] such studies have failed to relate the data generated to the specific problems facing the designer of information systems.

In this study of the reading behavior of the subscribers to *The Journal of Organic Chemistry*, we explore the possibilities of using the data generated as a basis for the design and test of new systems of disseminating and communicating scientific information—in particular, to relate such data to the problems of providing users with units of scientific information more closely matched to their interests and job-contact patterns whether the medium of transmission be the printed page or a computer console.

The primary objectives of this study were:

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1. To gather basic information on reading behavior of journals.
2. To provide a measure of readership of articles in an issue of *The Journal of Organic Chemistry*.
3. To learn if it is possible to discern patterns of reading related to subject and/or job interests.

The scientific journal offers an excellent place to study what scientists actually do in their information-seeking efforts. The journal is widely used as an information source, and it offers unique opportunity for precise measurement of use. For example, we can know with certainty whether or not a user subscribes to a particular journal. It is likely that we also have available how long he has been a subscriber, his renewal pattern, and demographic data gathered as part of the subscription process. Building on this base of exact measures and using accepted techniques for studying readership behavior, we can develop a powerful tool to aid in the design and implementation of innovations in the primary publishing system as well as in the development of total information systems.

The Journal of Organic Chemistry was a good choice for study since it faces many of the problems of scientific journal publishing. It is a rapidly growing journal, it is large in terms of pages and number of subscribers, it has financial problems which it must meet at least partially through increased subscription rates, it has at least looked at the problems of subdividing, and its editors were willing to cooperate in the study.

The November 1968 issue of JOC became the subject issue in response to the requirements of our time schedules. It is assumed that the manner of handling assignment of papers to the respective issues of JOC is such that any issue is a representative random choice. That issue contained 81 articles. The first 48 of these were "full papers" and appeared consecutively in the first part of the issue. The remaining 33 papers followed in a section headed "Notes."

In a trade-off between possible biases and economic considerations of data acquisition, candidates for interview were selected through an area probability sample of the American Chemical Society's list of individual subscribers to *The Journal of Organic Chemistry* who either live or are employed in one of the 40 Standard Metropolitan Statistical Areas in the United States with a chemist population of 300 or more.[5] This produced a bias of respondents working in more densely populated areas, and to the extent that their patterns are different from their colleagues in less dense population areas, the results are affected. This sample selection also eliminated the possible responses of nonsubscriber users of JOC.

Out of a sample of 701 names, 419 were reached by telephone in an attempt to determine issue readers and to arrange personal interviews. Current reading of the November issue during the telephone interview period was claimed by approximately 87% of those reached by phone. This figure is relatively high when compared to similar studies conducted by the ACS on other of its journals and shows a high subscriber interest in the *Journal*.

There was some concern that respondents would not participate in an interview which required them to go through 81 articles in addition to describing their subject and job interests. A pretest conducted on the February 1968 issue among 16 readers indicated that the interviews could be successfully conducted. A final count of 281 personal interviews were made with interview times ranging from a low of 45 minutes to a high of 1½ hours.

Readership of each article in the issue was determined by means of the recognition technique. Each respondent was given an indexed copy of the issue and was asked to go through it article by article and to recall his reading behavior in the case of each article. Provision was made for possible respondent fatigue bias caused by the long attention span required to go through 81 articles by use of seven random article start positions in the issue. A respondent replied by using any one of the seven statements to describe his utilization of an article.

The average subscribing issue reader statistic is as follows:

Type of Reading	Approx. No. of Articles
Did not remember seeing	25.4
Noticed and:	
Do not intend to read	30.3
Intend reading	10.0
Read up to __% of an article:	
25%	7.2
50%	3.0
75%	1.9
100%	3.0

That is, the average reader read half or more of about eight articles out of 81 at the time of the interview. Although readership per article is relatively low, every one of the 81 articles was read completely by one or more of the respondents (Figure 1).

The reading of the articles in this issue ranged from a high commenced reading of 33.5% of the issue readers to a low of 7.7% of the issue readers. *The average commenced reading statistic for all articles was 17.0%*. The reading of 50% or more of the articles ranged from a high of 14.6% to a low of 0.7%. An article on the average got 5.0% readership. *The reading of 75% or more of articles ranged from a high of 10.22% of the issue readers to a low of 0.7%*.

It is of interest to note the difference in degree of reading between full papers and articles in the "Notes" section. The average length of full papers in the November issue was 5.25 pages while "Notes" averaged about two pages each.

	Full Papers	Notes
Commenced reading	17.0%	17.0%
Read more than 25%	7.2%	9.6%
Read more than 50%	4.0%	6.6%
Read more than 75%	2.6%	4.5%

The highest reading of any article in the issue was recorded for a Note, "Cope Rearrangement of *trans,trans*-2,8-*trans*-Bicyclo[8.4.0] tetradecadiene."

The fact that the average reader of JOC utilizes but 17% of the articles presented to him appears to be an argument for dividing the *Journal* into more specialized packages. But it is also clear that he looks at a large number of articles in arriving at a "do not intend to read" decision. The communication value of this kind

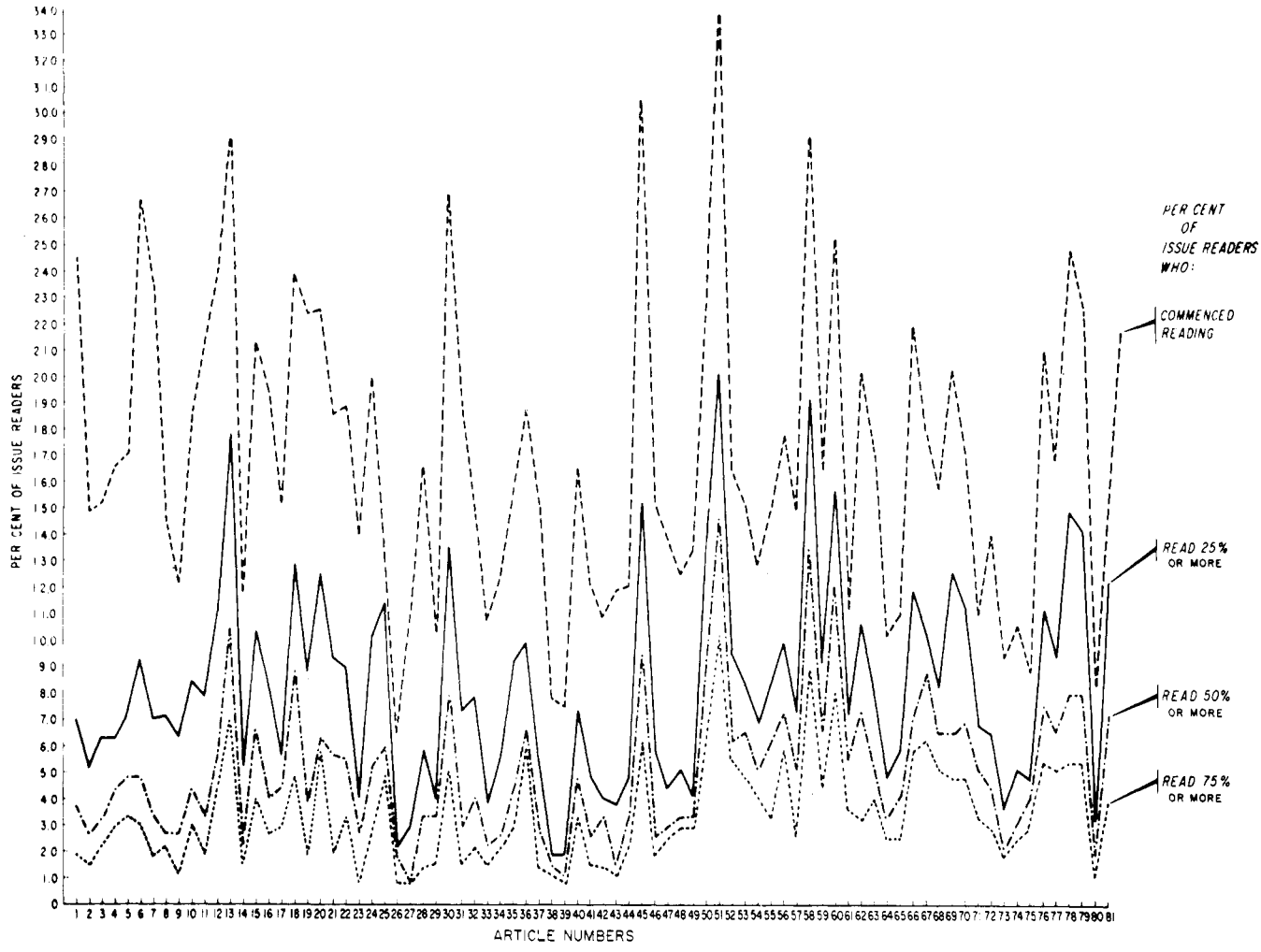

Figure 1. Reading behavior—November 1968 issue of *The Journal of Organic Chemistry*

of information transfer needs to be considered carefully in the design of either innovations or new systems.

To obtain insight into what mechanisms readers used in deciding whether or not to read an article, a list was developed of 11 different article segments. Twenty-two articles were randomly selected from the 81 articles in the issue for study of article segment usage. The respondents who had stated that they "intend to read," "do not intend to read," or "read less than 25% or 50%" were asked to note, using a list furnished to them, what part or parts of the article they noted or read. Table I indicates the frequencies of respondent reaction of what segments were noted and/or read.

The observable differences between the "do not intend to read" group and the "intend to read" group are that the latter group showed more interest in structures or equations and abstracts. Titles served most frequently to provide enough information to make a decision not to read. From a system design point of view, it appears worth noting that the author's name and structures or equations also were high as noted by the "do not intend to read" group. That is, those article segments which

Table I. Article Segment Analysis

	Reader Reaction			
	Do not intend reading	Intend reading	Read 25%	Read 50%
Article *Noted* Segments				
Noted the:				
Title	92.2%[a]	84.3%	71.7%	78.6%
Author's name	37.3	38.6	37.7	48.4
Structure or equation	30.8	48.9	58.3	60.2
Figure or graph	3.8	7.9	12.5	15.6
Table (data)	0.8	4.2	5.9	9.5
Article *Read* Segments				
Read part or all of the:				
Abstract	8.6	18.5	33.5	47.8
Introduction	1.9	7.7	24.9	39.0
Discussion	1.4	7.4	26.7	55.1
Experimental section	1.0	3.5	9.7	18.2
Results	0.6	3.3	8.7	29.1
Table (data)	0.1	1.2	1.8	5.1

[a] Table reading example: Approximately 92% of those subscribing issue readers who do not intend to read one or more of the selected articles noted the title as one or more of the segments in making their reading decision not to read.

are easiest to note and therefore probably communicate best, provide the greatest number of issue readers with enough information or lack of information as to the paper's perceived value. Among those who read 50% of the article, the discussion section was the most often read (55.1%), followed by the abstract (47.8%) and introduction (39.0%).

UTILIZATION ASPECTS OF THE ISSUE

In the interview schedule, prior to the issue reading question, inquiry was made as to how many days after receiving the issue was the first opportunity taken to read or look through it. Over 60% of the issue readers first read or looked through the November 1968 issue within the first two days of receipt of the issue and within the first week 87.7% of the issue readers behaved the same.

Most often (76.3%), the first action upon receipt of the *Journal* is to scan and read the table of contents and follow through to the author index (22.7%). The probe question, "Then what?" was used for further insight into receipt behavior. A major portion of the issue readers, 40.4%, related that their interest was nothing more than "to read and scan articles of interest." The next two highest frequency responses to this probe were from 9% of the respondents, who stated, "put aside for further reading later," and 8.3% of the readers, who claimed to scan the *Journal* thoroughly (Table II).

Past and future time spent with the November issue was measured. The median for all issue readers is 2.2 hours. The median for the "below average" issue readers is 0.7 hour, 2.1 hours for the "average" reader group, and 2.9 hours for the "above average" weight group. Continued use of the publication is also indicated by Question 18, which tends to be consistent with the information obtained via the telephone schedule. Some 22% of the issue readers, however, do not expect to spend any more time with the November issue.

At the face-to-face interview, the first two questions sought information on the amount of time spent reading any and all published material and an estimate of time spent on all job career field publications reading. The median reading time for all publications is approximately 64.8 hours per month while the job and career field publication reading figure is at 37.8 hours per month.

Although these figures are only estimates, it seems clear that there is a limitation on the amount of time available to a scientist for reading. In the innovative design phase, it should be recognized that it is difficult to foresee a reader adding to his reading publication list without deleting one or more of the publications presently in use. The alternative to this would be to educate the reader to change his perception as to the value received from reading. These concepts of saturation or perceived value in terms of reading time should be an essential consideration in any innovations that may be hypothesized.

Table II. First Action Upon Receipt of the Journal

Q. When you received this issue, what was the first thing you did?

Total number answering 278 = 100%

Scanned and read Table of Contents, then read articles of interest	60.1%
Scanned Table of Contents and Author Index for articles of interest	16.2
Scanned and read Author Index	6.5
Leafed through publication for articles of interest	14.0
Read *Journal* thoroughly (completely)	1.1
Checked, scanned all ads	1.4
Read, scanned Notes section, and/or Communications	0.7

SUBJECT INTEREST AND JOB CONTACT PATTERNS

Any clues which will enable us to relate information to need would be most useful in system design efforts. To test for possible relationships between reading behavior and both subject interest and job contact, 60 subject areas and 51 chemical compounds were derived from the articles in the issue. The 51 compounds were presented to respondent in terms of his job contact. He was given a printed list of the compounds and asked to rate them in terms of job contact as "often," "sometimes," or "seldom." The interest questions were put to respondents before any questions concerning reading behavior.

To measure interest in subject areas, a nonnumerical scalometer was devised. This technique used a six-position scale for ranking the subject areas from "major interest" to "little or no interest." "Synthesis" received the greatest ranking, 83.3%. "Mechanisms" was second with 67.5% of the respondents sorting this word into one of the two top spaces on the scalometer. "Calophyllum" received the lowest major interest cluster with only 3.7% placing this word in the high interest position. Another compound, "zearalenone," ranked 59th at 7.3%. We feel that these results need further study in an effort to understand the relationship between general words and highly specialized terms in affecting readership.

We were aware that the list of subject areas was quite arbitrary, and subject to some bias because of the aided recall approach, but we did want to have something to use as a first approximation. To get some further clues, respondents were asked to relay freely their other interest areas. A total of 391 different subject areas were thus generated. Some 56% of the respondents gave only one or two additional subject words of interest to them. Of the 391 added subject words, only 11 of the same subject were given by five or more respondents as being of interest to them. The highest free response interest word was *heterocyclic chemistry* (13 respondents). It is likely these free response interest words would have received higher interest ratings had they been presented to respondents using aided recall technique. In future studies much more time and attention will need to be devoted to selection of interest areas.

A probe into the stability of these interests was made by asking respondents if they foresaw any changes in their jobs or careers within the next three years which would modify or alter their range of interest. Thirty-one percent (86 respondents) replied in the affirmative (Table III). They predicted these changes would take the form of change in present work environment (45.4%), change into a broader subject area (16.3%), and change in subject area (14%). This relatively high percentage of scientists expecting changes in their information needs poses a significant problem for those planning new information systems.

Table III. Anticipated Changes in Work Environment

Q. What might these changes be?

Total number of respondents answering yes to Q. 86 = 100%

Change in present work environment:		45.4
to broader subject area of work	16.3%	
subject area of work	14.0	
to more specific subject area of work	9.3	
scope of job responsibility	3.5	
pattern of research business	2.3	
Change job or employment		20.9[a]
Student		18.6
Will retire		1.1
Don't know - can't tell - unpredictable		14.0

[a] Table Reading Example: Approximately 20.9% of those subscribing issue readers who foresee a modification in their current interests indicate that the change will be due to a change in job and employment.

For further probing of this point a regression analysis was performed on subject area interest ratings (from high to little or none) and the percentage of reading of articles from which the subject areas were derived. A review of Figure 2 shows there is a relationship between interest and per cent reading, for the equation of the line is $Y = 29.21 - 3.42X$. The correlation coefficient for the regression is −.49. This figure plus the slope of the line indicates that the relationship between the subject areas shown and readership of the related articles is not a particularly strong one. This observation is further exemplified by the fact that the square of the coefficient of correlation shows that only 23.8% of the total variations in per cent reading values is associated with variations in subject interest ratings. That is, factors other than the interest

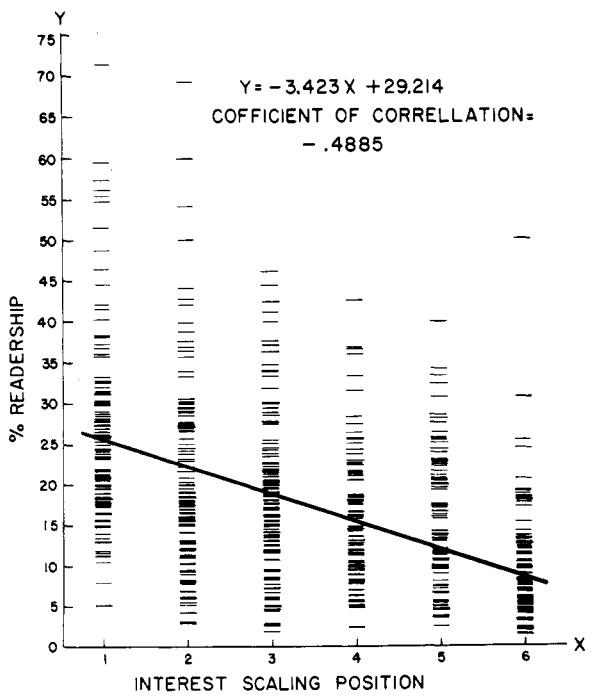

Figure 2. Per cent readership versus interest scaling (1 to 6)

ratings have influenced the reading behavior. This may be due in part to the large number of relatively broad terms used as subject areas.

We feel that further work in this area is very much indicated. It would be most desirable to know, for example, that if an issue reader were given certain articles, there would be a predictable readership for those articles by knowing something about the reader's interest—a key need in terms of designing selective systems of dissemination.

Eleven chemical compounds were named in both the interest sort question and job contact question, and there were 23 articles in the issue whose subject area content could be defined as relating to one or more of these compounds. Assumption was made that a relationship between readership and job contact and interest might exist; a multiple regression analysis was conducted on interest in and job contact with these compounds and article reading.[6]

Of the 24 tests made, six article-compound relations were determined to be significant. Two of the six indicated that interest rather than job contact was the predictor, and, of the remaining four, job contact was the better predictor of readership than interest. We note that in none of the six predictive articles was a combination of both interest and job contact useful for the predictive equation. The highest measure of the association between the dependent variable, reading, and the independent variables of interest and job contact was 41.5% for the article titled "Reactions of Nitropolymethylbiphenyls" and its related interest word, "biphenyls." For the article whose related word "zearalenone" appeared in the title, "The Synthesis of DL-Zearalenone," only 15.3% of the variations in reading weights are associated with both interest and job contact weights.

Why is it that only six of the 24 predicted a reading relationship? Readers' perception of an article's relatable chemical compound is different from prescribed? The readers' article reading behavior is other than interest or job contact related? If predictable article reader behavior is desirable, future studies should be designed specifically to investigate and identify reader perceptions, interest, and job contact relations.

Upon review of the 11 chemical compounds that were used in both the interest and job contact question, speculation was made as to the possibilities a study of the bivariate relationship might indicate. Three possible patterns were theorized:

1. Compound X is "in balance," i.e., stated interest is commensurate with job contact.
2. Expression of high interest in compound Y even though there is little job contact indicates compound Y is one in which there is growing interest, i.e., a comer.
3. When lack of interest tends to correlate with high job interest, we read this relationship as one where the compound is in a period of declining interest, i.e., passed its heyday.

A chi-square (χ^2) and a contingency coefficient was calculated for each compound. The contingency coefficient or degree of association is:

$$C = \left(\frac{(\chi^2)}{n + \chi^2}\right)$$

Compound	Ranked Coefficient	Possibly Definable as:
Amino acids	0.627	In balance
Carbohydrates	0.575	In balance
Biphenyls	0.495	In balance
Isoquinolines	0.434	In balance
Cycloalkanes	0.412	In balance
Carbinols	0.405	In balance
Cycloalkanones	0.403	In balance
Aldoximes	0.391	A comer
Calophyllum	0.333	A comer
Zearalenone	0.332	A comer
Esters	0.328	Passed heyday

Bivariate relationship analysis for three compounds are shown in Table IV as examples of each of the three theorized patterns.

FACTOR ANALYSIS

As a further step in the analysis of reading behavior as it relates to interest patterns and thus becomes useful in designing system innovations, a start was made in the use of factor analysis.[7,8] We should like to emphasize the word "start." The concept of using factor analysis for the purpose of analyzing reading behavior was suggested by several persons. The analysis here is intended to alert others to the potential of the tool. We have not done more than attempt a crude first approximation using a technique which was quite new to us.

Factor analysis, according to Kerlinger, "helps the scientist to locate and identify unities or fundamental properties underlying tests and measures."

In this particular study the factor analysis was based on a correlation matrix constructed using reading weights versus each of the 81 articles in the issue. Using the principal factors method,[8] a series of factors and related numbers were generated by a computer. Out of these certain basic use patterns are revealed. The reading of JOC is systematic, that is, not random. Readers look for specific kinds of information which tend to cluster around definite factors. For example, the following papers gave high loadings for one factor:

1. Synthetic Routes to Cyclopropyl-Substituted Azoalkanes. Some Reactions of Cyclopropylcarbinyl Cyanates, Isocyanates, Benzoates, and *p*-Nitrobenzoates. Jack W. Timberlake and J. C. Martin.
2. Alkyl-Substitution Effects in the Photochemistry of 2-Cyclohexenones. William G. Dauben, Gary W. Shaffer, and Noel D. Vietmeyer.
3. Addition of Bromotrichloromethane and Carbon Tetrachloride to Dibenzobicyclo[2.2.2]octatriene. Bruce B. Jarvis.
4. Cyclopropanes. XXV. Cleavage of Cyclopropane Rings by Solutions of Sodium in Liquid Ammonia. H. M. Walborsky and J. B. Pierce.
5. Oxymercuration-Demercuration of 7-Substituted Norbornenes and Norbornadienes. Wm. C. Baird, Jr., and Maris Buza.
6. Stereochemistry of the Bromination and Deuterobromination of *anti*-7-Bromobenzonorbornadiene. Ronald Caple, Fu Mei Hsu, and Casmir S. Ilenda.
7. Cope Rearrangement of *trans,trans*-2,8-*trans*-Bicyclo[8.4.0]tetradecadiene. P. S. Wharton and R. A. Kretchmer.

In this case we assume that the factor is a common subject interest area such as "small ring compounds" or "cyclopropane" which relates the readers of this group of articles. There are other influences possible such as authors, institutions, use of structures, etc., which lead to clustering of users. Others types of factor analysis are possible from the basic input and we plan to pursue these in more detail. Factor analysis looms as a useful tool which is worthy of further use as a basis for system analysis and design.

Table IV. Chemical Compounds Interest *vs.* Job Contact

		Interest Rank (Clustered)		
		High	Medium	Low
Amino Acids (in balance) (C = 0.627)				
Total number of cases 277 = 100%		24.9%	25.3%	49.8%
Job contact				
Often	20.6	14.4	5.1	1.1
Sometimes	27.8	8.3	12.3	7.2
Seldom	51.6	2.1	7.9	41.6
Esters (past heyday) (C = 0.328)				
Total number of cases 278 = 100%		42.1	39.2	18.7
Job contact				
Often	64.7	32.7	24.8	7.2
Sometimes	27.0	7.2	12.6	7.2
Seldom	8.3	2.2	1.8	4.3
Aldoximes (comer) (C = 0.391)				
Total number of cases 275 = 100%		20.7	33.7	45.6
Job contact				
Often	7.6	4.7	1.8	1.1
Sometimes	27.2	8.7	11.6	6.9
Seldom	65.2	7.2	20.3	37.7

C = Contingency coefficient or degree of association

DIVIDING USER GROUPS BY READING WEIGHTS

A review of the article-by-article reading by the sample group stimulated a profile of the average, below average, and above average issue readers. In order to define a reading group, each respondent was given a weight as to his degree of reading all articles in this issue. A set of articles reading weight values was established for each of the reading measurements by using a numerical progression of halving the interval between measurements. These weights are as follows:

Weight	Reading Measurement
0 =	Do not intend to read
1 =	Intend to read
2 =	Read up to 25%
2.5 =	Read up to 50%
2.75 =	Read up to 75%
2.875 =	Read up to 100%

The arithmetic means of the reading weight distribution was 41.23 and the median statistic was at a weight of 36.0. The weights ranged from 0 through 192.875, with the sum of the weights equal to 11,502.

The respondents were divided by their reading weights

into three equal groups around the median. The result of this division placed 93 respondents in each group for a total of 279 respondents. Two respondents were not included in this analysis since both refused to tell what articles they read in the November issue. Prior to testing whether or not the distributions observed under the three different average groups were statistically significant, an analysis of date of interview by reading weight was conducted to determine whether or not the date of interview would bias any one of the three groups. The analysis showed no real difference between the interviewing time and the amount of weighted reading.

Interview Days of Survey	Total	Below Average	Average	Above Average
	279 = 100%	93 = 100%	93 = 100%	93 = 100%
5	13.3%	15.1%	13.1%	11.9%
10	51.6	53.9	50.8	50.6
15	73.8	76.6	70.2	75.4
20	87.4	87.5	87.4	88.4

Chi-square tests were conducted to determine which of the questions show a significant difference in the distribution pattern under each of the "average" reading groups. If a null chi-square hypothesis is rejected for a particular question, the reading groups are assumed to be distinctively different, that is, coming from populations which have different characteristics.

The null hypothesis was accepted in the following question areas, acceptance indicating that all three groups come from the same population and that the following questions have no relationship to reading weight group divisions:

1. Number of days after receiving *Journal* before taking an opportunity to look at it or read it.
2. Physical location of the issue.
3. Copy seen by anyone else.
4. Number of people *Journal* is passed along to.
5. First action upon receipt of the publication.
6. Amount of time one expects to spend in the future with the issue.
7. Suggestions concerning the current information value of the *Journal*.
8. Professional fields of endeavor.
9. Number of professional fields given.
10. Job title.
11. Job functions.
12. Age of the issue reader.

For question 17, which asked, "About how much time have you spent reading in this issue of *The Journal of Organic Chemistry?*" when tested, the null hypothesis was rejected. This indicates that the weighted reading groups do differentiate themselves, and are heterogeneous, at least in terms of the amount of time they have spent reading. This affirms to some extent questions that arise concerning the validity of the other answers as given by respondents.

FIELD AND JOB INTERESTS

On the assumption that what one perceives as his professional field and job activity influences his information-seeking patterns, insight was sought into the scope of the reader subscribers' professional fields and job activities served by JOC's editorial content. Two questions were asked, one with aided recall and one without.

A list of 32 separate professional fields was used (aided recall) to solicit respondents' professional fields of endeavor. Of those listed, some 23 different professional fields were used by issue readers to describe the area of their endeavor. An additional 11 statements were obtained from respondents who perceived their field of activity in something other than in those presented on the list. The following fields were listed but not used by any of the respondents:

Bacteriology	Geology
Biophysics	Metallurgy
Chemistry	Microbiology
Clinical Chemistry	Pathology
Engineering	Physics

The three most frequently mentioned fields were "Organic Chemistry" by some 71% of the respondents, "Physical Organic" by 21%, and "Medicinal Chemistry" by 21%.

In the design of the professional field question it was anticipated that the respondents would select only one professional field to describe their field of endeavor. In fact, the adjective "a" was used in the question. Some 43.3% of the respondents chose to describe their professional endeavors by using more than one professional field. It would be of interest to learn if there is a relationship between the number of professional fields given and the use of journals.

Content analysis was conducted on the free responses given in answer to the question of job description activities. A total of 81 different activities were given by the issue readers. (There is no known similar measure to determine whether or not 81 different activities constitutes a large, average, or small number to be served by one journal.) The major portion of the activities was related to specific application areas of chemistry, such as "new drug development," which was given by 11.1% of the respondents as one of their activities. The general activity categories showing the highest frequencies were "research, general" 30%, "synthesis of compounds" 27%, "teaching" 18%, and "administration, management, supervision" 15%.

Issue readers' titles clustered into basically two title groups, that of "chemists and scientists" at 36.6% and "professor" at 29.8%. The next highest frequency was shared by both title groups of "student" and "work" foreman and head of department" at a frequency of 6%.

Job functions are multiple in nature. The functions of issue readers clustered in "basic research" at 65% followed by "teaching" and "student" at 21% equally. A figure of 14% is shared equally by the functions of "technical management" and "process research and development."

An analysis of the age of current issue readers indicates a median figure of 30.7 years and an average age figure of 32.95 years. Both these measures are relatively younger in comparison to the scientific community as a whole.

The responses to the last question in the interview schedule, "Finally, what suggestions do you have concerning *The Journal of Organic Chemistry's* current value to you?" were analyzed as to content and grouped into five categories. The two categories with the highest frequencies were "displeased with suggestions" (43.8%) and "comments with no suggestions" (43.0%).

As might be expected, many of the suggestions were contradictory. What one reader wanted more of, another wanted less. But if there are any definite trends to be noted among the suggestions two might be identified:

1. Shorter articles and/or smaller issues.
2. More selectivity including devices which aid selectivity by reader.

But neither is sufficiently defined to be useful as other than a basis for further study and analysis.

CONCLUSION

Much more data has been gathered than we have presented here. For those interested, it will be made available in the full report. By any criterion this study must be considered a first approximation of the system design data that can be generated through a study of how the scientist uses existing information means. There are questions of universe definition which need further study, and, of course, a study of but a single issue at best serves as a pilot for further study. We have begun to look at how interests and readership behavior can be studied to yield important data on interest clustering as a basis for providing more selective information services. In the main, what we have shown is that much remains to be done that can prove useful in the design and implementation of new information systems.

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