An Experiment in Selective Dissemination—The ACS Single Article Service*

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As a first step toward more selective dissemination and usage, the ACS Single Article Service experiment was designed to measure the usefulness of providing, on demand, single copies of ACS-published articles. A twice-monthly announcement, reproduced from the tables of contents from the latest issues of 15 ACS primary journals, was sent to a representative sample of the ACS membership. Included with each announcement was a mechanism for ordering single copies of up to 10 of the announced items. Two questionnaires provided statistics on the article-reading activities of ACS members and their probable use of such a service on a subscription basis. In addition, the six-month program yielded data on the relative use of articles and journals. Such information was used in estimating cost and resource requirements for offering this service to the full ACS membership and others. The data will also provide a base for added services based on single article distribution and for designing a user-oriented chemical classification schedule for future group SDI programs.

In moving to meet the variety of needs among users of primary information the Primary Publications Division of the American Chemical Society has undertaken to test the value of a series of programs based on disseminating single articles or small groupings of articles rather than journal packages in the traditional pattern. The first experiment in this series is the ACS Single Article Service (SAS). While the Service appears to have value in itself, it is of particular significance when viewed as a first step toward developing a system of putting a more selective and relevant set of documents into the hands of the user.

The goal of the experiment is twofold:

1. Identify and measure the usefulness of a system of primary dissemination making available, on request, single copies of papers published in primary journals.
2. Assess the value of an alerting service based on a limited but significant portion of the chemical literature—the content of the ACS journals.

In the experiment a twice-monthly announcement bulletin consisting of the tables of contents from the latest issues of 15 of the ACS primary journals was sent to a sample group of 1000 ACS members selected from the membership files. These were selected with the aid of a random number table, and the sample was checked to ensure that we had a truly representative sample. For example, the sample contained the same ratio of subscribers and nonsubscribers to ACS journals as the full membership list.

Tables of contents were selected for the alerting service because of the apparent value of titles in making decisions as to whether or not the user wishes to read an article. In a recent survey of the readers of the *Journal of Organic Chemistry*,[1] 84% of those who read part or all of an article cited the title as a factor affecting their decision. Of those who made a decision not to read an article, 92% cited the title as an influencing factor. Use of tables of contents also reduced costs and aided in rapid handling via photographic processing. By the limitation of the service to ACS publications, the user was assured that selected articles would be available either through his own information facilities or through the ACS service.

The publishing frequencies (and hence the availability of the contents page) of the 15 journals vary from biweekly to quarterly. By plotting the number of contents pages that would become available during the six-month period, we found that we could assemble an announcement containing between 200 and 450 items on a twice-monthly basis, approximately on the 14th and 28th of each month. On this schedule, the announcement would be received by users at about the same time that any single journal would be received by a subscriber. During the experiment, a typical announcement consisted of the tables of contents from six or seven journals.

Next to each article, communication, note, etc., listed on a contents page we affixed sequential ordering numbers, beginning with 1 in each announcement. On the back

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cover of each announcement was an order card for requesting articles. The user would copy the numbers of the articles wanted on the order card, fill in his name and address, and send the card to the ACS. On receiving the card, we recorded the day of receipt and the day we fulfilled the order. These data, combined with the data supplied by the user (the day he received the announcement), enabled us to measure the time periods between receipt of the announcement by the user, the mailing of the order card, its receipt at the ACS, and the mailing of the articles to the user.

The fulfilled request card was then used as a source document for preparing a machine-readable record. The data elements in the record were:

a. type or record code (for control purposes)
b. announcement number
c. the four dates mentioned earlier
d. number of articles requested from this announcement
e. individual article numbers
f. user's ACS account number

These request cards served as input into a series of statistical programs, giving us a feedback mechanism for monitoring the progress of the experiment. Many factors affect the statistical results: seasonal variations, mailing delays, etc. It is clear, though, that the number of requests and the number of articles ordered are nearly proportional to the number of items offered in the announcements. It is not surprising to find this supermarket principle at work here; the more we offered, the more we sold. With a limit of 10 articles per announcement, the average number of articles ordered ranged from 5.40 to 6.54, with a mean of 5.78. During the six-month period (12 issues) we received a total of 2246 requests and sent 12,979 copies. Of the 1000 members in the sample, 420, or about 42%, requested one or more items during the six-month period. With the first issue of the announcement, each member was informed of his participation in the experiment and given the option of dropping if he wished. About 5% of the sample was dropped for reasons varying from wrong address to retired.

The maximum number of requests received for a single article was 30, while some 14% of the total number of articles offered were never requested at all. Nearly 63% of all articles offered were requested three times or fewer. Such a wide distribution over the aggregate of articles prohibits taking advantage of the lower unit price afforded by reprinting in quantity. In practice, copies of requested articles were supplied in the form of press overruns. Ten copies of each journal provided a sufficient number of articles to enable us to fulfill the majority of requests. Where more copies were needed to fill requests for popular items, we provided Xerox and offset copies. Our experience in handling led us to conclude that this variety of processing procedures was probably the most difficult (but least expensive) way of processing the requests. The cost of providing single copies is going to be a factor in making the system work.

By examining the number of requests for each item, we can gain insight into what makes some article titles more attractive than others. The first and obvious factor is the subject of the title. Titles about pollution control, spectrographic analysis, and nuclear magnetic resonance, for example, enjoyed high popularity. We found little difference between the ordering frequency of full articles *vs.* the briefer communications, notes, and letters; however, we do not know if the users perceived the difference when ordering.

Realizing that the journals themselves represent a general classification of chemistry, we analyzed the requests for articles in terms of the journals in which they appeared. *Environmental Science & Technology*, *Analytical Chemistry*, and the JOURNAL OF CHEMICAL DOCUMENTATION were the most popular journals on a basis of requests/article offered. We then compared the ranking of journals by popularity in the SAS with a ranking by the numbers of new subscriptions received in a recent promotional campaign. The JOURNAL OF CHEMICAL DOCUMENTATION, which deals with chemical information handling, ranked much higher on the SAS list than on the promotional list. This lends evidence to the feeling that while scientists recognize the importance of information handling problems, their concern is not immediate enough to warrant their subscribing to a specialty journal in this field.

We included abstracts and summaries with some of the titles, in an attempt to measure the impact of providing more informative article surrogates. For *Analytical Chemistry* there was no significant difference in the number of requests for articles between the abstract-bearing announcements and the title-only announcements. For *Environmental Science & Technology* there was an increase in requests/article offered in the announcements that carried abstracts. Because we tried this with only two journals, we are not ready to draw any conclusions in this regard.

An additional set of statistics was compiled from the demographic and journal subscription data we have about ACS members. About 20% of the sample were college professors or graduate assistants, and over 32% of those who used the service were in this category. About 27% of the sample were between 26 and 35 years old; nearly 40% of the users were in this age bracket.

We were especially interested in the behavior of the journal subscribers. About 42% of the sample subscribers to one or more ACS journals, and 57% of those who used the SAS subscribe to one or more ACS journals. Thus, more journal subscribers used the service than nonsubscribers. We also found frequent cases in which subscribers to a journal used the service to obtain copies—i.e., of the 59% of the sample who ordered items from *Analytical Chemistry*, 15% were also subscribers to this journal.

The experiment also has yielded a certain amount of insight into marketing problems. For example, both the announcement service and the reprints were supplied to participants at no cost. This enabled us to use a controlled audience for the test and gave the user time to develop a value judgment of the new service before he was asked to subscribe. We attempted to measure how quickly the users would develop an opinion by counting the number of new, or first time, users with each announcement. We can see that the rate of acquisition of new users decays rapidly. Of the 420 who eventually used the service, 54% took action with the first announcement; by the second announcement 65% of the users had responded, and by the fifth announcement over 79% had used the service.

This kind of data is useful in promoting new information services; for example, it may not be necessary to provide free samples for six months or a year for the purpose of introducing a service.

In designing the system there was some discussion on whether or not the ACS should pay the postage for the request card; often such decisions are made quite arbitrarily. We found it convenient to test how much the inconvenience of affixing a stamp would modify the response. The request cards sent to one-half of the sample were imprinted with postage-paid permits, while the other half was directed to affix a stamp. As a result, 57.3% of the requests came from those who did not have to supply a stamp. This might be translated by the systems designer into a cost-benefit relationship: would the expense of paying for postage be offset by an increase in revenue from a greater number of users?

Near the middle of the experiment we mailed a questionnaire to a group of 250 respondents selected from the original sample using a random number table. Three weeks later the same questionnaire went to a second group of 250 participants. The replies to the questionnaire are somewhat biased in that 67% of the replies came from persons who indicated they found articles of sufficient interest to warrant their taking some further action. This "further action" consisted of sending in the article request card by 78% of those who took some action. 17.5% obtained the articles they wanted from other sources while the rest took a variety of other actions including 8% who used the announcement to prepare bibliographic references.

We also found that those who used the service during the experiment see approximately four more technical or scientific publications per month than the nonusers. This again confirms what is becoming a truism, that the best market for information services are those who already are the heavy users. As a corollary it points up the more difficult problem of how to identify and to meet the information needs of those who are not so readily identified as users of existing information services.

After seeing the articles they had requested, respondents found 36.5% of the articles "highly relevant" and 48.8% at least "partially relevant." Only 8.4% of articles were rated "of little or no relevance." Almost half the respondents who rated the articles in the latter category cited the title as "misleading."

Participants were apparently satisfied with the time from receipt of announcement to receipt of articles (about two weeks). Average response time from receipt of announcement to action by user was 3.09 days. It took 5½ days for the mail to reach us and the copy was on its way back to the user in another 3 days. Despite apparent satisfaction with this schedule, written comments by respondents would indicate that rapid fulfillment of requests is perceived as an important factor in user satisfaction.

One question requested the user to provide an opinion of his probable use of the service if it were offered on a paid subscription basis. About 25% of those responding said they would definitely subscribe or indicated a strong possibility that they would subscribe.

To test the price sensitivity of the potential subscribers, a mailing was made to 1800 ACS members (900 who had participated in the experiment and 900 who were seeing the service for the first time) that offered two options at the following prices:

Announcement service only:	$ 8.00	$14.00	$20.00
Announcement plus 50 reprints:	38.00	44.00	50.00

The price for copies of articles was set at $1.00 for the first article and sixty cents for each additional article with the same order.

The returns favored the low price and surprisingly showed little difference between those who had participated in the experiment and those who had not. But the numbers were small and too inconclusive for further action. We therefore went back to the group who said they would subscribe and asked why they had not responded to our offer. It seems apparent that the combined price gave the impression of a very high price for the service. But regardless of the price opinion, all felt the service would be useful and that "the ACS should launch the service at this time."

Therefore, a promotion mailing offering the announcement service only but outlining reprint availability was made to some 4000 persons—approximately 2000 selected at random from our membership list, 1000 from the nonmember list, and 1000 from our library list. The return from this mailing was sufficiently strong to merit a recommendation to the ACS Board of Directors that the service be offered starting January 1971. At its September meeting the Board approved the recommendation.

The SAS will serve as a base for testing more ambitious and comprehensive information services. For example, the data gathered from the experiment is being analyzed to identify clusters of subject interests. We plan to incorporate the Research Results Service (which makes available manuscripts offered for publication in the three I&EC Quarterlies) into the SAS. Adding author abstracts is an additional possibility.

In summary, then, the ACS Single Article Service is a step in combating the problems of volume and relevancy in scientific and technical communication. Our aim is to fill a need in primary publishing—timeliness with selectivity. The SAS and future programs will provide a valuable supplement to the primary journal system and comprehensive secondary services within the spectrum of information services offered by the ACS.

LITERATURE CITED

(1) Kunev, J. H., and W. H. Weisgerber, "System Requirements for Primary Information Systems. Utilization of the *Journal of Organic Chemistry*," *J. Chem. Doc.*, **10**, 150 (1970).