

PHYSICIANS' PARTICIPATION IN A DISK-BY-MAIL SURVEY*

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Disk-by mail surveys have been used by researchers for a number of years to reach business professionals. Disk-by-mail surveying is growing as more and more researchers discover its benefits. The reported benefits of this methodology are: increased response rate, quicker return of the surveys, improved data quality, and lengthier and more embellished responses to open-ended questions. It is believed that the novelty of disk-by-mail surveys helps "break through the clutter" and create curiosity among oversampled respondents. Since physicians are one of the most oversampled populations, we tested the effectiveness of the disk-by-mail approach on a physician survey. A national random sample of physicians was split into two groups: one was sent a four-page paper questionnaire and the other was sent both a four-page paper questionnaire and a questionnaire on diskette.

In this paper we will examine the profile of the physicians who returned the diskette and their opinions of the disk-by-mail methodology. We will compare the physicians who returned the paper questionnaire with the physicians who returned the diskette questionnaire on the following variables: response rate, amount of time to return questionnaire, completeness of data, and length of responses to open-ended questions. We begin with a review of the previous research on disk-by-mail surveys. We then discuss our work in this area, and draw conclusions from it.

Previous Research

Previous research on the disk-by-mail methodology is sparse. All of the studies have been conducted with business professionals.

Goldstein used a disk-by-mail survey to examine the computer printer needs of MIS directors, marketing executives, and CEOs from a wide variety of large companies. Prerecruitment was conducted to ensure that the individual had access to IBM-compatible equipment and they were willing to complete the survey. The survey was mailed out to 1,500 individuals. Within four weeks, a 50% response rate

was achieved. Goldstein concluded that disk-by-mail surveys work very well (Goldstein, 1987).

Morrison compared the disk-by-mail methodology with the traditional mail survey. A 5 1/4" disk was mailed to corporate buyers to determine their reaction to the new IBM microchannel system. The disks were prepared with specially printed labels, which listed the return mailing address. A self-addressed, pre-stamped cardboard mailer was provided for returning the completed interview disks. A cover letter listing a telephone number for assistance was included in the mailing package. Fifty percent of the sample was given a \$1.00 incentive, fifty percent received no incentive. A 68% response rate was achieved. Sixty percent of the total disk mailing was returned within three weeks. The response rate equalled but did not exceed the client's usual response for standard mail surveys. The significant advantage with the disk-by-mail methodology was in the speed of the returns. Responses to the disk-by-mail survey were accrued in half the time of the client's standard mail surveys. The inclusion of an incentive did not result in a significant difference in the response rates. To gauge respondent reaction to the disk-by-mail survey, an open-ended question regarding their opinions of the format was included. Respondents' reactions were overwhelmingly positive. They found the survey to be fun, easy, and quick to complete. Although the interview contained approximately 60 screens, the average length of time spent on the survey was less than ten minutes. According to Morrison, disk-by-mail surveys have several advantages over traditional mail surveys, including producing higher respondent interest (Morrison, 1988).

The disk-by-mail methodology has been used by Fitzgerald (1993) in qualitative studies of business professionals. It was consistently found that on disk-by-mail surveys individuals were willing to type in several sentences or paragraphs. When similar questions were asked on paper surveys, very few people filled in the answers and when they did, they did not use full sentences. It was also found that open-ended

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responses from diskette-based surveys were more robust and sincere.

Kiesler and Sproull (1986) compared the quality of the data obtained with an on-line survey and a paper survey. Respondents to the electronic format left fewer items blank and refused to answer fewer questions than did respondents to a paper survey. Electronic survey respondents were less likely to be "yea-sayers" and more likely to use extreme scale points than were paper survey respondents.

Method

A mail survey regarding on-line services was sent to a general random sample of 2,750 physicians. The sample was divided into two groups, Group 1 was sent a 4-page paper questionnaire and Group 2 was sent both a 4-page paper questionnaire and a questionnaire on diskette.

Included in the mailing to Group 1 were a paper questionnaire, a cover letter signed by the Executive Vice President of the AMA, and a standard-size business reply envelope. Included in the mailing to Group 2 were a 4-page questionnaire, a questionnaire on a 3 1/2" diskette that ran on DOS-based, IBM-compatible computers in a cardboard mailer, a cover letter from the Executive Vice President of the AMA that instructed the physicians to return either version of the questionnaire, and a 7 X 10" business reply envelope.

The diskette questionnaire was programmed using Sawtooth Ci2. The diskettes were sent to an outside company for duplication. Each diskette was assigned a sequential respondent identification number. Labels displaying instructions on how to start the survey were affixed to the diskettes.

The paper questionnaires for the two groups were identical except that for Group 2 a question that asked why they chose to complete the paper questionnaire instead of using the questionnaire on diskette was added. The questionnaire on diskette was the same as the paper questionnaire, only a set of questions was added that asked for the physicians' opinions of the disk-by-mail methodology. These questions included: the reason for completing the diskette questionnaire rather than the paper questionnaire, the ease of completing the questionnaire, the number of other questionnaires on diskette they have completed, and whether they would prefer completing the questionnaire on-line or using the diskette.

We determined whether the physicians who completed the diskette questionnaire were representative of the physician population. We evaluated the reasons given for completing one format rather than the other.

For those physicians who completed the diskette questionnaire, we looked at their opinions of the methodology. We tested if the disk-by-mail methodology produced a higher response rate, quicker turnaround time, improved data quality, and longer responses to the open-ended questions.

Findings

Characteristics of Physicians

The physicians who returned the diskette survey were not representative of the physician population. Physicians less than 35 years of age, female physicians, and physicians practicing in the Northeast or West were underrepresented. Physicians 35-44 years of age, male physicians, physicians practicing in the South, and physicians whose major professional activity is administration were overrepresented. In contrast, the physicians who returned the paper survey were representative of the physician population.

Reasons for Completing Format

The physicians were asked on the diskette version of the questionnaire, "Why did you complete the computer questionnaire rather than the paper questionnaire?" Two-fifths (41%) of the physicians commented that the computer questionnaire was more fun or they enjoy using computers. The next most frequent response was curiosity or interest in seeing how the questionnaire was set up for the computer (23%). This was followed by the assessment that the computer questionnaire was faster (19%) and easier (17%) (Table 1).

A similar question was asked on the paper questionnaire, "Why did you complete the paper questionnaire rather than the computer questionnaire?" The two most frequent responses were not having access to a computer (34%) and incompatibility between the diskette and their computer (23%). Other responses included the paper questionnaire being faster (13%), the paper questionnaire being more convenient (10%), and computer illiteracy (7%) (Table 1).

Opinions and Previous Experience with Disk-by-Mail Methodology

As can be seen in Table 2, the majority (84%) of the physicians found the diskette survey very easy to complete. Five percent of the physicians thought the diskette survey was difficult to complete, with 4% finding it somewhat difficult to complete and 1% finding it very difficult to complete. These physicians mentioned that the instructions given to start the survey did not work for their computer and they had to copy

files to another diskette.

More than one-half (57%) of the physicians would prefer completing the survey on-line rather than on diskette. More than two-fifths (43%) of the physicians would prefer completing the survey on diskette rather than on-line.

Three-quarters (74%) of the physicians had completed a survey on diskette for the first time. Five percent of the physicians had previously completed one survey on diskette, 6% had completed two surveys, 8% had completed three surveys, and 8% had completed four or more surveys.

Comparison of the Effectiveness of the Disk-by-Mail Survey and Paper Survey

To determine whether the disk-by-mail survey is more effective than the traditional paper survey, we compared the methodologies on the following variables: response rate, turnaround time, number of blank items, number of incorrect responses, completion rate for open-ended items, and length of responses to the open-ended questions.

The response rate for the diskette questionnaire (23%) was higher than for the paper questionnaire (18%). Furthermore, the diskette survey (mean=17 days) was returned more quickly than was the paper survey (mean=24 days) (Table 3).

The data quality of the responses to the closed-ended items was found to be superior for the diskette questionnaire. First, the number of blank items was examined. For the diskette questionnaire, 28% of the respondents had one or more blank items compared with 34% of the respondents for the paper questionnaire (Table 3).

When the number of incorrect responses was examined it was found that none of the diskette survey respondents had one or more incorrect responses compared with 22% of the paper survey respondents (Table 3).

An examination of the open-ended items found that a greater percentage of diskette survey respondents (93%) than paper survey respondents (60%) completed the open-ended items. Moreover, the length of the responses to the open-ended questions for the diskette survey (mean=14 words) was longer than the length of the responses to the open-ended questions on the paper survey (mean=9 words) (Table 3).

Discussion

This study yielded three major findings. First, the physicians who returned the diskette survey were not representative of the physician population on a number of variables including age, gender, geographic location, and major professional activity. The

underrepresentation of physicians less than 35 years of age, female physicians, and physicians practicing in the Northeast or West may be due to those groups of physicians not having a computer readily accessible.

Second, the main reasons why the physicians returned the diskette survey rather than the paper survey was that they thought the diskette survey was more fun and they were curious and interested to see how the questionnaire was set up. This finding supports the notion that the novelty of disk-by-mail surveys helps "break through the clutter" and create curiosity among oversampled respondents, such as physicians. This notion is further supported by the finding that for three-quarters of the physicians this was their first questionnaire on diskette.

The third major finding of this study is that the disk-by-mail survey is more effective than the traditional paper survey. The diskette survey produced a higher response rate and was returned quicker than the paper survey. The data quality of the diskette survey was superior to that of the paper survey. The completion rate for the open-ended items and the length of the responses to the open-ended questions were greater for the diskette survey than the paper survey. These findings are consistent with the results obtained by Goldstein (1987), Morrison (1988), Fitzgerald (1993), and Kiesler and Sproull (1986) with business professionals.

Although the disk-by-mail methodology is superior in many respects to the traditional paper survey for use with physicians and similar hard to reach populations one major drawback of the methodology is that the respondents may not be representative of the population, whereas with the paper survey the respondents are more likely to be representative of the population.

When using the diskette-by-mail methodology, prerecruitment of physicians should be done prior to mailing the diskette to determine if the physician has access to a computer and whether the computer takes a 5 1/4" or a 3 1/2" diskette. We found that the main reasons why physicians returned the paper questionnaire rather than the diskette questionnaire were lack of access to a computer or incompatibility between the diskette and their computer. The use of prerecruitment will eliminate these problems and produce even higher response rates.

Researchers should consider conducting surveys of physicians on-line, as well, since more than one-half of the physicians who returned the diskette survey commented that they would have preferred to complete the survey on-line.

Table 1. Reasons for Completing Format

	<u>Percent</u>
<u>Reasons for Completing Diskette Format</u>	
More Fun/ Enjoy Using Computers	41
Curiosity/Interest	23
Faster	19
Easier	17
Total	100
Number of Respondents	74
<u>Reasons for Completing Paper Format</u>	
No Access to a Computer	34
Diskette Not Compatible With Computer	23
Faster	13
Convenient	10
Not Computer-Literate	7
Other	14
Total	101
Number of Respondents	234

Table 2. Opinions and Previous Experience with Disk-by-Mail Methodology (Among Physicians Using Diskette)

	<u>Percent</u>
<u>Ease of Completing Survey</u>	
Very Easy	84
Somewhat Easy	11
Somewhat Difficult	4
Very Difficult	1
Total	100
Number of Respondents	74
<u>Preference for Completing Survey on Diskette or On-line</u>	
Diskette	43
On-line	57
Total	100
Number of Respondents	74
<u>Number of Other Surveys on Diskette Completed</u>	
0	74
1	5
2	6
3	8
4 or More	8
Total	101
Number of Respondents	74

Table 3. Comparison of the Effectiveness of the Diskette Survey and the Paper Survey

<u>Response Rate</u>	
Diskette Questionnaire	23%
Paper Questionnaire	18%
<u>Mean Turnaround Time</u>	
Diskette Questionnaire	17 days
Paper Questionnaire	24 days
<u>Respondents With One or More Blank Items</u>	
Diskette Questionnaire	28%
Paper Questionnaire	34%
<u>Respondents With One or More Incorrect Responses</u>	
Diskette Questionnaire	0%
Paper Questionnaire	22%
<u>Completion Rate for Open-Ended Responses</u>	
Diskette Questionnaire	93%
Paper Questionnaire	60%
<u>Mean Length of Open-Ended Responses</u>	
Diskette Questionnaire	14 words
Paper Questionnaire	9 words

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