

The Effect of an Advance Letter, a Reminder by Telephone, and the
Enclosure of a Second Questionnaire on the Response to Mail Surveys

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Second Questionnaire.

Abstract

Dillman's Total Design Method (TDM) for mail surveys has been proven to be effective in the U.S.A., Germany, the Netherlands, and other countries. A serious drawback of the TDM is the time it takes to complete the survey. Two techniques for shortening the TDM were tested on a sample of Dutch parents: i.e. advance letter and third reminder by telephone after four and a half weeks. Both factors did not improve the final amount of response. The advance letter, however, did significantly improve the initial response. Additionally the influence of a third factor was investigated: the enclosure of a second questionnaire for the oldest child in the household. This lowered the response dramatically, as predicted by social exchange theory. Neither of the three experimental factors influenced the quality of the response, as indicated by an index for item nonresponse and a social desirability measure.

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Introduction

Because of its low costs and geographical flexibility, mail surveys have been popular over the years (Houston & Ford, 1976; Kanuk & Berenson, 1975). However, the general low response rates associated with this survey method, limits its effectiveness (Rossi, Wright & Anderson, 1983; Tull & Hawkins, 1984: 126-137).

An increasing number of empirical studies, designed to increase the response rate, have been reported over the last three decades. This resulted in several comprehensive review articles and quantitative reviews (Baumgartner & Heberlein, 1984; Goyder, 1982; Heberlein & Baumgartner, 1978; Kanuk & Berenson, 1975; Linsky, 1975; Yu & Cooper, 1983). Of the four factors found to be effective in increasing response rate -saliency, sponsorship, follow-up contacts and incentives- only the last two can be controlled by an individual survey researcher. Further research indicated that a special kind of reminder, for instance by certified mail, would be even more effective than an ordinary follow-up (Heberlein & Baumgartner, 1978; House, Gerber, McMichael, 1977).

A fifth factor -personalization- gives mixed results. For instance, an increase in response rates is reported by Carpenter (1974) and Dillman & Frey (1974); a decrease in response rate is reported by Andreasen (1970) and by Houston & Jefferson (1975). It appears that personalization interacts with other characteristics of the survey (Houston & Jefferson, 1975; Wiseman, 1976). To fully understand these effects it is necessary to develop theories of mail questionnaire response rates (Baumgartner & Heberlein, 1984).

A theoretical framework for mail surveys is given by Dillman (1978), who guided by social exchange theory, has integrated several well-known procedures for increasing response rates. Important features of Dillman's method are: personalized cover letter, a simple and attractive questionnaire, and the use of follow-up mailings. One week after the initial mailing the entire sample (respondents and non-respondents) receives a postcard 'thank you' reminder. Three weeks after the initial mailing all non-respondents receive a new questionnaire with cover letter; seven weeks after the initial mailing this procedure is repeated, but this time the questionnaire is sent by certified mail. According to Dillman (1978: 7, 9), these procedures interact to produce a maximum result.

Using the TDM, Dillman (1978: 27) reports an average response rate of 70% for samples from the general population in the United States. There is some evidence for the cross-cultural validity of the TDM. Both in the Netherlands (De Leeuw & Hox, 1985, De Leeuw & Hox, 1987; Nederhof, 1983) and in Germany (Hippler & Seidel, 1985) the TDM has been successful in achieving high response rates (on average 66%).

A serious drawback of the TDM is its long implementation time (cf Houston & Ford, 1976). In general, using the TDM, the first data-analysis cannot be done until 10 weeks after the initial mailing of the questionnaire. Though the possibilities for shortening the TDM are limited, two procedures are promising: an

advance notice a week before the initial mailing, and a telephone reminder 4 1/2 weeks after the initial mailing instead of a reminder by certified mail after 6 weeks.

An advance notice can be sent out, while preparing the initial mailing, so that it will not lengthen the total procedure. Furthermore, there is some evidence that a prenotification increases the response rate (Yu & Cooper, 1983) and can be used instead of a, more time-consuming, reminder (Heberlein & Baumgartner, 1978). Also Heberlein and Baumgartner (1978) point out that a last reminder by telephone is somewhat more effective than a reminder by special mail.

In this study the effects of an advance letter and a telephone reminder on the response are tested in a controlled field experiment. Furthermore, the effect of the enclosure of a second questionnaire is investigated in this experiment. This has both theoretical and practical importance. First of all, the addition of this third experimental factor makes it possible to test the social exchange theory as formulated by Dillman (1978: 12, 16). By enclosing an additional questionnaire, and asking the potential respondent to give this second questionnaire to another member of the household, the researcher increases the demand on the first respondent. Or, in terms of the social exchange theory, the psychological costs of responding increase. This should lead to a decrease of the response of the original first potential respondent. Secondly, when implemented successfully, the enclosure of an extra questionnaire makes it possible to survey several members of one household at the same time and in an inexpensive way.

Questionnaire Content

The response rate experiment was part of a survey on parental attitudes and goals in education, done by the Department of Education of the University of Amsterdam. The sample consisted of 800 Dutch parents with children younger than 15 years. The names and addresses were randomly drawn from a commercially available list of parents, which was obtained through the the Dutch National Post, Telegraph, and Telephone Office (PTT, 1985).

A group of researchers at the Department of Education planned a survey among parents and their children, and they wondered about the possible effects of the enclosure of a children's questionnaire on the response of the parents. So, in this study a questionnaire for the eldest child in the household was used to define the third experimental factor: enclosure of a second questionnaire. This 'children's questionnaire' contained questions on parental reactions in various situations.

Method

Implementation of the Design

Eight hundred Dutch parents were asked to participate in a mail survey on their attitudes and goals in education. The recommendations made by Dillman (1978) concerning the questionnaire, the cover letters and the implementation of the survey were closely followed. Potential respondents were mailed a cover letter, a questionnaire, and a postage paid reply envelope. No selection of respondents within households was attempted. One week later all received a 'thank you' reminder postcard. Three weeks after the initial mailing, those who had not yet responded were mailed a different worded cover letter, a replacement questionnaire, and a postage paid reply envelope. No third reminder by certified or ordinary mail was used after seven weeks. Three experimental factors were manipulated: advance notice, third reminder by telephone, and enclosure of a second questionnaire for the eldest child in the household.

The experimental factors were implemented in the following fashion:

(a) **Advance Notice.**

A short letter, explaining the survey, was typed on letterhead stationary and printed. Names and street addresses were then individually typed on each letter. Each letter was signed by the head of the department in blue ball-point pen. One half of the sample received this letter, the other half received no advance notice at all.

(b) **Third reminder by telephone.**

Four and a half weeks after the initial mailing non-respondents were contacted by telephone. After a short introduction, the non-respondents were asked whether they had received the questionnaire and whether they had any questions to ask the researcher. Assistance in completing the questionnaire was offered by the interviewer. The telephone conversation was concluded with a request to complete and return the questionnaire. The non-respondents of one half of the sample were contacted by telephone. The other half of the sample did **not** receive a third reminder **at all**.

(c) **Children's questionnaire.**

A short questionnaire for the eldest child in the family was enclosed for one half of the sample. This questionnaire contained questions about parental reactions in everyday situations, as perceived by the child. In the cover letter this second questionnaire was explained, and the parents were requested to give it to their eldest child for completion. Again the second half of the sample did not receive a children's questionnaire, and the cover letter for this group did not mention it.

The three experimental factors have been crossed in a 2x2x2 design. This resulted in eight experimental groups. Group 1 received an advance letter, had a questionnaire for the eldest child enclosed, and got a third reminder by telephone. Group 2 received an advance notice, no children's questionnaire, but did receive a third

reminder by telephone. Group 3 received an advance notice, a children's questionnaire, and no third reminder. Group 4 received an advance notice, no children's questionnaire, and no third reminder. Group 5 did not receive an advance notice, but did receive a children's questionnaire and a third reminder by telephone. Group 6 received no advance notice, no children's questionnaire, but did receive a third reminder by telephone. Group 7 did not receive an advance notice, nor a telephone reminder, but did receive a children's questionnaire. Group 8 received neither an advance notice, nor a children's questionnaire, nor a third reminder by telephone. This design makes it possible to study both the main effects of the experimental factors and their interactions (cf Heberlein & Baumgartner, 1978).

Dependent Variables

In the literature on mail surveys several different formulae to compute the response have been used (Kviz, 1977). The most straight-forward measure is the completion rate, defined as the number of completed questionnaires expressed as a percentage of the total number of questionnaires mailed out. However, the response rate, defined as the number of completed questionnaires as a percentage of the total number mailed out minus the number of ineligible questionnaires (address unknown, addressee moved, deceased) is more often used in survey research. In this study **both** the completion rate **and** the response rate of the parents have been used as dependent variables. This makes it possible to detect different effects of the experimental factors on information about ineligibles and the response rate (Dillman & Moore, 1983; Hox, De Leeuw & Duijx, 1984).

Besides the quantity of response, the quality of the response is an important factor for consideration too. Unfortunately, response quality has received comparatively little attention in methodological studies (Houston & Ford, 1976; Jones & Lang, 1982). In order to broaden the scope of this mail survey experiment, we have added two well-known indices of data quality: social desirability and item-nonresponse (De Leeuw & Hox, 1987; Houston & Ford, 1976). Both were assessed for the main scale of the parental questionnaire.

Results

Quantity of Response

The data were analyzed using a logit analysis (McCullagh & Nelder, 1983). Both completion rate and response rate of the parents were used as dependent variables. Analyses were done on the total response after the initial mailing plus postcard reminder (first wave), on the total response after the second reminder (second wave), and on the final response after the last reminder (third

wave). The results concerning the quantity of response are summarized in Table 1.

Table 1

Number of completed questionnaires, nonresponse, ineligible, completion rate and response rate per condition.

	Condition (a)							
	1	2	3	4	5	6	7	8
Final Response:								
Completed	51	61	56	60	50	59	43	64
Nonresponse	25	22	28	28	31	28	47	21
Ineligible	24	17	16	12	19	13	10	15
Completion Rate	51%	61%	56%	60%	50%	59%	43%	64%
Response Rate	67%	73%	67%	68%	62%	68%	48%	75%
After 2nd Reminder:								
Completed	42	59	56	59	42	53	43	64
Nonresponse	41	25	28	29	44	37	47	21
Ineligible	17	16	16	12	14	10	10	15
Completion Rate	42%	59%	56%	59%	42%	53%	43%	64%
Response Rate	51%	70%	67%	67%	49%	59%	48%	75%
Initial Response:								
Completed	40	50	54	56	36	47	37	52
Nonresponse	46	35	33	34	51	45	54	36
Ineligible	14	15	13	10	13	8	9	12
Completion Rate	40%	50%	54%	56%	36%	47%	37%	52%
Response Rate	47%	59%	62%	62%	41%	51%	41%	59%

(a) 1= Advance Notice + Child's Questionnaire + Telephone Reminder; 2= Advance Notice + Telephone Reminder; 3= Advance Notice + Child's Questionnaire; 4= Advance Notice; 5= Child's Questionnaire + Telephone Reminder; 6= Telephone Reminder; 7= Child's Questionnaire; 8= Control group, i.e. No advance notice, No child's questionnaire, and No telephone reminder.

In all cases a simple main effects model gave a good fit to the data. Adding first order interactions did not improve the fit significantly. Parameter estimates for the main effects model are given in Table 2.

Table 2

Parameter estimates for the main effect model; logit analysis. Dependent variables are both completion rate and response rate. Fit of the model, parameter estimates, standard errors and significance are given.

To aid in the interpretation of the parameter estimates the contribution to the response in percentages is given in parentheses.

Final Response: Completion Rate (55%) Response Rate (65%)

Exper. Factor:	Par.	S.E.	p	%	Par.	S.E.	p	%
Advance letter	.12	.14	.39	(3%)	.26	.16	.10	(7%)
Telephone rem.	-.02	.14	.89	(0%)	.14	.16	.86	(3%)
Child quest.	-.45	.14	.00	(-11%)	-.47	.16	.00	(-11%)

Model fit: Dev=3.43, df=4, p=.49; Dev=7.59, df=4, p=.11

After 2nd Rem. Completion Rate (52%) Response Rate (61%)

Exper. Factor:	Par.	S.E.	p	%	Par.	S.E.	p	%
Advance letter	.14	.14	.32	(4%)	.26	.16	.10	(6%)
Child quest.	-.52	.14	.00	(-13%)	-.61	.16	.00	(-15%)

Model fit: Dev=0.71, df=1, p=.40; Dev=1.15, df=1, p=.28

Initial Resp. Completion Rate (46%) Response Rate (53%)

Exper. Factor:	Par.	S.E.	p	%	Par.	S.E.	p	%
Advance letter	.28	.14	.05	(7%)	.38	.15	.01	(9%)
Child quest.	-.39	.14	.01	(-9%)	-.41	.15	.01	(-10%)

Model fit: Dev=1.06, df=1, p=.30; Dev=1.03, df=1, p=.31

To aid in the interpretation of the estimators, percentages are given in parentheses. At the top the total response percentage is given, and after each factor the percentage is given that this specific factor contributed to the total percentage. For example, the final response rate was 65%. Leaving out the advance letter

would decrease this final response with 7%. Though substantial, this decrease is not statistically significant at a conventional significance level ($p=0.10$).

When we inspect the results in Table 2, we see that -contrary to our expectations- a third reminder by telephone does not increase the final response. Also, contrary to our expectations, an advance letter does not significantly increase the final response, nor the total response after the second reminder. However, it does significantly increase the initial response ($p=0.05$). Looking at the parameter estimates, we see that the use of an advance letter increases the initial completion rate with 7% from 39% to 46%, and the initial response rate with 9% from 44 to 53%. Finally, the inclusion of a second questionnaire for the eldest child in the household, dramatically lowered the response of the parent with an average of 11%. This effect was statistically significant in all cases ($p=0.01$).

Quality of Response

To assess the social desirability of the questionnaire used, we asked eight dutch experts in the field of data collection methods, to rate the items of the parental goals scale on social desirability. The agreement among the judges was high, and the reliability of the ratings was satisfactory (Cronbach's $\alpha = 0.78$). As an indicator of item-nonresponse the proportion missing values on the parental goals scale was used.

There were no statistical significant differences in socially desirable answers and item-nonresponse between the experimental treatments. Neither an advance letter, nor a third reminder by telephone, nor the enclosure of a children's questionnaire, has any influence on the social desirability of the answers of the parent, or on the item-nonresponse.

Finally, we checked if respondents to the three experimental treatments differed on the variables age, sex, and education. No statistical significant differences were found. Also, early and late respondents did not differ significantly on these biographical variables.

Summary and Conclusions

Three experimental factors were investigated in a controlled field experiment.

The first experimental factor, an advance letter explaining the survey and asking for cooperation, did increase the total amount of response though not statistically significant ($p=.10$). It did have a positive effect on the response to the initial mailing. The use of an advance letter significantly increased the completion rate on the first mailing with 7% and the response rate with 9%. Similar results were found by Nederhof (1982) in a general survey of the inhabitants of a medium sized Dutch town, and by Hippler & Seidel (1985) in a

general survey of the population of West-Germany.

The advance letter did not influence the quality of the response in any way. It seems that the use of an advance letter is very useful in those cases when speed of response is important or when the survey is restricted to an initial mailing and reminders are not possible.

The second experimental factor, a special third reminder by telephone, did not have any statistically significant effect on the quantity or the quality of the response of the parents.

In an earlier mail survey experiment of the general population of the Netherlands Hox, De Leeuw & Duijx (1984) found that a special third reminder by certified mail was successful, and did increase the response rate significantly. Similar results are reported by Kulka, Shirey, Moore & Woodbury (1981) for a national sample of registered nurses in the U.S. Also, Assael & Keon (1982) report that a mail follow-up performs considerably better than a telephone follow-up in a A.T.&T survey of small businesses. When comparing the effectiveness of a telephone reminder and a reminder by certified mail, Dillman & Moore (1983) find mixed results. In two studies done in Pennsylvania they find statistically significant differences between certified mail and telephone reminder of more than 4 percent in favor of the certified mail. In two studies done in Oregon-Washington, on the other hand, they find clear though not statistical significant differences of 3 to 4 percent in favor of the telephone reminder. A partial replication of the study reported here, in which a telephone reminder and a reminder by certified mail are explicitly compared is highly desirable.

The third experimental factor, the enclosure of an extra questionnaire for the eldest child, had a large, statistically significant effect on the response of the parents. It lowered both completion rate and response rate with an average of 11%. However, it did not effect the quality of the responses made by the parents.

Discussion

Two results of this study need further attention: the ineffectiveness of the telephone reminder, and the negative effect of the children's questionnaire.

The ineffectiveness of the telephone reminder was contrary to expectation. In general, more reminders result in more response (cf Baumgartner & Heberlein, 1984). In our case, an extra reminder did not result in an increase of response. An explanation could be found in the initial differences between experimental groups. Though respondents were randomly assigned to experimental conditions, this does not guarantee exchangeability of experimental groups. In order to investigate this possibility, we reanalyzed the data.

Inspecting Table 1, it is seen that comparable experimental groups differ in the response after the second reminder, i.e. there are already differences in response before the telephone reminder is

implemented. Adding the response after the second reminder to the main effects model does **not** improve the fit for the completion rate, but **does** improve the fit for the response rate. In the latter case, the effect of a telephone reminder is significant at the 5% level ($p=0.02$). The number of completed questionnaires is somewhat increased, but the completion rate does not show a significant difference ($p=0.09$). The number of ineligibles (address unknown, addressee moved or deceased) is also somewhat increased. Together, this results in a significantly higher response rate for the condition with the telephone reminder. So, the effect of the telephone reminder is partly 'cosmetic' (Hox, De Leeuw & Duijx, 1984). However, information about ineligibles, as reflected in the response rate, is important because it provides important information about the accuracy of the sampling frame. the model, concerning the telephone reminder. Differences in initial response do not explain the ineffectiveness of the telephone reminder.

The disappointingly small effect of the telephone reminder in our study can be caused by the high saliency of the questionnaire (parents were asked about their attitudes to educational goals for their children), and its influence on the amount of initial response. As a consequence, the response rate could already have approached the maximum value possible, before the telephone reminder was used. And some of the ineffectiveness of the telephone reminder can be attributed to this 'ceiling effect'. It is likely that in any survey an upper boundary exists beyond which the response can not be raised. In that case response increasing factors will become less effective when they asymptotically approach the upper boundary of the response. The data in Table 1 provide two arguments in support of this 'ceiling effect'. First of all, we see that the response for the control group is already extremely high. This group, on which **no** response increasing treatments were tried, has an initial completion rate of 52% and a response rate of 59%. An initial response rate of 30% and a final response rate of 50% would be more typical (cf. De Leeuw & Hox, 1986). Secondly, in those conditions where the response has been lowered by including a child's questionnaire, the last reminder does bring in a higher final response. Of course, these arguments are post hoc, and experimental research on this topic is highly recommended.

The enclosure of an extra questionnaire for the eldest child in a mail survey of Dutch parents, had a dramatic, negative effect on the quantity of response of the parents, as predicted by social exchange theory. Exploration of the data provides further indication of the validity of the social exchange theory. In the light of the social exchange theory, the enclosure of a second questionnaire for another person in the household, probably upsets the balance between costs and rewards for the original first respondent. In that case, an extra reward is needed to overcome this problem, and restore the balance. There is some evidence for this hypothesis. Both the advance letter and the telephone reminder interact with enclosure of child's questionnaire, and appear to neutralize the negative effect

of the enclosure of the children's questionnaire somewhat (cf. Table 1). The reward, in the form of extra attention of the researcher, neutralizes the extra cost of responding. Further research on these points is necessary. We suggest highly controlled response experiments in which costs and rewards are systematically manipulated.

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