

## THE EFFECTS OF INCENTIVES, INTERVIEW LENGTH, AND INTERVIEWER CHARACTERISTICS ON RESPONSE RATES IN A CATI-STUDY

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Through an experimental study, this research note analyses the effect of incentives, announced interview length, and interviewer characteristics on response rates in a CATI-study. Survey response rates are declining throughout the developed world (De Leeuw & De Heer, 2002). A public weary of having their dinner interrupted by an increasing number of polling agencies and media-conducted surveys (not to mention other types of commercial calls) has increased refusal rates. This development is partly aggravated by the fact that more and more people increasingly rely on cell phones and unlisted numbers, which are not included in survey samples unless Random Digit Dialing (RDD) is used. Furthermore, together with the increasing number of polls conducted in recent years, there has been an increasingly louder public debate calling for a ban on polls in the weeks prior to elections (e.g. Schultz-Jørgensen, 2005; Ullerup, 2005). This public critique of commercial polling might also have increased the likelihood of potential respondents to refuse to participate in surveys.

Response rates in Denmark have declined in recent decades, as has been the case in other western countries. The Danish National Institute of Social Research (SFI), one of the most respected polling agencies in Denmark, has experienced a 10 percentage point decrease in response rates over the last ten years, averaging over the 30–50 telephone and face-to-face surveys they conduct annually (personal communication with SFI, 2005). Other commercial agencies have also experienced declining response rates in recent years (personal communication with Gallup, Vilstrup, Rambøll Management 2005).

Throughout the period marked by declining response rates, the polling industry has made various attempts at reversing—or at least halting—this decline. Survey research organizations have, among other things, increased the number of call-backs and advance letters, as well as introduced different forms of incentives to encourage survey participation. Much attention was paid to the declining response rates (Steeh, 1981; Smith, 1995; Curtin, Presser, & Singer, 2005) and the impact of efforts to improve them.

Research indicates that advance letters and postcards improve response rates significantly and cost-effectively. Hembroff, Rusz, Rafferty, McGee, and Ehrlich (2005) reveal that advance letters improve response rates by 5.8 percentage points and postcards by 2.8

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percentage points in a telephone survey, whereas Singer, Van Hoewyk, and Maher (2000) find that an advance letter has no significant effect.

Incentives also indicate a positive effect on response rates. Pre-paid incentives are generally more effective than promised incentives are, and monetary incentives are more effective than, for example, lotteries, charities, vouchers, or in-kind incentives (Warriner, Goyder, Gjertsen, Hohner, & McSpurren, 1996; Kalantar & Talley, 1999; Porter & Whitcomb, 2003; Fahimi et al., 2005; Ryu, Couper, & Marans, 2006). The impact of lottery incentives varies from 1.4 to 14.8 percentage points, whereas the impact of pre-paid incentives varies between 12 to 27 percentage points after one contact across different forms of surveys (post, e-mail, and CATI) and population (students, general population, faculty members, and company owners). The studies also confirm the diminishing effect of the value of the incentive, that is the first euro spent on incentives is more effective than the last one.

The above findings have contributed to our understanding of the various factors in play when respondents decline or accept an invitation to participate in opinion surveys. This research note aims to supplement and advance this insight on a number of factors. By applying an experimental design, this note assesses the effect of lottery incentives, announced interview length, and the interviewer effect on response rates in a CATI-study.

## METHOD

The data is a simple random sample of Danish voters interviewed through CATI. An experimental design is used, varying the announced promised interview time between 15 and 20 minutes and randomly varying incentives between lottery travel vouchers, lottery grocery vouchers and no incentives. The incentives are combined with the background data of the interviewers in order to assess the effect on the refusal rate. All interviewers received training before starting the interviews and were supervised throughout the study. The CATI-system randomly assigned interviewers to a respondent. In this manner, the interviewers were randomly assigned to conduct 15- and 20-minute interviews, as well as to the use of incentives at the beginning of the interview. The introduction upon reaching the respondent was:

‘Hello—My name is ... I am calling from Rambøll Management on behalf of the University of Copenhagen. We are conducting an opinion survey and would like to hear whether we could ask you some questions. The survey is about political issues of concern to us all. It will take approximately 15/20 minutes.’

The 15-minute announcement represented a true decrease in the length of the survey, as a time-consuming set of questions was dropped to achieve the 5-minute decrease.<sup>1</sup> The topic was politics in general, with many questions similar to the national election studies. Screening for likely voters was not used, mainly due to the high turnout in Denmark. The incentive splits were:

<sup>1</sup> On average, the promised 15-minute interviews took approx. 25 minutes, including call-up and ending procedures, whereas the 20-minute interviews took 28 minutes.

'For the inconvenience, you will participate in a lottery where there are good chances for winning [SPLIT 1: travel vouchers to e.g. London and Paris] [/] [SPLIT 2: vouchers to different grocery stores] of a total value of DKK 15,000 [approx. 2,000 €].'

In practice there were three prizes of DDK 5,000 (approx. 700 €) within each split, that is a total of DDK 30,000 (approx 4,000 €) was spent on the prizes. If the respondent asked the interviewer, this information was provided. The third incentive split provided no incentives. The reason for the choice of lottery incentives in this study—despite the fact that the studies mentioned above have demonstrated that cash and pre-paid incentives are more effective—is twofold. First, pre-paid incentives in telephone interviews demand a sample in which it is possible, prior to the interview, to identify the respondent in order to send an advanced letter with the incentive. In this study, once a household was reached, a respondent was randomly selected by the 'last birthday' technique. Secondly, cash and pre-paid incentives are liable to be taxed in Denmark, and it is the organizer's duty to report recipients of such incentives to the taxation authority. Cash and pre-paid incentives are therefore quite time-consuming. Thus, lottery incentives with grocery store and travel vouchers are the most widespread form of incentives used in Denmark.

Table 1 summarizes the response to the experimental survey. Refusal rates account for 43 percent, whereas non-contact merely accounts for 11 percent of the relative response rate. Other elements have effects below 1 percent in understanding the response rate level; that is with 11 call-backs spread over a month, it was possible to reach 89 percent of the net-sample. Thus the main obstacle for a good response rate is the high refusal rate.

TABLE 1 Overview of response to the survey

	<i>N</i>	<i>Percentage of net sample</i>
Population (known household telephone numbers in Denmark)	1,852,065	
Simple random sample	5,669	
Gross-sample (companies manually removed)	5,100	
Non-working numbers (faxes, companies, out of order, etc.)	316	
Net-sample	4,784	100.00
Refusals	2,076	43.39
Non-contacts	528	11.04
Other—do not speak Danish	37	0.77
Other—disabilities	63	1.32
Aborted/interrupted interview	80	1.67
Fully completed interviews	2,000	41.81
Response rate (percent of net sample)		41.81
Refusal rate (percent of net sample)		43.39

*Note:* The definition of response rate follows the American Association of Public Opinion Research Response Rate 1. The interviews were conducted by Rambøll Management using CATI from January 5 to February 7, 2005. Minimum 11 call-backs were conducted, ranging up to 19. The respondents were randomly selected within each household on last birthday and no substitution allowed.

Many other studies also support this conclusion (Steeh, 1981; Nicolaas & Stratford, 2005; Curtin et al., 2005).

From the 500 respondents who refused to participate, a random sub-sample was re-interviewed, with up to seven call-backs, between 14–18 February 2005. The re-interview focused on people's reason for not participating in the original interview. The response rate was 85 percent for this 1-minute re-interview. Results show that 'too many contacts' and 'on principle never participate' were mentioned by 42 percent of all respondents, thus representing the most important reasons for not participating. Even though the number of telephone polls is increasing, the statistical likelihood that a telephone number is included in two random samples is very small, as the number of known telephone extensions in Denmark is roughly 1.8 million. On this background, 'too many calls' simply cannot be true, objectively speaking; however, there are other elements contributing to this strong, subjectively stated unwillingness. First, if the person with the last birthday is not at home at the time of the initial contact attempt, the survey agency will usually call back later, maybe repeatedly, before the target person in the household is reached. Secondly, if the household has been listed on a commercial list of telephone numbers (similar to various e-mail spam lists) used by, for instance, newspaper or insurance salespersons, a household might experience an increasing number of calls over a period of time. Finally, people usually at home between 4 and 9 p.m.—when most polls are conducted—are more likely to be contacted by a polling agency. In spite of these elements, the probability of being contacted by a survey institute remains quite small in the objective sense. In this manner, the general unwillingness to participate due to an excessive number of calls is quite subjective and objectively overestimated by the respondents.

Twenty-three percent indicate 'lack of time' as the reason for refusing to participate. Even through the 'lack of time' statement is probably partly a hidden 'no interest' indicator, it makes sense to attempt to make an appointment to call back at a more suitable time or simply registering the time of day for the refusal and attempting a call-back at another time of day, as a means of dealing with this challenge. Lack of time also constitutes a dominating factor in Rogers' (1976) study of reasons to refuse participation. Exactly 71 percent of those re-interviewed in our study indicated—somewhat absurdly *in* an interview—that they would never consent to an interview. The idea of 'getting a foot in the door' combined with a very short interview appears to increase the cooperation rate substantially in this case.

## THE EFFECT OF INCENTIVES, INTERVIEW LENGTH, AND INTERVIEWER EFFECT

### INCENTIVES AND LENGTH

One means of achieving an increased response rate is by providing incentives and conducting less time-consuming interviews. Table 2 illustrates the general picture, showing the response rates for the different experimental conditions.

Field time was longer for the 20-minute interviews than for the 15-minute interviews, which leaves the level of non-contacts higher among the 15-minute interviews than

TABLE 2 Response rates by incentives and announced interview length

	Announced 20 minutes			Announced 15 minutes		
	Lottery travel vouchers	Lottery grocery vouchers	No incentives	Lottery travel vouchers	Lottery grocery vouchers	No incentives
Net-sample	1,240	1,226	1,227	361	365	365
Fully completed interviews	519	512	494	180	150	145
Refusal rate	45.00**	44.62*	46.54**	34.35	37.81	37.81

Note: The 20-minute interviews were conducted from January 5 to February 7, 2005, whereas the 15-minute interviews were conducted from January 29 to February 7, 2005. \* =  $p < .05$ , \*\* =  $p < .01$ , indicating a significant difference between the same incentive groups when interview time varies. When length of interview is held constant but incentives are set to vary, no statistical difference is found. Compared by independent-sample  $t$ -test (2-tailed).

among the 20-minute interviews. As response rate is affected by both refusal and non-contact levels, refusal rate is the best comparative measure when interview length varies because a subject can be counted as a refusal only when contact is achieved.<sup>2</sup>

At first glance, Table 2 reveals that cutting five minutes off an interview affects the refusal rate much more than providing incentives does: approximately a 10 percentage point decline in the refusal rate when going from 20 to 15 minutes. Incentives show no significant effect when the (announced) length of interview is held constant. In our case, offering incentives did not affect the refusal level. A final point to be drawn from Table 2 is that there appears to be no significant interaction between interview length and the incentive.

### INTERVIEWER EFFECTS

When it comes to interviewer effect, research usually focuses on response bias and substantive bias. This line of research finds an interviewer effect in terms of social desirability when it comes to interviewer race (Huddy et al., 1997) and gender (Kane & Macaulay, 1993; Davis, 1997), face-to-face compared to CATI (Holbrook, Green, & Krosnick, 2003), and interviewer style (Rogers, 1976). Nevertheless, Groves and Magilavy (1986) conclude that the generalized interviewer effect tends to be smaller than usually reported in various studies (see also Tucker, 1983).

Few studies focus on the interviewer effects on refusal rates in surveys. Baruffolo, Verger, and Rotily (2001) find that female interviewers generally have higher refusal rates than male interviewers in telephone surveys. Pickery and Loosveldt (2002) find no significant effect of interviewer gender, whereas Campanelli and O'Muircheartaigh (1999) find that male interviewers have a significantly higher nonresponse rate in face-to-face interviews. In order to shed more light on the interviewer effect combined with the incentives and interview length, a binary logistic regression is presented in Table 3.

The first regression model in Table 3 confirms the findings from the analysis presented in Table 2, but focuses instead on the effect of incentives and announced interview length when other variables are held constant. An (announced) 15-minute interview as opposed to a 20-minute interview has a 1.304 larger chance of resulting in a completed interview when incentives are held constant. That is a 30 percent greater chance when the interview is framed as a 15-minute interview rather than a 20-minute interview. Secondly there is neither a significant effect of incentives, nor a significant interactive effect between incentives and announced interview length. Thus, the regression confirms the bivariate analyses of Table 2, that is a €700 lottery incentive had no effect on the refusal rate.

The second regression model analyzes the effect of interviewers' gender, experience, and age. Fifty-seven different interviewers conducted the interviews, with response rates ranging from 18 to 76 percent and refusal rates ranging from 20 to 88 percent. These large ranges suggest a strong interviewer effect on the response rate, but it does not

<sup>2</sup> As the 15-minute interviews are all collected between 29 January and 7 February and all of the 20-minute interviews between 5 January and 7 February, there is a possible bias in the experimental design. Nevertheless, there is no significant difference in the refusal rate when comparing the 20-minute interviews across the two time periods—January 5–28 compared to January 29–February 7 (excluding the cases where an appointment with the respondent was made to complete the interview at a specific time in the future). Thus, bias is not found between the two time intervals.

**TABLE 3 Completed interviews compared to interviews refused by respondent: Odds ratios in binary logistic regressions**

	<i>Model 1: Incentive and length of interview model</i>	<i>Model 2: Interviewer effect model</i>	<i>Model 3: Combined model</i>
Constant	1.039	0.176**	0.180**
15-minute interview vs. 20-minute interview	1.304**		1.246**
Travel voucher vs. no incentive	1.135		1.149
Grocery voucher vs. no incentive	1.071		1.068
Male vs. female interviewer		4.680**	5.516**
Age of interviewer (range 19–32 years old)		1.070**	1.065**
Employed more than two weeks vs. less when interview is completed		1.332**	1.338**
Interaction: age of interviewer × male vs. female interviewer		0.937**	0.931**
<i>N</i>	4076	4075	4075
Nagelkerke pseudo $R^2$	.01	.03	.03
Correctly predicted	49 %	55 %	56 %
Hosmer and Lemeshow's $\chi^2$	2.907	30.331	12.170
goodness-of-fit $p$	.574	.000	.144

*Note:* Interaction between incentives and length of interview was insignificant and removed. Number of days employed, etc. was also tried, but the critical value was 2 weeks.

\* =  $p < .05$ ; \*\* =  $p < .01$ .

explain it. The second regression in Table 3 helps us to understand the differences. Male interviewers prove to be much more proficient in terms of persuading respondents to participate, as compared to female interviewers. This finding is also supported by Baruffol et al. (2001). Male interviewers are actually four to five times more effective than female interviewers when the other independent variables are held constant. One explanation might be that male interviewers are perceived as more authoritative and are thus taken more seriously by the respondents. Secondly, male interviewers might be more impertinent in their attempts to initiate the interview, even though the respondent initially expresses reluctance. However, the study does not allow investigating this explanation further. It is also relevant that studies of face-to-face interviewing tend to suggest the opposite relationship, that is male interviewers are less successful in achieving a high cooperation rate (Pickery & Loosveldt, 1998; Campanelli & O'Muirheartaigh, 1999). A practical consequence of these findings for research companies suggests concentrating

male interviewers in CATI-studies and female interviewers in face-to-face-studies in order to achieve high cooperation rates.

Moreover, interviewer age and experience also have a positive effect on the response rate. In the latter case, the levels of completed interviews increase by more than 33 percent after the first two weeks of interviewing. Finally, a negative interaction is significant in the model, that is, as age increases, women tend to be better interviewers than men when the other variables are held constant. Generally speaking, these interviewer effects call for better interviewer training, but they also reveal that much is gained by simply using interviewers with two weeks experience. Other studies have also highlighted the importance of interviewer training on the substantive responses in surveys (Billiet & Loosveldt, 1988; Kiecker & Nelson, 1996).

The final model combined the effects of incentives, announced interview length and interviewer effects. The general picture is that the results are robust, as all of the significant results from the two earlier models are also present in the combined model with the same strength. Nevertheless, it ought to be noted that the model fits are relatively weak and the high significance of the effects is partly related to the large samples. To obtain a better fit, the factors not under the organizer's control (e.g. the reasons why respondents declined to participate in the interview) must be included in the model. The independent variables included in Table 3 are all variables controlled by the organizer.

## CONCLUSION

The various analyses suggest that the declining response rate is primarily due to a large number of potential respondents refusing to participate in the interview. A follow-up interview with respondents refusing to participate in the original interview reveals a strong general unwillingness due to the perception that demands for answering surveys are excessive. Highlighting the uniqueness and importance of the survey in the introduction of the interview might generally be one means of confronting this general skepticism. Furthermore, avoiding calls immediately before and during dinner and shorter interviews would do away with another motive for refusal: lack of time.

Various factors and their interaction have been explored in order to achieve a better understanding of the reasons for declining participation and to remedy the problem. The use of incentives shows no significant effect on refusal; however, changing the announced interview time from 20 to 15 minutes results in a 25 percent increase in the number of completed interviews. The effect of this 5-minute reduction should not be generalized to other possible interview durations. In a future study, it would be interesting to attempt to estimate the response curve when changing the announced length of interview, for example in 5-minute steps. One plausible hypothesis would be that an exponentially decreasing relationship between response rate and interview time exists, that is cutting five minutes off a 15-minute interview increases the response rate much more than five minutes from a 40-minute interview.

Interviewer training represents a crucial aspect of dealing with the declining response rates. Alarming differences in the response rates and refusal rates between the 57 different interviewers used during the project were found. Their response rates ranged from 18 to 76 percent, and their refusal rates ranged from 20 to 88 percent. The regression



analyses suggest that male interviewers achieve better response rates in telephone interviews than female interviewers do. Furthermore, the more experienced interviewers achieve 33 percent more completed interviews than less experienced interviewers do. This pinpoints the importance of interviewer training.

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## BIOGRAPHICAL NOTE

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