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Postal recruitment to a probability based web panel. Long term consequences for response rates, representativeness and costs

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Title: Postal recruitment to a probability based web panel. Long term consequences for response rates, representativeness and costs

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ABSTRACT

This study evaluates the efficiency of postal recruitment strategies to a probability based web panel. An experimental set-up varied the use of incentives and reminders. The different strategies are evaluated in terms of recruitment rates, panel participation, panel attrition, costs and representativeness. The recruited respondents are followed over an eight wave panel study during two years to evaluate long term effects.

The results show that even a very small lottery incentive leads to significantly higher (4-5 percentage points) recruitment rates. The incentives lead to lower costs per recruited panelist and slightly lower costs per responded survey also after eight panel waves. The representativeness improves with incentives in the first surveys but this difference disappears since attrition is somewhat higher among respondents that are more difficult to recruit to the panel. The reminder effects seem to be more robustly lasting over time than the effects from an incentive, and the cumulative response rate is significantly higher in the groups receiving reminders than in the groups who do not.

POSTAL RECRUITMENT TO A PROBABILITY BASED WEB PANEL. LONG TERM CONSEQUENCES FOR RESPONSE RATES, REPRESENTATIVENESS AND COSTS

One of the main challenges of running a probability based web panel is to recruit and maintain a high quality panel. To recruit respondents into a web panel is more demanding than recruiting respondents to a single survey since panel participation implies a commitment of respondents to participate in multiple surveys, usually over a fairly long period of time. The efficiency of recruitment to a panel can be assessed in different ways. Busse and Fuchs (2014) define successful panel recruitment as: achieving a high recruitment rate, reaching a high participation rate in subsequent panel waves and being representative to the studied population.

Several studies have found that the initial recruitment rate into an online panel is important since participation in upcoming waves depends on the number of initially recruited respondents (Göritz and Wolff 2007; Scherpenzeel and Toepel, 2012; Rao and Pennington, 2013). Additionally demographic discrepancies seem to maintain over time and it might therefore be worthwhile to put extra effort into the recruitment to achieve as representative a panel as possible from the start (Bosnjak et al, 2013). Understanding the mechanisms behind who can be convinced to join a probability based web panel and how this is most efficiently achieved is thus important in order to improve panel quality and maximize recruitment rates and representativeness. At the same time, financial costs of different recruitment strategies must also be considered in all data collection efforts.

When analyzing sample composition compared to population data internet access seems to be a key issue in many studies (see for example Couper et al 2007; Hoogendoorn and Daalmans 2009, Bosnjak et al 2013). Bosnjak et al (2013) find that well-educated younger people with a higher degree of internet access are more probable to join a web panel. The age imbalance however seems to decrease over time as the drop-out rate is higher for younger respondents. Hoogendoorn and Daalmans (2009) also found that households with older age structures and lower incomes were less likely to join the dutch CentERpanel. In Sweden internet penetration is comparably high. In 2013 as many as 91 percent of the Swedish population aged 16-85 had internet access in their homes. However, 34 percent of the population aged 75-85 had never used a computer, with a slightly higher number among women than men (Statistiska Centralbyrån 2014).

Two strategies: incentives and reminders

Incentives have previously proven to increase response rates in web panels, and extensive research has been performed on how to best implement the incentives, although most studies have focused on participation rates within existing panels and fewer on incentives as recruitment strategy and their long term effects.

Scherpenzeel and Toepoel (2012) experimented with different cash incentives in web panel recruitment where the incentive was delivered either together with the panel

invitation, or promised and delivered after panel registration. They found that a higher amount, 50 euro compared to 10 euro, does not increase panel participation and that only prepaid cash incentives had positive effects on the recruitment. Hansen and Pedersen (2012) on the other hand examine the effect of including a chocolate bar with a university logo with the panel invitation. They find no significant effect on recruitment rates from this non-monetary incentive.

Lotteries are another form of incentive which is commonly used in web panels. Lotteries are comparably easy and cheap to implement since only a small portion of the respondents actually win and receive money. Lotteries have been shown to increase response rates (e.g. Groves, 2006; Göritz and Wolff, 2007; Göritz and Luthe, 2012; Pedersen and Nielsen, 2013; Göritz and Luthe, 2013) and tend to appeal to respondents that are otherwise more difficult to attract, like groups with lower income and respondents that do not feel particularly attracted by the survey topic (Groves, 2006; Göritz and Luthe, 2013), which is expected to have a positive effect on socio-demographic representativeness. In an experiment on a Danish opt-in panel Pedersen and Nielsen (2014) found that relatively cheap lottery incentives increase response rates whereas donations to charity do not.

Although few previous studies have followed respondents for a prolonged period of time a study by Göritz and Wolff (2007) follow respondents recruited with and without incentives in a four wave panel. In their study some respondents received lottery incentives and some did not. They found that the lottery incentive had a positive effect on participation in the first wave of the panel but, no direct effect in later waves. The positive effect of the early incentive remained in the later waves, however, since only those who had answered the previous wave received an invitation to the next wave. Since the direct effect on participation rates turned negative by wave three however, the amount of usable data was in the end lower for those who were offered incentives. This study has extensive limitations though since their data collection took place when online panels were still a recent phenomenon (2003-2004), and they rely exclusively on small self-recruited samples.

In a subsequent study Göritz (2008) demonstrates that the effect of lottery incentives can be enhanced by increasing trust in the survey organization through the provision of an advance (unconditional) gift. However, once the effects of the cash lottery dwindles over time despite the advance gift enhancement to the point where an alternative group who instead received loyalty points surpasses the lottery group.

Reminders are probably the most commonly used tool to increase response rates in surveys. Especially in an online surveys this practice is understandable since unlike in other survey modes, it is almost without financial costs to remind those who have not yet answered by sending another e-mail. Previous meta-analyses (Shih & Fan 2008) also conclude that such e-mail reminders sent to non-respondents do have positive effects on the response rates. In a recent and updated overview Keusch (2015) points out that previous studies have found that web surveys seem to reach an earlier saturation point when it comes to reminders than other survey modes.

However, most previous studies have not focused on the effects of the reminders when *recruiting* to an online panel. In fact, none of the larger studies on panel recruitment (e.g. Scherpenzeel & Toepoel 2012; Hansen & Pedersen 2012) experimentally varied the number of reminders used, only the type of reminders. Thus, our knowledge of the long term effects of the number of contact attempts and reminders used in recruitments to a

standing panel is very limited. The implications for costs, representativeness and subsequent participation rates are very uncertain.

Aim of the study

Achieving high recruitment rates have previously been found to enhance panel quality in terms of attracting difficult respondents and increasing response rates over time. But from a practical panel management perspective it is also important to know how long the extra respondents attained from higher recruitment rates stay in the panel? Further, how much (if anything) do they add in terms of representativeness of the obtained sample? This study aims to contribute to earlier research by evaluating the efficiency of different recruitment strategies for non-commercial probability based online panels with a long run perspective in mind. More specifically we want to examine the impact *incentives*, and whether they should be introduced immediately or at a later stage of the recruitment effort. Similarly, we want to examine the impact of *reminders* specifically in recruitment to web panels.

Our study will focus on five aspects of panel quality: 1) recruitment rates to the panel, 2) participation rates to subsequent surveys, 3) panel attrition, 4) financial costs of recruitments and surveys, and 5) representativeness of the samples achieved through the different recruitment strategies. Since it is an important goal to have the long term consequences of recruitment strategies in mind we examine these aspects in an eight wave panel during two years after the original recruitment efforts.

Data

The Laboratory of Opinion Research (LORE) at the University of Gothenburg is hosting a large university run web panel, the Citizen Panel. The Citizen Panel currently consists of more than 50,000 respondents which are a mix of self-recruited and probability-recruited respondents. The participants in the Citizen Panel receive on average around 4 surveys per year and participate on a voluntary basis (see Riedel 2014).

In November 2012 LORE conducted a postal recruitment effort to 14,000 randomly selected individuals drawn from the Swedish population register. The sample consisted of Swedish inhabitants aged between 18 and 70 years.

All postcards were personalized in the sense that they featured the name and the address of the respondent on the backside of the postcard. Earlier studies have found that the use of the respondent's name on survey invitations increases response rates, but also increases the respondent's awareness of data security with more comments on data management and can affect responses to sensitive questions (see for example Fan and Yan, 2010; Heerwegh, 2005). Since a postal recruitment that is not directed to households requires both name and address on the invitation postcard all invited respondents were equally subject to this personalization.

The postcards also contained the sentence: "Currently we are especially looking for more [men/women] between [18 and 30/31 and 50/51 and 70] years old in order to make the Citizen panel represent Sweden well." with the text matching the respondents' own characteristics. This was intended as a scarcity appeal to increase the value of participation. Mentioning scarcity, or using an egoistic appeal, stating that the respondent has been specifically selected among a panel or demographic group has been found to

significantly increases response rates (see for example Pedersen and Nielsen, 2014; Porter and Whitcomb, 2003).

On the recruitment postcard the invited respondents received a link to a website and a personal code to use to sign up to the panel. The recruitment survey included both demographic background questions and a set of various political opinions and took on average 14.3 minutes to fill in, excluding outliers.

The visual logo of the Multidisciplinary Opinion and Democracy Research Group at the University of Gothenburg was printed on the front page of the invitation postcard and the backside stated that participation in the Citizen Panel meant regularly receiving surveys with questions on society, politics and current issues.

The first respondents received their postal invitation postcard on November 15th and a postal reminder was received on December 10th if they had not signed up before that date. Respondents receiving a lottery incentive needed to sign up before December 17th to be able to receive the incentive. Out of the 14,000 postal addresses 92 turned out to be invalid and could not be delivered. Thus the net sample size was 13,908. Of the total 1,433 people who were recruited 1,373 were assigned to an election panel within the frame of the Citizen Panel which received eight politically related surveys in the coming two years.

Design

The recruitment used an experimental design where the presence of incentives and a reminder was varied in a two by two factorial design. In addition, an additional group which first received a standard postcard, followed by a reminder with incentives was used. The incentive consisted of a lottery number printed on the postcard. The monetary value (the cost of buying such a lottery number) was only 0.3 euros and only awarded if the respondent signed up before a specific date. Although we expect most people to know that such a lottery ticket is very inexpensive the monetary value of the lottery number was not explicitly stated to the respondent. All invited respondents received post cards with identical front pages. Thus, only the back side content varied. Table 1 explains the experimental set-up and the net sample size in each group.

Table 1: Experimental design

Invitation type	Reminder	Net sample
Standard	none	2,977
Standard	Standard	2,977
Standard	Incentive	1,980
Incentive	none	2,987
Incentive	Incentive	2,987
Total		13,908

Comment: Net sample size is the original sample minus returned postcards due to invalid addresses.

Results

We examine the efficiency of a recruitment effort by analyzing panel participation, cost efficiency and representativeness to the studied population. Although we can follow our sample from the panel invitation to eight survey waves and two years later, for the sake of simplicity and space the analyses are focused on the recruitment itself that was launched in November 2012, on the first wave of the panel study which was launched in late February 2013, and on wave 8 of the panel study which was launched in October 2014 almost two years after the recruitment.

In accordance with our expectations and in line with some previous studies, we find that both incentives and reminders increase the probability of a person invited to the panel will actually sign up. The groups which receive an incentive but no reminder reach a recruitment rate of 9.3 percent, compared to the group which did not receive any incentive and reached 5.8 percent. The pattern is similar in the groups receiving reminders where the groups which received incentives reach 13 to 14 percent, while the group with a reminder but no incentive reaches 10 percent. Introducing an incentive in the follow-up contact rather than immediately in the first contact, the invitation, also seem to have a clearly positive effect on the recruitment since this group actually reaches almost as high a recruitment rate as the group who receives incentives straight from the beginning (see table 3).

For the purpose of significance testing and to further disentangle the recruitment effects of using incentives, reminders and introducing the incentive in the reminder, table 2 reports a logistic regression model estimating the probability of being recruited to the panel and to answer to panel waves 1 and 8, dependent on received treatment during the recruitment effort.

Table 2: Treatment effects on recruitment and long term panel participation (logit regression, odds ratios)

	Recruitment		Wave1		Wave8	
	Odds ratio	p	Odds ratio	p	Odds ratio	p
Incentive	1.70***	(0.00)	1.40***	(0.00)	1.29*	(0.05)
Reminder	1.79***	(0.00)	1.61***	(0.00)	1.78***	(0.00)
Rem*incentive	0.89	(0.20)	0.95	(0.66)	0.86	(0.28)
Late incentive	1.49***	(0.00)	1.40***	(0.00)	1.24	(0.11)
constant	0.06***	(0.00)	0.05***	(0.00)	0.03***	(0.00)
N	13,908		13,908		13,908	
Pseudo R2	0,0156		0,0101		0.008	

Comment: ***, * Variable significant at 99% and 90% respectively. Incentive is a dummy for the treatment groups receiving the incentive already in the first postcard, late incentive is a dummy for the group receiving the incentive in the reminder. Note however that interaction term between reminder and incentive includes all incentive groups, regardless of whether the incentive was introduced in the invitation or reminder postcard. In additional models not reported here that include controls for gender, age, marital status, if born in Sweden, having children under the age of 20, and level of urbanization they show very similar results, except that late incentive in wave 8 are then also significant at 90%.

Starting by examining the results from the recruitment phase Table 2 shows us that the positive effects of both reminders and incentives are indeed statistically significant.

However, there is no significant interaction between these two techniques. Introducing an incentive later on during the recruitment effort – in the reminder – also has a significant effect on the recruitment probability, with an odds ratio almost of the same size as introducing the incentive from the beginning to everyone.

When we follow respondents over time to examine the long term effects of the different recruitment strategies the effects from the recruitment phase seem to be fairly stable in the first wave of the panel. All effects are still significant and of approximately the same size although the odds ratios of participating have decreased somewhat. Arriving at the eighth wave of the panel study however, the positive effect of the late incentive has however almost disappeared is no longer statistically significant. Likewise, the odd ratio of the incentive can also be seen to decrease over time but is still significant at the 90% confidence level after two years and eight survey waves. However, the continually decreasing effect indicates a higher attrition among those who received incentives in their recruitment than in the control group that received a standard postcard.

In contrast, the reminder effect seems to last longer and does not diminish over time. Instead, this group has a stable and clearly higher probability of answering the eight wave of the panel study than if the respondent did not belong to a group which received a reminder. Thus, increasing recruitment rates through a reminder does not seem to result in higher panel attrition, unlike incentives.

The interaction between reminder and incentive is not significant but shows a slightly negative tendency. This indicates that when using both techniques we do not get the full benefit of both, their combined effect seem to be slightly lower than their sum.

Next, we will examine more closely the long term descriptive statistics such as response rates after two years, panel attrition and financial costs of the recruitments and per survey (table 3). The cumulative response rate 1 is, according to DiSogra and Callegaro (2015), defined as the recruitment rate multiplied by the profile rate and the study-specific completion rate. Since the recruitment process to the Citizen Panel does not include a specific profile survey phase the cumulative response rate is here calculated as the recruitment rate multiplied by the study-specific completion rate. In this recruitment effort the cumulative response rate is clearly positively related to the recruitment rate, even two years later. Thus, the effects of efforts aimed at reaching a higher recruitment rates seem to last over time.

Table 3 demonstrates that when using a lottery incentive and a reminder in the invitation to the panel the cumulative response rate in the eighth wave two years later is 5.2 percent, which is almost as high as the 5.8 percent the single standard recruitment postcard reached in the recruitment itself.

Table 3: Cumulative response rates, average number of answered surveys and costs per respondent

Invitation	Reminder	Recr. Rate (%)	CRR wave 8 (%)	Attrition (%)	No of responded surveys	Cost per recruited (SEK)	Cost per survey (SEK)
Incentive	Incentive	14.2	5.2	63.8	4,9	102	21
Standard	Incentive	13,3	5,4	59,5	5,3	109	21
Standard	Standard	9,8	4,8	51,0	5,7	131	23
Incentive	-	9.3	3.5	62.0	5.1	88	18
Standard	-	5.8	2.7	54.3	6.0	114	20
Total		10.3	4.2	58.9	5.0	108	21

Comment: **The recruitment survey is included in the number of responded surveys since the recruitment survey was not simply a short profile survey but instead rather similar to upcoming panel waves. At the time of recruitment, one euro was worth approximately 9.1 units of Swedish currency (SEK). Cost calculations do not include salaries for time spent by in-house staff managing the recruitment efforts.**

When it comes to the cumulative response rate in a survey two years after the recruitment there is no significant difference between the standard and incentive groups, neither between the groups that received a reminder or the groups that did not. The differences in cumulative response rates between the groups that did receive a reminder and the corresponding groups which did not are on the other hand still statistically significant with higher cumulative response rates. Having a higher initial recruitment rate clearly has lasting effects. This fits well with earlier results showing that it is worth the effort to increase recruitment rates since the positive effects last over time (Scherpenzeel and Toepel, 2012; Göritz and Wolff, 2007; Rao and Pennington, 2013).

When we examine attrition in this paper we follow the formula and definitions for the $ATTR_{base}$ also defined by DiSogra and Callegaro (2015). The $ATTR_{base}$ of interest in our case is attrition in the eighth wave in relation to the recruitment survey (which is our baseline survey rather than the first survey after the recruitment). We thus subtract the number of respondents in the eighth and last survey from the number of respondents in the recruited and divide divided by the number of respondents recruited.

As we can see in table 3 the attrition rates in this study are higher for the groups receiving incentives than for other groups with the highest levels surpassing 60 percent rather than the 50 percent seen among those who did not receive incentives. Using reminders to raise recruitment rates does not seem to increase future attrition in the same way. In fact, the attrition is slightly lower (51 percent) for the group who received a reminder than the group which did not (54 percent). These results are in line with the regression results presented in table 2 which also indicated higher attrition among the groups receiving incentives.

On average, the respondents recruited by the standard postcards answered 5.8 surveys (64 percent of the surveys invited to) whereas the respondents recruited using an incentives have answered 5 surveys on average (56 percent of the surveys invited to). There is a weakly negative connection between the initial recruitment rate and subsequent activity in the panel. However, the big picture is rather that incentives in particular decrease future survey participation somewhat.

When it comes to financial costs, however, these are still lowest when recruiting with incentives. The reason is that the recruitment rates are markedly lower in the standard treatment groups and that the cost of the incentive was only 0.3 euros per actually

recruited respondent. The least expensive recruitment is thus using incentives but no reminder (88 SEK / 9.7 euros), and the most expensive using a reminder but no incentives (131 SEK / 14.4 euros). When calculating the cost per survey during the two year period, however, the costs even out substantially due to the higher attrition in the groups receiving incentives. The cost per survey in the least expensive group is now 18 SEK (2.0 euros) compared to 23 SEK (2.5 euros) for the most expensive group.

Representativeness

Our next question concerns how the different recruitment strategies and recruitment rates are connected to the representativeness of the achieved sample. This will help improve our understanding of the potential nonresponse bias in online panels. We proceed in a way similar to that of for example Yeager et al (2011) where the average absolute deviation from a benchmark is used to describe and compare representativeness between samples.

There are several difficulties when analyzing representativeness and nonresponse bias. One is the availability of good reliable benchmarks to compare the sample against. Another is that the choice of which variables to include is arbitrary. What we choose to measure will affect the degree of representativeness. Further, the relevant factors potentially leading to nonresponse bias varies between estimates within every survey. This argument is further elaborated by Groves and Peytcheva (2008). However, ultimately the choice of benchmark variables usually depends on data availability. In this study we mainly rely on demographic variables where Statistics Sweden provide accurate information from the national population register. In line with Groves (2006) argument we believe that it is important to analyze more factors than strictly demographic. We therefore also include interest in politics and vote intention as attitudinal variables in addition to demographics. For these two variables, however, there exists no true benchmark. For political interest we instead rely on the SOM Institute annual mail surveys as a quasi-benchmark. The SOM Institute is a university run probability survey with high response rates (above 50 percent, see www.som.gu.se). For vote intention we use a survey based measure from Statistics Sweden.

Comparing estimates from Statistics Sweden to the sample characteristics of sex, age, country of origin and having children under the age of twenty is relatively straightforward since that information is retrieved from the Swedish population register itself and was included with the gross sample, thus we can rely directly on register data for the sample instead of self-reported demographics. Labor market situation and level of education, however, are based on self-reported answers by the respondents, with the usual risks of measurement errors and item nonresponse. This kind of questions is not very problematic since they are very common and not particularly sensitive to most people.

Table 4: Representativeness

	Standard, no reminder			Standard, with reminder			Incentive, no reminder			Incentive, with reminder			Incentive in reminder only		
	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8
Sex	4.3	2.3	0.1	0.8	0.0	1.9	5.7	6.0	5.2	3.9	1.2	1.4	1.4	3.1	10.2
Age	7.5	8.9	11.4	8.3	9.1	11.8	5.7	6.5	9.1	5.0	6.3	9.7	5.8	6.4	11.3
Country of rigin	2.3	1.0	1.2	2.4	0.8	3.0	0.3	4.9	2.8	4.7	3.4	2.9	2.0	0.8	0.0
Children under 20	7.9	10.1	5.8	4.9	4.5	10.1	8.4	11.2	15.7	6.8	5.4	10.1	8.2	11.9	12.2
Education	8.3	8.4	10.2	7.1	7.1	5.8	6.7	7.3	8.2	7.9	8.9	8.8	6.9	6.9	8.6
Labor market situation	7.7	7.4	7.8	7.9	7.6	8.4	11.3	11.8	13.5	7.5	7.3	8.1	13.5	14.7	10.9
Political interest	11.0	11.7	15.3	8.6	10.0	12.5	6.2	6.6	9.7	8.7	10.4	14.3	8.3	10.6	11.6
Vote intention	2.1	3.4	4.9	3.5	2.8	4.5	2.4	2.9	4.4	3.1	2.4	5.2	3.0	3.0	4.9
Av. Abs. deviation: demographics	6.3	6.3	6.1	5.2	4.8	6.8	6.4	7.9	9.1	5.9	5.4	6.8	6.3	7.3	8.9
Av. Abs. deviation: political attitudes	6.6	7.6	10.1	6.0	6.4	8.5	4.3	4.8	7.0	5.9	6.4	9.7	5.6	6.8	8.3
Av. abs deviation: All variables	6.4	6.6	7.1	5.4	5.2	7.2	5.8	7.1	8.6	5.9	5.6	7.5	6.1	7.2	8.7
Largest deviation	11.0	11.7	15.3	8.6	10.0	12.5	11.3	11.8	15.7	8.7	10.4	14.3	13.5	14.7	12.2
Cumulative response rate	5.8	4.7	2.7	9.8	7.3	4.8	9.3	6.4	3.6	14.2	9.5	5.2	13.3	9.7	5.4
N	173	139	79	292	216	143	279	191	106	425	284	154	264	192	107

Comment: The table shows mean percentage point absolute deviations from the benchmark. Register data from Statistics Sweden are used as benchmark for sex, age, country of origin (whether born in Sweden or not), having children under the age of 20, education, labor market situation. Vote intention benchmark is from a bi-annual survey from Statistics Sweden (PSU). The SOM-survey is used as benchmark for political interest. Average absolute deviation for demographics show the average deviation of sex, age, country of origin, having children under the age of 20, education and labor market situation. Average absolute deviation politics include political interest and vote intention.

Table 4 shows the average absolute deviations from the benchmark for eight different variables. For details concerning each category within the eight variables, please see the appendix.

A common pattern among all groups is an overrepresentation of highly educated individuals, a pattern that in most cases increases over time. All groups also have an overrepresentation of older people, which increases over time. Due to the skewed age structure among the recruited the labor market situation is also unbalanced with more pensioners in the panel than in the overall population. Overall, the nonresponse bias in the Swedish context seems to be due to other factors than the lack of internet coverage among older generations, which has been the case in other studies (cf. Couper et al 2007; Hoogendoorn & Daalmans 2009).

Table 4 also show us many cases where it seems that using a reminder increase representativeness of the sample. For standard postcards the ADD for all variables is 6.4 without reminder compared to 5.4 with a reminder for example. Similarly, the largest deviation from the benchmark is also lower for those with a reminder: 8.6 compared to 11.0. For the ADD for all variables this difference disappears over time and wave eight it is slightly above 7 for both samples. There are many exceptions to this pattern however. For the incentives postcards we see the same level of ADD for all variables in both groups and actually the reverse pattern for political variables specifically (5.9 with a reminder versus 4.3 without). This reverse difference also persists over time and is even larger after two years (9.7 versus 7.0). The number of observations when we examine these groups separately is quite low, so these results are best interpreted with care.

Overall both the absolute deviations and the largest deviation in each treatment group increase over time, regardless of treatment and recruitment rate. Respondents with certain traits, such as young people, individuals with low level of education and people with low political interest, seem to drop out of the panel early and increase the nonresponse bias over time. The bias increases among both the demographic and political indicators when respondents drop out of the panel.

Note however that the variation in recruitment rates is low and that it therefore is difficult to make any inference based on these numbers. Yeager et al (2011) conclude that web panels recruited in a probability frame yield fairly correct estimates despite quite low cumulative response rates. Similarly, Groves and Peytcheva (2008) find that the connection between nonresponse rates and nonresponse bias is not always that clear.

When examining specific demographic and political groups more closely (see appendix), incentives seem to attract more women. The incentive groups also reach a better balance of young people, though the youngest seem to drop off to a high extent in the coming waves. Incentives also seem to attract more unemployed respondents than the control groups do.

Regarding political interest the effect of incentives seem to follow expectations based on previous findings and attract somewhat more people with low political interest. Generally, the political indicators seem to be closer to the benchmark in the groups receiving incentives. This is in line with earlier studies (e.g. Göritz and Luthe, 2013; Groves, 2006) who find that incentives increases the propensity to participate among groups that are generally harder to attract.

Reminders seem to improve representativeness in both the groups receiving the standard postcards and among the groups receiving incentives. Rao and Pennington (2013) argue

that late responders, recruited after receiving a reminder, increase representativeness, an argument which is supported by findings in this study.

Interestingly however, the standard postcards perform better over time with a smaller increase in the average absolute deviation from the benchmark than the groups receiving incentives. The more representative respondents recruited by incentives seem to be the ones dropping off to a larger extent and more quickly. This is in line with the higher attrition among the groups receiving incentives revealed in table 3.

Concluding discussion

This study reveals relatively large effects of rather small treatments. The difference in recruitment rates between no or one postal reminder is around 4 percentage point in both the groups receiving standard postcards and the groups receiving incentives (or in other words between 50 and 70 percent higher recruitment rate). Similarly, the lottery incentive, with a monetary cost of 0.3 euros, is found to increase recruitment rates 4-5 percentage points compared to the groups not receiving the incentive (an increase of 45 to 60 percent). A delayed introduction of an incentive, i.e. where the incentive is introduced in the reminder but not mentioned or offered in the first invitation, results in almost as high a recruitment rate as those who receive an incentive offer in the first invitation (13.3 compared to 14.2). The cumulative response rate after eight panel waves, however, is highest in this group since the attrition rate slightly lower than among those who receive an incentive from the beginning (5.4 compared to 5.2).

By taking advantage of the ability to follow the recruited respondents during two years we are able to demonstrate that many of the effects in terms of panel participation and representativeness from the recruitment phase persist over time despite that respondents that need more effort to be recruited generally speaking drop out of the panel to a larger extent. However, differences in representativeness does even out somewhat over time.

Higher recruitment rates are in this study associated with lower costs per recruited respondent and lower costs per answered survey, though the differences even out over time due to higher attrition in these groups. The higher recruitment rates are also associated with better representativeness which reduces the risk of nonresponse bias. Reminders seem to have a more long-lasting and stable effect than incentives and generate less attrition over time, although achieving the same recruitment rates through incentives is more expensive. . At a general level conclusions made in earlier studies are supported in that it seems to be worth the trouble and money to put an extra effort into the recruitment phase since effects at the recruitment stage are often lasting.

Appendix

				Standard, no reminder			Standard, with reminder			Incentive, no reminder			Incentive, with reminder			Incentive in reminder		
	Bench-mark 2012	Bench-mark 2013	Bench-mark 2014	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8
Sex																		
Women	49.5			53.8	51.8	49.4	50.3	49.5	47.6	55.2	55.5	54.7	53.4	50.7	48.1	48.1	46.4	39.3
Men	50.5			46.2	48.2	50.6	49.7	50.5	52.4	44.8	44.5	45.3	46.6	49.3	51.9	51.9	53.6	60.7
Age																		
18/30	24.8			12.7	12.9	6.3	13.0	11.1	7.7	17.6	15.7	9.4	19.5	16.5	11.7	16.7	15.1	7.5
31/40	18.7			13.9	11.5	10.1	12.3	10.6	8.4	13.6	13.1	11.3	13.4	12.3	9.1	17.0	16.1	12.1
41/50	20.3			18.5	17.3	19.0	17.8	19.4	18.2	18.3	18.8	20.8	18.4	19.4	18.8	15.9	16.7	15.9
51/60	18.0			27.2	28.8	31.6	24.0	23.1	24.5	25.1	24.1	25.5	23.5	24.3	24.0	17.8	18.2	21.5
61/70	18.1			27.7	29.5	32.9	32.9	35.6	41.3	25.4	28.3	33.0	25.2	27.5	36.4	32.6	33.9	43.0
Country of origin																		
Born in Sweden	92.5			90.2	93.5	93.7	90.1	91.7	89.5	92.8	97.4	95.3	87.8	89.1	89.6	90.5	91.7	92.5
Born outside Sweden	7.5			9.8	6.5	6.3	9.9	8.3	10.5	7.2	2.6	4.7	12.2	10.9	10.4	9.5	8.3	7.5
Children																		
No children under 20	62.6			70.5	72.7	68.4	67.5	67.1	72.7	71.0	73.8	78.3	69.4	68.0	72.7	70.8	74.5	74.8
Children under 20	37.4			29.5	27.3	31.6	32.5	32.9	27.3	29.0	26.2	21.7	30.6	32.0	27.3	29.2	25.5	25.2
N				173	139	79	292	216	143	279	191	106	425	284	154	264	192	107

Comment: **With the exception of political interest, all benchmark data come from Statistics Sweden. Sex, age, country of origin, education and labor market situation are register based, while vote intention is survey based (PSU). For political interest, the SOM Institute annual survey is used as a benchmark.**

	Bench-mark 2012	Bench-mark 2013	Bench-mark 2014	Standard, no reminder			Standard, with reminder			Incentive, no reminder			Incentive, with reminder			Incentive in reminder		
				Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8
Education																		
Not completed elementary school	5.0			0	0	0	0	0	0	0.4	0.5	0.9	0.5	0.7	1.3	1.1	0.5	0
Elementary school	11.9			5.8	7.2	6.3	7.9	8.3	11.2	8.6	9.4	6.6	5.4	3.9	6.5	8.7	8.3	9.3
High school: Less than three years	22.9			9.2	7.2	5.1	8.2	7.9	8.4	7.9	5.8	4.7	7.3	5.6	2.6	6.4	6.8	4.7
High school graduation/non-university studies/degree	24.1			31.2	31.7	31.6	30.5	30.6	28.0	28.7	26.7	30.2	31.3	31.3	32.5	32.6	31.3	36.4
University/college without a degree	14.8			10.4	10.8	7.6	13.7	13.4	15.4	13.6	13.1	13.2	13.4	12.7	13.6	14.0	15.1	10.3
University/college: with a degree	20.3			40.5	41.0	45.6	37.3	37.0	33.6	37.6	41.4	39.6	39.8	43.3	42.2	34.8	35.4	36.4
PhD	1.1			2.9	2.2	3.8	2.4	2.8	3.5	2.2	2.6	3.8	1.4	1.8	0.6	2.3	2.6	2.8
Labor market situation																		
Unemployed	6.0			4.0	3.6	0.0	5.8	5.6	4.9	10.0	8.9	10.4	7.1	4.9	6.5	10.6	10.9	3.7
Working	79.2			65.9	66.9	69.6	63.7	64.4	63.6	60.6	58.6	56.6	65.4	65.8	63.6	56.8	54.7	59.8
Total	85.2			69.9	70.5	69.6	69.5	70.0	68.5	70.6	67.5	67.0	72.5	70.7	70.1	67.4	65.6	63.5
N				173	139	79	292	216	143	279	191	106	425	284	154	264	192	107

Comment: With the exception of political interest, all benchmark data come from Statistics Sweden. Sex, age, country of origin, education and labor market situation are register based, while vote intention is survey based (PSU). For political interest, the SOM Institute annual survey is used as a benchmark.

	Bench-mark 2012	Bench-mark 2013	Bench-mark 2014	Standard, no reminder			Standard, with reminder			Incentive, no reminder			Incentive, with reminder			Incentive in reminder		
				Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8	Recr	Wave 1	Wave 8
Political interest																		
Very interested	12.0			17.9	18.0	21.5	19.9	23.1	23.8	17.2	17.8	25.5	18.6	20.4	24.7	18.9	20.3	24.3
Rather interested	42.3			58.4	59.7	63.3	51.4	50.9	55.2	49.5	49.7	48.1	52.9	54.6	57.8	51.9	55.2	53.3
Not particularly interested	36.5			19.7	19.4	13.9	26.0	24.1	20.3	27.6	26.7	22.6	25.4	22.2	16.2	26.5	22.4	20.6
Not at all interested	9.2			4.0	2.9	1.3	2.4	1.4	0.0	5.7	5.8	3.8	2.8	2.5	0.6	2.7	2.1	1.9
Vote intention / turn-out	Nov 12	Mar 13	Elec. result Sep 14															
Left party	5.9	6.4	5.7	9.6	11.5	13.0	13.3	12.3	11.8	12.2	11.5	14.3	10.0	7.6	7.1	9.7	7.3	10.9
Social Democrats	35.2	35.6	31.0	33.9	31.7	27.3	25.1	26.3	21.3	33.0	32.1	24.8	28.2	31.8	18.7	29.2	26.5	22.8
Center party	4.4	4.2	6.1	4.3	1.9	7.8	1.5	0.6	5.1	2.1	2.3	6.7	2.7	2.8	4.5	3.8	2.0	5.9
Liberal party	5.6	6.0	5.4	6.1	7.7	7.8	6.9	7.0	8.8	3.7	6.9	9.5	4.8	3.3	5.2	6.5	7.9	12.9
Moderates	28.4	26.9	23.3	26.1	23.1	16.9	32.0	30.4	24.3	29.8	23.7	21.0	27.5	28.4	21.9	24.9	31.1	18.8
Christian Democrates	3.8	3.6	4.6	3.5	2.9	3.9	4.4	4.7	2.2	1.1	0.8	2.9	1.7	0.9	5.8	2.2	1.3	6.9
Greens	8.7	8.5	6.9	13.0	14.4	13.0	7.9	9.9	8.1	10.6	11.5	7.6	14.8	14.2	14.8	11.9	12.6	9.9
Sweden Democrats	8.0	7.7	12.9	3.5	4.8	5.2	8.9	8.2	11.0	7.4	9.2	9.5	10.3	7.6	11.0	11.9	9.9	8.9
Other		1.1	4.1		1.9	5.2		0.6	7.4		2.3	3.8		3.3	10.9		1.3	3.0
N				173	139	79	292	216	143	279	191	106	425	284	154	264	192	107

Comment: With the exception of political interest, all benchmark data come from Statistics Sweden. Sex, age, country of origin, education and labor market situation are register based, while vote intention is survey based (PSU). For political interest, the SOM Institute annual survey is used as a benchmark.

References

Bosnjak, M., Haas, I., Galesic, M., Kaczmirek, L., Bandilla, W. & Couper, M. P. (2013). Sample composition discrepancies in different stages of a probability-based online panel. *Field Methods,* 25(4), 339-360.

Busse, B. & Fuchs, M. (2014). Recruiting respondents for a mobile phone panel: The impact of recruitment question wording on cooperation, panel attrition, and nonresponse bias. *Methodology,* 10(1), 21-30.

Callegaro, M. & Disogra, C. (2015) "Metrics and design tool for building and evaluating probability-based online panels" *Social Science Computer Review,* 0894439315573925, first published on March 5, 2015 doi:10.1177/0894439315573925.

Couper, M. P., Kapteyn, A., Schonlau, M. & Winter, J. (2007). Noncoverage and nonresponse in an internet survey. *Social Science Research.* 36, 131-148.

Fan, W., & Yan, Z. (2010). Factors affecting response rates of the web survey: A systematic review. *Computers in Human Behavior*, 26(2), 132-139.

Groves, R. M. (2006). Nonresponse rates and nonresponse bias in household surveys. *Public OpinionQuarterly,* 70(5), 646-675.

Groves, R. M., & Peytcheva, E. (2008) "The impact of nonresponse rates on nonresponse bias – a meta-analysis". *Public Opinion Quarterly*, 72(2), 167-189.

Göritz, A. S. & Luthe, S. C. (2012). Lotteries and study results in market research online panels. *International Journal of Market Research.* 55(5), 611-626.

Göritz, A. S. & Luthe, S. C. (2013). Effects of lotteries on response behavior in online panels. *Field Methods,* 25(3), 219-237.

Göritz, A. S. & Wolff, H.-G. (2007). Lotteries as incentives in Longitudinal Web Studies. *Social Science Computer Review.* 25(1), 99-110.

Göritz, A. S. (2008). The Long-Term effect of Material Incentives on Participation in Online Panels. *Field Methods*, 20(3), 211-225

Hansen, J. M., & Pedersen, R. T. (2012). Efficiency of different recruitment strategies for web panels. *International Journal of Public Opinion Research,* 24(2), 238-249.

Heerwegh, D. (2005). Effects of personal salutations in e-mail invitations to participate in a web survey. *Public Opinion Quarterly,* 69(4), 588-598.

Hoogendoorn, A. W. & Daalmans, J. (2009). Nonresponse in the recruitment of an internet panel based on probability sampling. *Survey Research Methods,* 3(2), 59-72.

Keusch, F. (2015). Why do people participate in web surveys? Applying survey participation theory to internet survey data collection. *Management Review Quarterly,* 1-34.

Pedersen, M. J. & Nielsen, C. V. (2014). Improving survey response rates in online panels: Effects of low-cost incentives and cost-free text appeal interventions. *Social Science Computer Review,* 1-15.

Porter, R. P. & Whitcomb, M. E. (2003). The impact of contact type on web survey response rates. *Public Opinion Quarterly.* 67, 579-588.

Rao, K. & Pennington, J. (2013) "Should the third reminder be sent? The role of survey response timing on web survey results." *International Journal of Market Research.* 55(5):651-674.

Riedel, K. (2015) *Annual Report – Citizen Panel 2014*, Gothenburg, University of Gothenburg, LORE.

Scherpenzeel, A. & Toepoel, V. (2012). Recruiting a probability sample for an online panel: Effects of contact mode, incentives and information. *Public Opinion Quarterly,* 76(3), 470-490.

Shih, T-H & Fan, X. (2008). Comparing Response Rates from Web and Mail Surveys: A Meta-Analysis. *Field Methods* 20(3). 249-271. doi: 10.1177/1525822X08317085

Statistiska Centralbyrån (2014). Privatpersoners användning av datorer och internet 2013. http://www.scb.se/Statistik/_Publikationer/LE0108_2013A01_BR_IT01BR1401.pdf

Yeager, D. S., Krosnick, J. A., Chang, L., Javitz, H. S., Levendusky, M. S., Simpser, A. & Wang, R. (2011). Comparing the accuracy of RDD telephone surveys and internet surveys conducted with probability and non-probability samples. *Public Opinion Quarterly.* 75(4), 709-747.

Svensk titel: Postal rekrytering till en sannolikhetsbaserad webbpanel. Långsiktiga effekter för svarsfrekvenser, representativitet och kostnader.

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SAMMANFATTNING

Denna studie utvärderar hur effektiva postala rekryteringar till en sannolikhetsbaserad webbpanel är. Genom ett experimentellt upplägg varieras användandet av incitament och påminnelser. De olika rekryteringsstrategierna utvärderas med avseende på rekryteringsfrekvenser, paneldeltagande, avhopp från panelen, kostnader, och representativitet. De rekryterade respondenterna följs över åtta panelsteg och två år för att utvärdera de långsiktiga effekterna.

Resultaten visar att även ett mycket svagt lotto-incitament leder till signifikant högre (4-5 procentenheter) rekryteringsfrekvenser. Incitamenten sänker kostnaderna per rekryterad paneldeltagare och ger något lägre kostnad per enkät även efter åtta panelsteg. Representativiteten förbättras med användandet av incitament i de första enkäterna, men denna skillnad försvinner efterhand då avhoppen är något vanligare bland respondenter som är svårare att rekrytera till panelen. Påminnelseeffekterna tycks däremot mer varaktiga över tid än incitamentseffekterna, och den kumulativa svarsfrekvensen är signifikant högre i grupper som rekryterades med hjälp av påminnelser än bland andra.

The Laboratory of Opinion Research (LORE) is an academic web survey center located at the Department of Political Science at the University of Gothenburg. LORE was established in 2010 as part of an initiative to strengthen multidisciplinary research on opinion and democracy. The objective of the Laboratory of Opinion Research is to facilitate for social scientists to conduct web survey experiments, collect panel data, and to contribute to methodological development. For more information, please contact us at:

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