Effects of Incentive Amount and Type on Web Survey Response Rates

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Abstract
Providing meaningful incentives demonstrates to respondents that researchers understand the competing demands on their time and value their input. The effects of incentives, particularly when prepaid, are strongly established in survey research literature as effective tools for increasing response. However, effectiveness of incentives on web-administered surveys is less clear, and can be impacted by a number of factors, including incentive type and amount, timing, and mode of survey administration.

This paper seeks to contribute to research on incentives for web-based surveys by examining the effects of the following:
(1) An additional post-incentive for early completion
(2) A pre-paid incentive in combination with a post-paid incentive
(3) Pre-incentives as a nonresponse follow-up strategy

This paper will use data collected during the first wave of a nationally-representative survey of public school principals designed to take place across three waves of data collection. To determine a maximally-effective incentive strategy for subsequent years, we embedded an experiment into the study using electronic gift cards. All sample members were eligible for a standard $50 post-response incentive, but were also randomly assigned to one of four experimental conditions: (1) an additional $50 incentive for completing early in the field period, (2) a $25 incentive pre-paid with the initial survey mailing, (3) a $25 pre-paid incentive used during nonresponse follow-up, and (4) the standard $50 post response incentive, which serves as the control group for this experiment.

Keywords: Incentives, response rates, web surveys

1. Introduction

When designing a strategy for motivating individuals to complete a survey, certain fundamental questions need to be answered. First, what incentive types will be offered, and relatedly, how will they be valued? And next, when will the incentives be offered? We implemented a set of experiments varying each of these factors to determine the best approach for a particular type of respondent: public school principals. These experiments were implemented in the second wave of The National College Ready Survey (NCRS), a web survey sponsored by the Bill & Melinda Gates Foundation. A total of four NCRS survey administrations have been planned by the end of 2018. Wave 2 was completed in 2014 by Mathematica Policy Research, with Wave 1 having been completed in 2012 by a different contractor. The purpose of the experiment in Wave 2 was to identify the optimal incentive strategy to be used in Waves 3 and 4.

Research has shown that incentives can increase response rates, though effectiveness can be limited by factors such as incentive type, amount, timing, sample composition, mode of administration, and the demands of the request (Singer and Ye 2013). In an effort to encourage participation in the surveys for principals, the default condition for the Wave 2 NCRS used online gift cards as incentives, which were delivered as a post-response payment. In contrast, the experiments sought to compare the relative effectiveness of the following three alternative incentive conditions: (1) offering a larger gift card amount in exchange for and upon early completion, (2) providing an additional gift card at initial contact prior to and in anticipation of completion, and (3) providing an additional gift card to initial nonrespondents to encourage completion of the survey. Our motivation, experimental conditions, results, and discussion of the results follow.

1.1 Experiment purpose and related work

The NCRS targets a busy and therefore challenging-to-interview population of public school principals. Providing meaningful incentives to this group demonstrates that researchers understand the many competing demands on their time and value their input. We considered several incentive options to test for Wave 2. In Wave 1, the NCRS offered a single lottery incentive of $5,000 to be paid when the principal responded. In addition, NCRS offered another lottery in which 10 responding principals would be randomly selected to receive $500 for their schools. Research suggests that direct monetary incentives boost response rates to a higher degree than do lotteries, and prepayment of monetary incentives can be particularly advantageous (Gajic et al. 2011; Halpern et al. 2011). However, providing incentive payments in advance of participation introduces the risk of paying sample members who never participate. Another option, generally found to be more effective at increasing response than prepaid incentives (LeClere et al. 2012), is offering an "early bird" incentive, where early completion of the survey results in receiving more money for completion. A final option we considered was the use of nonresponse conversion payments, which have also been found to increase survey participation, but not without ethical concerns of fairness for participants (Singer and Ye 2013). To assess which option would be the most effective for increasing the rate of participation for the NCRS web survey among principals, we designed three experimental conditions.

1.2 Experiments

We undertook three experiments in the Wave 2 survey to test the effect of different incentive conditions offered up front compared to the control group, who were offered a $50 Amazon gift card code via email to be received only after completing the web survey.

1. **Differential incentive experiment for "early response."** We tested the effectiveness of offering a higher value gift card for responders who completed the survey within the first three weeks of the initial contact. Those completing in the first three weeks were promised a $100 gift card, compared to the $50 gift card they would receive for completing surveys after the three-week period (the same amount offered to the control group).

2. **Prepaid incentive experiment.** The prepay group members received a $25 prepaid gift card code with their initial email invitation in addition to the offer of a standard $50 gift card to all sample members to be received upon completing the survey.

3. **Nonresponse incentive experiment.** The nonresponse follow-up group received a $25 prepaid gift card code if classified as nonrespondents when follow-up began.

2. Methods

The experimental sample was randomly split into three groups of equal size, one of which was split into two subgroups. Group 1 was assigned the additional $50 early-response incentive and Group 2 was assigned the $25 prepaid incentive. The remainder of the experimental sample was assigned to Group 3 (the control group), which was randomly split into two groups. Group 3a was sent a $25 nonresponse follow-up gift card if applicable. Group 3b was offered only the default $50 post-response incentive. Groups 1, 2, 3a, and 3b all were offered the default $50 post-response incentive to be received upon responding to the survey. Table 2.1 shows which groups served as the treatment and comparison groups for each incentive test. [1]

All comparisons excluded principals who were first sent the survey after January 2013 because these cases were not in the field long enough to test the effectiveness of the various incentive conditions. To avoid possible bias due to district-level refusal, principals within districts that had refused participation were included in the analysis and coded as nonrespondents. However, to focus attention only on cases eligible to receive the nonresponse follow-up incentive offer, our second comparison of groups 3a and 3b excluded these principals from the analysis.

Table 2.1. Comparison groups for incentive tests, and original group assignment numbers

Incentive comparison	Treatment group	Comparison group
$100 early response vs. $50 post-response only	Group 1 (n = 560)	Group 3 (n = 560)
$25 prepay vs. $50 post-response only	Group 2 (n = 560)	Group 3 (n = 560)
$25 nonresponse follow-up prepaid vs. $50 post-response only	Group 3a (n = 280)	Group 3b (n = 280)

To test the differences in response rates, chi-squared tests of association were used to determine if a relationship existed between incentive type and response rates. When comparing the mean number of days until response, independent sample t tests were run, with equal variances assumed. [2] Tests with p-values less than 0.05 were considered statistically significant, while those between 0.05 and 0.10 were considered marginally significant. No adjustments were made for multiple comparisons. All analyses were run unweighted using SAS 9.3.

[1] Note that 21.3 percent of the Wave 2 sample used for the incentive experiments were respondents in Wave 1.

[2] No variances were determined to be different per the folded F values. Likewise, significance conclusions were unchanged using either pooled variance or the Satterthwaite method.

3. Results

3.1. Early-response incentive

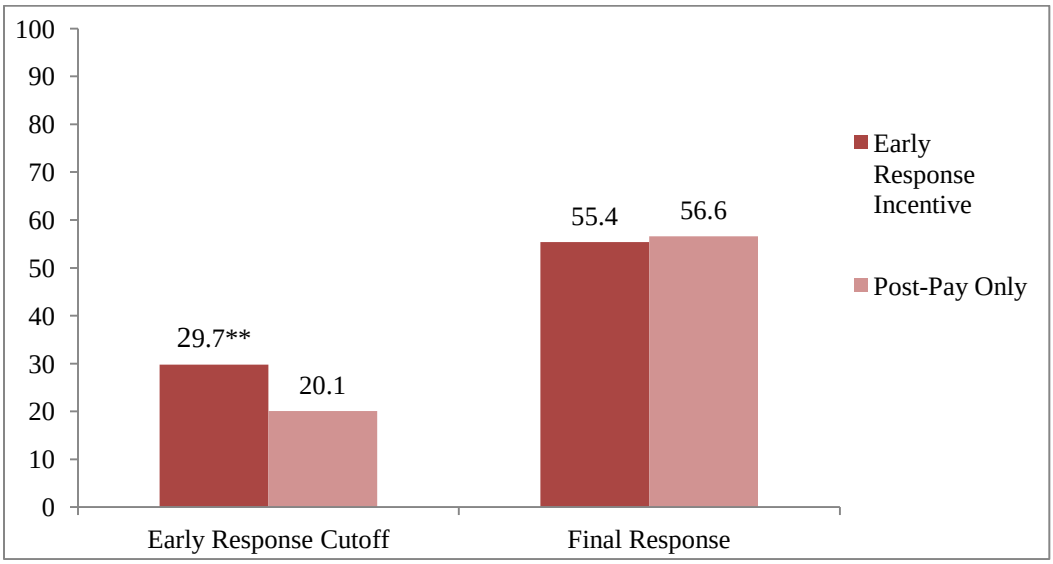
The standard incentive offered to all principals was a $50 post-response reward for replying. A randomly selected number of principals (Group 1) were offered an additional $50 post-response incentive if they replied within the first three weeks of the field period. The purpose of this early-response incentive was to increase both response rates early in the field period and final response rates above those obtained by offering only the standard $50 post-response incentive. We hypothesized that the additional incentive would promote an early response, providing an increase to the response rate at the beginning of data collection over that of the standard incentive, and that this difference would be maintained when the response incentives in the treatment and control groups became equal after three weeks in the field.

A total of 560 principals were randomly selected into this treatment group (Group 1) and would be offered the standard $50 post-response incentive plus the additional $50 post-response incentive for early reply, and 560 principals were randomly selected into the control group (Group 3), which would be offered only the standard $50 post-response incentive.[3] The research boards in some school districts did not give approval for its principals to participate in the study, or approved participation but did not allow for differential incentives to be offered to principals. This meant 37 principals in the treatment group and 40 principals in the control group could not participate in the experiment. However, removing these principals from the experiment could introduce bias, yielding results that may not represent the actual response to these incentives across all subgroups in the sample. To avoid the possibility of introducing bias, these principals were kept in the experiment as if they had received the treatment or control conditions. This "intent-to-treat" approach provides unbiased results, although treatment effects may be dampened due to a certain portion of principals not receiving the treatment condition or (in some cases) the control condition.

Exhibit 3.1 shows the response rates for the treatment and control conditions at the early response cutoff date (three weeks after initial contact) and the response rates at the end of data collection.

[3] Half of these were also part of the nonresponse conversion incentive, but this offer occurred well after the three- week early incentive cutoff date.

Exhibit 3.1. Response rates for groups 1 and 3 at two time points

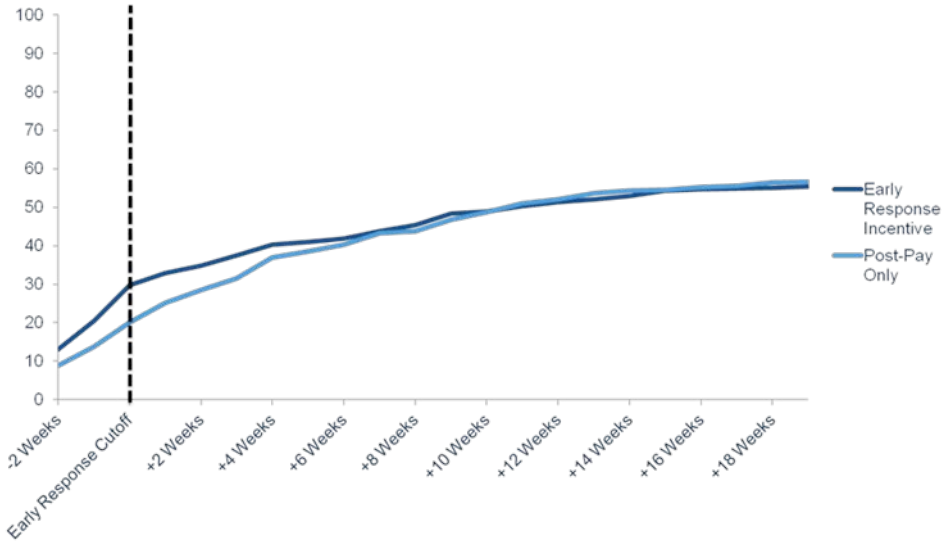


**p<0.05

After three weeks in the field, the treatment group had a 29.7 percent response rate, while the control group had a 20.1 percent response rate. This difference was statistically significant at the 5 percent level, indicating a clear positive effect of the early-response incentive on response rates three weeks into the field period. This result confirms our hypothesis of an initial boost in response rates early in the field period due to the additional $50, as compared to the standard incentive.

In contrast to the early response cutoff, there was no effect of the early-response incentive at the end of data collection. Although the difference was not statistically significant, the control group actually had a slightly higher response rate (56.6 percent) than the treatment group (55.4 percent). This finding rejects the second half of our hypothesis—that the initial boost in response rate in the treatment group would be maintained until the end of data collection. Clearly the effect of the early-response incentive did not hold throughout the data collection period as expected. It appears that even though response incentives became equal in the two groups after the early response cutoff, the increase in their response rates after that cutoff were not equal. To demonstrate this pattern visually, Exhibit 3.2 below plots response rates for the two groups across time.

Exhibit 3.2. Response rates for groups 1 and 3 plotted over time in field



Because the sample was released at several different time points, dates are not presented in the x axis. Instead, time-in-field in relation to the early-response incentive cutoff (three weeks in the field) is shown in two-week increments. The broken black line is also used to highlight the end of the early-response incentive period. The first time point shown is two weeks prior to the early response cutoff (one week in the field) and already at this time point there appears to be an effect of the additional incentive, with the treatment group having a response rate about 4 percentage points higher than the control group. This difference increases to a maximum of 9.6 percentage points at the early response cutoff, which is the same result shown in the bar graph above.

Because the response incentives in the two groups became equal after the early response cutoff, we had expected the difference in response rates at that point to hold more or less steady until the end of data collection. However, we can see in the line graph that this difference starts to diminish immediately following the early response cutoff, and continues to decrease until about seven weeks after the early response cutoff when the response rates of the treatment and control groups become essentially equal.

Although the early-response incentive did effectively increase response rates early in the field period, this effect did not hold throughout the full period of data collection. It is possible that the early-response incentive actually became a disincentive to respond after the cutoff date. Principals in the treatment group who did not respond in time to receive the additional incentive may have been less motivated to respond knowing they were no longer eligible to receive the additional incentive. In contrast, principals in the control group were eligible for the same incentive at all times during data collection and therefore were unaffected by this possible disincentive effect. These results indicate that while the early-response incentive was effective at boosting early response rates, this effect only held for a certain amount of time after the additional incentive was no longer available.

3.2. Prepaid incentive

We tested a $25 prepaid incentive, which was provided to randomly selected principals (Group 2) in the initial contact materials. If these principals responded to the survey they also received the $50 post-response incentive, bringing their total possible compensation to $75. Previous studies have shown that prepaid incentives are usually more effective than promised post-response incentives (Singer and Ye 2013; Göritz 2010). We hypothesized that principals offered the prepaid incentive would respond at higher rates than those offered only the post-response incentive, as this initial online gift card would create a sense of obligation among the principals receiving the prepaid incentive, and thereby draw on the norm of reciprocity (Gouldner 1960).

We found no evidence that the additional prepaid incentive increased response rates above that obtained by only the offered post-response incentive. The final response rate for the prepaid incentive group was 54.6 percent, versus the 56.6 percent response rate for the control group. And although it was not statistically significant, the post-response incentive-only group had a higher response rate. We suspect the use of Amazon.com gift card codes for the incentives—rather than a check or cash—may have reduced the effectiveness of the prepaid incentive, as principals may not have recognized the prepaid, no obligation nature of this additional incentive, some mistakenly thinking that response would still be required before obtaining both incentives. If this assumption was true, we would expect most of the gift cards for the nonrespondents would not be redeemed. However, we were unable to check the redemption status of the prepaid gift cards, so we could not test this assumption.

3.3. Nonresponse conversion incentive

The final experiment tested the use of a $25 prepaid incentive used during nonresponse follow-up to convert nonrespondents. This incentive was offered to a random subset of principals (Group 3a) who had not yet responded when phone follow-ups began at 12 weeks after initial contact. If a principal received this additional incentive and then responded to the survey, he or she received both this $25 refusal conversion incentive and the standard $50 post-response incentive, bringing his or her total compensation to $75. The purpose of this additional incentive was to increase the response rates among principals who were not convinced to respond with the standard $50 post-response incentive. For this test, we randomly split the 560 principals in the control group (Group 3) into two groups of 280; one group would be offered the additional $25 prepaid nonresponse conversion gift card if they were nonrespondents when follow-up calls were made, while the other group would not. Eighteen principals in the experimental group and 22 in the control group were either in a district that did not allow its principals to be surveyed or did not allow for differential incentives. Following the intent-to-treat model, these principals were included in the initial analysis. In contrast to the other incentives tested, this incentive was offered only to a subgroup of the initially selected treatment group, those principals who had not responded prior to the beginning of nonresponse follow-up emails. Therefore, we analyzed the results twice, first including the full count of selected cases, regardless of when respondents completed the survey, and second only for those principals who had not responded prior to the beginning of nonresponse follow-up emails, and therefore received the treatment condition. The principals in the control group were analyzed in the same fashion. The idea behind this approach was to first test whether the additional incentive boosted overall final response

rates, and second, to test if this incentive was effective in boosting response rates only among initial nonrespondents.

Virtually no difference in the overall response rates between the treatment and control groups was seen. The overall final response rate for principals initially eligible for the additional $25 nonresponse conversion incentive plus $50 post-response incentive was 56.5 percent compared to 56.7 percent for the $50 post-response incentive-only group. Thus, no evidence exists that the $25 nonresponse conversion incentive increased overall response rates. A null finding of this test is not completely unexpected as only a subgroup of these cases, nonrespondents as of week 12, received the treatment in Group 3a. To estimate the impact of this incentive on those actually receiving the treatment, we removed (1) all principals who had responded or had explicitly refused prior to the nonresponse follow-up emails, (2) principals in districts that did not grant approval for the survey or incentive experimentation, and (3) any cases deemed ineligible due to school closure. The final number of cases included in the analysis was 79 in the treatment group and 62 in the control group. The final response rate for principals offered the additional $25 nonresponse conversion incentive plus the $50 post-response incentive was 24.1 percent compared to 12.9 percent for the $50 post-response incentive-only group. This seemingly large difference was only marginally significant at the 10 percent level due to the small sample size. This provides some evidence that this additional incentive was effective at converting nonrespondents to respondents. And, although this incentive did not increase overall response rates, it did increase response rates among the principals who were nonrespondents at the start of nonresponse follow-up and received the offer compared to those who did not receive the offer.

3.4. Time in field

In addition to testing the effect of each incentive on response rates, we also examined differences in how long it took each respondent to complete the survey within each incentive group. We measured length of time in field as the average number of days between the initial contact with the principal and when he or she completed the survey. Only respondents were included in this analysis. The assumption is that reducing time in field will result in lower costs per completed case, as fewer nonresponse follow-up efforts are needed and the overall field period could be shortened. We hypothesized that the early-response incentive would have a lower average time-to-response value, as this incentive specifically promotes quick responses. We also hypothesized that the prepaid incentive would have a lower average time to response, as this additional incentive was immediately available upon initial contact, thereby immediately incentivizing principals to respond. We hypothesized no difference in time to response by the $25 nonresponse conversion incentive, as this incentive was available only among a subgroup of cases and not until 12 weeks into the field period. Table 3.1 below shows the results of this test.

The results for the early-response incentive confirmed our hypothesis: principals offered the early-response incentive responded, on average, one week earlier than those not offered this incentive. This shows an overall effect of this incentive on response times, even if it did not have an overall effect on response rates. Principals in the prepaid incentive group responded about two-and-a-half days more quickly than those in the control group; however this difference was not significant. Finally, contrary to our initial expectations, there was a significant increase in average time to complete for those in the $25 nonresponse conversion incentive group compared to the control group. In this case,

Table. 3.1. Respondents' days to response

	Average days to complete	
Incentive comparison	**Treatment group**	**Comparison group**
Group 1 – $100 early-response incentive	41.8**	48.8
Group 2 – $25 prepaid incentive	46.1	48.8
Group 3a – $25 nonresponse conversion incentive	55.3***	42.4

***p<0.01
**p<0.05

the group receiving the nonresponse conversion incentive (Group 3a) had a much longer response time, taking nearly two weeks longer, on average, than the control group (Group 3b). As noted above, the nonresponse conversion incentive did increase response rates among principals who had not responded prior to the beginning of nonresponse follow-up emails. As a result of this effect, the average time to complete increased in this group—much higher than the control group because there were more late responders in the treatment group. Given that this incentive was targeted toward late responders, the increase in the average time to complete for the nonresponse conversion incentive should actually be seen as confirmation that this incentive effectively increased response rates among initial nonrespondents.

4. Discussion

Our findings suggest that the $50 post-response incentive, which served as the control condition in the experiment, is the most overall effective incentive, both in terms of promoting response rates and in terms of cost. All three experimental incentive conditions increased the total potential incentive payment, two of which involved prepaid incentives that could be redeemed by nonrespondents. Yet all three failed to show gains in response rates at the end of data collection. This suggests that a significant incentive amount, with simple requirements for redemption (that is, survey completion at any point during the data collection period), explained to sample members at the beginning of the data collection period is the most effective overall incentive strategy for this population with this survey mode.

The early-response incentive did significantly increase response rates while it was available, but this effect rapidly decayed after that period. This may be the result of an after-period disincentive effect, where sample members who missed the early response period are disincentivized to respond, as they are aware the post-response incentive is half of what they could have received if they responded earlier. Therefore, the overall effect of this strategy may be highly dependent on the length of time between the end of the early response period and the end of data collection. As the length of time expands between those two dates, the less likely this incentive strategy will have an overall effect on response rates. Thus, rewarding quick response with larger incentives can be effective for surveys with very short fielding periods, but less so for those with longer field periods.

The additional prepaid incentive with the post-response incentive was no more effective than the post-response incentive alone. Previous findings have shown the effectiveness of prepaid incentives (Gajic et al. 2011; Halpern et al. 2011), and we do not see our findings as evidence against the effectiveness of prepaid incentives in general. Rather, we suspect that the method we used to deliver incentives, Amazon.com gift card codes, did not effectively communicate the prepaid nature of the incentive. Given that sample members had to go on a computer to receive the prepaid incentive, the immediate impact of the incentive may have been lessened, as compared to more direct prepaid incentives (for example, cash included with the invitation materials). In addition, some sample members may have thought that response was still required to obtain the incentive, given the need to use the included web address to obtain it. Consequently, the prepaid incentive may have been perceived as a post-response incentive, thereby making it no more effective than the actual post-response incentive.

The nonresponse conversion incentive was effective among those who did not respond by 12 weeks into the field period, although the effect was only marginally significant, and there was no effect for all initially selected sample members. This finding suggests the use of this method in an adaptive design strategy, where certain subgroups with low response rates could be targeted with this incentive to boost their response rates. Similarly, other metrics like R-indicators (Schouten et al. 2009) could be used to identify underrepresented subgroups during data collection, and this incentive could be used to improve their representation in the responding sample. However, given the small sample size for this test, further research would be needed to confirm the effectiveness of this incentive strategy.

5. Limitations

The ability to generalize these findings across survey domains is limited by two factors: 1) the population that took part in this experiment and 2) the mode of delivery for the incentives. The population included in this experiment, public school principals, may not have the same likelihood of participating in surveys or responding to incentives as members of the general population. High demands on their time and the varying levels of restrictive policies of school districts may dampen the potential effect of response incentives. Because of such circumstances, the incentives tested in our experiments may be more effective in general population surveys. We also found that the content of the survey, particularly that dealing with the Common Core standards, may have been considered controversial by some principals and therefore made them reluctant to respond to the survey. Different effects may have been found if the survey content was less likely to be seen as controversial by the target population.

Both the survey collection and the incentives were administered via the internet. This may have resulted in a mode effect, particularly with the incentives. As noted above, the need to redeem the gift card codes online may have dampened the effect of the incentives, particularly for principals who do not frequently use Amazon.com. In addition, sample members had to read the invitation materials to become aware of the incentives. Anyone skimming or only reading the first sentence or two would not have been aware of the incentives, thereby negating any possible effect. Gift card codes from other retailers or the use of physically delivered incentives (for example, cash or checks) may have different effects for a web survey.

6. Conclusion

We tested the effectiveness of several incentive strategies for a web survey of public school principals via Amazon.com gift card codes. We examined the effect of an early-response incentive, a prepaid incentive, and a nonresponse conversion incentive compared to the effectiveness of a post-response incentive. Overall we found no incentive strategies more effective than the post-response incentive, making this strategy preferable as it is the least costly. However, we did find that the early-response incentive was effective while it was available, making this strategy useful in some situations. In addition, we found some evidence that the nonresponse conversion incentive was effective among initial nonrespondents, and therefore may be useful as a targeted incentive in adaptive design for improving the representation of certain subgroups. Further research is needed on the use of incentives in the context of web surveys and electronic delivery of incentives. The findings presented here suggest that the effectiveness of different incentive strategies in this context may not be the same as findings for similar strategies used for traditional mail surveys.

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