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The Effects of Cash, Electronic, and Paper Gift Certificates as Respondent Incentives for a Web-Based Survey of Technologically Sophisticated Respondents

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An experiment was conducted to determine the effectiveness of three invitation and incentive combinations in a web-based survey. A stratified convenience sample of 434 researchers who were target users of a laboratory for earthquake engineering was randomly divided into three experimental conditions: (a) a \$5 bill sent with the survey instructions via first class mail, (b) a \$5 gift certificate code to Amazon.com sent with the survey instructions via first-class mail, or (c) a \$5 gift certificate code to Amazon.com sent with the survey instructions via e-mail. Overall response was 43%. Results show that \$5 bills led to significantly higher response rates than either gift certificate condition (57% for cash vs. 36% for the two gift certificate conditions, $\chi^2(1) = 9.3, p < .01$). This suggests that cash is a superior incentive for an online survey, even with technologically sophisticated respondents. This may be due to the perceived limitations, delayed payoff, or reduced visibility of online gift certificates.

Keywords: survey incentives; web-based surveys; methods; earthquake engineering; laboratory

The explosion of popular access to the Internet in recent years has brought about significant interest in web-based survey deployment, due in large part to administrative cost savings (Couper, 2001). Couper also argued that the amount of data that can be collected from any survey depends on the willingness of respondents to complete it. In some ways, this echoes Grudin's (1989) claim that computer-based systems are less likely to be adopted when the system's beneficiaries are not the people who have to use the system. In this case, the researchers benefit from reduced costs of electronic administration, whereas potential respondents must endure increasing numbers of surveys and reduced convenience in that survey completion requires ready access to the web. Thus, an important research area involves understanding how to achieve desirable response rates for online surveys.

Research on incentives for online surveys is sparse and frequently seeks to test findings from the mail survey literature suggesting that among the factors that can increase response

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are the following: prepayment of incentives (Church, 1993; Dillman, 1978; Singer, Van Hoewyk, & Maher, 1998) and cash in lieu of alternatives (Gendall, Hoek, & Brennan, 1998; Warriner, Goyder, Gjertsen, Hohner, & McSpurren, 1996). Online survey experiments we are aware of have compared incentive amounts and timing (Downes-Le Guin, Janowitz, Stone, & Khorram, 2002) and various incentive types (Bosnjak & Tuten, 2003). One meta-analysis of online surveys found a negative relationship between incentive use and response rate (Cook, Heath, & Thompson, 2000).

This latter finding suggests that there are differences between web and mail surveys that can make application of lessons from mail surveys problematic. We are concerned with the following two differences: (a) invitation constraints and (b) incentive constraints.

Invitation Media

Unlike mail surveys, web surveys present the option of sending invitations via e-mail, traditional postal mail, or telephone. Although e-mail is the lowest cost of these options, these cost savings apply to other mass-mailers as well. This has resulted in an explosion of unwanted e-mail, or spam (Cranor & LaMacchia, 1998) and a corresponding propensity of sophisticated users to ignore it. This suggests the possibility that e-mailed invitations may either not be noticed by participants or may be automatically filtered.

Incentive Options

Online surveys also restrict the range of possible incentives in that they must be in electronic form. There are the following three key implications of this constraint:

1. Many vendors of online incentives specify a minimum value. Amazon.com, for example, does not sell gift certificates for less than \$5.
2. Noncash incentives may impose redemption costs on participants in four forms: (a) direct costs of incentive redemption (e.g., Paypal fees for issuing a check), (b) the cost in terms of time required to set up an account or to type in gift certificate information, (c) the inconvenience of having to redeem an incentive such as a gift certificate with a particular online merchant, and (d) the potential cost difference if, for example, a \$5 gift certificate is redeemed for something that costs more. Not all costs are present for all electronic incentives, but at least one is present for every incentive type we identified.
3. The value of cash is clear in that respondents know what it can buy. The value of alternative incentives may vary based on individual preferences.

THE EXPERIMENT

In fall 2002, a survey was conducted with a group of 434 engineers involved in academic research who were target users of a collaboratory for earthquake engineering research. A collaboratory is a kind of laboratory without walls that connects scientists, instruments, and data via computer networks (Finholt, 2003). The 2002 survey administration was part of a longitudinal study that began with a web survey in fall 2001 of a nearly identical convenience sample with no incentive and using only e-mail invitations. The sample for the 2002 survey was identical to the first, except that (a) persons no longer at the institutions being surveyed were removed, (b) new persons were added, and (c) five additional institutions were added to reflect an expansion in project scope. In light of our 2001 response data and concerns about overall response, there was not a no-incentive control group.

TABLE 1
Assignment of the Sample Into Three Experimental Conditions

<i>Description</i>	<i>Paper Invitation</i>	<i>E-Mail Invitation</i>
\$5 cash incentive	144	NA
\$5 gift certificate	145	145

Participants were randomly assigned to the three experimental groups to reflect a modified two-by-two design (see Table 1):

1. Paper invitation, cash incentive: Group 1 received an invitation via postal mail with a crisp \$5 bill enclosed.
2. Paper invitation, gift certificate: Group 2 received an invitation via postal mail with a gift certificate code for Amazon.com printed in the text of the letter.
3. E-mail invitation, gift certificate: Group 3 received an e-mail invitation with a gift certificate code for Amazon.com included within the text of the email.

The amount of \$5 was chosen because it is the minimum value for an Amazon.com gift certificate. Beyond direct references to the relevant incentive, the text of the survey invitations was otherwise identical. Follow-up e-mails were sent to all participants at 2-, 3-, and 4-week intervals after the initial invitation. These follow-up e-mails referred to the incentive. The total response period was 6 weeks.

Hypotheses

We were interested in testing the following three hypotheses:

Hypothesis 1: Consistent with mail survey research, the presence of an incentive will result in a higher overall response rate for the survey administered with an incentive (in 2002) than was achieved with a similar sample without an incentive (in 2001).

Hypothesis 2: Existing research on the superiority of cash as an incentive remains true in the online world, and respondents receiving cash incentives will have higher response rates than those receiving gift certificates.

Hypothesis 3: Respondents receiving postal invitations will have higher response rates than those receiving e-mail invitations because of the combined effect of in-boxes cluttered with spam and the greater salience of paper communication.

RESULTS

This section of the article examines the results of the experiment in two steps: (a) overall incentive effect and (b) the effects of the experimental conditions.

Overall Incentive Effect

To test the overall effect of the incentive, we decided to compare only those respondents who were added to the sample in 2002 (45% response rate, $n = 164$) with the entire 2001 sample (36% response rate, $n = 469$), thus comparing two groups who were seeing the survey for the first time, one with an incentive and the other without. There is a marginally statistically significant difference between these two response rates, $t(631) = -1.82$, $p < .1$. Thus,

TABLE 2
Response Rates in the Three Experimental Conditions

<i>Description</i>	<i>Paper Invitation</i>	<i>E-Mail Invitation</i>
Cash incentive	82 / 144 = 57%	NA
Gift certificate	58 / 145 = 40%	47 / 145 = 32%

Hypothesis 1 is preliminarily supported, and the low sample size may account for the marginal significance of the result.

Effects of Experimental Conditions

Table 2 shows the response rates from the three experimental groups.

Our second hypothesis was that respondents who received a paper invitation with a cash incentive would have a higher response rate than those who received an electronic gift certificate incentive and either type of invitation. This hypothesis was confirmed as the response rate for those who received cash was 57% versus 36% for those who did not, $\chi^2(1) = 9.3, p < .01$. This supports existing studies of cash versus other incentives in mail surveys and suggests that this holds true in web-based surveys as well.

In Hypothesis 3, we theorized that paper would be a more visible invitation medium than e-mail, such that those who received a paper invitation and a gift certificate incentive would have a higher response rate than those who received an e-mail invitation with a gift certificate incentive. Although the response rate for paper invitations was higher (40% vs. 32%) than e-mail, there is no statistically significant difference between these response rates— $\chi^2(1) = 1.2, p = .28$. Thus, Hypothesis 3 is not supported, although it is also possible that the small number of respondents accounts for the lack of statistical significance.

In addition, we received free-response comments leading us to believe that people receiving invitations to participate in the survey for the second time might be less likely to respond than those participating for the first time. We therefore divided the overall sample into two groups, first-time, or new, participants and second-time, or repeat, participants. Figure 1 suggests that cash becomes an even more salient incentive when restricted just to new participants, as the response rate for new participants receiving cash was nearly 70%. It may be that the unwillingness of some repeat participants to fill out a similar survey for the second time had a dampening effect on our overall results.

We also considered the possibility that respondents receiving different types of incentives would be differently inclined to complete the full survey or provide us with differing amounts of information in terms of the number of survey items completed and the length of free-response answers. We counted the number of completed items and the length of free responses for each respondent, and compared these values across treatment groups. There were no statistically significant differences.

DISCUSSION

The results presented above suggest that cash is a superior incentive to electronic gift certificates, but that there is little difference in response rates when paper and electronic gift certificates are compared. This section of the article discusses both the implications of this work, and our suggestions for future research in this area.

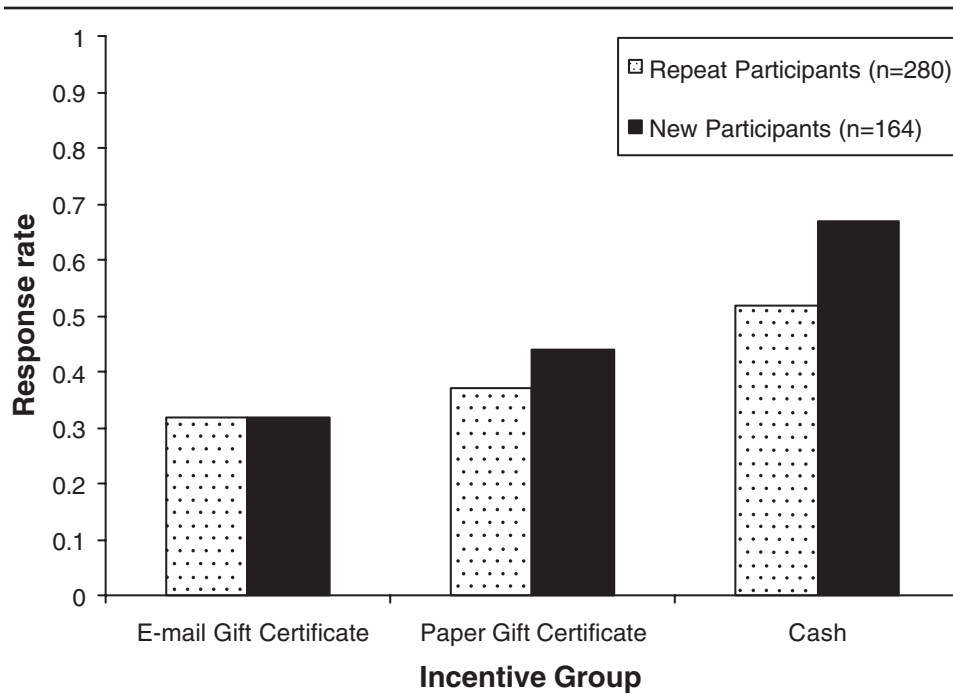


Figure 1: Response Rates in the Three Incentive Groups for New Versus Repeat Participants in the Survey

Implications

These results have the following three important implications: (a) cash is a superior incentive, even for online surveys, (b) e-mail and paper invitations yield similar response rates with an electronic incentive, and (c) the reduced costs that web surveys bring to researchers do not appear to apply equally to survey respondents.

First, these results support the finding from the mail survey literature that incentives do have some effect on overall online survey results. They also support the mail survey literature finding that cash has a higher impact on response rate than other forms of incentives. This finding is particularly important for those who administer web-based surveys because it suggests that one may not be able to achieve the highest possible response rates using low-cost e-mail invitations and an incentive. Rather, the additional costs of paper invitations and cash incentives must be weighed against the benefit of the higher response rates that they may yield. It may, in fact, be possible that a smaller cash incentive such as a crisp \$1 bill could yield similar or better response rates than a larger electronic incentive, such as a \$5 Amazon.com gift certificate. If this were the case, the additional cost of the incentive would surely outweigh the printing, postage, and handling costs of paper invitations with the smaller value cash incentive.

Second, these results suggest that if an electronic incentive is to be used in a technologically sophisticated group, there may be no significant difference in response rates whether a paper or e-mail invitation is used. In this case, the reduced printing and postal costs clearly

make e-mail invitations the more attractive choice. The reasons for this are not entirely clear, however.

Third, these results provide preliminary evidence that many of the cost benefits of web-based surveys apply disproportionately to researchers and less to the respondents. Indeed, it seems that in many cases, the cost to respondents is increased. The significantly higher effect of a cash incentive on response rate, for example, suggests that cash has a higher net value to the respondent because there are fewer redemption costs (along the dimensions outlined above) than with an electronic gift certificate. In Grudin's (1989) terms, we see that the respondents receiving electronic incentives are faced with additional work for which they receive no benefits.

Furthermore, we return to Couper's (2001) observation that the low cost of web surveys has led to a proliferation of online questionnaires, despite the fact that there has been no concurrent increase in the number of respondents willing to complete them. This is similar to Simon's (1996) notion of the economy of attention, which suggests that increasing information leads to a scarcity of human attention. Thus, the likelihood of each survey getting noticed and responded to may be dropping, meaning there is an increasing need to distinguish one's survey via incentives, invitations and other means.

Future Work

These results open the following three interesting areas of work: (a) visibility of e-mail versus paper incentives, (b) considering balancing points for cash versus electronic incentives, and (c) the effect of incentive visibility within the invitation.

First is the issue of e-mail versus paper visibility. This design and our results make it difficult to distinguish between the effects being explored in Hypothesis 3 and potential interactions between them. It is plausible, for example, that paper invitations were more visible (supporting Hypothesis 3), but that the reduced convenience of accessing the survey by typing in a URL from the invitation forced the response rate down. Inversely, it is further plausible that e-mail invitations were not as visible, but that those who did read them were more likely to respond because of the increased convenience. Testing for these effects would require the capability to gauge what fraction of invitations were actually read by respondents, which is not possible with current technologies. This may be possible, however, with Internet-based tracking agents and other emerging technologies.

Furthermore, recent economic analyses of e-mail (Kraut et al., 2002) advocate prioritization schemes that would reduce the visibility of unsolicited e-mail and provide a *high-priority* e-mail option at a higher cost. In addition to flagging high-priority e-mail, it is also possible to send highly visible invitations via e-mail or postal mail using colorful and enticing multimedia technologies. These are akin to Dillman's (1978) recommendations about envelope size, color, and style. A greater understanding of the effects of visibility and convenience will be quite valuable to researchers should such suggestions be adopted in Internet mail standards.

Next, consider the additional costs associated with electronic incentives listed above. The existence of these costs suggests that they might be quantifiable and that there is some theoretical equilibrium point at which a certain cash incentive and a certain electronic incentive produce equal response rates. Also important to consider here is Bosnjak and Tuten's (2003) finding that a random prize draw incentive produced a greater response rate than either prepaid or promised incentives in their web-based survey. This raises the important, but unanswered, question of how a prepaid cash incentive would compare to a random prize draw.

Additional research into respondent preferences for various incentive types could help illustrate when these are appropriate, and the exact nature of the tradeoffs involved.

Finally, it may be that there is some effect of visibility of the incentive once the respondent opens the envelope. Cash, for instance, is immediately apparent. A gift certificate code embedded within the text of a letter or e-mail is less visible. Figure 1 offers a preliminary suggestion that increasing visibility and tangibility of incentives may lead to increased response rates, particularly if one considers only first-time response rates. Additional research using tangible gift certificate incentives (i.e., gift cards), and various means for increasing the visibility of electronic incentives (i.e., embedded graphics, links, etc.) would help shed light on this effect. It would also be useful to investigate usage of noncash incentives as a means for tracking incentive visibility. Mitchell, Lamothe-Galette, and Potter (2003), for example, used phone cards as incentives and could assess incentive utility by tracking how many minutes respondents had used. We tried to obtain similar data for our gift certificates, but Amazon.com indicated that their policy prohibits the release of this information.

CONCLUSION

This article has described an experimental test of the effect on web survey response rate of cash versus noncash preincentives when accompanied with e-mail versus postal mail invitations. The results suggest that all incentives had some effect on overall response rate, but that cash sent via postal mail has a stronger effect than gift certificates sent via postal mail or gift certificates sent via e-mail.

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