UC Berkeley
UC Berkeley Previously Published Works

Title
When Less Is More in Boosting Survey Response Rates*

Permalink

Journal

ISSN

Authors
Conn, Katharine M
Mo, Cecilia Hyunjung
Sellers, Laura M

Publication Date

DOI

Peer reviewed

When Less Is More in Boosting Survey Response Rates*

Katharine M. Conn, *Columbia University*

Cecilia Hyunjung Mo, *University of California, Berkeley*

Laura M. Sellers, *Vanderbilt University*

Objectives. Previous general population survey research has found that, relative to monetary incentives, altruistic appeals are ineffective in increasing survey response and that offering additional monetary incentives is always desirable. We consider an alternative population—a pro-social population—and ask whether these same conclusions apply. *Methods.* To evaluate the relative effectiveness of different incentive strategies, we randomly assign individuals to one of five conditions. We consider altruistic incentives (a narrative appeal or a charitable donation) and monetary incentives (three separate lotteries). *Results.* Among pro-social individuals, "less is more": altruistic appeals are just as effective, if not more effective, than costly monetary incentives. Moreover, the simplest lottery structure (fewer large-payoff prizes) is the most cost effective of the lotteries. *Conclusions.* The target population of interest matters when designing survey incentive strategies. Moreover, increasing the incentives budget is not always beneficial.

Survey researchers rely heavily on incentives to boost response rates to their surveys. Extant research has explored the use of simple narrative appeals, charity incentives in which the respondent is informed that participation in the survey translates to a charitable donation for a good cause, and various types of monetary or gift-based incentives, including lotteries where the respondent has a chance to win a prize. The utilization of incentives is not surprising given that many studies have found incentives to be effective at increasing response rates for general population surveys (Deutskens et al., 2004; Heerwegh, 2006), including online surveys, which are increasingly being employed by researchers. In an aggregate analysis of over 32 online surveys, which included over 200,000 respondents, Göritz (2006) found that surveys that offered participation incentives to respondents had a 19 percent higher response rate than those that did not offer any incentive (see also Göritz, 2014; Göritz and Luthe, 2013).

However, prior survey research frequently ignores the possibility that different populations may respond differently to the range of incentive strategies employed today. Extant web survey response literature leverages online panels, which are disproportionately comprised of students, unemployed individuals, homemakers, and retirees. Whether inferences about these individuals can be applied to other populations is unclear (Ahn, Ryu, and Han, 2007; Galesic and Bosnjak, 2009; Heerwegh, 2006; O'Neil and Penrod, 2001; Porter

and Whitcomb, 2003; Schonlau et al., 2009). For example, educated professionals have been shown to be less influenced by small personal monetary incentives (Mack et al., 1998; Singer, Hoewyk, and Maher, 2000; Singer and Kulka, 2002), suggesting that it is important to experiment with other ways to effectively improve online survey response rates when considering a different population sample.

Leveraging an original experiment on a new data set of individuals who applied to a service program, this study examines which types of incentives work best to elicit online survey participation for an important population: "pro-social" individuals. As social science research often aims to assess the opinions of individuals who work in the public sector (e.g., political officials, bureaucrats, appointees) or the not-for-profit sector, the results of this study will inform strategies for future survey research targeting these important populations.

Additionally, this research reconsiders whether the expansion of a researcher's budget for incentives is always needed by considering multiple lottery strategies. Prior survey research is mixed on whether a few large prizes with a lower probability of winning or many small prizes with a higher probability of winning is desirable. What if a researcher chooses to increase the respondents' probability of winning by essentially doubling the research budget and offering the same few large prizes and many small prizes? Researchers have to work with a limited budget, and if greater expenditures translate to no response rate payoff, this is important to know.

Finally, in addition to asking whether various incentive strategies affect survey participation, we also ask whether these strategies affect the commitment of the respondent to answer more questions (e.g., lower item nonresponse) in a more careful manner (e.g., fewer errors), resulting in higher-quality survey data overall. That is, do certain incentives increase a respondent's engagement with the survey? Specifically, are recipients of certain incentive strategies more likely to skip fewer survey questions and pay closer attention to each question (e.g., correctly answer questions intended to simply check the attention of the respondent)?

This article thus explores the relative effectiveness of five frequently utilized incentive strategies to maximize web-based survey response rates (and response quality) among this pro-social sample. Specifically, we consider the following five incentive strategies: a narrative appeal alone, a donation to charity (of the respondent's choice) worth U.S. $5, entry into a lottery worth U.S. $1,000 (two prizes), entry into a lottery worth U.S. $100 (20 prizes), and entry into a lottery with both U.S. $1,000 prizes (two) and U.S. $100 prizes (20).[1] Previous online survey research on the general population suggests that monetary prizes are more effective than altruistic appeals, and offering more monetary prizes with a higher probability of winning is better than offering fewer prizes with a lower probability of winning. We reconsider these finding by exploring these five incentive strategies in a randomized experiment designed to answer the following questions: Do incentives that appeal to respondents' altruism such as narrative appeals or small charitable donations work better than lottery-based monetary incentives among "pro-social" individuals? Will offering more in monetary prizes translate into higher response rates? And will these various incentives differentially affect the quality of the survey response?

---

[1]Pre- and postpaid individual monetary incentive strategies were not logistically feasible given that the survey was being implemented through an international web survey. The option to send hundreds of individual electronic gift cards or wire funds was explored extensively, and ultimately discarded given the cost of wiring funds was cost prohibitive, and the awarding of cash prizes required extensive coordination with the prize winners.

Theoretical Framework

Research Concerning Altruistic Incentives

To our knowledge, the potential impact of altruistic appeals in incentivizing survey participation and performance has not been explored among pro-social populations. However, when we consider literature on recruiting participants for laboratory studies and incentives to improve work performance, there is evidence that altruistic appeals may carry promise among those who are socially-inclined. For example, Kam, Wilking, and Zechmeister (2007) experimented with various zero-cost verbal appeals to recruit individuals for a laboratory study across different population groups. The authors found that the content of the appeal to participate had no impact on response rates among the general public. Among university employees, however, they found that both a "social utility appeal" and the control condition with no appeal were more likely to elicit participation than a "self-interest appeal," and that the control condition was in fact the most effective overall. Thus, for this population, willingness to be a study participant may be driven more by an overall intrinsic motivation to contribute to the university.

Further, in a study of performance incentives, Gneezy and Rustichini (2000) found that offering no incentives to a group of high school student volunteers (who were collecting money for various charities and medical research) was more effective than a substantial monetary incentive. Sandel (2012) argues that the inherent value placed on volunteering is corrupted or degraded by the offer of a monetary incentive, thereby decreasing, rather than increasing the socially desirable behavior. Meanwhile, those who are given just motivational verbal appeals see the opportunity as a way to provide a social good. As such, when the task at hand is about doing a social good, it is best to not incorporate a monetary component.

Again, while there is little to no survey research on the impact of altruistic incentives targeted at pro-social individuals, these incentive structures have been widely studied on the general population, and the verdict is negative. Apart from one early experiment showing positive effects associated with charitable incentives (Robertson and Bellenger, 1978), the overall body of literature on the impact of charitable incentives on survey response rates (in the general population) indicates that charity donations are relatively ineffective when compared to monetary incentives. For example, Furse and Stewart (1982) found that monetary incentives outperformed both the charitable donations and the "no incentive" condition. Further, Hubbard and Little (1988) found that the "charitable donations" group had the lowest response rate, which was not statistically significantly different from the "no incentives" group, while the "personal cash gifts" group and the "monetary lotteries" group had the highest response rates. Warriner et al. (1996) found that charitable donations performed less well on average than comparable monetary compensation, and Tzamourani (2000) found that an offer of a charitable incentive had no positive effect on response rates, as compared to a control condition with no incentive.

In addition to survey participation, the quality of response data is important to researchers who depend on survey responses to make inferences. Previous research is largely silent on the effect of altruistic incentives on survey performance, and to our knowledge, nonexistent in any study of pro-social populations. Extant studies of incentives have largely found no link between the provision of various monetary incentives (including cash, monetary lotteries, vouchers, gift lotteries, lottery tickets, among others) and response quality metrics (namely, item nonresponse and length of free response answers), regardless of whether the incentives were pre- or postpaid (Birnholtz et al., 2004; Göritz, 2004; Singer, 2002; Singer, Hoewyk, and Maher, 1998; Shettle and Mooney, 1999; Singer and Ye, 2013). However, with the

exception of Deutskens et al. (2004), who explored the number of "don't know" responses and the number of semi-completed questions by incentive type on a general population in the Netherlands, there are no experimental studies on the effects of charitable incentives on response quality.

In sum, while extant survey incentive literature largely does not find charitable donations to be an effective method of increasing survey response rates and is largely silent on whether they improve survey response quality in a general population survey, there is suggestive evidence from related literature that pro-social populations may respond differently to altruistic appeals or charitable incentives. Applicants to a service program, a group of people who have conveyed a clear interest in pro-social careers, may be more likely to respond to a survey if they felt that their involvement could contribute to a social cause of their choice than if they were offered comparably sized monetary compensation. Likewise, they may also take more care in answering questions more completely and accurately if the offer of a charitable incentive (or a simple narrative appeal) has primed them for further altruistic behavior. In fact, promising a small financial incentive may have a negligible or even negative effect on response rates as it may reduce the intrinsic motivation (Deci, 1975) of these potential participants. Based on this research, we have the following hypothesis:

Hypothesis 1: Offering a narrative appeal alone or a charitable donation is more effective at increasing survey response rates and response quality in socially inclined individuals than monetary incentives, as altruistic incentives tap into volunteerism, an activity for which this group has already shown a proclivity.

This altruism-related hypothesis will be tested with the use of two incentive structures tied to altruistic behavior (a narrative appeal and charitable donations), versus three incentive structures tied to personal monetary gain (various forms of lotteries). Note that we consider multiple lottery conditions to assess how altruistic incentive strategies hold up against lotteries as the attractiveness of prizes increases and/or the probability of winning prizes increases.

Research Concerning Lottery-Based Incentives

As a researcher looking to employ lotteries to incentivize study participation with a limited budget, what is the appropriate lottery design? The literature on survey incentives does not elucidate whether a few larger prizes is more or less optimal than many smaller prizes, assuming a fixed budget. The probability of winning a lottery may influence response rates; however, previous research on designing lottery-based incentives is mixed. According to Deutskens et al. (2004), smaller prizes yielding higher chances of success were more effective than larger prizes yielding lower chances of success in producing higher response rates in their online survey. However, Gajic, Cameron, and Hurley (2012) found that offering a lottery with a smaller number of big attractive prizes was more effective at increasing the level of respondent cooperation than offering a large number of small prizes. In contrast to both studies, Göritz (2004) also found that different-sized lottery prizes with the probability of winning held constant had response rates of a similar magnitude. In other words, the size of prizes did not matter. In sum, previous studies do not elucidate whether fewer larger prizes are more or less optimal than many smaller prizes.

What if researchers expand their budget, and offer more prizes? Do researchers gain anything by sweetening the offer of a few large prizes with many small prizes, all of which translate to a greater probability of winning a prize for the study participant? Previous

research on lotteries that speaks to the significance of the size of prizes and the probability of winning a prize would suggest that lottery structures that are more attractive on both dimensions would have a positive effect on response rates. However, we hypothesize that more is not always better when it comes to lottery-based incentives. According to market researchers Khan and Kupor (2014), the inclusion of smaller incentives alongside a large incentive can actually diminish the attractiveness of the large incentive. Rationally, a strategy of including additional positive prospects should increase the perceived value of a potential option no matter how small or large the additional prospects are. Thus, a lottery offering a chance to win a vacation to Hawaii should be perceived as more attractive if it also offers a chance to win other prizes, even if the additional prospects are small.

In contrast to this normative view, Khan and Kupor show that "additional smaller prospects can reduce the perceived value of a risky option such that the addition of positive prospects makes a positive option less positive," and refer to this phenomenon as "value atrophy" (2014:2). In other words, offering a set of small prizes along with a large prize is less attractive to a consumer than offering the large prize on its own. For example, a lottery offering a chance to win an iPad is viewed as less attractive when the lottery offers the same iPad *and* a chance to win other smaller prizes like ball-point pens, a sports water bottle, a ceramic coffee mug, or a t-shirt. In other words, individuals perceive a *lower* likelihood of experiencing a large good fortune when a large prospect is in the presence of smaller prospects, and this reduction in the perceived likelihood of the large prospect reduces the overall value of the option. Can we learn from this research on consumer behavior to design lotteries with higher survey response rates? Is it better to offer a few large prizes or a few large prizes *and* many small prizes to incentivize survey participation? If Khan and Kupor (2014) are right, resources allocated to providing the small prizes to accompany an attractive large prize(s) are wasted. This leads us to our second hypothesis:

Hypothesis 2: Offering a few large prizes by themselves is more effective in increasing survey response rates than offering the same large prizes along with many small prizes.

Our claim around lotteries will be tested with the use of three lottery-based incentive structures, which vary the size and number of cash prizes.

Methods

Experimental Design

The experiment involved the promise of one of five incentives to respondents upon completion of a web-based survey of college-educated professionals who applied to join Teach For India, a not-for-profit service organization in India, between 2009 and 2014. The survey panel was comprised of every unique applicant who made it to the final interview stage of the India-based service organization and had valid contact information, which equates to 14,335 individuals. The surveyed individuals were all Indian citizens and people of Indian origin, given the eligibility criteria of the youth service organization. The survey itself contained questions relating to the respondents' career and educational trajectories, as well as their political and social beliefs.

The online survey was implemented using Qualtrics, and kept open for two weeks between December 24, 2014, and January 6, 2015. Within that period, 1,780 individuals opened the e-mail and saw the invitation and incentive (12.20 percent of the panel), and

643 completed the survey (4.41 percent of the panel; 36.12 percent of those who saw the e-mail invitation). We limit our analysis sample to the 1,780 individuals who were exposed to one of the five treatments.[2] The median respondent and average respondent took 45.05 and 55.80 minutes to complete the survey, respectively.[3]

Each individual in the survey panel was e-mailed a unique link to the survey. The subject of the e-mail was "Survey of Former Applicants to Teach for India." The source of the e-mail was Vanderbilt University, and the first sentence of the e-mail read "You are invited to participate in an important research study conducted by Vanderbilt University in the United States" so that recipients would know that the origin of the e-mail was a U.S.-based institution of higher education.[4] The invitation e-mail was the same for all individuals and included a narrative appeal but no incentive information. On the introductory page of the survey (with consent form information), respondents were randomly assigned to one of the following five incentives: (1) narrative appeal only (control condition; $n = 362$), (2) a U.S. \$1,000 cash prize lottery ($n = 363$) with two winners, (3) a U.S. \$100 cash prize lottery with 20 winners ($n = 345$), (4) both a U.S. \$1,000 cash prize lottery with two winners and a U.S. \$100 cash prize lottery with 20 winners ($n = 345$), or (5) a U.S. \$5 donation to a charity ($n = 365$).[5] These five conditions will hereafter be referred to as (1) the narrative appeal only, (2) a lottery with a "few large prizes," (3) a lottery with "many small prizes," (4) a lottery with a "few large plus many small prizes," and (5) the charity condition.[6] The survey platform was programmed such that there was random assignment across all respondents.

In a test of proportional equivalence across all available baseline characteristics in the Teach for India administrative data—gender of respondent, application year, and whether or not the respondent was accepted into the program—there were no statistically significant differences across treatment groups.[7] We also conducted a balance test considering demographic questions asked in the survey itself. In a test of proportional equivalence (among respondents) across a range of demographic characteristics—admission status, cohort year, gender of respondent, hometown size, marital status, number of children, socioeconomic class, maternal education level, and religion—there were no statistically significant differences across treatment groups.[8] These analyses provide reassurance that the randomization procedure was successful.

The narrative appeal read as follows: "We are very much interested in learning from individuals like you, who have applied to service programs like Teach For India. We recognize that you have extremely valuable insights, and we very much appreciate your participation."

---

[2]Note that compared to the TFI applicant population overall, these 1,780 respondents skewed less female (difference of 6.3 percentage points), started TFI at a later date (by 0.259 years), and were less likely to be admitted applicants (difference of 7.6 percentage points). See supplementary Appendix B, Table B4(c) for results of one-sided t tests.

[3]Outlier respondents who took longer than 208 minutes were removed in the computation of average survey lengths to ensure length estimates were not positively skewed (the top 5 percentile in survey length). Note that respondents could return to the survey, and did not need to complete the survey in one sitting. The *SD* for time to complete the survey, excluding those outlier respondents, was 33.02 minutes.

[4]The full text of the e-mail is available in supplementary Appendix A, Figure A1.

[5]The full text of each of the five experimental conditions is available in supplementary Appendix A, Figures A2–A6.

[6]We did not state the number of total participants (the denominator used in further analysis and information for respondents on the probability of winning) in the lottery invitation because we could not know in advance of sending out the survey how many people would either open this e-mail or take the survey.

[7]A joint orthogonality test of treatment arms for these baseline characteristics in the administrative data shows no evidence of baseline gender imbalance across treatments groups, nor is there evidence of cohort year or acceptance rate imbalance (see supplementary Appendix B, Table B4(a)).

[8]A table with the results of a joint orthogonality test of treatment arms (for the sample of respondents) is reported in supplementary Appendix B, Table B4(b).

Respondents assigned to the charity incentive condition were additionally provided with a list of 10 nonprofit organizations from which they could choose to donate their U.S. $5, which covered a wide range of issue areas (e.g., civic participation, education, emergency relief, environment, gender, marginalized communities [e.g., tribal and scheduled caste], poverty, and youth). Those assigned to one of the three lottery conditions received information on the number and size of the cash prizes. Note that we do not consider pre- and postpaid incentives in this study given that a simple mechanism for transferring payment globally is not available, and lotteries are the primary monetary incentive employed in web-based surveys (Gajic, Cameron, and Hurley, 2012).[9] Given pre- and postpaid incentive strategies were not logistically feasible, the large (two U.S. $1000 prizes) and small (20 U.S. $100 prizes) awards were designed such that the expected return was equivalent to approximately U.S. $5, which is equivalent to the donation value of the charity incentive.[10]

Measures

We employ two binary response rate measures to assess the merits of each incentive option: a variable for whether the respondent started the survey, as well as a variable for whether the respondent completed the survey. We also consider response completeness, which is the share of the survey completed, and the share of respondents who correctly answered the attention check question. The attention check question was designed to gauge each respondent's level of survey engagement (e.g., whether respondents were reading the survey questions).[11] We list the definitions of each of these outcome measures here:

> *Completion rate* is the number of respondents who completed the survey divided by the number of individuals who were exposed to the incentive condition of interest (AAPOR RR1 response rate).
> *Participation rate* is the number of respondents who proceeded past the first page of the survey (the consent form), divided by the number of individuals who were exposed to the incentive condition of interest (AAPOR RR2 response rate).
> *Response completeness* is the average percentage of the possible questions answered by respondents.
> *Attention check correct* is the number of respondents who answered the attention check question correctly divided by the number of respondents who answered the attention check question.

Results

Given the five experimental treatments used in this study, we first examine the relative effectiveness of the altruistic incentives (narrative appeal only and charity donations) versus

---

[9]See footnote 1.

[10]In designing the lottery, we predicted that approximately 10–15 percent of our starting sample would be eligible respondents (valid e-mails that would be opened) based upon information from the service organization about their survey participation rates in the past. Hence, with a total of U.S. $2,000 in cash prizes, the expected return for a respondent would be between U.S. $4.48 and U.S. $6.7. Twelve percent were eligible responses. Between 345 and 365 individuals were in each of the five conditions. As such, with lottery prizes valued at U.S. $2,000, the expected return to survey completion was between U.S. $5.48 and U.S. $5.80.

[11]Our attention check question is as follows: "To be sure that our computer is properly recording your answers, please click 'slightly disagree' below" (response options: strongly agree, moderately agree, slightly agree, neither agree nor disagree, slightly disagree, moderately disagree, strongly disagree).

TABLE 1

Summary Table of Outcome Measures by Incentive Condition

Condition	(1) Completion (%)	(2) Participation (%)	(3) Percent Complete (%)	(4) Attention Check Correct (%)
Narrative appeal only	36.19	75.00	47.63	88.55
Few large prizes (lottery; two $1,000)	36.36	76.11	48.01	90.91
Many small prizes (lottery; 20 $100)	33.04	71.59	41.95	90.18
Few large and many small prizes (lottery)	35.36	73.47	46.36	89.34
Charity	39.45	79.11	50.19	85.82

the lottery-based strategies on survey response rates, and then we compare the relative effectiveness of each of the lottery-based incentives. Table 1 provides a summary of each of our outcome measures for each treatment condition, and Figure 1 provides a visualization of this summary table. All analyses reported in this section were completed using ordinary least squares (OLS) regression analyses. Inferences made from these analyses do not change when we conduct logistic regression models instead.[12]

The Effectiveness of Altruistic Incentives

Overall, the narrative appeal only condition performs as well as, if not better than, any lottery condition (see Columns (1)–(3) in Table 2). When we examine the effectiveness of the narrative appeal alone against each individual lottery-based condition, we find that participation and completion rates across the lottery conditions are nominally lower than (if not equivalent to) the appeal alone, and up to 5.7 percentage points lower in the case of response completeness ($p = 0.090$). Further, there is no statistically significant difference in the rate at which participants answered the attention check question correctly (a measure of survey quality) across all of the treatment groups (see Column (4) in Table 2).

We also find that participants are just as likely, if not more likely, to participate in the survey having received the promise of a charitable donation (compared to those who received a lottery-based condition). While only marginally significant, the survey participation rate (RR2) and response completeness rate were in fact 4.4 percentage points higher (see Column (2) in Table 3; $p = 0.097$) and 4.7 percentage points higher ($p = 0.082$; see Column (3) in Table 3), respectively, among those who received the charitable donation. The completion rate (RR1) of those who received the charity incentive was also 4.5 percentage points above the lottery-based incentives; however, this difference is not statistically significant at traditional levels ($p = 0.123$; see Column (1) in Table 3). There were also no statistically significant differences with regard to the attention check (see Column (4) in Table 3).

[12]It could be argued that a logistic regression would be the appropriate form of analysis due to the dichotomous nature of the completion, participation, and attention check dependent variables. When employing this analysis, however, results do not change. Due to ease of interpretation, we have reported the OLS regression coefficients. Tables with the marginal effects from logistic regressions can be found in supplementary Appendix B, Tables B1–B3.

FIGURE 1

Outcome Measures by Incentive Condition
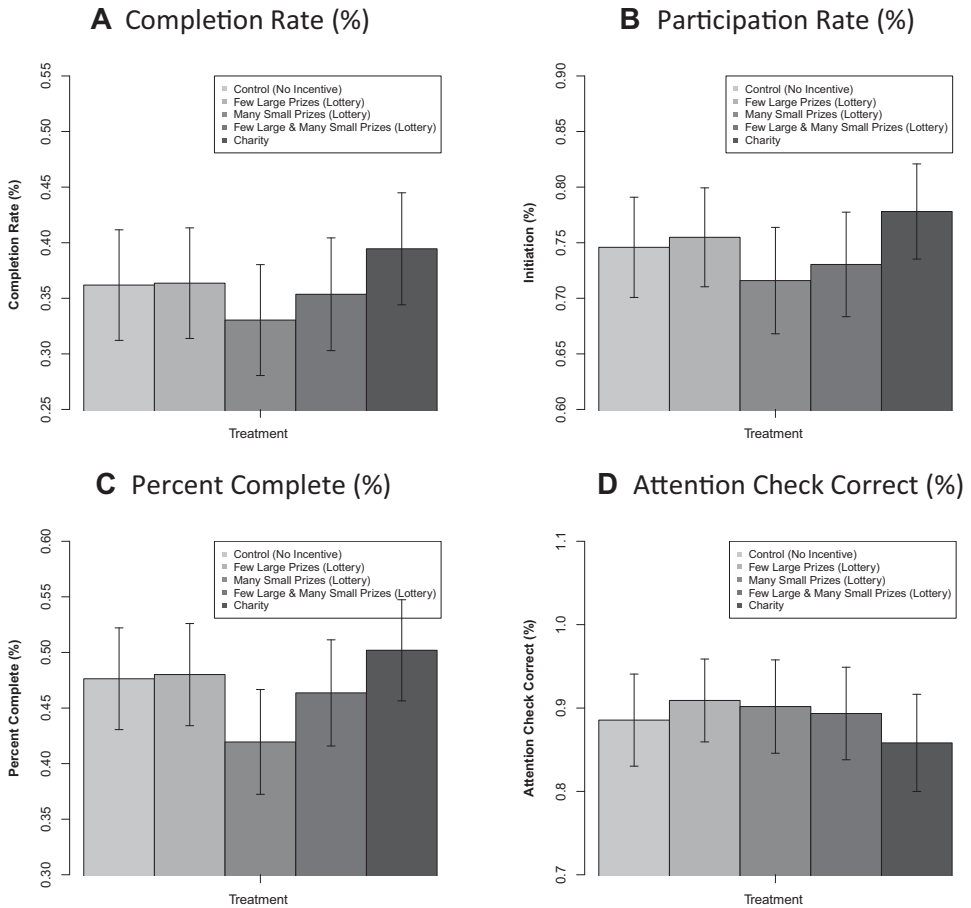
NOTES: The figure displays effect sizes with 95 percent confidence intervals for each measure. "Control (no incentive)" condition refers to the "narrative appeal only" condition.

While charitable incentives do seem promising, it is important to note that we are unable to disentangle whether these findings are due to the fact that respondents value certainty; that is, that they may prefer the charity incentive, which involves a certain payment (although not to the respondent) to the lottery incentive, which has an uncertain outcome. With that said, in reviewing existing survey research on incentive strategies to boost response rates, charitable incentives do not have a history of being effective at increasing response rates relative to monetary incentives, including lottery incentives. Thus, it is notable that the charity condition is weakly more effective than monetary incentives in encouraging higher survey response.

Finally, while both the narrative appeal only condition and the charity condition have been shown to have response rates that are just as high as, if not higher than, the lottery-based conditions, when we examine the relative effectiveness of these two "altruistic" incentives, we find that charity-based incentives are nominally more effective than the narrative appeal

TABLE 2

Performance of the Appeal Only Condition Versus Each Individual Incentive

Condition (Omitted Category = Narrative Appeal Only)	(1) Completion (%)	(2) Participation (%)	(3) Percent Complete (%)	(4) Attention Check Correct (%)
Few large prizes (lottery)	0.002	0.009	0.004	0.024
	(0.036)	(0.032)	(0.033)	(0.039)
Many small prizes (lottery)	−0.031	−0.030	−0.057*	0.016
	(0.036)	(0.033)	(0.033)	(0.041)
Few large and many small prizes (lottery)	−0.008	−0.015	−0.013	0.008
	(0.036)	(0.033)	(0.033)	(0.040)
Charity	0.033	0.032	0.026	−0.027
	(0.036)	(0.032)	(0.033)	(0.038)
Constant	0.362***	0.746***	0.476***	0.885***
	(0.025)	(0.023)	(0.023)	(0.028)
Observations	1,780	1,780	1,780	638
R-squared	0.002	0.002	0.004	0.003

NOTES: The SEs are in parentheses. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$ (two-tailed).

TABLE 3

Performance of the Charity Incentive Versus All Lottery Incentives

Condition (Omitted Category = All Lotteries)	(1) Completion (%)	(2) Participation (%)	(3) Percent Complete (%)	(4) Attention Check Correct (%)
Charity	0.045	0.044*	0.047*	−0.043
	(0.029)	(0.026)	(0.027)	(0.031)
Constant	0.349***	0.734***	0.455***	0.902***
	(0.015)	(0.013)	(0.014)	(0.016)
Observations	1,418	1,418	1,418	507
R-squared	0.002	0.002	0.002	0.004

NOTES: Control sample removed for this analysis; the three lotteries make up the omitted category. The SEs are in parentheses. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$ (two-tailed).

only condition; however, these differences lack statistical significance (see Row 4 in Table 2). In sum, for this pro-social population, offering an appeal alone or offering to pay only U.S. $5 per person as a charity donation is just as effective at inducing participation as lottery-based monetary incentives as a whole. From a cost perspective, "less is more"; offering nothing but a narrative appeal is the most optimal response rate enhancing strategy (see cost-effectiveness results in the "Cost-Effectiveness Results" section).

The Relative Effectiveness of Different Lottery-Based Strategies

Per Hypothesis 2, we again find evidence that "less is more." It is notable that the addition of many small prizes to "sweeten" the offer of a few large prizes added nothing in terms of increasing response rates, response completeness, or speed of response, which is consistent with the theory of value atrophy. In terms of relative magnitude, the few large prizes plus the many small prizes underperformed each of the other lottery-based conditions, though these differences were not statistically significant (see Row 2, Columns (1)–(4), Table 4). As such,

TABLE 4

Performance of a Few Large Prizes (Lottery) Versus Many Small Prizes (Lottery) or a Few Large Prizes and Many Small Prizes (Lottery)

Condition (Omitted Category = Few Large Prizes [Lottery])	(1) Completion (%)	(2) Participation (%)	(3) Percent Complete (%)	(4) Attention Check Correct (%)
Many small prizes (lottery)	−0.033	−0.039	−0.061*	−0.007
	(0.036)	(0.033)	(0.034)	(0.038)
Few large and many small prizes (lottery)	−0.010	−0.024	−0.016	−0.016
	(0.036)	(0.033)	(0.034)	(0.038)
Constant	0.364***	0.755***	0.480***	0.909***
	(0.025)	(0.023)	(0.023)	(0.026)
Observations	1,053	1,053	1,053	366
R-squared	0.001	0.001	0.003	0.000

NOTES: The *SE*s are in parentheses. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$ (two-tailed).

the offer of a few large prizes is meaningfully more cost effective than the offer of the same large prizes and many additional small prizes. The few large and many small prizes lottery was two times more expensive than the few large prizes lottery, but we saw no improvement in response rates. There is a marginal *loss* rather than gain from the added expenses.

When we compare the few large prizes lottery to the many small prizes lottery, we find evidence that the few large prizes lottery incentive is viewed as equal to, if not more attractive than, the many small prizes with regard to all of our outcome measures. In particular, the few large prizes lottery treatment elicited a higher level of survey response completeness (by 6.1 percentage points; $p = 0.072$) than the many small prizes lottery incentive (see Column (3) in Table 4). Additionally, in terms of relative magnitude, the few large prizes lottery condition was also slightly more effective than the many small prizes lottery condition in terms of participation rate, completion rate, and attention check correctness, though these results were not statistically significant (see Row 1, Columns (1)–(2) and (4) in Table 4).

Cost-Effectiveness Results

The incentive costs were zero for the no incentive narrative appeal only group, U.S. $2,000 for the few large prizes lottery, U.S. $2,000 for the many small prizes lottery, U.S. $4,000 for the few large plus many small prizes lottery, and U.S. $720 for charity donations (see Row 1 in Table 5). The numbers of respondents who completed the survey were 131, 132, 114, 122, and 144, respectively (see Row 3 in Table 5). We adjust for the fact that there are slight differences in the number of individuals who actually saw the survey invitation containing the treatment by creating an adjusted completion rate that assumes that the same number of individuals saw each incentive (see Row 4 in Table 5).[13] Hence, the average cost per completed survey was U.S. $0, U.S. $15.06, U.S. $16.58, U.S. $30.99, and U.S. $5, respectively (see Row 6 in Table 5). These calculations ignore the labor costs of implementing the lottery and charity incentives, though these costs are marginal (e.g., two to three hours to administer the incentives).

---

[13] Our adjustment is based upon the charity condition, and as such, we assume that there were 365 individuals who saw each condition when doing the adjustment. The condition on which we base the adjustment does not affect how we interpret relative cost effectiveness.

TABLE 5

Cost-Effectiveness of Each Incentive

	(1) Narrative Appeal Only	(2) Few Large Prizes (Lottery)	(3) Many Small Prizes (Lottery)	(4) Few Large and Many Small Prizes (Lottery)	(5) Charity
Cost of incentive	$0	$2,000	$2,000	$4,000	$720
Number of invitations	362	363	345	345	365
Number of completed surveys	131	132	114	122	144
Adjusted number of completed surveys	132	133	121	129	144
Average cost per completed survey	$0	$15.15	$17.54	$32.79	$5
Adjusted average cost per completed survey	$0	$15.06	$16.58	$30.99	$5

We find that the altruistic incentives are more cost effective than monetary incentives, and that the few large prizes lottery is more cost effective than both the many small prizes lottery *and* the few large and many small prizes lottery. It is important to note, however, that the relative cost effectiveness of these treatments was calculated with a target sample size of 1,780. If, for example, the target sample size increased threefold, the "few large prizes" lottery would become more cost effective than the charity treatment; this is assuming that the number of lotteries held is unchanged and that the response rates stayed constant, despite the probability of winning shrinking. This potential change in cost effectiveness is due to the fact that the fixed cost of the lottery would be spread out over a larger sample. Nevertheless, the narrative appeal only condition remains the most cost effective, regardless of sample size.

Discussion

This experiment highlights the importance of the target group in question when designing survey participation incentives. We find that with regard to survey incentives, less is actually more when targeting socially inclined individuals. For this group, offering an appeal or a small charity donation in exchange for participation is just as effective as any monetary lottery incentive, with no decrease in response quality. These results differ markedly from preceding studies, which favor monetary incentives over charity donations (Furse and Stewart, 1982; Hubbard and Little, 1988; Tzamourani, 2000; Warriner et al., 1996). Further, among lottery incentives themselves, we find that doubling the budget does not necessarily translate to improved response rates: adding multiple smaller prizes to the few large prizes in order to increase a respondent's sense that she has a higher chance of winning a prize does not increase the effectiveness of the incentive overall. In fact, the addition of smaller prizes may even diminish the impact of the attractive large prizes.

Finally, the charity incentive condition and narrative appeal only condition returned the largest raw response rates, and their average cost per survey completed was only U.S. $5 and U.S. $0, respectively; meanwhile lottery incentives cost between U.S. $15 and U.S. $31 per completed survey. While a larger sample size would improve the cost effectiveness of the

lottery conditions relative to the charity condition, the narrative appeal is just as effective as the charity condition, and cost free regardless of sample size. As such, the narrative appeal is the most cost effective by far. Moreover, the offer of a few large prizes is meaningfully more cost effective than the offer of the same large prizes and many additional small prizes.

The implications of these findings are important, as we contribute to survey methodology research for alternative populations. These results establish that for certain segments of the population (e.g., service-minded individuals, public-sector employees, government elites, etc.), both offering and spending less may generate the biggest returns in terms of survey participation and response quality. These results thus show that incentives do not work uniformly across all groups. Our results suggest that it may even be worth piloting various incentives schemes at the outset of a study to ensure that the incentive schemes that have worked in other populations are in fact effective for the population at hand.

A limitation of this study, however, is the fact that the country context itself may also influence response preferences. Perhaps respondents in India are more suspicious of a research query from an American institution than respondents in the United States. In order to further isolate this causal pathway, further research is needed in other cultural contexts. However, at minimum, this study clarifies that there are external validity concerns with extant findings on research incentives based upon general population surveys in the United States and other Western country contexts, and that some incentive strategies may be more or less effective depending on the target population of interest. Future research should explore country-level differences. This study also raises the possibility that increasing the incentive budget is not an unalloyed good and may in fact result in an inefficient allocation of resources. A simple lottery with a few large prizes performs weakly better than a lottery with the same number of large prizes and the addition of many smaller prizes. In other words, a researcher can double the incentive budget and not change the response rate at all. As the theory underlying the observed finding is a general one that should hold in all populations, future research should be conducted to verify that this pattern remains across different groups, and not simply pro-social populations.

REFERENCES

Ahn, Tony, Seeon Ryu, and Ingoo Han. 2007. "The Impact of Web Quality and Playfulness on User Acceptance of Online Retailing." *Information & Management* 44:263–75.

Birnholtz, Jeremy P., Daniel B. Horn, Thomas A. Finholt, and Sung Joo Bae. 2004. "The Effects of Cash, Electronic, and Paper Gift Certificates as Respondent Incentives for a Web-Based Survey of Technologically Sophisticated Respondents." *Social Science Computer Review* 22(3):355–62.

Deci, Edward L. 1975. *Intrinsic Motivation*. New York, NY: Plenum Press.

Deutskens, Elisabeth, Ko de Ruyter, Martin Wetzels, and Paul Oosterveld. 2004. "Response Rate and Response Quality of Internet-Based Surveys: An Experimental Study." *Marketing Letters* 15(1):21–36.

Furse, David H., and David W. Stewart. 1982. "Monetary Mail Incentives Versus Promised Contribution to Charity: New Evidence on Mail Survey Response." *Journal of Marketing Research* 19(3):375–80.

Gajic, Aleksandra, David Cameron, and Jeremiah Hurley. 2012. "The Cost-Effectiveness of Cash Versus Lottery Incentives for a Web-Based, Stated-Preference Community Survey." *European Journal of Health Economics* 13(6):789–99.

Galesic, Mirta, and Michael Bosnjak. 2009. "Effects of Questionnaire Length on Participation and Indicators of Response Quality in a Web Survey." *Public Opinion Quarterly* 73(3):349–60.

Gneezy, Uri, and Aldo Rustichini. 2000. "Pay Enough or Don't Pay at All." *Quarterly Journal of Economics* 115(3):791–810.

Göritz, Anja S. 2004. "The Impact of Material Incentives on Response Quantity, Response Quality, Sample Composition, Survey Outcome, and Cost in Online Access Panels." *International Journal of Market Research* 46(3):327–45.

———. 2006. "Incentives in Web Studies: Methodological Issues and a Review." *International Journal of Internet Science* 1(1):58–70.

———. 2014. "Incentive Effects." Pp. 339–50 in Uwe Engel, Ben Jann, Peter Lynn, Annette Scherpenzeel, and Patrick Sturgis, eds., *Improving Survey Methods: Lessons from Recent Research*. London: Taylor & Francis.

Göritz, Anja S., and Susanne C. Luthe. 2013. "Lotteries and Study Results in Market Research Online Panels." *International Journal of Market Research* 55(5):611–26.

Heerwegh, Dirk. 2006. "An Investigation of the Effect of Lotteries on Web Survey Response Rates." *Field Methods* 18(2):205–20.

Hubbard, Raymond, and Eldon L. Little. 1988. "Promised Contributions to Charity and Mail Survey Responses: Replication with Extension." *Public Opinion Quarterly* 52(2):223–30.

Kam, Cindy D., Jennifer R. Wilking, and Elizabeth J. Zechmeister. 2007. "Beyond the 'Narrow Data Base': Another Convenience Sample for Experimental Research." *Political Behavior* 29:415–40.

Khan, Uzma, and Daniella Kupor. 2014. "Value Atrophy in Consumer Assessment of Risky Options." Unpublished manuscript, Stanford University.

Mack, Stephen, Vicki Huggins, Donald Keathley, and Mahdi Sundukchi. 1998. "Do Monetary Incentives Improve Response Rates in the Survey of Income and Program Participation?" *Proceedings of the Survey Methods Section, American Statistical Association* 529–34. Available at ⟨https://www.asasrms.org/Proceedings/papers/1998_089.pdf⟩.

O'Neil, Kevin M., and Steven D. Penrod. 2001. "Methodological Variables in Web-Based Research that May Affect Results: Sample Type, Monetary Incentives, and Personal Information." *Behavior Research Methods, Instruments, & Computers* 33(2):226–33.

Porter, Stephen R., and Michael E. Whitcomb. 2003. "The Impact of Lottery Incentives on Student Survey Response Rates." *Research in Higher Education* 44(4):389–407.

Robertson, Dan H., and Danny N. Bellenger. 1978. "A New Method of Increasing Mail Survey Responses: Contributions to Charity." *Journal of Marketing Research* 15(4):632–33.

Sandel, Michael. 2012. *What Money Can't Buy*. New York: Farrar Straus and Giroux.

Schonlau, Matthias, Arthur van Soest, Arie Kapteyn, Mick Couper. 2009. "Selection Bias in Web Surveys and the Use of Propensity Scores." *Sociological Methods & Research* 37(3):291–318.

Shettle, Carolyn, and Geraldine Mooney. 1999. "Monetary Incentives in Government Surveys." *Journal of Official Statistics* 15:231–50.

Singer, Eleanor. 2002. "The Use of Incentives to Reduce Nonresponse Household Surveys." In R. M. Groves, D. A. Dillman, J. L. Eltinge, and R. J. A. Little, eds., *Survey Nonresponse*. Wiley: New York.

Singer, Eleanor, John Van Hoewyk, and Mary P. Maher. 1998. "Does the Payment of Incentives Create Expectation Effects?" *Public Opinion Quarterly* 62(2):152–64.

———. 2000. "Experiments with Incentives in Telephone Surveys." *Public Opinion Quarterly* 64(2):171–88.

Singer, Eleanor, and Richard A. Kulka. 2002. "Paying Respondents for Survey Participation." Pp. 105–28 in Michele Ver Ploeg, Robert A. Moffitt, and Constance F. Citro, eds., *Studies of Welfare Populations: Data Collection and Research Issues*. Washington, DC: National Academy Press.

Singer, Eleanor, and Cong Ye. 2013. "The Use and Effects of Incentives in Surveys." *Annals of the American Academy of Political and Social Science* 645:112–41.

Tzamourani, Panagiota. 2000. "An Experiment with Promised Contribution to Charity as a Respondent Incentive on a Face-to-Face Survey." *Survey Methods Newsletter* 20(2):13–15.

Warriner, Keith, John Goyder, Heidi Gjertsen, Paula Hohner, and Kathleen McSpurren. 1996. "Charities, No; Lotteries, No; Cash, Yes: Main Effects and Interactions in a Canadian Incentives Experiment." *Public Opinion Quarterly* 60(4):542–62.