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Effects of Lotteries on Response Behavior in Online Panels

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Abstract

To examine the effects of lotteries on response behavior, five experiments were conducted in a nonprofit online panel. The type of lottery offered for study participation was a cash lottery, a voucher lottery, or a lottery of surprise gifts of either known or unknown value. The control group was not offered a lottery. Dependent measures were response, retention, and several facets of response quality. None of the lotteries significantly increased response, retention, or response quality. However, looking at effect sizes reveals a pattern across the five experiments that can inform and refine the practice of employing lotteries in nonprofit online panels. This pattern suggests that lotteries are more effective with panelists low in motivation than high in motivation.

Keywords

incentive, lottery, online panel, response, retention, response quality

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This article examines the following questions in five experiments: Is a lottery effective in enhancing response, retention, and response quality in nonprofit online panels? Do lotteries that raffle physical items or those that raffle cash work better? Are there respondent characteristics that moderate the effectiveness of lotteries?

Online panels are a popular and widespread form of web-based data collection within both academic and commercial research (Baker et al. 2010; Göritz 2006a; Hines et al. 2010). An online panel is a pool of people who have consented to take part in web-based studies from time to time. Among other advantages, panels ensure the immediate availability of respondents, shorten the field time, enable the researcher to ascertain refusal bias, and keep recruiting costs affordable (Göritz 2008). To realize this potential of online panels at the lowest possible costs, researchers offer rewards to respondents. By offering rewards, researchers aim at augmenting (1) response, which is the share of invited panelists who call up the first page of a study; (2) retention, which is the share of respondents who stay until the final page of the study; and (3) various facets of response quality, such as item nonresponse and the length of open-ended answers. Possible means of rewarding people are cash payments, redeemable loyalty points, donations to charity, study results, and lotteries. This article deals with lotteries, which are sometimes called prize draws (Göritz 2010).

Lotteries have been widely used to incite people to take part in web-based studies (e.g., Göritz 2006a; Porter and Whitcomb 2003; Tuten et al. 2004). Lotteries have several benefits over other rewards: They are easy to implement, transaction costs incur only for a few winners, and incentive costs in general are reduced considerably. The greater the number of people who take part in a study, the more cost efficient a lottery becomes in comparison to a per capita reward. Compared to the standard type of lottery in which a fixed total payout is raffled, the cost savings are usually smaller in a lottery in which every *n*th participant wins a prize.

Previous research examining the effectiveness of lotteries in online panels is sparse. In a meta-analysis of six experiments, Göritz (2006a) finds no reliable effect of cash lotteries on response and retention. In contrast, Göritz and Wolff (2007) find that a lottery of vouchers increases response in the first wave of a longitudinal study but not in later waves. Göritz (2004) finds no difference between cash and gift lotteries regarding response, retention, and response quality. Summarizing individual web-based experiments conducted partly inside and partly outside of online panels, Göritz (2006b) finds a small positive effect of lotteries on response and retention: In 25 comparisons, lotteries increased the odds of a person responding to a study by 19%

(OR = 1.19), and in 23 comparisons lotteries increased respondents' odds of being retained in a study by 26% (OR = 1.26).

The six experiments by Göritz (2006a) were limited to examining cash lotteries, Göritz and Wolff (2007) examined a lottery of vouchers, and Göritz (2004) compared a cash lottery against a gift lottery. The work at hand widens the type of lotteries that are examined when employed in an online panel. Among other types of lottery, this article examines a lottery of surprise gifts. According to social exchange theory, a surprise gift might not evoke the feeling of being paid for participation as cash usually does, but rather a sense of enjoyment and suspense, which might stimulate willingness to participate. Moreover, to our knowledge there is no research prior to this article that has looked at a lottery in which every *n*th participant wins a prize.

Do respondent characteristics moderate the effectiveness of lotteries in online panels? In a nonprofit online panel (Göritz 2006a), the effect of cash lotteries was not influenced by invitees' age and sex. In a commercial online panel, however, age, sex, education, and frequency of Internet use did moderate the effectiveness of cash versus gift lotteries (Göritz 2004). For example, the more often panelists used the Internet, the greater the effectiveness of the cash lottery compared to the gift lottery. This article will shine more light on whether respondent characteristics moderate the effect of lotteries.

Most research on the effectiveness of lotteries has focused on response and retention as dependent variables and has neglected other facets of response behavior such as response quality. Lotteries might draw participants to a study and thus increase response and retention and at the same time reduce response quality. If panelists become extrinsically motivated as a consequence of perceiving a lottery as payment, they might maximize their benefit–cost ratio. Panelists load the study and stay until its end to become eligible for the lottery, but they save time and thereby neglect response quality, for example by skipping more items, straightlining grid questions, or typing in shorter open-ended answers. Thus, a comprehensive approach to evaluate a lottery's effectiveness should take into account that go beyond response and retention. Indirect evidence from a commercial online panel shows response quality not to be affected by the type of lottery (Göritz 2004), but this experiment lacked a no-incentive control group. Therefore, it remains unclear (1) if and how response quality is affected by lotteries in nonprofit online panels; and (2) if a lottery in contrast to no incentive affects response quality at all. This work will examine these two questions.

To sum up, drawing on the literature, which shows null or mild positive effects of lotteries on response behavior in online panels, we hypothesize

that lotteries have no impact or a negligible one on response, retention, and response quality.

General Method

Participants are recruited from the WiSo-Panel, a German university–based nonprofit panel that holds demographically heterogeneous panelists from all walks of life (www.wisopanel.net). Panelists in each experiment are randomly assigned to one of the incentive conditions. Each experiment includes a no-lottery control group. The invitation e-mails sent to the panelists in each study contain varying incentive information but are otherwise identical. There are six dependent variables.

1. Response indicates whether an invitee calls up the study's first page. There are currently many different ways and conflicting terminology used to compute and denote participation metrics for online panels (Callegaro and DiSogra 2008). The "response rate," as defined and reported in this study, corresponds to Eysenbach's (2004) definition of "view rate," to European Society for Opinion and Marketing Research's (ESOMAR 2005) "% of questionnaire opened" as well as to Association Collaborative Effort's (ACE 2009) "response rate."
2. Retention reflects whether a respondent finishes the study. The "retention rate," as defined and reported in this study, corresponds to Eysenbach's (2004) definition of "completion rate" and is the complement of Callegaro and DiSogra's (2008) "break-off rate" and ACE's (2009) "drop rate."
3. Straightlining is a stereotypical response pattern in grid questions whereby a participant clicks identical answers blockwise. To calculate an index of straightlining per respondent, we take the absolute frequency of the most frequently chosen answer in each grid, sum these frequencies up throughout the questionnaire, and divide this sum by the number of grid questions in the questionnaire, which we previously adjusted by the number of omitted items (Holbrook et al. 2003; Tourangeau et al. 2004). This index of straightlining theoretically ranges from 0 to 1, with lower values indicating less straightlining (i.e., higher response quality). Because the lowest practically reachable value depends on both the number of questions forming one grid and the number of scale points in a grid, the lowest value varies across the experiments (see Table 1).
4. Item nonresponse is the percentage of omitted closed-ended items. It is examined in experiments 2 and 5. Item nonresponse ranges from 0 to 1,

Table 1. Characteristics of the Five Experiments.

Study title	Lottery	Invitees	Field Time	Result Summary	Lowest Nondifferentiation	Duration of Study [min]	No.of Study Pages	No. of Items	No. of Invitees	Age [years] (*SD*), Range	Women (%)	High-school (%)	Daily Internet Use (%)	Panel Tenure [years] (*SD*)
1. Good manager, managerial simulation	3 times 25 euros	From all walks of life	April 22, 2003 until May 25, 2003	Yes	0.2	25	36–70	59–78	195	26 (4), 17–46	56	86	66	2.0 (0.4)
2. Flexibility of work	3 times 30 euros/ 3 surprise gifts	Employees & unknown employment status	February 5, 2004 until February 28, 2004	No	0.28	15	13	88	574	38 (9), 13–62	41	61	79	1.9 (1.1)
3. Ideal employer & work group	39 surprise gifts each worth 3 euros	Students	November 9, 2004 until November 15, 2004	No	0.28	10	10	47	545	25 (4), 17–47	54	91	68	2.2 (1.2)
4. Ideal employer & work group	5 euros voucher for every third participant	Employees	November 9, 2004 until November 16, 2004	No	0.28	10	10	49	248	38 (9), 13–59	42	69	83	2.6 (1.2)
5. Changing forms of employment	12 euros for every fourth participant	Temporary workers	August 26, 2005 until September 6, 2005	No	0.26	10	13	103	47	35 (8), 26–60	47	81	81	3.6 (1.2)

with lower values indicating less item nonresponse, that is, better response quality.
5. The percentage of selecting the "no comment" option is examined in experiment 2. It is measured in six questions designed as dropdown menus and ranges from 0 to 1.
6. The number of meaningful characters typed in as an answer to open-ended questions is examined in experiment 1. To prevent confounding of dependent measures #4, #5, and #6 with retention, these three measures are calculated for retainees only.

As possible moderators, we take five participant characteristics into account, which are known from registration with the panel, namely sex, age (in years), education (six levels), frequency of Internet use (originally six levels, but we restrict analyses to the two levels "daily" and "several times a week" because in each of the five experiments these two levels hold 95% or more of the invited sample), and tenure in the panel (in years).

Hypotheses are tested with regression analyses. Response and retention are dichotomous measures and are therefore tested with logistic regression. Reported effect size is odds ratio. The other dependent measures are continuous and hence are tested with linear regression. Reported effect size is β, the standardized regression coefficient. Moderator analyses are carried out with the main effects of lottery and the moderator in question plus the moderator's interaction with the lottery included in the model. Table 1 summarizes characteristics of the five experiments. In the following, we describe the five experiments in the order in which they were conducted. For brevity, only facts not contained in any of the tables are mentioned.

Experiment 1

Method and Results

Participants who were offered a lottery are unaware of their odds of winning. Regardless of incentive condition, all participants are offered a summary of the study's results.

There is no statistically significant difference between the lottery and the control condition with regard to response and retention (see Table 2). Looking at effect sizes, however, the lottery increases both response and retention mildly. Straightlining and the number of characters in the open-ended answer are independent of the lottery. In total, 20 moderator analyses (4 dependent variables $\times$ 5 moderators) are conducted, of which one is

Table 2. Experiment 1: Results.

Characteristics	Control	3 × 25 Euros	Effect	*p*
n invited	99	96		
Response (rate)	35 (35.4%)	43 (44.8%)	OR = 1.48	.18
Retention (rate)	20 (57.1%)	28 (65.1%)	OR = 1.40	.47
Straightlining (*SD*)	.57 (.12)	.54 (.08)	$\beta = -.13$	.38
No. of characters (*SD*)	250 (251)	258 (186)	$\beta = 0.02$	.90

significant. In the presence of a lottery, elder participants type in shorter answers to the open-ended question ($\beta = -3.30$, $p = .007$).

Discussion

The lottery in tendency increases response and retention, but these effects do not reach a conventional level of statistical significance. The lottery does not affect response quality. Thus, our hypothesis is confirmed. A ceiling effect of willingness to participate might account for the lack of a marked effect. In online panels, people have consented to occasionally take part in studies at their registration. In other words, panelists' a priori willingness to participate is high already without an incentive, so the offer to be included in a lottery does not increase their motivation much more. Beyond that, participants in online studies report themselves to be less driven by economic motives when deciding for participation but more by their desire to contribute to scientific progress and by their curiosity (Bošnjak and Batinic 2002). Both of these noneconomic motives are likely to be even stronger in members of nonprofit online panels. The offer of a summary to everybody in the study at hand may have additionally enhanced intrinsic motivation. When it comes to potential moderator effects, only one significant influence is found: If offered a lottery, elder respondents type in shorter answers than do younger respondents. However, one expects to find by chance one significant effect when conducting 20 tests at $p < .05$, so this effect might be spurious and needs to be replicated before considered genuine.

Experiment 2

Method and Results

Participants in both the surprise gift lottery condition and the cash lottery condition are unaware of their odds of winning, and in the gift lottery

condition they do not even know the gift's value. To evaluate the impact of a lottery in general, both lotteries are collapsed and tested against the no-incentive group. To examine differences due to the type of lottery, the gift and the cash lottery are contrasted.

Regarding the effect of a lottery in general, response, retention, straightlining, item nonresponse, and selecting "no comment" do not significantly differ between the two collapsed lotteries and the control condition (Table 3). Looking at the effect size, however, the lottery mildly enhances retention. In total, 25 moderator analyses (5 dependent variables × 5 moderators) are conducted, of which one is significant. If a lottery is offered, elder respondents select "no comment" more frequently than younger respondents ($\beta = 0.88, p = .008$). With regard to the effect of the type of lottery, response, retention, straightlining, item nonresponse, and selecting "no comment" do not differ between the cash and the gift lottery. Here, none of the 25 moderator tests (5 dependent variables × 5 moderators) is significant.

Discussion

The lotteries do not significantly affect response, retention, and response quality. Nor does it make a difference if cash or surprise gifts are raffled. A lottery in general somewhat increases retention, but this tendency does not reach a conventional level of statistical significance. Thus, the hypothesis is confirmed. The experiment at hand corroborates results from experiment 1: Members of nonprofit online panels are only mildly affected by lotteries in their response behavior. This experiment also confirms the findings made by Göritz (2004) in a commercial online panel that gift lotteries are not better than cash lotteries. So, the equivalence of raffling cash and surprise gifts with regard to response behavior seems to hold true for nonprofit online panels. Unlike the study in a commercial panel (Göritz 2004), in the nonprofit panel, we find no moderating effects pertaining to raffling gifts versus cash. However, we find age moderates the effectiveness of a lottery per se in that elder respondents select "no comment" more frequently than younger respondents if a lottery is offered. As one significant result is about what could be expected to be found by chance when carrying out 25 tests, this effect might be spurious.

Experiment 3

The next two experiments, experiments 3 and 4, examine the robustness of previous findings. They add value in that they allow for a between-study

Table 3. Experiment 2: Results.

		Lottery Conditions		Lottery vs. No Incentive		Gift vs. Cash Lottery	
Characteristics	Control	3 × 30 Euros	3 Gifts	Effect	*p*	Effect	*p*
n invited	195	181	198				
Response (rate)	110 (56.4%)	94 (51.9%)	106 (53.5%)	OR = 0.86	.41	OR = 1.07	.76
Retention (rate)	92 (83.6%)	83 (88.3%)	93 (87.7%)	OR = 1.43	.28	OR = 0.95	.90
Straightlining (*SD*)	.49 (.07)	.48 (.07)	.49 (.09)	$\beta = -0.01$	.85	$\beta = 0.10$	.19
Item nonresponse (*SD*)	.02 (.03)	.02 (.04)	.02 (.03)	$\beta = 0.00 >$	.99	$\beta = -0.02$	.82
Selecting "no comment" (*SD*)	.11 (.13)	.09 (.12)	.08 (.13)	$\beta = -0.09$	.15	$\beta = -0.02$	.75

Table 4. Experiment 3: Results.

Characteristics	Control	39 Surprise Gifts at 3 Euros Each	Lottery versus No Incentive Effect	*p*
n invited	272	273		
Response (rate)	112 (41.2%)	134 (49.1%)	OR = 1.38	.06
Retention (rate)	92 (82.1%)	115 (85.8%)	OR = 1.32	.43
Straightlining (*SD*)	.51 (.07)	.52 (.09)	$\beta = 0.03$	.69

comparison: The two studies are identical in content and field time but one is cross-sectional, comprises students exclusively, and offers a gift lottery of unknown expected value. The other study is carried out as a consecutive wave of a longitudinal study with employees and a voucher lottery where participants are aware of the expected value of the lottery.

Method and Results

Experiment 3 is conducted on a student sample, implements a lottery of surprise gifts of unknown expected value, and is carried out as a cross-sectional study.

The lottery mildly increases response, but at $p = .064$ this tendency fails a conventional level of significance (Table 4). No significant difference emerges regarding retention, although the lottery also mildly increases retention. Straightlining is independent of the lottery. Two of the 15 moderator tests (3 dependent variables $\times$ 5 moderators) are significant: Male panelists (OR = 1.99, $p = .049$) and those who do not use the Internet every day (OR = 2.22, $p = .048$) are more strongly attracted to respond by the lottery than female panelists and daily Internet users.

Discussion

Like in the previous experiments, the lottery somewhat increases response and retention, but these effects are not at a conventional level of statistical significance. Straightlining is not affected by the lottery. Thus, there is further support for our hypothesis. Looking at moderators, a lottery makes less frequent Internet users and men more likely to respond to the study. If this effect is not spurious, it might be due to a more risk-seeking attitude of men (Lauriola and Levin 2001).

Table 5. Experiment 4: Results.

Characteristics	Control	5 Euros Voucher to Every 3rd Respondent	Lottery versus No Incentive Effect	*p*
n invited	123	125		
Response (rate)	82 (66.7%)	82 (65.6%)	OR = 0.95	.86
Retention (rate)	76 (92.7%)	76 (92.7%)	OR = 1.00	>.99
Straightlining (*SD*)	.54 (.08)	.56 (.11)	$\beta = 0.11$	.18

Experiment 4

Method and Results

This experiment is a twin to experiment 3. The questionnaire, the announced duration of the study, and the field time are identical. However, this is a consecutive wave of a longitudinal study surveying employees, and the lottery is different. With regard to the lottery, this is the first lottery known to us in which every *n*th participant wins a prize. As a consequence and unlike a conventional lottery used in web-based data collection, invitees know the lottery's expected value. As this study is a consecutive wave of a longitudinal study, only participants who took part in the previous wave are solicited.

There is no difference between the lottery and the control condition with regard to response, retention, and straightlining (Table 5). None of the 15 moderator tests (3 dependent variables × 5 moderators) is significant.

Discussion

The lottery implemented in this experiment does not affect response, retention, and response quality. Thus, our hypothesis is confirmed. In contrast to experiments 1–3, participants were aware of the expected value of the lottery (i.e., 1.65 euros), as every third respondent receives a prize worth 5 euros. Despite the nonnegligible size of this reward for participation in a 10-minute survey, the lottery is ineffective. Several particularities of the study's layout possibly contribute to this null effect.

First, the sample consists of employed people who might be comparatively better off and therefore less attracted to material rewards than students (in experiment 3) or people from all walks of life (in experiments 1 and 2). Second, raffling vouchers from the online store Amazon instead of cash might be attractive only for those panelists who are already registered with this online merchant. Third, only those panelists who participated in a previous study are

Table 6. Experiment 5: Results.

Characteristics	Control	12 Euros to Every 4th Respondent	Lottery vs. No Incentive Effect	*p*
n invited	19	28		
Response (rate)	15 (78.9%)	20 (71.4%)	OR = 0.67	.56
Retention (rate)	12 (80.0%)	16 (80.0%)	OR = 1.00	>.99
Straightlining (SD)	.50 (.07)	.53 (.07)	$\beta = 0.16$	.39
Item nonresponse (SD)	.08 (.11)	.02 (.05)	$\beta = -0.36$	.06

invited to this study. Previous participation indicates a high a priori willingness to participate. As a result, a ceiling effect might have occurred that prevented the lottery from exerting impact on response behavior.

Experiment 5

Method and Results

This experiment resembles experiment 4 in that it revisits a rarely studied type of lottery, namely a lottery in which every *n*th participant wins a prize. Thus, the odds of winning in the lottery are known. Only panelists who had indicated in an earlier study to be employed on a temporary basis are invited.

There is no difference between the lottery and the control condition with regard to response, retention, and straightlining (Table 6). With the lottery, item nonresponse tends to be lower ($p = .058$). None of the 20 moderator tests (4 dependent variables $\times$ 5 moderators) is significant.

Discussion

The lottery does not affect response, retention, and straightlining. In the experiment at hand, participants are aware of their chances of winning of 3 euros, which is quite generous for investing 10 minutes. Nevertheless, the lottery is ineffective in increasing response and retention. These findings mirror experiment 4. The lottery mildly reduces the number of skipped items, but this effect is only marginally significant. Thus, we find support for the hypothesis.

General Discussion

In five experiments in a nonprofit online panel, we examined different types of lotteries of known and unknown expected value on different kinds of

Table 7. Grouping of the Five Experiments into Two Groups.

	Treatment		
Experiment	Cash Prize	Surprise Gift	Voucher
Group 1: Participants less well off, low topic salience, no prior involvement, unaware of lottery's expected value			
1.	3 × 25 euros		
2.	3 × 30 euros	3 (no value specified)	
3.		39 worth 3 euros each	
Group 2: Participants better off, high topic salience, prior involvement, aware of expected value			
4.			5 euros Amazon voucher for every 3rd participant
5.	12 euros for every 4th participant		

respondents. Overall, we observed no strong beneficial effects of lotteries on response behavior. The experiments' internal validity is assumed to be high as each experiment entailed random assignment of participants and included a no-incentive control group. When merely looking at the statistical significance of the findings, it appears that lotteries are ineffective regardless of their type and the kind of people to whom they are offered. However, this conclusion is premature. When we take effect sizes into account, we arrive at a more differentiated picture because we were able to look at five experiments instead of just one or two. Moreover, looking at effect sizes, the small statistical power in a few of our experiments does not matter.

Among the five experiments, two groups can be distinguished: Group 1 encompasses experiments 1 to 3, whereas group 2 includes experiments 4 and 5. In two experiments in group 1 (i.e., 1 and 3), the lottery increased response, and in all three experiments in group 1 the lottery increased retention. By contrast, in both experiments that make up group 2, the lottery somewhat reduced response and did not affect retention at all. There are several differences between the two groups of experiments that are likely to account for the differing impact of lotteries on response behavior (Table 7).

Group 1 studied less well-off participants (i.e., people from all walks of life, people of unknown employment status or students) for whom topic saliency was comparatively low (i.e., the studies were about professional life),

and people were invited independent of their prior study participation in this panel. Moreover, the lotteries were of unknown expected value. In contrast, group 2 of experiments studied comparatively well-off participants (i.e., employees) for whom topic saliency was high (i.e., the studies were about professional life), and who were invited because they had taken part in a prior study. Moreover, the lotteries were of known expected value.

The following differences between these two groups of experiments are likely to be responsible for the higher effectiveness of the lottery in group 1 compared to group 2.

1. A lottery as a material reward should be more attractive to people with a lower income than to people with a higher income.
2. Lower topic saliency entails a lower baseline motivation to participate than higher topic saliency. Consequently, there is more room for an enhancing effect of a lottery to compensate for low topic saliency (Marcus et al. 2007). Conversely, if baseline motivation is high, a ceiling effect is likely to occur.
3. Being invited to a study regardless of one's prior response behavior entails a lower baseline motivation to participate than being invited to a study on account of having participated in a prior study because the latter invitees are a preselected sample who have already proven their willingness to participate. Again, if baseline motivation is low there is more room for a lottery to stimulate response behavior. The difference in invitee's baseline motivation in groups 1 and 2 is also indicated by the lower overall response rates in group 1 compared to group 2 experiments.
4. Inviting people to a study independent of their prior response behavior implies that, on average, they have had less experience with lotteries than people who are invited on account of having participated before. Two longitudinal studies show a fading effect when applying lotteries repeatedly: Göritz and Wolff (2007) find that a lottery increases response only in the first wave but not in subsequent waves. Comparing the long-term effects of cash lotteries with those of loyalty points, Göritz (2008) finds equal response rates in the first wave but decreasing attractiveness of the lottery in later waves. The (repeated) experience of being included in a lottery but not winning anything seems to have a sobering effect on panelists.
5. It is less clear whether the fifth difference between the two groups of experiments contributed to the observed differences in the impact of the lottery.

In group 1, the expected value of the lottery was unknown and in group 2 it was known. Knowing the expected value of a lottery might be less attractive than being in the dark about its expected value. First, knowing the expected value might take much fun and suspense out of a lottery. Second, knowing the expected value might be disappointing in many instances where high hopes undergo a reality check. Third, knowing that only every *n*th person will get a prize might be perceived as an unfair mode of distribution: That is, due to this framing of the lottery, participants might be pointed to the fact that $n - 1/n$ respondents will come away empty handed despite having invested the same as the $1/n$ of the respondents who will get a reward. Fourth, telling the expected value in advance is unusual with lotteries on the web, which might cause invitees to be distrustful of such a lottery and/or the study and/or the panel. Examining the psychological effect of the two types of lotteries in more depth is a task for future research.

The two groups of experiments differed in several features at the same time. Future research should clarify which of these features contributes how much to the lottery effect. At this stage, it remains an open issue how much of the lottery effect or lack thereof was due to topic salience, invitees' preselection according to their participation history, invitees' financial status, communicating the expected value of the lottery, or interactions among these features.

This research shows that even under favorable circumstances, lotteries' effect on response and retention is small. Thereby, we replicate the overall trend of no or mild lottery effects in the literature and extend this picture to other types of lotteries. The mild or even null effect of lotteries in nonprofit online panels likely has several causes. We suggest four.

1. With invitees, intrinsic motivation rather than extrinsic motivation prevails. In Bošnjak and Batinic (2002), people report four motives to participate in web-based studies in descending importance: being curious, contribute to scientific progress, learn something about oneself, and material incentives. Intrinsically motivated people can be expected to be less susceptible to extrinsic rewards.
2. The general willingness to participate is higher in academic studies than in commercial ones (Bošnjak and Batinic 2002). The experiments described here were conducted in a university-based online panel.
3. In online panels as compared to web-based studies with ad hoc recruitment, willingness to participate is higher as panelists have declared and proven their readiness to fill out questionnaires when they registered

with the panel. As a consequence of the high a priori willingness to participate resulting from (1) to (3), a ceiling effect prevents a lottery from appreciably enhancing response and retention.

4. Most panelists have experience with lotteries. As in most lotteries there are only a few winners, panelists have learned that they are unlikely to receive a reward for their effort (Göritz and Wolff 2007). In accordance with cost–benefit models of response (Hill and Willis 2001), panelists have readjusted their cost–benefit calculation when deciding on participation in a study that offers a lottery.

Furthermore, across all five experiments we found a confirmation of meta-analytical results (Göritz 2006b) that lotteries enhance retention more than they enhance response. To our knowledge, this work was the first to examine in a comprehensive manner whether lotteries compared to no incentive influence response quality in an online panel. The lotteries did not have any consistent influence on the three examined facets of response quality (i.e., straightlining, length of open-ended answers, and item nonresponse). However, this does not mean that lotteries do not influence facets of response quality other than the ones studied here such as socially desirable responding or acquiescence.

When looking at participant characteristics as potential moderators, participants' age, sex, and their frequency of Internet use appeared to moderate the effect of lotteries, but in a haphazard manner. Future research can examine these moderators in more detail. As we did not postulate these relationships beforehand, as long as they are not corroborated with new data we are cautious about interpreting them. More research is needed to test other panelist characteristics that may moderate a lottery's effectiveness such as panelists' impulsivity or risk seeking.

Our studies have limitations. The statistical power of some of our experiments is limited. However, we conducted as many as five experiments yielding a robust pattern of results. External validity is a strength of our series of experiments: We implemented different lotteries (different payouts, different items raffled, with and without announcing the odds of winning), different study types (both longitudinal and cross-sectional, a managerial simulation, classic surveys), different samples (students, employees, people from all walks of life), different boundary conditions (additional offer of a summary or not), and different study characteristics (topic, length).

In comparison with previous studies, we have covered a variety of lotteries and circumstances, but other lotteries, payouts, or conditions not examined in our experiments might, of course, lead to different results. The strength of

taking many variations into consideration is also a limitation, as modifying several conditions simultaneously impedes isolating individual determinants of effects. However, despite the vastness of the ground we covered, there was considerable overlap among our experiments that enabled us to derive a consistent pattern of results that can inform and refine the practice of employing lotteries in online panels. Further research is needed to confirm these effects and to build a comprehensive theoretical framework of study participation in online panels. This work is largely explorative in nature and our results might help incite more systematic and theory-driven research.

The fact that all experiments were conducted in one panel is a mixed blessing. On one hand, it leaves open the demonstration that our results generalize to other panels. On the other hand, our experiments share the environment as well as many background variables that would otherwise carry error into cross-study generalizations.

To conclude, we offer some recommendations on the use of lotteries in nonprofit online panels: Generally, the money for staging a lottery can often be saved because a lottery usually does not have a strong effect. However, there are circumstances under which a lottery may be effective. For less well-off populations with a low motivation to respond (e.g., if topic salience is low or invitees have not participated in a previous study), a lottery can increase response and retention by some percentage points. This gain comes at relatively low cost without any side effects on response quality. Thus, it may be worth it to spend some of one's budget on a lottery incentive.

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