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Cash Lotteries as Incentives in Online Panels

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Six incentive experiments were conducted in a nonprofit online panel. In each experiment, the incentive offered for participation was a cash lottery. The control group was not offered any incentive. The cash lottery was offered in two versions: Either the total payout of the lottery was mentioned, or the lottery was split into multiple prizes. Dependent measures included response and retention rates. The results of the six individual experiments were meta-analytically summarized. Cash lotteries relative to no incentives did not reliably increase response or retention; neither did it make a significant difference if one large prize or multiple smaller prizes were raffled.

Keywords: *incentive; lottery; online panel; prize draw; cash; World Wide Web*

Online panels are an important form of obtrusive Web-based research (Batinic & Moser, 2005; Couper, 2000; Göritz, Reinhold, & Batinic, 2002). An online panel is a pool of people who have agreed to occasionally take part in Web-based studies. An online panel is sometimes referred to as an online access panel. It can be used as a sampling source for thematically and methodologically diverse studies. In contrast to ad hoc recruitment of participants, online panels reduce the cost associated with locating respondents and ensure their immediate availability. In addition, online panels offer such benefits as easy identification of key sample segments, increased response rates, augmented response quality, shorter field times, validation of responses on the basis of previously collected data, limitation of questionnaires to novel items, and ethical advantages (Göritz, in press-b). These benefits, hand in hand with the increasing expense of ad hoc recruitment on the Web (Batinic & Moser, 2005), have contributed to the popularity of online panels within academic and commercial research.

The primary goal when conducting studies in online panels is to gather high-quality data that are unbiased by nonresponse. To achieve this aim at the lowest possible cost, researchers must design a study so as to induce panelists to respond to the study (i.e., to increase the response rate) and to prevent panelists who have started the study from prematurely dropping out (i.e., to increase the retention rate).

Material incentives such as cash lotteries (i.e., prize drawings) have been widely used to motivate panelists to respond to and participate in a study for its full duration. In a 2002 study, 64 online panel operators were surveyed about their use of incentives (Göritz et al., 2002). Of

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the 53 panels that employed material incentives, 26 (49%) staged lotteries. On average, they raffled $115 per study, with a minimum of $50 and a maximum of $250. Furthermore, in two meta-analyses by Göritz (in press-a), those featuring a lottery were 27 (84%) of all 32 identifiable comparisons on response and 24 (92%) of all 26 comparisons pertaining to retention.

Researchers and panel operators are fond of using lotteries because the costs are usually capped.[1] That is, in contrast to per capita rewards, the costs stay the same regardless how many participants take part. Moreover, the costs to distribute any lottery payouts are comparatively small because only a few participants actually win something (cf. Göritz, 2004a). Although lotteries—especially cash lotteries—are popular incentives with researchers and panel operators, it is still questionable whether they fulfill their intended purpose of augmenting the response and retention rates and thereby lower nonresponse bias and data collection costs.

Regarding the results from previous research on the effectiveness of lotteries in Web-based studies, there are two meta-analyses by Göritz (in press-a) showing that lotteries significantly increase response, odds ratio (OR) = 1.19, and retention, OR = 1.26.[2] An OR of 1.19 means that a lottery increases the odds of a person responding by 19% over the odds of responding when there is no lottery present; and an OR of 1.26 means that a lottery increases the odds of a respondent staying until the end of a study by 26% over the odds of staying where there is no lottery present. However, the two meta-analyses contained studies with various lottery prizes. The various prizes for these lotteries included cash, vouchers, and physical items such as computer hardware or tickets to cultural sites. Because this article deals with the question of whether cash lotteries are useful incentives, next we are taking a closer look at Web experiments that featured cash lotteries exclusively.

O'Neil and Penrod (2001) conducted a study where an experimental group of participants was included in a cash lottery with prizes of $50, $25, and $10, and where a control group was not offered any incentive whatsoever. The percentage of participants who were retained until the penultimate study page was 35.4% with the lottery and 35.9% without any incentive (OR = 0.98).[3] O'Neil, Penrod, and Bornstein (2003) used the same lottery but on a different sample.[4] They obtained a retention rate of 22.8% with the lottery and 15.6% in the control group (OR = 1.60). In another study by Frick, Bächtiger, and Reips (2001), participants in the experimental group were included in a lottery with cash prizes of $40, $25, and $10, and participants in the control group were not offered any incentive. Participants' retention was 90.6% with the lottery and 81.5% without an incentive (OR = 2.19).

Furthermore, Bošnjak and Tuten's (2003) study included an experimental group that was offered a lottery with two prizes of $50 and four of $25 and a control group that was not offered any incentive. The response rate was 35.9% in the lottery group and 26.6% in the control group (OR = 1.54). The retention rate in this study was 65.3% in the lottery group and 48.3% in the control group (OR = 2.01).[5] In addition, in a study by Tuten, Galešič, and Bošnjak (2004), an experimental group was offered a lottery with a prize of 1000 Kuna (approximately $170), and a control group was not offered any incentive whatsoever. There were two versions of this particular lottery. In the first version, the winners were announced immediately, and in the second version, the announcement of the winners was delayed. The response rate was 76.6% with the immediate lottery, 70.5% with the delayed lottery, and 62.3% with the control group (ORs = 1.97, 1.45). Retention was 67.3% with the immediate lottery, 57.8% with the delayed lottery, and 57.5% without any incentive (ORs = 1.52, 1.01).[6]

To sum up, cash lotteries seem to increase response and retention in Web-based studies—at least in those Web-based studies that were not conducted in an online panel. Although Church (1993) found no significant effect of lotteries and other promised nonmonetary incentives in offline studies, it may be the case that participants in online studies are affected by lotteries because lotteries are widely used in this domain (cf. Bošnjak & Tuten, 2003). However, as controlled experiments involving cash lotteries have never been conducted in an online panel, it remains unclear as to whether they work with all kinds of Web-based studies, including studies conducted in online panels. The present research tried to answer this question by testing the following hypotheses:

Hypothesis 1: Panelists included in a cash lottery as part of a study are more likely to respond to this study than are panelists who are not included in a cash lottery. That is, the response rate is higher with a cash lottery than without any incentive.

Hypothesis 2: Panelists included in a cash lottery as part of a study are more likely to stay with the study until the end than are panelists who are not included in a cash lottery. In other words, the retention rate is higher with a cash lottery than without any incentive.

A connected issue is whether response and retention are higher if the total prize of the lottery is a single large cash prize or several smaller cash prizes. In terms of the cost of the lottery payout, there is no difference between the two versions. However, in terms of cost of distribution, the cost is somewhat higher when multiple smaller prizes are awarded because of the need to transfer money to multiple winners.

Pertaining to this issue, two experiments were conducted in online panels (Göritz, 2004a). Within these experiments there was no significant difference in response or retention if one or multiple cash prizes were raffled. From a theoretical perspective, if different versions of a lottery have the same expected value (as is the case with the present setting), it is to be expected that they are equally attractive to panelists. Thus, response and retention will not differ as a function of raffling one prize or multiple prizes. As the available evidence is based solely on the results of two experiments, and because of implications for survey practice that such a simple modification of a cash lottery may increase response and/or retention, the following hypotheses were tested:

Hypothesis 3: Raffling one big cash prize rather than splitting the lottery into several smaller prizes influences invitees' likelihood of responding to a study.

Hypothesis 4: Raffling one cash prize rather than splitting the lottery into multiple prizes influences respondents' likelihood of staying until the end of a study.

Method

Six experiments were conducted in a university-based, opt-in online panel (cf. Couper, 2000). The panel had been in operation since 1999 and contained people from all walks of life. Most panelists had found the panel through banners, search engines, links on other Web sites, newsgroups, or word of mouth. New members could continuously sign up with this panel. Approximately 10% of the panelists had been recruited on the basis of probability samples using e-mail, fax, and letter (cf. Göritz, 2004b).

In each of the six experiments, experimental groups were offered a cash lottery as incentive for participation, and a control group was not offered any incentive at all. In each experiment, there were two different versions of the cash lottery. In Version 1 the payout of the cash lottery was mentioned as one lump sum prize, and in Version 2 the lottery was announced as being split into several smaller prizes. The two versions of the lottery did not differ in expected value. The respective incentive information was mentioned in the e-mail invitation. There were two dichotomous dependent measures: invitees' response status (responded or refused) and respondents' retention status (retained or dropped out). The characteristics of the six experiments are summarized in Table 1.

Results

In each of the six experiments, the control group's response and retention rate was compared to the averaged response and retention rate of the two lottery conditions. Next, the two versions of the lottery, which differed in the number of prizes but not in total payout, were contrasted with regard to the response and the retention rates. With one exception, no statistically significant effects were found in the six experiments. In Experiment 4, the response rate in the 4 × €25 lottery (39.0%) was significantly smaller that in the €100 lottery (45.7%), $\varphi = .07$, $n = 927$, $p = .04$. However, because as many as 24 statistical tests were performed, this one effect might have been significant because of chance. To find out whether the six experiments were underpowered to detect any small effects, the individual studies were meta-analytically summarized.

Four separate meta-analyses were conducted to test the four hypotheses.[7] Because of response and retention being dichotomous outcomes, OR was chosen as the effect size measure (Fleiss, 1994; Haddock, Rindskopf, & Shadish, 1998). The following information was coded from each comparison: offer of a result summary, year of the study, total lottery payout, number of cash prizes raffled in the split lottery condition, percentage of women in the invited sample, mean age of the invited sample in years, field time of the study in days, number of study pages, and number of items in the questionnaire (cf. Table 1). These study characteristics were examined as to whether they moderated the incentive effects. The influence of the dichotomous study characteristic, result summary, was ascertained through subgroup analyses. The influence of the continuous covariates year of study, number of cash prizes, percentage of women in sample, mean age of sample, field time of study, number of study pages, number of items, and lottery payout on the log incentive effect was examined using unrestricted maximum likelihood metaregression.

Response With Cash Lottery Versus Without Incentive

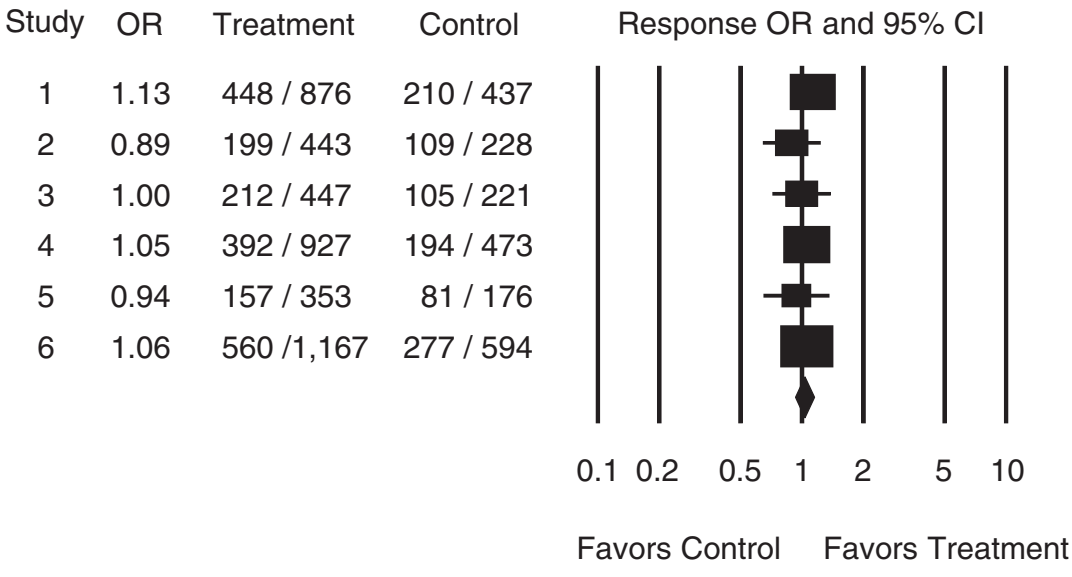
The six comparisons were homogeneous, $Q = 1.82$, $df = 5$, $p = .87$. Therefore, an inverse-variance, fixed-effects model was chosen for pooling individual ORs. The overall effect of a cash lottery over no incentive on response is OR = 1.03, with a 95% confidence interval (CI) ranging from 0.93 to 1.15 (cf. Figure 1). Because the CI does include 1, the overall effect is not significant. This means that online panelists' response to a study is independent of the offer of a lottery.

It is appropriate to use moderator analyses to explore sources of heterogeneity even if an overall test for heterogeneity is nonsignificant. The overall test for heterogeneity often has

Table 1
Characteristics of the Six Experiments

Study Title	Field Time	Prizes in Lottery	Total Lottery Payout	Result Summary	No. of Survey Pages	No. of Items	Age of Sample	*SD*	Women (%)
Work, Money, and Mind	2/14/03 to 2/21/03	3 × €15	€45	Yes	4	23	33	10	45
Strategies and Personality	5/25/03 to 6/2/03	5 × €20	€100	Yes	6	24	32	10	45
Strategies and Personality	5/25/03 to 6/2/03	5 × €20	€100	No	6	24	33	10	46
Personal and Societal Values	9/1/03 to 9/8/03	4 × €25	€100	Yes	7	39	32	10	47
Working in Teams	9/12/03 to 9/24/03	4 × €20	€80	Yes	15	78	37	9	42
Behavior in Work and Privacy	5/10/05 to 6/7/05	€100 + €60 + €40	€200	No	6	74	34	11	48

Figure 1
Individual and Overall Effect Size of the Impact of a Cash Lottery (Treatment) Versus No Incentive (Control) on Response in Six Online Panel Studies



Note: The treatment column lists the number of responding people who were offered a cash lottery followed by the total number of people who were offered a cash lottery. The control column lists the number of responding people who were not offered an incentive followed by the total number of people who were not offered an incentive. The square on each horizontal line of the forest plot represents the odds ratio (OR) for this comparison. The square's size indicates the relative weight of that comparison toward the combined result. The diamond represents the result of combining the data from all comparisons. Its center point represents the OR of the combined result, and its width represents the 95% confidence interval.

low power (Hardy & Thompson, 1998). Also, the test is for general overdispersion of study results and does not address whether heterogeneity relates to particular covariates (Thompson & Higgins, 2002). Still, the moderator analyses show that none of the study characteristics significantly correlate with the incentive effect (cf. Table 2, columns 2-3).

Retention With Cash Lottery Versus Without Incentive

Again, the six comparisons were homogeneous, $Q = 2.49$, $df = 5$, $p = .78$. Therefore, an inverse-variance, fixed-effects model was chosen for pooling individual ORs. The overall effect of a cash lottery over no incentive on retention is OR = 1.13 (95% CI = 0.91-1.42). Thus, retention in a study is independent of whether a cash lottery is offered (cf. Figure 2). Moreover, none of the study characteristics significantly correlates with the incentive effect (cf. Table 2, columns 4-5).

Table 2
Results of the Moderator Analyses

	Lottery vs. No Incentive on Response		Lottery vs. No Incentive on Retention		Single Prize vs. Multiple Prizes on Response		Single Prize vs. Multiple Prizes on Retention	
Characteristic	OR	*n*	OR	*n*	OR	*n*	OR	*n*
No summary	1.04	2	1.17	2	0.83	2	1.16	2
Summary	1.03	4	1.09	4	1.16	4	0.79	4
	Q	*p*	*Q*	*p*	*Q*	*p*	*Q*	*p*
	< 0.01	.95	0.08	.77	6.98	< .01	2.00	.16
	β	*p*	β	*p*	β	*p*	β	*p*
No. of pages	–.014	.47	–.058	.36	< –.001	.99	.082	.23
No. of items	< –.001	.93	–.003	.46	< –.004	.12	.002	.76
No. of prizes	—[a]		—[a]		.024	.80	.209	.17
Year of study	.014	.82	–.053	.65	–.060	.10	–.007	.97
Lottery payout	< –.001	.92	–.001	.62	–.002	< .04	.002	.53
Field time	< .001	.91	–.006	.59	–.016	.02	< .001	.97
Age of sample	–.008	.84	–.069	.55	–.061	.21	.033	.81
Women in sample	.015	.63	.014	.86	–.023	.59	.053	.58

a. Because the participation rate was first averaged across the single prize and multiple prize lottery and then contrasted with the no incentive condition, at this point the relationship in question would be tested only indirectly. The other two meta-analyses in this article (cf. columns 6-9 in Table 2) are more selective tests of this relationship.

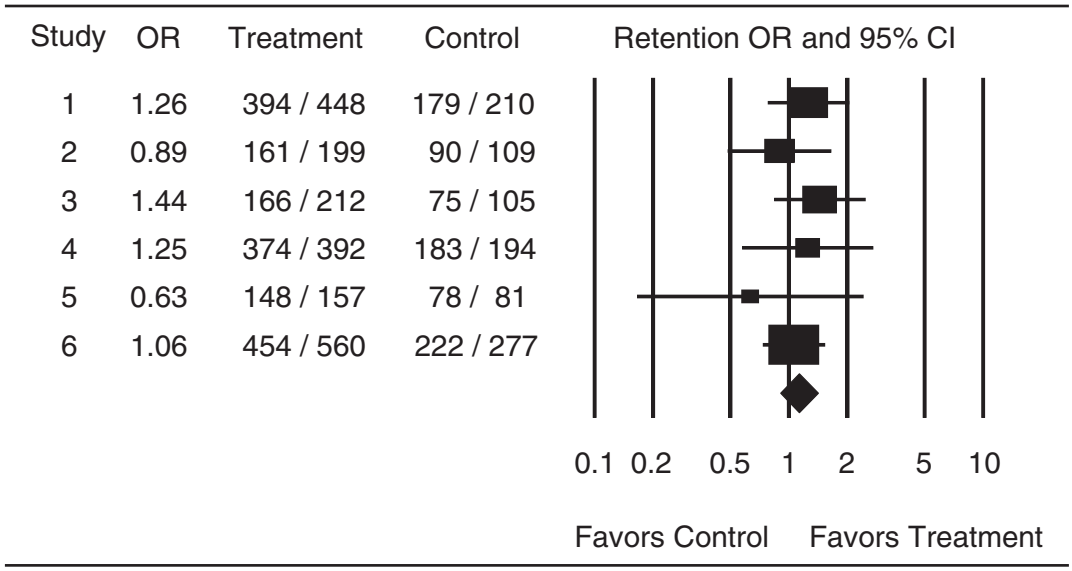
Response When Raffling One Cash Prize Versus Splitting the Lottery Into Several Prizes

The comparisons were homogeneous, $Q = 8.61$, $df = 5$, $p = .13$, and an inverse-variance, fixed-effects model was chosen for pooling individual ORs. The overall effect of raffling one big prize rather than several smaller prizes on response is OR = 1.02 (95% CI = 0.90-1.15). Thus, panelists' response to a study is independent of whether one large cash prize or several smaller prizes are raffled (cf. Figure 3). The moderator analyses show that response is higher when raffling one single prize compared to several smaller prizes (a) if participants are offered a result summary, (b) the lower the total payout of the lottery, and (c) the shorter the field time of the study (cf. Table 2, columns 6-7).

Retention When Raffling One Cash Prize Versus Splitting the Lottery Into Several Prizes

Again, the six comparisons were homogeneous, $Q = 7.33$, $df = 5$, $p = .20$, and an inverse-variance, fixed-effects model was chosen for pooling the ORs. The overall effect of raffling one large prize over several smaller prizes on retention is OR = 0.98, with a 95% CI ranging from 0.75 to 1.27 (cf. Figure 4). None of the study characteristics significantly correlates with the effect of raffling one large prize compared to several smaller prizes (cf. Table 2, columns 8-9).

Figure 2
Individual and Overall Effect Size of the Impact of a Cash Lottery (Treatment) Versus No Incentive (Control) on Retention in Six Online Panel Studies



Note: The treatment column lists the number of retained people who were offered a cash lottery followed by the total number of people who were offered a cash lottery. The control column lists the number of retained people who were not offered an incentive followed by the total number of people who were not offered an incentive.

Discussion

The meta-analytical summary of six experiments has revealed that invitees' response to studies that are run in nonprofit online panels is not significantly affected by staging a cash lottery compared to not offering any incentive (OR = 1.03). Furthermore, a cash lottery compared to no incentive does not have a significant effect on respondents' likelihood of staying until the last page of a study (OR = 1.13). Thus, Hypotheses 1 and 2 are not confirmed.

Because many Web-based experiments that were conducted outside of online panels have shown cash lotteries to be effective (cf. Bošnjak & Tuten, 2003; Frick et al., 2001; O'Neil et al., 2003; Tuten et al., 2004), the surprising absence of significant effects in this review is probably because of the fact that the summarized studies were conducted in a (nonprofit) online panel. In online panels—and even more so in noncommercial online panels such as university-based panels—panelists' decision to take part in studies may predominantly be determined by reasons other than having the chance to win cash in a lottery, such as curiosity and/or the desire to help in research. Moreover, in noncommercial panels, panelists probably do not view their participation as engaging in an economic exchange of selling their time and opinions for money. This appears to be different in studies with ad hoc recruitment of respondents and may also be different in commercial online panels such as market research panels. More studies are needed to find out whether cash lotteries are ineffective only in nonprofit online panels or whether they are ineffective in for-profit panels as well.

Figure 3
Individual and Overall Effect Size of the Impact of Raffling One Large Prize in a Cash Lottery (Treatment) Versus Raffling Several Smaller Prizes (Control) on Response in Six Online Panel Studies

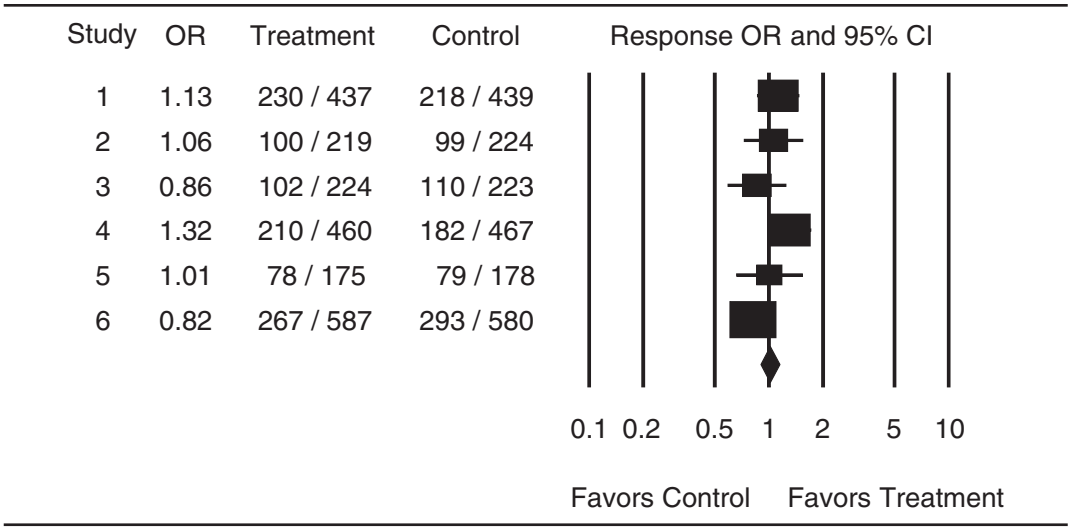
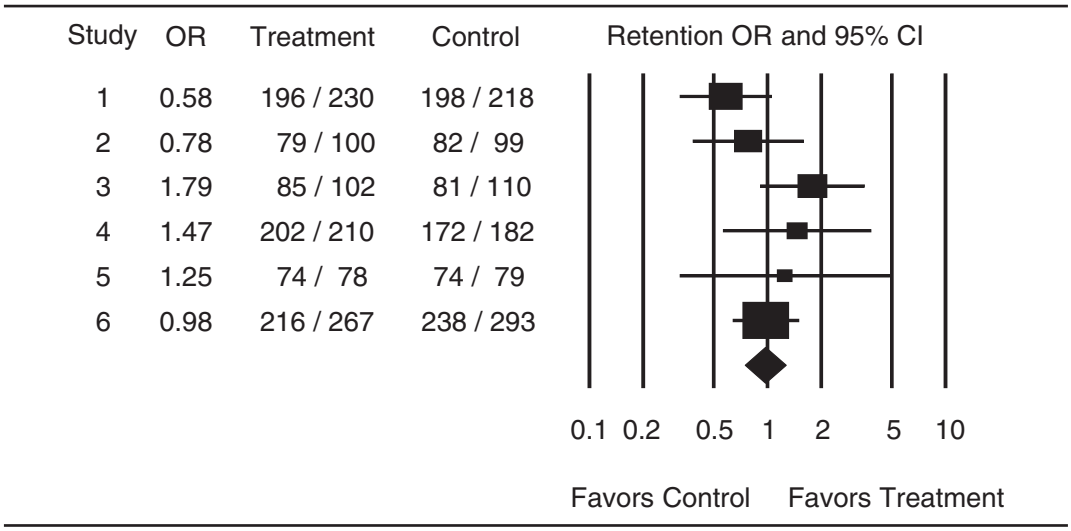


Figure 4
Individual and Overall Effect Size of the Impact of Raffling One Large Prize in a Cash Lottery (Treatment) Versus Raffling Several Smaller Prizes (Control) on Retention in Six Online Panel Studies



Besides the commercial or noncommercial nature of an online panel, the frequency at which panelists are invited to participate in panel studies may moderate the effectiveness of cash lotteries. Occasional invitations and participation is conducive to frame one's engage-

ment in the panel as a leisurely activity (e.g., in our university-based panel, members receive about one invitation per month). In this case, cash lotteries may not act as an incentive because the participation itself is the reward. By contrast, being invited and participating in studies frequently (e.g., several times per month or even per week) is burdensome. Such an effort may only be elicited if being externally rewarded, for example through a cash lottery. More experiments in different kinds of online panels are needed to find out whether the frequency of studies matters for the effectiveness of cash lotteries as incentives.

When assessing the overall usefulness of cash lotteries, a lottery's effects on response and retention need to be combined. First, a lottery incentive acts on invited panelists' choice whether to start a study, and then it acts again on the subset of responding panelists' decision to stay until the end of the study. Survey practitioners will probably be most interested in maximizing the completion rate (i.e., of the share of panelists initially contacted, the responsive panelists who stay until the end of a study). In this review of six experiments, the effect of a cash lottery versus no incentive on completion is OR = 1.06 (95% CI = 0.95-1.18), and the effect of one prize versus multiple prizes on completion is OR = 1.02 (95% CI = 0.90-1.16). Both effects are not significant.[8]

On a practical level, the obtained ORs of 1.03 and 1.13 for the effect of a cash lottery on response and retention, respectively, allow for making predictions about the expected increase in the completion rate if a cash lottery rather than no incentive is employed. Table 3 lists the combined effect of a cash lottery on response and retention for different baseline response and retention rates. As a reading example, imagine a sample of 1,000 panelists being invited to a survey. From a previous study, it can be assumed that the baseline response rate (i.e., the response rate without an incentive) is 70% (i.e., 700 panelists call up the first survey page) and the baseline retention rate is 55% of responding panelists. Combining this response and retention rate into a completion rate means that, of the total contacted sample, 38.5% (i.e., 385 panelists) both respond and stay until the end of the survey. Table 3 indicates what increase in completion rate to expect if a cash lottery rather than no incentive is employed: The cell pertaining to a baseline response rate of 70% and a baseline retention rate of 55% reads 2.59. Thus, with a cash lottery, 41.09% (38.50% + 2.59%) of the contacted panelists (i.e., 411 people) can be expected to complete the study, compared to 38.50% (i.e., 385 people) if no incentive is offered.

With this figure in mind, one can weigh whether offering a cash lottery is worthwhile by contrasting the gain in respondents against the increase in cost incurred by the lottery itself and the distribution of the prizes. It seems that lotteries with a high payout, or those with many prizes to distribute, are probably not worth the extra costs because the combined effect of a cash lottery on response and retention is very small.

With regard to the circumstances under which the use of cash lotteries should be considered, the two meta-analyses have not revealed any significant impact of study characteristics on the effectiveness of lotteries. However, the nonsignificant results of the moderator tests do not warrant the conclusion that the effect of cash lotteries on response and retention is independent of the examined study characteristics. The comparatively small number of summarized studies, and consequently the limited power of the tests, may have hindered any possible effects from being detected. Moreover, only certain moderators could be taken into account. Other sample and study characteristics that were not examined here, such as the sending of a reminder or the subject matter of the study (cf. Groves, Singer, & Corning, 2000), may have an impact on the magnitude of the lottery effect. Finally, with the continuous

Table 3
Expected Increase in Completion Rate When Using a Cash Lottery Over No Incentive Listed for Different Baseline Response and Retention Rates

	Baseline Response Rate Without Incentive																		
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
Baseline retention rate without incentive																			
5	0.04	0.08	0.12	0.16	0.20	0.23	0.27	0.30	0.33	0.37	0.40	0.43	0.46	0.48	0.51	0.54	0.56	0.59	0.61
10	0.08	0.15	0.23	0.30	0.37	0.44	0.51	0.57	0.63	0.69	0.75	0.81	0.86	0.92	0.97	1.02	1.06	1.11	1.15
15	0.11	0.22	0.33	0.43	0.53	0.63	0.72	0.81	0.90	0.98	1.07	1.15	1.22	1.30	1.37	1.44	1.50	1.57	1.63
20	0.14	0.28	0.41	0.54	0.67	0.79	0.91	1.02	1.13	1.24	1.34	1.44	1.54	1.63	1.71	1.80	1.88	1.96	2.03
25	0.17	0.33	0.49	0.64	0.79	0.93	1.07	1.20	1.33	1.46	1.58	1.69	1.80	1.91	2.01	2.10	2.19	2.28	2.36
30	0.19	0.37	0.55	0.72	0.89	1.05	1.21	1.36	1.50	1.64	1.77	1.90	2.02	2.14	2.25	2.35	2.45	2.55	2.63
35	0.21	0.41	0.61	0.80	0.98	1.15	1.32	1.48	1.64	1.79	1.93	2.07	2.20	2.32	2.44	2.55	2.65	2.75	2.84
40	0.22	0.44	0.65	0.85	1.05	1.23	1.41	1.58	1.75	1.90	2.05	2.19	2.33	2.45	2.57	2.69	2.79	2.89	2.98
45	0.24	0.46	0.68	0.90	1.10	1.29	1.48	1.65	1.82	1.98	2.14	2.28	2.42	2.54	2.66	2.77	2.88	2.97	3.06
50	0.25	0.48	0.71	0.93	1.13	1.33	1.52	1.70	1.87	2.03	2.18	2.33	2.46	2.59	2.70	2.81	2.91	3.00	3.08
55	0.25	0.49	0.72	0.94	1.15	1.35	1.54	1.72	1.89	2.05	2.20	2.34	2.47	2.59	2.70	2.80	2.89	2.97	3.04
60	0.25	0.50	0.73	0.95	1.16	1.35	1.54	1.72	1.88	2.03	2.18	2.31	2.43	2.54	2.64	2.73	2.81	2.88	2.94
65	0.25	0.49	0.72	0.94	1.14	1.34	1.52	1.69	1.84	1.99	2.12	2.25	2.36	2.46	2.54	2.62	2.69	2.74	2.78
70	0.25	0.49	0.71	0.92	1.12	1.30	1.47	1.63	1.78	1.91	2.04	2.15	2.24	2.33	2.40	2.46	2.51	2.55	2.57
75	0.24	0.47	0.69	0.89	1.07	1.25	1.41	1.56	1.69	1.81	1.92	2.01	2.09	2.16	2.21	2.25	2.28	2.30	2.30
80	0.23	0.45	0.65	0.84	1.02	1.18	1.32	1.45	1.57	1.67	1.76	1.84	1.90	1.95	1.98	2.00	2.01	2.00	1.98
85	0.22	0.42	0.61	0.79	0.95	1.09	1.22	1.33	1.43	1.51	1.58	1.63	1.67	1.70	1.71	1.70	1.68	1.65	1.60
90	0.20	0.39	0.56	0.72	0.86	0.98	1.09	1.18	1.26	1.32	1.37	1.39	1.41	1.41	1.39	1.36	1.31	1.25	1.17
95	0.19	0.36	0.51	0.64	0.76	0.86	0.95	1.02	1.07	1.10	1.12	1.12	1.11	1.08	1.03	0.97	0.89	0.80	0.69

moderators, only a limited range of possible values was instantiated in the primary studies. For example, the number of study pages varied between 4 and 15 and the lottery payout between ∈45 and ∈200. Although there were only negligible differences in the effectiveness of lotteries within these ranges, it may be that the effect of lotteries would more strongly vary at more extreme values of these characteristics. Although one cannot interpret the nonsignificant moderator effects as nonexistent effects, it can be assumed that the examined study characteristics within their studied ranges do not exert any large influence on the lottery effect. This absence of substantial effects has implications for survey practice. For example, all other things being equal, a lottery is similarly (in)effective whether ∈45 or four times as much is raffled. Moreover, a given lottery is similarly (in)effective if one's questionnaire is four pages or three times that long.

Hypotheses 3 and 4 dealt with whether a cash lottery influences response and retention differently if a single large prize or multiple smaller prizes are raffled. This summary of six experiments has revealed that it does not make a difference to either the response rate (OR = 1.02) or the retention rate (OR = 0.98) if cash lotteries equal in total payout differ in the number of prizes. The absence of effects of single-prize versus multiple-prize lotteries on response and retention may be because of the fact that the expected value of the contrasted lotteries did not differ, with the consequence that both lotteries were equally attractive in terms of their economic value. However, any conjectures about an underlying decision model (e.g., the cumulative prospect theory by Tversky & Wakker, 1995; the configural weight TAX model described in Birnbaum & Chavez, 1997) remain speculative because invited panelists were not told how many participants were invited, and therefore participants were unable to determine their odds of winning. Moreover, despite the experimental design that was used, invitees' assumptions on the number of invited people might not have been the same in the two versions of the lottery. The stimulus (i.e., the lottery information) and the context (i.e., participants' frame of reference of the assumed number of invitees) might be confounded in these between-subjects experiments (cf. Birnbaum, 1999). People who are told that several prizes are raffled might think that more people have been invited to the study than people who are only told the total payout of the lottery.[9]

Other than that, one might be tempted to interpret the lack of effect as an overall indifference toward lotteries on the part of the panelists, an indifference that may have prevented panelists from thoroughly reading and processing the lottery information. However, such an interpretation is not warranted because splitting a cash lottery into multiple prizes does make a difference if additional factors are taken into account. Namely, the moderator analyses show that response is higher with one prize than with multiple prizes if participants are offered a results summary. Moreover, response is higher with a single-prize lottery than with a multiple-prize lottery the lower the total payout of the lottery. In other words, the higher the total payout of the lottery, the more participants accept splitting the lottery into multiple prizes. Finally, response is higher with a single-prize than with a multiple-prize lottery when the field time of the study is shorter.

There are several cautions one must take with regard to the validity and interpretation of these moderator effects. The fact that these effects have not been postulated in advance, coupled with the fact that a large number of moderators were investigated and that the total number of primary studies was small, makes it likely that the chance of false positive decisions has been increased (Higgins & Thompson, 2004). Furthermore, the relationship described by a moderator analysis is an observational association across studies. Although the original

studies were true experiments, the moderator analysis does not have the benefit of randomization to underpin a causal interpretation. It therefore suffers from the same disadvantages as do other observational studies (Thompson & Higgins, 2002). In other words, the effects of the three moderators found in this meta-analysis can only be causally interpreted if they are reliably established within randomized studies. Furthermore, because there were only six studies, multiple regressions could not be undertaken to investigate confounding. Finally, the linearity of the regressions for continuous moderators is an assumption but need not be so in reality. Despite these cautions, these exploratory moderator analyses are of heuristic value in that they have helped identify possible moderators that could be submitted to more rigorous tests in future studies.

The present research did not address the effect of cash lotteries on data quality. Although there is preliminary evidence that suggests that in commercial online panels data quality is not affected by a cash lottery or by raffling a particular number of prizes (Göritz, 2004a), it remains to be shown that this generalizes to noncommercial online panels. For example, it is worth studying whether, depending on the offer of a cash lottery or the number of raffled prizes, members of noncommercial online panels type in longer or shorter answers to open-ended questions, skip more or fewer questions in the questionnaire, or answer grid-like question batteries in a fashion that is more or less stereotypical.

There is another limitation to the present research. Because experiments were conducted in a naturalistic setting (i.e., in an online panel where studies were run before and in between the six experiments), it cannot be ruled out that incentives offered outside the experiments have affected panelists' reaction to their incentive condition in the experiment(s). The problem is alleviated by the fact that in each of the six experiments, panelists were randomly assigned to an incentive condition, thus ensuring that incentives offered outside the six experiments did not affect the offer of an incentive inside any of the six experiments. Moreover, because in the studies run outside the six experiments a great variety of incentives had been used (e.g., donations to charity, result summaries, no incentives at all, lotteries of gift certificates, per capita payments, cash lotteries with various payouts, cinema tickets, surprise gifts), a one-sided conditioning of panelists who are expecting a particular type or value of incentive is unlikely. Yet to make sure that the results from these experiments are generalizable, similar experiments should be conducted in other noncommercial online panels.

To conclude, in nonprofit online panels with occasional studies, cash lotteries relative to no incentives do not reliably increase response and retention in a study. Moreover, the attempt to significantly influence response and retention by splitting a cash lottery into multiple prizes needs to be regarded as failed.

Notes

1. In most lotteries, a fixed number of prizes are raffled. However, there are also lotteries where every *n*th participant gets a prize. With the latter kind of lottery, the costs are not capped.

2. An odds ratio (OR) is the odds of an event (e.g., response to the study) occurring in one group (e.g., where participants are offered to be included in a lottery), divided by the odds of the event occurring in the other group (e.g., where participants are not offered an incentive). If an experimental intervention (e.g., a lottery is offered) has no effect, the OR is 1. If the intervention reduces the chance of having the event, the OR is less than 1; if it increases the chance of having the event, the OR is greater than 1. The smallest value an OR can take is zero.

3. Dropout between the penultimate and the last page of O'Neil and Penrod (2001) was confounded with the requirement to disclose personal information. Therefore, retention at the penultimate (and not the last) study page was analyzed.

4. The study was somewhat atypical in that participants were not told about the lottery in advance, only on the first study page.

5. Bošnjak and Tuten (2003), instead of a retention rate, reported an "incompletion rate." It combines genuine dropouts, lurkers, and item nonresponders.

6. The response rates in Tuten, Galešič, and Bošnjak (2004) refer to all participants in their sample regardless of their employment status. The retention rates, however, refer to only those participants who were unemployed.

7. Of the possible comparisons between the three conditions of lottery (none vs. one prize vs. several prizes), I chose to compare lottery versus none and one prize versus several prizes rather than none versus one prize and none versus several prizes. When examining the effect of splitting the lottery into several prizes, comparing the one prize and the multiple prize conditions within each study is of higher internal validity than is comparing overall effect sizes with none versus one prize and none versus multiple-prizes in a between-studies fashion.

8. As the analysis of the effect of a lottery on completion does not present any novel information but is merely the combined result of the analyses on response and retention, it will not be dwelled on in more detail.

9. The degree of confounding likely correlates with the number of raffled prices. To illustrate the point, an offer that $500 \times \in 1$ are raffled suggests that more people are invited (because at least 500 people need to have been invited for the lottery to be meaningful) than if the offer is that $\in 500$ are raffled.

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