The impact of material incentives on response quantity, response quality, sample composition, survey outcome, and cost in online access panels

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Two incentive experiments were conducted in different online access panels. Experiment 1 was carried out in a commercial market research panel. It examined whether three different types of promised incentives (redeemable bonus points, money lottery and gift lottery), four different amounts of bonus points or raffled money, and two different denominations of raffled money influenced response quantity, sample composition, response quality and survey outcome. Type of incentive and number of bonus points mildly influenced dropout and sample composition. Moreover, response was higher with bonus points than with the two types of lotteries. Response quality and survey outcome were not affected. Experiment 2 was conducted in a non-profit panel, which holds one half self-selected and one half non-self-selected participants. Incentives were two different amounts of raffled money in two different denominations. Response, dropout, response quality, survey outcome and sample composition were not affected. Based on a cost-benefit analysis, recommendations for employing incentives in online access panels are given.

Introduction

This article deals with theoretical and methodological issues surrounding the use of incentives in online access panels. An online access panel is a pool of people who have agreed to repeatedly take part in web surveys (Göritz *et al.* 2002). Online panels are an important, if not the dominant, form of reactive web-based research in the medium term (Couper 2000). A panel can be used as a sampling source for thematically and methodologically diverse studies. In contrast to ad hoc recruitment, online panels reduce the cost associated with locating appropriate respondents

and ensure their immediate availability, along with additional benefits such as easy identification of key sample segments, increased response, augmented response quality, shorter field times and ethical advantages (Göritz 2002). Moreover, on the basis of previously collected data, respondents' answers can be cross-referenced and thereby validated (Göritz & Moser 2000) and questionnaires can be limited to relevant items, that is, panellists do not need to answer the same items again and again (for example age and sex).

Economic and research success with online access panels go hand in hand with learning how to induce panellists to participate in the surveys. A popular form of motivating people to take part in a survey is to offer incentives. In offline situations, researchers widely agree that if incentives are to increase response, they need to be given in advance, instead of being made contingent on the return of the questionnaire (Armstrong 1975; Linsky 1975; James & Bolstein 1992; Church 1993). If this holds with online panel surveys, researchers need to find pre-paid incentives appropriate for the web, for instance inclusion of electronic vouchers from online shops or redeemable loyalty points with the invitation email. Even money or credit can be sent by using products such as PayPal (www.paypal.com). Online money, however, is not 'in the hand' and collecting it can be cumbersome (depending on the user's web literacy and willingness to register with a transaction party). However, perhaps in online panels promised incentives work better than offline, because most panellists have agreed to participate in advance and are accustomed to receiving an incentive *after* their participation.

There are other differences between the use of incentives in offline surveys and those conducted in online access panels. Unless panellists have unlimited internet access (for example for a fixed monthly fee or at university/work) they have to pay for their online session (e.g. provider fees, telephone charge), whereas in most cases offline, researchers incur the monetary cost of participation. Thus, when collecting data online, incentives might be necessary to counteract a bias toward respondents who have a free or flat-rate internet connection. Another difference is that, on the one hand, panellists in the relatively anonymous medium of the internet might be more distrustful that, for instance, a lottery actually exists and will be run fairly (Porter & Whitcomb 2003). On the other hand, it can be assumed that with online panellists, a certain degree of trust has already been established. Furthermore, every panellist's participation history is recorded. As this information can be used to decide who is invited to future studies, panellists might think twice whether they

decline an invitation (Göritz 2004a). Another difference is that participation in online panel surveys compared to face-to-face studies is often more appealing, comfortable, easy, and saves time (Göritz 2002). Consequently, incentives might have less impact in online panels than in offline surveys. Yet, incentives are probably important because panellists are requested to participate repeatedly and one cannot avail oneself of the curiosity-bonus of one-time studies.

However, incentives are not only beneficial, but can also bring about a series of potential dangers to survey validity. Some challenges are the same offline and online: incentives might attract particular respondents and thus alter the sample's composition. But researchers can also take advantage of such knowledge and tailor incentives to particular target groups. In the same vein, the survey's outcome can be influenced by incentives. For instance, incentives can affect the participants' mood, which might lead to mood-congruent or mood-incongruent answering. Or, certain incentives (for example contributions to charity) might alter participants' attitudes toward the interviewing agency and thereby influence their statements. Finally, offering material incentives can drive intrinsically motivated participants away from the survey (Deci 1971).

Some downsides of incentives, however, are new or aggravated when conducting surveys online. For instance, incentives might encourage some people to fill out a survey many times (Batagelj & Vehovar 1998). Even more of a risk is that people fill in useless data to get to the end of the survey quickly in order to be eligible for the incentive. Without an incentive, respondents tend to give up when bored. Finally, in certain countries there can be legal problems with incentives, especially with the use of lotteries. In order to weigh up whether incentives are useful despite these drawbacks, we need to know whether incentives truly augment response quantity and quality.

Göritz *et al.* (2002) examined use of incentives in 64 online panels. They found that 53 panels used material incentives. Four panels did not award any material incentives and seven did not specify. Of the 53 panels that used material incentives, 33 rewarded either in cash or by cheque, ten relied on redeemable bonus points, 26 held lotteries, four donated money on behalf of the panellist, and 16 distributed gifts such as CDs, internet access, software, T-shirts, gift certificates, or panellists could keep tested products (multiple responses were possible). Asked about the amount of material incentives awarded, seven panels paid on average US$26 per hour to each participant, with a minimum payment of $4 and a maximum of $60. Thirteen panels reported a per-survey payment. The mean amount

was US$18, with a minimum of $3 and a maximum of $57. The five panels that relied on lotteries raffled on average US$115 per survey, with a minimum of $50 and a maximum of $250.

As regards evidence of the *effectiveness* of incentives, two meta-analyses were conducted on the influence of incentives on response and dropout in panel and stand-alone web surveys (Göritz 2004a). With regard to response, a minor but significant effect (odds ratio [OR][1] = 1.17, which corresponds to $d = 0.09$) was revealed, indicating that incentives do motivate people to start a web survey. Moreover, once people have loaded a survey they are less likely to drop out if an incentive is offered (OR = 1.34, which corresponds to $d = 0.16$). Furthermore, a positive correlation was obtained between prize value and incentive effect, which was significant for dropout, but not for response. An experiment not included in the meta-analyses was conducted in an offline-recruited market research panel: Müller-Peters *et al.* (2001) promised 120 respondents a cheque for 5 DM.[2]

Despite the scarcity of systematic studies of their effectiveness, material incentives have been widely applied in online access panels. Initial evidence points to a favourable but faint influence of incentives on response and dropout. How incentives influence sample composition, response quality and survey outcome, however, is unknown. The following two experiments glean more information on the impact of incentives on participation in online access panels.

Experiment 1

This experiment examines whether three different types of promised incentives (bonus points, a money lottery or a gift lottery), four different amounts of bonus points and raffled money, and two different denominations of raffled money influence response quantity, sample composition, response quality, and survey outcome. The range of bonus points (BPs) awarded and the amounts of money raffled in this experiment correspond to typical

[1] The odds of an event are the ratio of events to non-events. An OR is the odds of the event occurring in one group (e.g. incentive group) divided by the odds of the event occurring in the other group (e.g. control group). If one looks at a speculative 133 people allocated to the incentive condition, the ratio of events (went to first page of the survey) to non-events (did not load the first page) is 54/79 = 0.68. From the 134 people allocated to the control condition, 43 went to first page of the survey, whereas 91 did not, yielding odds of 43/91 = 0.47. The OR would then be 0.68/0.47 = 1.45. If an intervention (e.g. offering an incentive) has no effect, the OR is 1. If it reduces the chance of having the event (e.g. move to the first survey page), the OR is less than 1; if it increases the chance of having the event, the OR is bigger than 1. The smallest value an OR can take is zero.

[2] 1 DM (German Mark) approximately equals 0.4 USD or 0.5 Euro or 0.3 GBP (October 2000).

amounts (Göritz *et al.* 2002). 1–2 DM is the approximate financial cost for 15 minutes of internet use, which corresponds to the lowest BP condition.

Method

Participants

Altogether 6149 panellists had chosen to be part of a German commercial online access panel. They had found the panel through various methods such as banners, search engines, links on other websites, newsgroups and word-of-mouth. Table 1 compares the sociodemographics of the panel population and the German internet population (GfK 2000). The two populations were comparable with regard to sex and amount of internet usage. The panel population, however, was younger, more educated, and comprised more singles than the internet population. This deviation seems to be systematic, Hellwig *et al.* (2003) also described the population of their panel as being skewed towards more educated and younger users.

Procedure

Panellists were randomly assigned to one of 13 conditions. They received an otherwise identical email invitation with varying incentive information for the 15-minute 'Trends and Innovations' survey. For instance, the variable text segment in the lottery conditions read: 'We are going to raffle X times Y DM among the participants. The maximum number of respondents is 550.' The survey consisted of a welcome screen and six consecutive

Table 1 Sociodemographics of the panel population and German internet population

Characteristic	Internet population	Panel population	Characteristic	Internet population	Panel population
Age group [%]			Education [%]		
14–19	15.2	14.3	Less than O-levels	25.5*	11.3
20–29	23.9	47.4	O-levels	37.8	26.3
30–39	24.1	26.2	A-levels	18.0	43.0
40–49	19.5	9.4	College	18.8	19.4
50–59	12.9	2.3			
60–69	4.4	0.4	Sex [%]		
			Women	39.7	38.9
Marital status [%]					
Single	44.2*	72.9	Weekly internet usage	5 h: 29 min (mean)	6–10 h (median)
Married	50.3	23.8			
Divorced/widowed	5.2	3.3			

* Figures did not add up to 100 in the original source.

pages with questions. Therein, respondents were required to answer three 7-item psychometric scales as well as a number of closed-ended questions pertaining to opinion leadership and personal internet usage. The panel had been in operation since 1999. Because people could continuously sign up with this panel, most respondents had taken part in such a survey before. Data were collected between 11 October 2000 and 20 October 2000.

Design

There were three independent variables (see Table 2): the first being the type of incentive, which came in three formats – guaranteed BPs (one BP was worth 0,50 DM), a money lottery and a gift lottery. The second independent variable was the number of BPs and amount of raffled money, each varied at four levels: 3 BP/100 DM, 4 BP/300 DM, 6 BP/500 DM, and 8 BP/700 DM. The third independent variable was the denomination of raffled money with two levels: 50 DM and 100 DM. A control group with no incentives was not included because this would have contradicted the panel policy.

There were four dependent measures. Two pertained to different facets of response quantity, namely response status (whether invited people loaded the welcome page of the survey) and dropout (whether responding people reached the end of the survey). Two dependent measures pertained to response quality, namely the number of omitted items and the number of response sets used. The survey consisted of 87 items. For the number of omitted items, only non-dropouts were taken into account. Respondents were considered to have used a response set (Couper *et al.* 2001), if they had clicked the same choice (e.g. the 'I somewhat disagree' choice) down the column for all items of one of the three scales. The possible number of response sets thus varied between 0 and 3. For this analysis, only non-dropouts who answered all scales completely were admitted.

As regards sample composition, it was examined whether there was a relationship between response to the survey and 11 personal characteristics of participants that were known from the registration (sex, parenthood, age, frequency of shopping online, frequency of online entertainment, income, weekly internet usage, education, urbanity of living area and marital status) varied with incentive condition. Finally, it was tested whether incentives influenced the study's outcome. There were 68 outcome variables (i.e. the three scores on the psychometric scales, 61 items on opinion leadership, and four items on personal internet usage).

Hypotheses

It was hypothesised that BPs would yield a higher response quantity than the money lottery and the gift lottery (H1) (McDaniel & Jackson 1984), the more BPs are offered the higher would be the response quantity (H2), and the more money is raffled the higher would be the response quantity (H3) (Yu & Cooper 1983; Church 1993; Singer *et al.* 1999; Göritz 2004a). Because of the lack of previous research, there were no hypotheses on the effect of different denominations of raffled money and response quality.

Results

Across the 13 conditions, 78.9% panellists responded to the invitation and 4.5% of them dropped out (see Table 2).

Table 2 Number of invitations sent, response rate, dropout rate, item omissions, response sets used, and cost per response in DM* in Experiment 1.

Money Lottery	700 DM		500 DM		300 DM		100 DM	
Denomination	7 × 100	14 × 50	5 × 100	10 × 50	3 × 100	6 × 50	1 × 100	2 × 50
N invited	551	551	550	550	551	551	549	551
Response rate	78.2	78.2	78.5	79.6	77.1	78.6	78.1	75.9
Dropout rate	4.9	3.7	5.6	5.0	4.2	4.2	7.7	4.5
Items omitted	0.60	0.67	0.57	0.71	0.60	0.66	0.88	1.12
Response sets	0.21	0.23	0.22	0.25	0.23	0.25	0.23	0.23
Cost/response#	1.66	1.69	1.18	1.19	0.72	0.72	0.24	0.25
Bonus points	8		6		4		3	
n invited	300		300		300		299	
Response rate	80.0		81.7		86.0		81.9	
Dropout rate	0.8		3.3		2.3		5.3	
Items omitted	0.90		0.82		1.10		0.60	
Response sets	0.23		0.29		0.25		0.27	
Cost/response	4.00		3.00		2.00		1.50	
Gift lottery	3 watches, 5 CD-jackets, 5 alarm clocks, 25 key-ring torches							
n invited	546							
Response rate	78.6							
Dropout rate	4.00							
Items omitted	1.32							
Response sets	0.22							
Cost/response	0.44							

* 1 DM (German Mark) approximately equals 0.4 USD or 0.5 Euro or 0.3 GBP (October 2000).

With the money lotteries, 2 DM estimated cost was added, because winners need to be asked their bank details and the money be transferred.

Type of incentive

Response quantity. There was an overall difference in response, $X^2(2, n = 6149) = 10.82$, $p = 0.004$ (cf. Table 2). Pairwise comparisons yielded a higher response to BPs than to the money lottery, $X^2(1, n = 5603) = 10.79$, $p = 0.001$, $r = 0.044$. The difference between BPs and the gift lottery was marginally significant, $X^2(1, n = 1745) = 3.61$, $p = 0.058$, $r = 0.045$. The two types of lotteries did not differ, $X^2(1, n = 4950) = 0.08$, $p = 0.78$. With regard to dropout, there was an overall difference, $X^2(2, n = 4854) = 7.76$, $p = 0.02$. Dropout was lower with BPs than with the money lottery, $X^2(1, n = 4425) = 7.40$, $p = 0.01$, $r = 0.041$. There were no differences between BPs and the gift lottery, $X^2(1, n = 1417) = 1.01$, $p = 0.32$, nor between the money and gift lottery, $X^2(1, n = 3866) = 0.85$, $p = 0.36$.

Sample composition. A logistic regression analysis with main effects and interactions was conducted with response status (responded/refused) as dependent variable and incentive type and the characteristics that were available from the panellists' sign-up as predictors ($n = 4818$). The interactions between incentive type and income, parenthood, urbanity, frequency of shopping online, frequency of online entertainment, and marital status did not help to predict whether panellists responded ($p > 0.05$). However, the older the panellists the greater was the popularity of gifts relative to the other incentives, and the greater the attraction of the money lottery in comparison to BPs (OR = 1.09^{-1}, 95% CI: 0.87 – 0.96, per year for money lottery vs. gift lottery and OR = 1.12^{-1}, CI: 0.84 – 0.93, per year for BPs vs. gift lottery and OR = 1.03^{-1}, CI: 0.94 – 0.99, per year for BPs vs. money lottery). Perhaps older panellists are financially better off and can therefore afford to be more playful, that is, the gift lottery compared to the other two incentives and the money lottery compared to BPs has probably a fainter taste of being a remuneration. Moreover, to more educated panellists BPs were more attractive than the other incentives and the money lottery was more attractive than the gift lottery (OR = 1.78, CI: 1.30 – 2.43, per rising education level of altogether six levels for money vs. gifts, OR = 2.18, CI: 1.54 – 3.08, per rising education level for BPs vs. gifts, and OR = 1.23, CI: 1.01 – 1.49, per rising education level for BPs vs. money). An explanation is that more educated users are more inclined or able to calculate the expected value of the outcome. Furthermore, the less often panellists surf the internet the more they like the gift lottery compared to the money lottery and BPs (OR = 1.27, CI: 1.003 – 1.61, per rising intensity level of altogether seven levels for BPs vs.

gift lottery and OR = 1.26, CI: 1.00 – 1.58, per rising intensity level for money lottery vs. gift lottery). Possibly, a high-frequency usage brings about a less playful attitude to the internet and, therefore, getting money is more attractive than a trinket. Finally, winning gifts compared to the other two incentives was more popular with men than with women (OR = 2.22^{-1}, CI: 0.26 – 0.77, for men vs. women for money lottery vs. gift lottery and OR = 2.27^{-1}, CI: 0.23 – 0.82, for men vs. women for BPs vs. gift lottery). This difference might be due to the rather technical character of the particular gifts that were raffled in this study.

Response quality. The incentive types did not show a difference in the number of omitted items, $X^2(2, n = 4637) = 1.33$, $p = 0.51$, nor in the number of response sets used, $X^2(2, n = 4363) = 2.51$, $p = 0.29$.

Survey outcome. The three incentive types did not significantly affect survey outcome, as was determined through a one-way MANOVA, $F(136,6936) = 1.09$, $p = 0.22$.

Number of bonus points

Response quantity. Response was linearly independent of the number of BPs, $r_{pb}(1199) = -0.04$, $p = 0.21$. However, the more BPs were offered the less dropout occurred, $r_{pb}(988) = -0.08$, $p = 0.02$.

Sample composition. A logistic regression analysis ($n = 954$) was conducted with response status as a dependent variable and number of BPs and the panellists' characteristics as predictors. The interactions between the number of BPs and sex, age, parenthood, amount of internet use, frequency of online entertainment, urbanity, income, education and marital status did not help to predict whether panellists responded ($p > 0.05$). However, with increasing BPs, response was more likely among people who more frequently purchase goods via the internet (OR = 1.21^{-1}, CI: 0.75 – 0.92, per BP added and per decreasing frequency level of shopping of altogether five levels). This is no surprise, as in this panel BPs can be redeemed against vouchers for online shops.

Response quality. The number of BPs did neither correlate with the number of item omissions, Standardised J-T = 0.60, $p = 0.55$, $n = 959$, nor with the number of response sets, Standardised J-T = –0.60, $p = 0.55$, $n = 887$.

Survey outcome. Bivariate correlations between number of BP and the 68 outcome variables were examined. Despite the many comparisons, only six associations were significant. As three to four relationships are expected to be significant at the 0.05 level by chance alone and the largest association $r = 0.09$ was not even a small effect, it was therefore concluded that the survey outcome was independent of the number of BPs.

Amount and denomination of raffled money
Response quantity. A logistic regression analysis ($n = 4404$) with main and interaction effects was conducted with response status as dependent variable and amount and denomination of raffled money as predictors. The amount of money did not predict whether panellists responded (OR = 1.02, CI: 0.98 – 1.07, per 100 DM-increase), nor did the denomination of money (OR = 1.07, CI: 0.80 – 1.44, for 100 DM- vs. 50 DM-size), nor their interaction (OR = 1.02^{-1}, CI: 0.92 – 1.05, per 100 DM-increase for 100 DM- vs. 50 DM-size). An otherwise identical analysis ($n = 3437$) was conducted with dropout status as a dependent variable. The amount of money did not predict dropout (OR = 1.02^{-1}, CI: 0.88 – 1.09, per 100 DM-increase), nor did denomination (OR = 1.56, CI: 0.84 – 2.99, for 100 DM- vs. 50 DM-size), or their interaction (OR = 1.05^{-1}, CI: 0.83 – 1.10, per 100 DM-increase for 100 DM- vs. 50 DM-size).

Sample composition. A logistic regression analysis ($n = 3437$) was conducted with response status as dependent variable and amount of raffled money, denomination and the characteristics as predictors. The model contained all main effects, all 2-way interactions and the 68 3-way interactions between amount and denomination of money and the characteristics. Amount, denomination, and their combination did not interact with any characteristic ($p > 0.05$ in each instance).

Response quality. An ANCOVA was conducted with number of item omissions as a dependent variable, denomination of raffled money as a factor and amount of money as a covariate ($n = 3264$). The two main effects and the interaction were not significant ($p > 0.05$). An otherwise identical ANCOVA was conducted with number of response sets as dependent variable ($n = 3084$). The two main effects and the interaction were not significant ($p > 0.05$).

Survey outcome. A MANCOVA was carried out with the 68 outcome variables as dependent measures, denomination of money as a factor and

amount of money as a covariate ($n = 2499$). The two overall main effects and the interaction were not significant ($p > 0.05$).

Discussion

Different types and amounts of material incentives used in online panel surveys have no or only mild effects on response quantity and no effect on response quality. Redeemable bonus points (BPs) yield a higher response than money lotteries or gift lotteries; and BPs bring about fewer dropouts than a money lottery. Furthermore, dropout significantly decreased with number of BPs offered. Thus, parts of H1 and H2 were confirmed, whereas there was no support for H3.

BPs might have been more popular than the two types of lotteries because in each BP condition the expected value was higher than in each lottery condition. Another explanation is that panellists find a guaranteed compensation more attractive than a lottery (McDaniel & Jackson 1984); and this preference might be intensified by Germans' rather security-oriented mentality (Eichner & Habermehl 1981; Brennan 1992). However, all effects found in this experiment are statistically significant only on account of the large sample size. Considering their explanative strength, none of the significant outcomes were even a small effect. Hence, the principal outcome of this experiment is the overall absence of marked effects.

This experiment also asked whether incentives alter the sample's composition. Dependent on age, intensity of internet use, education and sex, one or the other incentive types are differently attractive to panellists. Also, response increases with a growing number of BPs the more frequently panellists purchase goods online. Therefore, on the one hand, offering particular types and amounts of incentives is a means to influence sample composition in the hand of the panel operator. On the other hand, panel operators need to be aware of undesired nonresponse bias due to having offered particular incentives that are more interesting for certain strata of the panel population than for others (e.g. raffling technical devices might lead to an under-representation of women). Depending on the type and amount of incentives offered, other characteristics besides the ones examined here might influence participation as well. Also, it is possible that some of the effects were significant by chance alone, given the large number of tests conducted. Therefore, more research is needed to bring to light systematic interactions of panellists' characteristics and incentives used. By contrast, survey outcome was neither influenced by type nor by amount of incentives.

Although the present response rates still fall within the usual range (Müller-Peters *et al.* 2001; Göritz 2004b), a ceiling effect might have occurred, in that possible differences between the different incentive conditions were covered up by the high overall response rate. The response rate might have been so high due to peculiarities of the study (for example the topic and length; Hippler 1988; James & Bolstein 1990; Thoma & Zimmermann 1996; Singer *et al.* 1999) and due to the nature of the panel (for example a commercial market research panel or self-selected panellists). In discussing whether the present findings can be generalised, one thus needs to ask whether they apply to studies of different length and topic and also to non-profit and non-self-selected panels. One might speculate that self-selected panellists are less susceptible to material incentives, because they make a commitment by signing-up with the panel of their own accord. On the other hand, recruited panels are afflicted with considerable non-response (Göritz & Moser 2000; Weßels & Zimmermann 2001; Göritz 2004c) – so it is questionable whether possible differences are still present on the level of individual surveys. To address the issues of panel sponsorship, self-selection, and study-specificity, a second experiment was conducted. It focuses on money lotteries, as a particularly cost-efficient incentive.

Experiment 2

Unlike Experiment 1, Experiment 2 was conducted in a non-profit university online panel. Half of the panel were self-selected, whereas the other half had been selected by the panel operator. Also, topic and length of the survey were different and different panellist characteristics and outcome variables were available to further examine the impact of incentives on sample composition and study outcome.

Method

Participants

All 317 panellists registered with the panel were invited. The sample consisted of 28% women. Average age was 34 years (SD = 11). Half of the panel population (158) was self-selected, that is, they had found the panel through means such as newsgroups, search engines, links and word-of-mouth, whereas the other half (159) had registered after they were solicited via email, fax, letter, or flier, as part of a recruitment experiment (Göritz 2004c).

Procedure

All panellists were randomly assigned to one of four types of money lottery (see Table 3). They received an email invitation to the 10-minute survey 'Evaluation of Media Contents'. The variable text segment read: 'We are going to raffle X times Y DM among the participants'. Participants had no information on how many panellists were invited. There was also an offer of a summary of the results. The survey existed in eight variants, which were independent of incentive condition, $X^2(21, n = 221) = 18.78$, $p = 0.60$. The survey itself consisted of a welcome screen and 13 to 16 consecutive pages, depending on subsequent branching. Respondents were required to answer two 7-item mood scales as well as a number of closed questions pertaining to personal media usage. This study was the first one to which the panellists were invited after the panel was built. Data were collected from 20 December 2000 until 2 January 2001.

Design

The four types of money incentive resulted from the combination of two variables (see Table 2): the first of which was the amount of raffled money with two levels: 90 DM and 180 DM and the second was the denomination of raffled money with two levels: 30 DM and 90 DM. Dependent measures were response, dropout, number of omitted items, and number of response sets used. The identical part of the survey for all participants consisted of 21 items. The number of skipped items was counted for each participant who did not quit the experiment prematurely. The possible number of response sets varied between 0 and 2. For this analysis, only non-dropouts who answered all scales completely were taken into account. As regards sample composition, it was examined whether the relationship of response status and six characteristics that were known from the sign-up with the panel varied according to incentive condition. These characteristics were selection status (i.e. whether panellists had selected themselves or not), sex, age, education, intensity of internet usage, and duration of internet usage. Finally, it was examined whether the study outcome was affected by the type of incentive. Altogether eight outcome variables were available: initial mood, current location, whether a panelist had to pay for the current online session, interest in survey results, subscription to a newspaper, frequency of watching TV, and a forced choice among three news magazines.

Hypotheses

Drawing on the nonexistent or faint effects in Experiment 1, it was hypothesised that response quantity and quality were independent of amount and denomination of raffled money.

Results

Of all invited people, 74.1% responded and 7.7% of those dropped out (see Table 3).

Response quantity and sample composition. A logistic regression analysis ($n = 317$) was conducted with response status as a dependent variable and amount of money, denomination and six panellist characteristics as predictors. The model contained all main effects, the interaction of denomination and amount of money, the interactions of the characteristics with amount of money, the interactions of the characteristics with denomination of money, and the 3-way interactions between denomination and amount of raffled money and the characteristics. The amount of raffled money did not affect response (OR = 33.33^{-1}, CI < 0.01 – 13.75, for 180 vs. 90 DM); neither did denomination (OR = 1.19, CI: 0.01 – 306.06, for 90 DM- vs. 30 DM-size), nor the amount × denomination interaction (OR = 1.75^{-1}, CI < 0.01 – 2965.10, for 180 vs. 90 DM for 90 DM- vs. 30 DM-size). As regards the six characteristics, there were no significant effects. A similar analysis ($n = 235$) was conducted with dropout status as a dependent variable. The amount of raffled money did not predict whether panellists prematurely quit (OR = 1.35, CI: 0.22 – 8.38), neither did denomination (OR = 2.55, CI: 0.47 – 13.72), nor their interaction (OR = 1.17, CI: 0.13 – 10.26).

Table 3 Number of invited panellists, response rate, dropout rate, item omissions, response sets used, and cost per response in DM* in Experiment 2.

Amount of money	180 DM		90 DM	
Denomination	2 × 90	6 × 30	1 × 90	3 × 30
n invited	79	79	80	79
Response rate	77.2	78.5	71.3	69.6
Dropout rate	13.1	4.8	8.8	3.6
Items omitted	0.09	0.47	0.25	0.32
Response sets	0.04	0.19	0.09	0.09
Cost/response	3.02	3.10	1.61	1.75

* 1 DM (German Mark) approximately equals 0.5 USD or 0.4 EUR or 0.26 GBP (June 2004).

Response quality. An ANOVA was conducted with number of omitted items as the dependent variable and denomination and amount of raffled money as factors ($n = 214$). The two main effects as well as the interaction were not significant ($p > 0.05$). Another ANOVA was conducted with number of response sets as the dependent variable ($n = 195$). Again, the two main effects as well as the interaction were not significant ($p > 0.05$).

Survey outcome. A MANOVA was carried out with initial mood and frequency of watching TV as dependent measures and denomination and amount of money as factors ($n = 207$). The two overall main effects as well as the interaction were not significant ($p > 0.05$). Two nominal regression analyses were conducted with current location ($n = 213$) and choice among three magazines ($n = 215$) as dependent measures. Both variables were independent of amount and denomination of money and their interaction ($p > 0.05$). Three logistic regression analyses were calculated with the cost of the current online session ($n = 216$), interest in survey results ($n = 214$), and newspaper subscription ($n = 207$) as dependent measures. The three variables were independent of amount and denomination of money and their interaction ($p > 0.05$).

Discussion

Experiment 2 confirmed that the denomination and amount of raffled money do not influence response quantity, response quality, sample composition, and study outcome. Self- and non-self-selected panellists do not differ in their susceptibility to the incentive conditions. Although this experiment differed from Experiment 1 in several ways, comparable results are obtained in the overlap of both experiments. This agreement in principal outcomes can be regarded as a hint for the reliability and robustness of the findings. However, it cannot be considered as proof, because several aspects were varied at the same time. Therefore, future experiments need to manipulate topic, length, and other study characteristics systematically.

Online panellists start a survey, stay until the end, and answer questions conscientiously for reasons other than receiving large amounts or particular denominations of money, or because of other types of material incentives. This is the principal outcome of two incentive experiments, one of which was conducted in a market-research panel and one in a non-profit panel. The overall result is supported by existing experimental (Müller-Peters *et al.* 2001) and meta-analytical evidence (Göritz 2004a).

Perhaps, panellists take part almost independently of type and amount of material incentives because their next invitation might depend on their response now. Furthermore, the basic interchangeability of type and amounts of incentives in their effect on participation points to a preponderance of non-material rather than financial interests. Indeed, panellists have the opportunity to do good for the population as a whole, have fun and be entertained, satisfy their curiosity, help research, belong to the panel community and identify with the panel. Moreover, all things being equal, the low costs of taking a survey on the web can tip the balance towards participation. For instance, participation in an online compared to a face-to-face study is often more comfortable and easy: web users can participate at a convenient time in their own home while wearing casual clothes. Also, the time spent participating tends to be less than offline and the questionnaire itself more appealing.[3] To find out whether material incentives play a part for participation at all, experiments with a non-incentive group need to be conducted in online panels whose policies allow non-compensation of panellists.

As all hitherto evidence stems from cross-sectional experiments, the ability to generalise these results to apply to repeated surveys is largely unknown: response quantity and quality might change if the same incentives are given again and again. For instance, if lotteries are staged repeatedly, panellists might feel bored or discouraged, especially if they have never won anything. Indeed, there is evidence that the attractiveness of lotteries dwindles over time (Göritz 2004b). However, more longitudinal studies need to be conducted.

Furthermore, the limited frame of experimental manipulations in these experiments might not have been able to bring out possible effects, that is, the manipulation of the number of BPs, amount of money, or denominations of money might not have been extreme enough. This is especially relevant with regard to the denomination of raffled money, because in both experiments it was varied at two levels only. As regards BPs and money, a range of typical amounts (Göritz *et al.* 2002) was covered in Experiment 1. In Experiment 2 different denominations and amounts of raffled money were used compared to Experiment 1.

Finally, it is conceivable that incentives that work in Germany may not work or may work differently elsewhere, depending on such factors as

[3] Participation in web studies is difficult for some people because of unfamiliarity or technical difficulties when interacting with an internet survey (e.g. slow modem speeds, unreliable connections, and low-end browsers). However, as such difficulties and concerns presumably deter people already from signing up with a panel, surveys subsequently conducted in the panel are unlikely to be affected.

mentality, availability of particular goods, the legal situation with lotteries, fiscal regulations concerning casual earnings, the population's differing familiarity with the internet and norms concerning helpful behaviour. Experiments conducted in other countries need to throw light on the possibility of cross-national and especially cross-cultural generalisations.

Recommendations for employing incentives in online access panels

When choosing an incentive, there are a few general points to note: a lottery costs the same regardless how many panellists take part in the study, whereas with BPs and other personal rewards costs rise linearly with the number of participants. Some BPs, however, are never redeemed (e.g. this occurs if there is a time limit on redeeming points, or if panellists discontinue their panel membership and leave BPs). Finally, raffling a few big cash prizes or a few big gifts instead of several smaller ones keeps transaction costs lower, as fewer people need to be contacted and sent their prizes.

Apart from these general considerations, the present experiments illustrate the huge possible savings on incentives that can be achieved. With negligible loss in response quantity and data quality, when raffling a small sum of money one response can cost as little as 0.24 DM, or as much as 4 DM when each participant is awarded several BPs (Tables 2 and 3). Therefore, lotteries where small amounts of money or a few gifts are raffled are recommended as standard incentives. By choosing to raffle particular denominations of money over others, nothing can be gained in terms of response quantity and data quality. If the panel administrative software supports automatic accounting of BPs, occasionally a few BPs might be offered as well. However, purchasing or developing a costly BP-accounting system is not worthwhile.

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References

Armstrong, J.S. (1975) Monetary incentives in mail surveys. *Public Opinion Quarterly*, **39**, pp. 111–116.

Brennan, M. (1992) The effect of a monetary incentive on mail survey response rates: new data. *Journal of the Market Research Society,* **34**, pp. 173–177.

Church, A.H. (1993) Estimating the effect of incentives on mail survey rates. A meta-analysis. *Public Opinion Quarterly,* **57**, pp. 62–79.

Couper, M.P. (2000) Web surveys: a review of issues and approaches. *Public Opinion Quarterly*, **64**, pp. 464–494.

Couper, M.P., Traugott, M.W. & Lamias, M.J. (2001) Web survey design and administration. *Public Opinion Quarterly,* **65**, pp. 230–253.

Deci, E.L. (1971) The effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology,* **18**, pp. 105–115.

Eichner, K. & Habermehl, W. (1982) Ergebnis einer empirischen Untersuchung zur Repräsentativität postalischer Befragungen [Results of a study on the representativeness of mail surveys]. *Kölner Zeitschrift für Soziologie und Sozialpsychologie,* **34**, pp. 93–116.

GfK (2000) *GfK Online-Monitor, 6. Untersuchungswelle* [GfK Online-Monitor, 6th wave]. Retrieved Feb 14, 2004, from http://www.gfk.de/produkte/eigene_pdf/OMO_W6.pdf

Göritz, A.S. (2002) *Web-based Mood Induction.* Unpublished Doctoral Dissertation, University of Erlangen-Nürnberg, Germany.

Göritz, A.S. (2004a) *Incentives in web surveys: methodological issues and a review*. Manuscript submitted for publication, University of Erlangen-Nürnberg, Germany.

Göritz, A.S. (2004b) *The long term impact of material incentives on response quantity and quality in online access panels*. Manuscript submitted for publication, University of Erlangen-Nürnberg, Germany.

Göritz, A.S. (2004c) Recruitment for online access panels. *International Journal of Market Research*. Manuscript accepted for publication.

Göritz, A.S. & Moser, K. (2000) Repräsentativität im Online-Panel [Representativeness in online panels]. *Der Markt,* **155**, pp. 156–162.

Göritz, A.S., Reinhold, N. & Batinic, B. (2002) 'Online Panels' in *Online Social Sciences*, ed. Batinic, B., Reips, U., Bosnjak, M. & Werner, A. pp. 27–47. Seattle: Hogrefe.

Göritz, A.S. & Schumacher, J. (2000) The www as a research medium: an illustrative survey on paranormal belief. *Perceptual and Motor Skills,* **90**, pp. 1195–206.

Hellwig, J.O., von Heesen, B. & Bouwmeester, R. (2003) Rekrutierungsunterschiede bei Online-Panels und ihre Folgen [Differences in recruitment with online panels and their consequences]. In *Online-Marktforschung – Beiträge aus Wissenschaft und Praxis*, ed. A. Theobald, M. Dreyer, & T. Starsetzki, pp. 227–240. Wiesbaden: Gabler.

Hippler, H.-J. (1988) Methodische Aspekte schriftlicher Befragungen: Probleme und Forschungsperspektiven [Methodological aspects in mail surveys: Problems and perspectives]. *Planung und Analyse,* **6**, pp. 244–248.

James, J.M. & Bolstein, R. (1990) The effect of monetary incentives and follow-up mailings on the response rate and response quality in mail surveys. *Public Opinion Quarterly,* **54**, pp. 346–361.

James, J.M. & Bolstein, R. (1992) Large monetary incentives and their effect on mail survey response rates. *Public Opinion Quarterly,* **56**, pp. 442–453.

Linsky, A.S. (1975) Stimulating responses to mailed questionnaires: a review. *Public Opinion Quarterly,* **39**, pp. 82–101.

McDaniel, S.W. & Jackson, R.W. (1984) 'Exploring the probabilistic incentive on mail survey research'. In *Proceedings of the American Marketing Association Summer Educators' Conference*, ed. K. Bernhardt *et al.*, pp. 372–375. Chicago: AMA.

Müller-Peters, A., Kern, O. & Geißler, H. (2001) *Die Wirkungsweise unterschiedlicher Incentivierungssysteme auf Rekrutierungserfolg und Stichprobenqualität* [The effect of incentives on recruitment and sample quality]. Paper presented at the German Online Research conference, Göttingen, Germany.

Porter, S.R. & Whitcomb, M.E. (2003) The impact of lottery incentives on student survey response rates. *Research in Higher Education*, **44**, pp. 389–407.

Singer, E., Van Hoewyk, J., Gebler, N., Raghunathan, T. & McGonagle, K. (1999) The effect of incentives on response rates in interviewer-mediated surveys. *Journal of Official Statistics,* **15**, pp. 217–230.

Thoma, M. & Zimmermann, M. (1996) Zum Einfluß der Befragungstechnik auf den Rücklauf bei schriftlichen Umfragen. Experimentelle Befunde zur 'Total-Design-Methode' [The influence of surveying technique on response rates in mail surveys: experimental results on the 'Total-Design-method'], *ZUMA-Nachrichten,* **39**, pp. 141–157.

Weßels, M. & Zimmermann, M. (2001) *Offline-rekrutierte Access-Panels als Königsweg der panelbasierten Online-Forschung*? [Are offline-recruited access panels the silver bullet of panel-based online research?]. Paper presented at the German Online Research conference, Göttingen, Germany.

Yu, J. & Cooper, H. (1983) A quantitative review of research design effects on response rates to questionnaires. *Journal of Marketing Research,* **20**, pp. 36–44.