Article

The Early Bird Catches the Worm! Setting a Deadline for Online Panel Recruitment Incentives

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Abstract

The literature on the effects of incentives in survey research is vast and covers a diversity of survey modes. The mode of probability-based online panels, however, is still young and so is research into how to best recruit sample units into the panel. This paper sheds light on the effectiveness of a specific type of incentive in this context: a monetary incentive that is paid conditionally upon panel registration within two weeks of receiving the initial postal mail invitation. We tested early bird cash incentives in a large-scale recruitment experiment for the German Internet Panel (GIP) in 2018. We find that panel response rates are significantly higher when offering early bird cash incentives and that fieldwork progresses considerably faster, leading to fewer reminders and greater cost-effectiveness. Furthermore, sample representativeness is similarly high with or without early bird incentives.

Keywords

Online panels, incentives, representativeness, recruitment, probability sampling, cost-effectiveness

Introduction

The rise of the internet as a mass medium in the early 2000s has brought with it a surge in online panels as a means of survey data collection (Callegaro et al., 2014). This development has come with many benefits, including that survey data can be collected faster, more cheaply,

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more frequently, and more flexibly than ever before (Blom et al., 2020). In addition, general population online panels that are based on probability sampling approaches have been shown to allow accurate inference from their survey data to the population (Cornesse et al., 2020).

However, the recruitment of a probability-based online panel of the general population faces several challenges (Baker et al., 2010). The most crucial challenge is that email address lists of the general population are usually unavailable as sampling frames. This can be a disadvantage as compared to online surveys which target special sub-populations, such as company employees or university students, for which email lists are often available (Saunders, 2012; Woo et al., 2015).

In probability-based online panels of the general population, sampling frames of offline contact details (e.g., addresses or telephone numbers) usually need to be used to draw the initial probability sample. Consequently, sample units have to be contacted offline first and then asked to switch to the online mode of the panel. Each step of such a two-step recruitment process is labor-intensive and comes at the cost of losing some sample units along the way due to (potentially systematic) nonresponse (Cornesse et al., 2021; Scherpenzeel, 2011).

Some general population probability-based online panels contact sample units via postal mail and ask them to register with the panel at a URL provided in the contact letter. Examples include the American Trends Panel (Keeter, 2019) and Ipsos Knowledge Panel (Ipsos, 2021) in the US. Other probability-based online panels take an interviewer-mediated approach to the online panel recruitment (i.e., through initial face-to-face and/or telephone interviews). Examples of such interviewer-mediated recruitment approaches are predominantly found in Europe (Blom et al., 2016) and include the Dutch LISS Panel (Scherpenzeel & Toepoel, 2012), the French ELIPSS (Revilla et al., 2016), and the first two recruitment rounds of the German Internet Panel (GIP; Blom et al., 2015). In addition, some probability-based online panels use a combination of contact through interviewer-mediated and postal mail modes. In the US, this is, for example, done in the Gallup Panel (GALLUP, 2020) and AmeriSpeak (NORC, 2021).

To maximize online panel registration rates, researchers commonly invest considerable resources to convince sample units to register and remind them about the study, for example via reminder letters that are sent to sample units who have not yet registered for the panel a few weeks after the initial contact. While this has been shown to increase response rates (Göritz & Crutzen, 2012; Shih & Fan, 2008), having to remind sample units of the registration slows down the recruitment process.

A potential way to speed up the panel recruitment process, reduce the number of reminders that have to be sent out, and nevertheless increase online panel registration rates is to offer an early bird monetary incentive, that is, a monetary incentive that is paid if sample units register for the online panel before a pre-defined date. So far, the literature on early bird incentives stems nearly exclusively from interviewer-mediated surveys (see literature review below). In this paper, we add to the literature with the results of a large-scale experimental study conducted during the recruitment of a probability-based online panel, the German Internet Panel (GIP), in 2018. The experiment included three conditions that are compared against each other: A control group without early bird incentive, a treatment group with an early bird cash incentive of 20 € (approximately 24 USD), and a treatment group with an early bird cash incentive of 50 € (approximately 60 USD). The paper presents detailed analyses of the effects of these incentives on response rates, sample representativeness, and panel recruitment cost-effectiveness.

Background on Respondent Incentives

Previous research has shown that respondent incentives increase survey response rates (Armstrong, 1975; Singer & Ye, 2013). This benefit of incentives seems to apply to all survey modes (Singer et al., 1999; Göritz, 2006) and to cross-sectional as well as to longitudinal surveys

(Castiglioni et al., 2008; Laurie & Lynn, 2009). Overall, unconditional prepaid cash incentives are often considered to be superior to other types of incentives, such as conditional postpaid incentives, non-monetary incentives (e.g., gifts and vouchers), and lotteries (Pforr et al., 2015; Singer & Ye, 2013). Concerning the effect of incentives on sample composition, some research suggests that incentives can increase the response propensity of population subgroups that are otherwise underrepresented (Dykema et al., 2020; Felderer et al., 2018; Laurie & Lynn, 2009; Singer et al., 1999). Thus, incentives may increase sample representativeness, which is defined here as the similarity between a survey sample and the population under investigation (for a discussion of the concept of representativeness see Schouten et al., 2009). A number of studies have also found that combining a prepaid unconditional incentive with a postpaid conditional incentive is even more beneficial than providing one of these incentive types only, for example to increase contact rates and response rates (Avdeyeva & Matland, 2013; Beydoun et al., 2006; Hsu et al., 2017; Kretschmer & Müller, 2017).

A particular way in which different types of respondent incentives may be combined is by offering a prepaid unconditional incentive with the request for survey participation and, in that same request, additionally include a promise of a conditional incentive, which sample units will only receive if they participate in the survey before a given date. The idea behind this approach is that the conditional incentive will serve as an early bird bonus, which may not only encourage sample units to participate, but to do so early (Coopersmith et al., 2016).

Various theoretical frameworks explain the effect of early bird bonus incentives. Social exchange theory (Dillman, 1991) expects the added bonus to raise sample units' perceived rewards for partaking in the survey, by far outweighing the additional costs of responding early. Leverage-saliency theory suggests that promoting the early bird bonus in the letter makes the monetary incentive more salient to sample units for whom this aspect of the survey has high leverage (Groves et al. 2000). According to rational choice theory ensuring sample units that they will receive an early bird bonus maximizes their subjective expected utility given the available options (Krieger 2018): Responding late turns from a perfectly suitable option into the worst possible choice because sample units would forgo the bonus incentive while having to invest time and effort anyway.

So far, such early bird incentives have been primarily tested in surveys which use interviewers for all or some of the data collection (Fomby et al., 2017; LeClere et al., 2012). These studies have shown that early bird incentives increase response rates while at the same time reducing other types of fieldwork costs, such as repeated contact attempts by interviewers to sample units before an interview can be conducted (Brown & Calderwood, 2014; Olsen, 2005) or additional conversion attempts where interviewers follow up initially unsuccessfully recruited addresses (Carpenter & Burton, 2018).

To the best of our knowledge, early bird incentives have not been experimentally tested in the context of the recruitment of probability-based online panels. This is surprising, because the potential benefits of early bird incentives in such a setting are promising: They may boost panel registration rates by attracting additional sample units, speed up the fieldwork progress by encouraging sample units to not delay their response and thereby reduce the number of reminders that need to be sent out to initial nonrespondents, and, finally, they may add different subgroups of the population to the panel sample, thus, increasing sample representativeness.

Data and Methods

This article uses data from the 2018 recruitment round of the German Internet Panel (GIP). The German Internet Panel is part of the Collaborative Research Center 884 (SFB 884) funded by the German Research Foundation (DFG)—Project Number 139943784—SFB 884. The GIP is a

probability-based online panel of the general population aged 16–75 in the year of recruitment. It was established in 2012 as a large-scale longitudinal survey of social, political, and economic life in Germany. A general description of the GIP can be found in Blom et al. (2015). The first two recruitment rounds in 2012 and 2014 were conducted using face-to-face recruitment interviews while the 2018 recruitment was conducted using a postal mail recruitment strategy.

The 2018 GIP Recruitment

The GIP 2018 sample was drawn from municipal population registers in Germany in a two-stage sampling process. Germany has population registers that can be used by academic institutions for sampling purposes; however, the registers are only available at the local communities (i.e., at the administrations of cities and municipalities). Therefore, the GIP first sampled 180 communities as primary sampling units (PSUs) from a list of all communities in Germany. Subsequently, 13,050 individuals within these sampled PSUs were drawn together with their names and addresses (for details of the sampling design see Cornesse et al., 2021).

The sampled units were invited to the GIP by postal mail. This mailing included an invitation letter, an illustrated leaflet, legal information on the GIP data protection protocols, and an unconditional prepaid cash incentive of 5 € (approximately 6 USD). Initial nonrespondents to the registration invitation received up to two reminder letters, the first sent after three weeks and the second after another three weeks.

Generally, the panel registration process consisted of four steps: First, sampled individuals logged into their panel accounts via the log-in information provided in the invitation letter. Second, they filled out a brief survey, which consisted of 12 questions, including questions on key socio-demographics as well as respondents' email addresses. Third, an email verification request was sent to the respondents' email accounts. Last, after verifying their email address, respondents participated in another brief survey of approximately 20 questions (depending on how many follow-up questions were triggered by filters) asking for panel consent as well as more socio-demographics and panel membership specifications (e.g., incentive payout preferences).

Invited individuals who started their online panel registration process (e.g., completed the first brief survey and the email verification, but not the second brief survey) received up to three email reminders at individualized dates depending on when they had completed the first short online survey. The fieldwork period of the recruitment ran from September 13, 2018 to February 28, 2019. During this time, registration was possible. After completion of the second survey, the new panel members were invited to the GIP's regular online panel waves by email every other month.

Early Bird Cash Incentives Experiment

The early bird cash incentives experiment was fielded at the beginning of the GIP recruitment fieldwork period, when 171 of the 180 PSUs had delivered addresses from their registers[1]. We randomly sampled 4651 individuals for the early bird cash incentives experiment. These sampled units were randomly distributed across two treatment groups and one control group. 2251 individuals were assigned to the control group and 1200 individuals were assigned to each of the treatment groups. The early bird incentives experiment was located in the postal mail part of the recruitment process, that is, the bonus incentive was announced in the initial invitation letter. The invitation letter for the first treatment group informed sampled individuals that they would receive 20 €, if they completed the panel registration by a given date (i.e., October 1, 2018), which was 18 days after sending out the invitation letters. For individuals in the second treatment group the offered bonus amount was 50 €. The control group

letter made no mention of an early bird cash incentive. Other than the one-sentence information on the early bird cash incentive, the invitation letters and all additional materials were the same across groups. Individuals in the treatment groups who registered for the GIP before the early bird deadline received their bonus incentive in cash via postal mail.

For 113 sample units included in our experiment, the postal office returned the invitation letters sent by us (59 for the control group, 24 for the 20 € group, and 30 for the 50 € group). We excluded the return-to-sender cases from our analyses.

Analytical Strategy

Our analyses examine two success indicators for panel registration in the GIP: Response rates and sample representativeness. We consider these indicators for both the online panel recruitment phase and over time across the first year of panel data collection waves. Moreover, we investigate the cost-effectiveness of the two early bird cash incentives as compared to the control group at the time of panel recruitment.

We use several data sources: (1) GIP survey data generated during the recruitment and the subsequent year of panel data collection waves, (2) benchmark data from official population statistics, and (3) operations data on the online panel registration and costs.

Response rates. We compute response rates (*RR*) for each experimental group cumulatively at each day of the fieldwork period to track the overall recruitment success with

$$RR = \frac{R}{N_{eligible}} \tag{1}$$

where R is the number of sample units who successfully registered for the GIP and $N_{eligible}$ is the number of eligible sample units in the gross sample that were assigned to the early bird incentive experiment. This response rate is equivalent to AAPOR RR2 (AAPOR, 2016) based on the GIP eligible gross sample. R includes individuals who completed the registration process for the GIP online panel, even if they provided only partial information on some of the variables. Individuals who did not complete the whole registration process, for example because they broke off one of the two surveys they were asked to complete, or because they did not verify their email address, or did not provide consent to become panel members, are considered as nonrespondents.

In addition to these cumulative panel registration response rates, we also examine final survey response rates for the panel survey data collection waves during the first year after recruitment. We calculate these survey wave response rates in accordance with equation (1) with the number of respondents to a certain wave divided by the number of all eligible sample units[2].

Sample representativeness. To investigate whether our recruited panel sample accurately represents the target population (i.e., the German resident population aged 16–75), we compare survey estimates on six variables collected during the GIP recruitment process with external population benchmarks. The benchmark data stem from the German Microcensus, a mandatory annual survey of one percent of the German resident population conducted by the German Federal Statistics Office (Destatis, 2021). Microcensus data were provided to us upon request as marginal distributions within the GIP age range.

The six variables were coded as follows: gender (male, female), age (16–29, 30–39, 40–49, 50–59, 60–75), education (low, medium, high), marital status (married, divorced, widowed, single), household size (single household, two-person household, three-person household,

four-and-more-person household), and nationality (non-German, German). To compare the sample representativeness across our experimental groups in terms of the selected socio-demographic variables, we estimate the relative bias ($\widehat{RB}$) for each category of each variable in percent (Groves, 2006). The relative bias for a category Y is given by

$$\widehat{RB}\left(\widehat{\overline{Y}}\right) = \frac{\widehat{\overline{y}}_{svy} - \overline{y}_{mz}}{\overline{y}_{mz}} * 100 \tag{2}$$

where $\widehat{\overline{y}}_{svy}$ is the estimated proportion of a given category in the GIP survey sample and $\overline{y}_{mz}$ is the respective proportion of the given category in the Microcensus.

The standard error (SE) of the relative bias is given by

$$SE\left(\widehat{RB}\left(\widehat{\overline{Y}}\right)\right) = \frac{100}{\overline{y}_{mz}} * SE\left(\widehat{\overline{y}}_{svy}\right) \tag{3}$$

where $SE(\widehat{\overline{y}}_{svy})$ is the standard error of the surveys estimate, which we estimate using a variance estimation method that takes into account the complexity of the GIP sampling design (see Cornesse et al., 2021 for more details). We assume that the proportions derived from the Microcensus represent true population values, that is, have zero sampling variance (see Felderer et al., 2019). Based on the standard errors we compute the 95%-confidence intervals of the relative bias estimates to evaluate statistical significance of the relative biases. A relative bias is considered significant if the respective confidence interval does not include zero.

To summarize relative bias distributions and to evaluate sample representativeness longitudinally, we investigate the distribution of the absolute relative biases by experimental group for the panel survey waves during the first year after recruitment. Absolute relative biases for each panel wave are calculated based on the estimation of relative biases in equation (2). Based on the respondent sample of the respective wave, we estimate $\widehat{\overline{y}}_{svy}$ for each panel wave for each of the six socio-demographic variables (gender, age, education, marital status, household size, and nationality). To give a summary of the absolute biases for each panel wave, we estimate the mean and quartiles of the bias distribution. The mean across all examined absolute relative biases is commonly referred to as the Absolute Average Relative Bias (AARB; (Groves, 2006)).

We conduct complete-case analyses because item nonresponse rates were lower than one percent on all variables in the GIP data.

Cost-effectiveness. To investigate the cost-effectiveness of the early bird cash incentives, we compare the total costs per person registered for the GIP across experimental groups (for an overview of ways to calculate costs see Olson et al., 2020). Scherpenzeel and Toepoel (2012) examined the total cost of panel members for registering for the LISS panel as a function of incentive costs and other fieldwork costs given group specific response rates. The general idea behind this cost calculation is to calculate the cost of successfully recruiting a panel member in experimental groups by putting fieldwork and incentive cost in relation to recruitment success.

Derived from the cost calculation approach proposed by Scherpenzeel and Toepoel (2012), the registration cost of one panel member R in an experimental group e is given by the sum of the total fieldwork costs and early bird cash incentive costs in group e divided by the number of registered sample units in the respective groups:

$$R_e = \frac{N_e * P + n_{I_e} * V_e}{n_e} \tag{4}$$

where N_e is the number of individuals in the gross sample of group e, n_e is the number of registered sample units in group e, and n_{I_e} is the number of individuals who received the early bird cash incentive by registering for the GIP prior to the deadline in experimental group e. The costs are given by the fieldwork costs per gross sample unit P and the group specific value of the early bird cash incentive V_e. P is fixed at the empirical value of 34.40 € for all experimental groups, because the contracted survey organization charged this fixed cost independently of the treatment. Any cost savings resulting from the expected or actual reduced fieldwork efforts of the early bird groups were not passed on to the research team.[3]

Equation (4) can be rewritten as

$$R_e = \frac{N_e * P}{n_e} + \frac{n_{I_e} * V_e}{n_e} * \frac{N_e}{N_e} \tag{5}$$

with N_e/n_e being the inverse of the group specific response rate RR_e and $T_e = n_{I_e}/N_e$ being the early bird take-up rate, that is, the number of individuals taking up the early bird cash incentive offer by registering for the GIP prior to the deadline in experimental group e, divided by the number of individuals in respective experimental group e. It follows that

$$R_e = \frac{P + V_e * T_e}{RR_e} \tag{6}$$

Equation (6) contains values readily available from response rate calculations. Note that R_e is independent of the absolute number of registered panel members n_e as well as the gross sample size N_e.

Results

We present the results of the early bird incentive experiment in three parts: We first present the results of the response rate analyses of and, second, the findings from the sample representativeness analyses. Both parts include analyses of the GIP registration phase as well as the first panel year. In the third part, we present the estimation of the cost-effectiveness of the early bird cash incentives.

Response Rates

During the registration phase. Overall, offering an early bird cash incentive had a positive impact on the response rate, but no difference could be observed between offering 20 € and 50 €. The final registration response rate was highest when 50 € were offered as an early bird cash incentive (30.3%), followed 20 € (29.4%) and the control group (24.7%; Figure 1). The difference between offering 50 € as an early bird cash incentive and 20 € was not statistically significant (p-value = 0.67).

The results also indicate that higher recruitment speed can be achieved when offering an early bird cash incentive. Cumulative response rates were higher in the early bird cash incentive treatment groups than in the control group from the start. In addition, we found a notable increase in response rates right before the end of the early bird deadline (indicated by a solid horizontal line in Figure 1) in the early bird treatment groups. At the deadline day, registration response rates were 20.3% when 50 € were offered as an early bird cash incentive, 18.4% when 20 € were offered, and 12.0% in the control group.

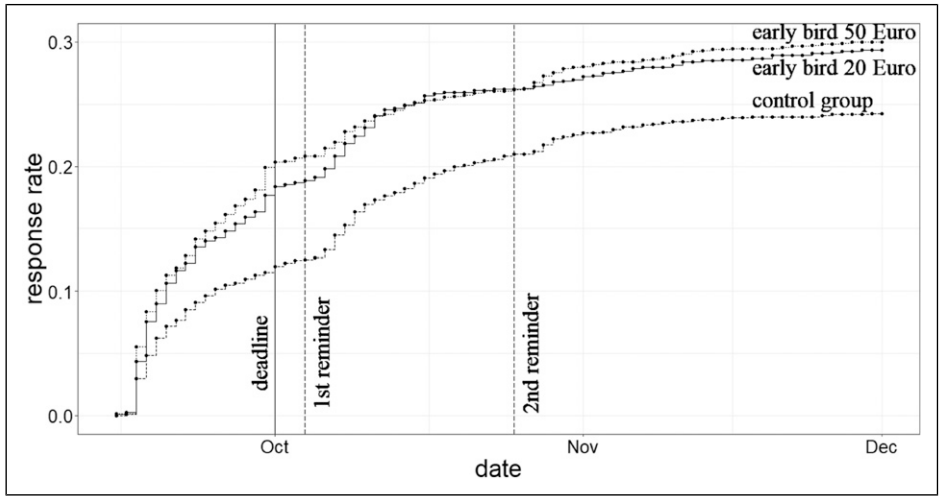

Figure 1. Cumulative response rate for the GIP survey over the registration phase in 2018.

Due to the higher recruitment speed, less reminders had to be sent out in the early bird incentive treatment groups than in the control group. While in the control group 83% of sample units had to be sent reminder letters, it was only approximately 75% of sample units in the both early bird incentive treatment groups. Generally, sending reminders (indicated by dashed vertical lines in Figure 1) had a positive impact on the response rates across all experimental groups.

Over the first panel year. Generally, survey wave response rates declined across the first year of panel data collection, with a particularly strong decrease right at the beginning (i.e., between the first and third wave), after which response rates stabilized to some extent (Figure 2 and Table A1 in the Appendix).

Offering an early bird cash incentive had a positive impact on panel survey response rates during the first year after the recruitment. The difference in response rates between the treatment groups and the control group was statistically significant at each of the examined panel data collection waves (all $p < 0.05$ in ANOVA-tests). The two early bird incentive groups, however, did not significantly differ at any wave (all $p > 0.05$ in t-tests).

Sample Representativeness

After registration, before first wave. Overall, the results do not indicate major differences in sample representativeness across the early bird incentive experimental groups on the examined socio-demographic characteristics (Figures 3–8).

All experimental groups represented the target population well with regard to age, gender, and marital status (Figures 3–5). On these characteristics, all confidence intervals around the estimated relative biases included zero (as indicated by the vertical lines in Figures 3–5).

In addition, all experimental groups misrepresented education and citizenship in the same direction and to a similar extent: They all underrepresented people with low education, and overrepresented people with high education as well as German citizens (Figures 6 and 7). On these characteristics, the point estimates were similar across the three experimental groups and the groups' confidence intervals overlapped.

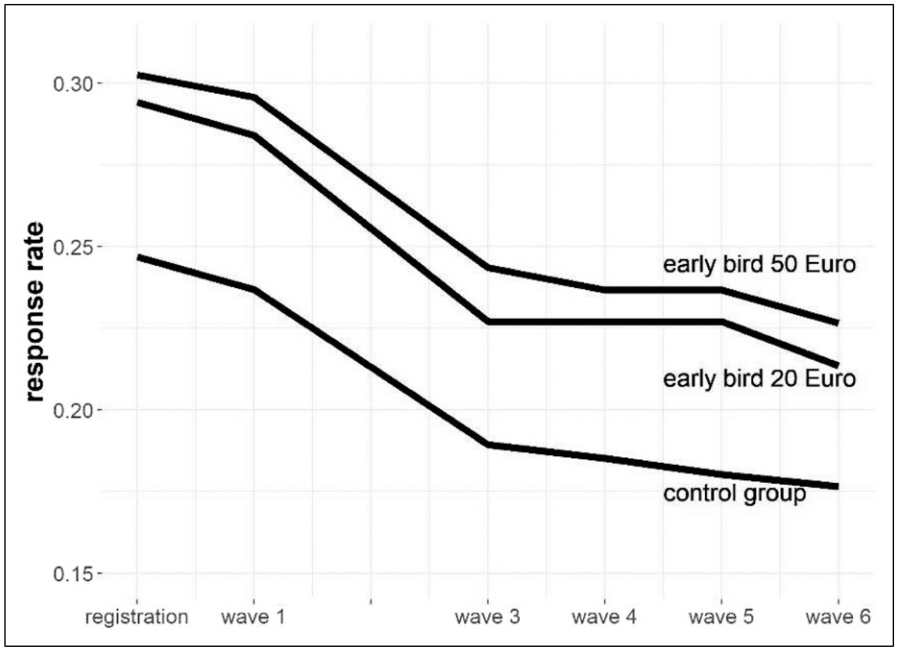

Figure 2. Response rate for the GIP survey and response rates to the subsequent panel waves. Note: All newly registered panel members were invited to the first regular wave immediately after the sign-up. Respondents who completed the first wave by the end of October in 2018 were invited to participate in the second wave (November 2018) on November 1st. Sampled individuals who registered later were not invited to the second panel survey wave. Since not every new panel member was invited to the second panel survey wave, second wave response rates are not reported.

Household size was the only characteristic where we found that the early bird incentive groups represented the target population well while the control group misrepresented some characteristics (Figure 8). In the control group, individuals living in single households were significantly underrepresented and individuals living in households with four or more members were significantly overrepresented.

To aggregate the findings above, we examined the distribution of the absolute relative biases across all examined characteristics. Figure 9 shows boxplots of the absolute relative biases for each of the experimental groups.

The large black dots of the box plots in Figure 9 denote the AARB in each of the experimental groups while the boxes represent the inner 50% of the absolute relative biases and the upper and lower bound of the boxes are the 25% and 75% quartiles. The inner horizontal bar is the median of the absolute relative biases. The upper whiskers denote the 75% quartile plus 1.5 times the interquartile range, the lower whiskers the 25% quartile minus 1.5 times the interquartile range. The small black dots outside the boxes indicate outliers.

As indicated by the size of the boxes, the variation of absolute relative biases was lowest for the early bird cash incentive group of 50 € and highest for the control group. The AARBs and medians are slightly higher for the early bird cash incentive group of 20 € than for the other two groups. The AARBs were higher than the medians, indicating that AARBs were strongly influenced by some outliers. The strongest outliers for all experimental groups represent the large underrepresentation of people with low education and overrepresentation of people with high education. The median

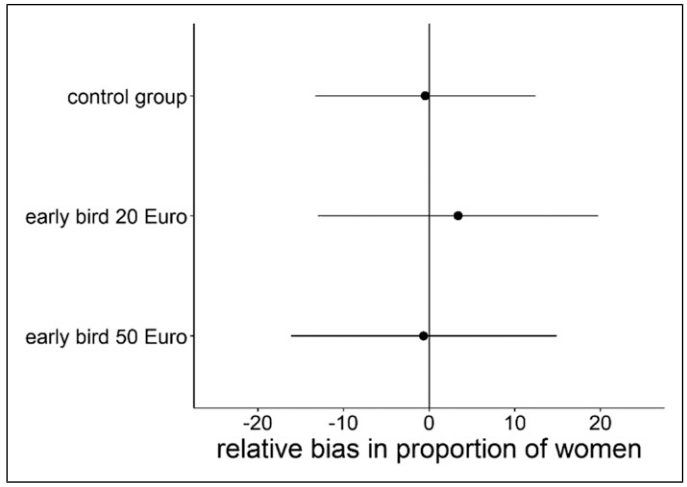

Figure 3. Relative bias in the proportion of females. Note: 95%—confidence intervals are denoted by horizontal bars.

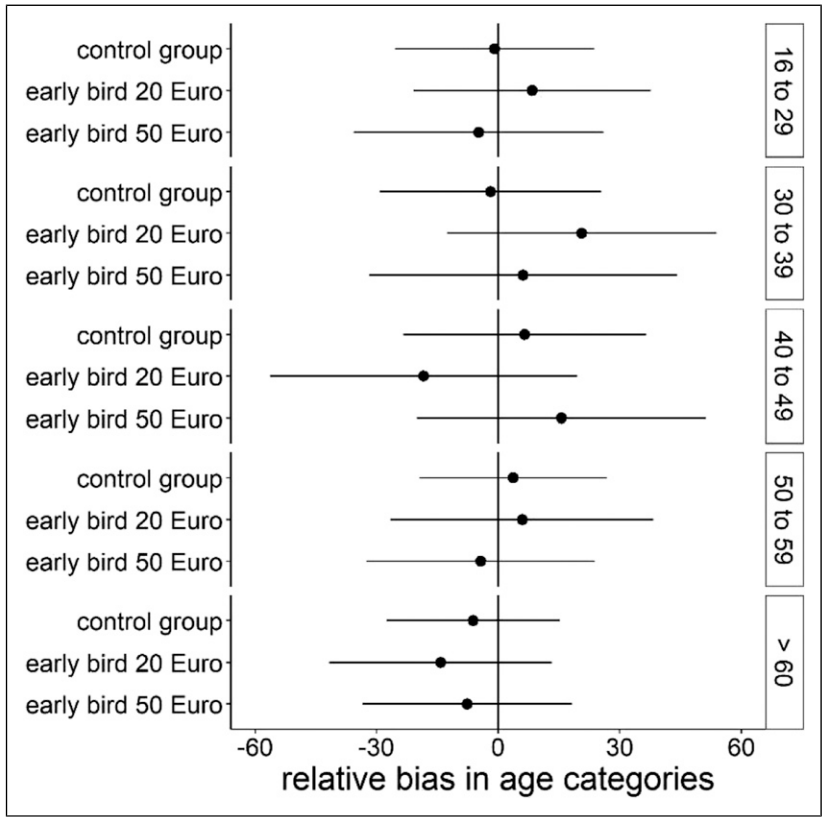

Figure 4. Relative bias in the age categories. Note: 95%—confidence intervals are denoted by horizontal bars.

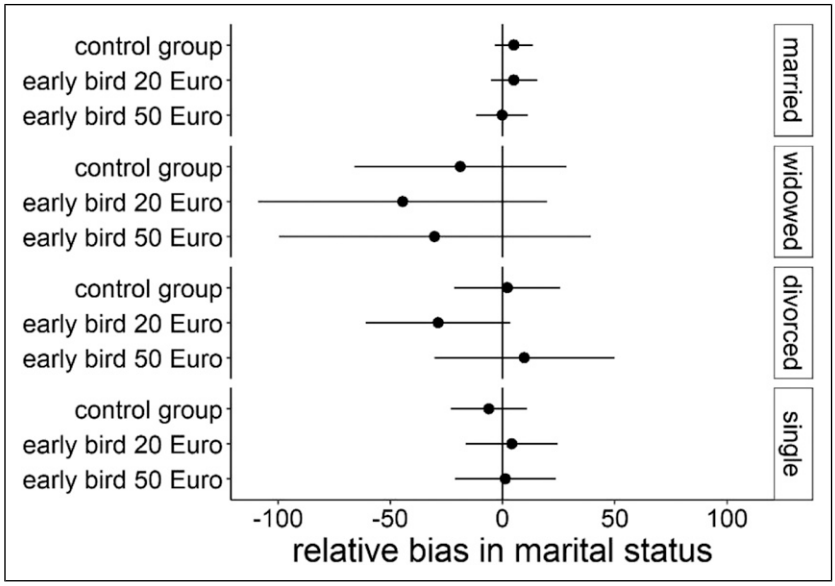

Figure 5. Relative bias in marital status. Note: 95%—confidence intervals are denoted by horizontal bars.

lines of all three box plots lie within the box of the other box plots, indicating no significant differences in the distributions of relative biases across the experimental groups.[4]

Over the first panel year. Figure 10 shows box plots for the absolute relative biases across the three experimental groups over the first panel year. At each of the first six survey waves of the panel, the

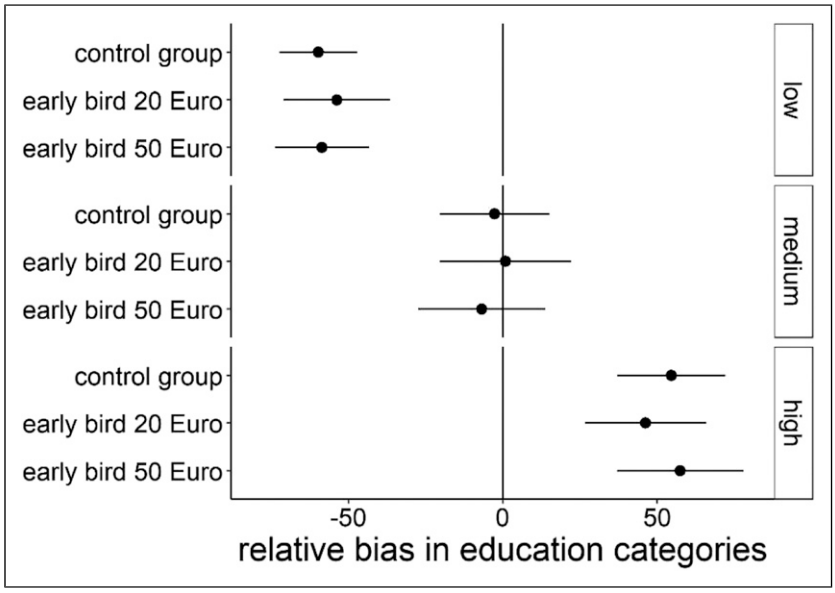

Figure 6. Relative bias in the education categories. Note: 95%—confidence intervals are denoted by horizontal bars.

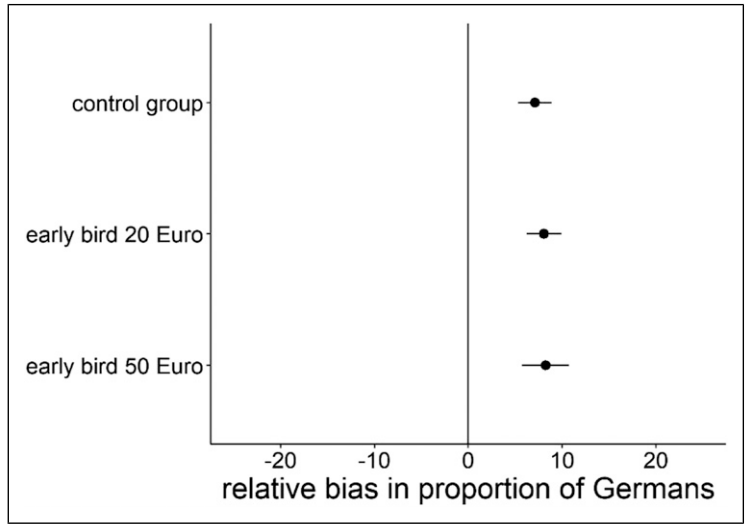

Figure 7. Relative bias in german nationality categories. Note: 95%—confidence intervals are denoted by horizontal bars.

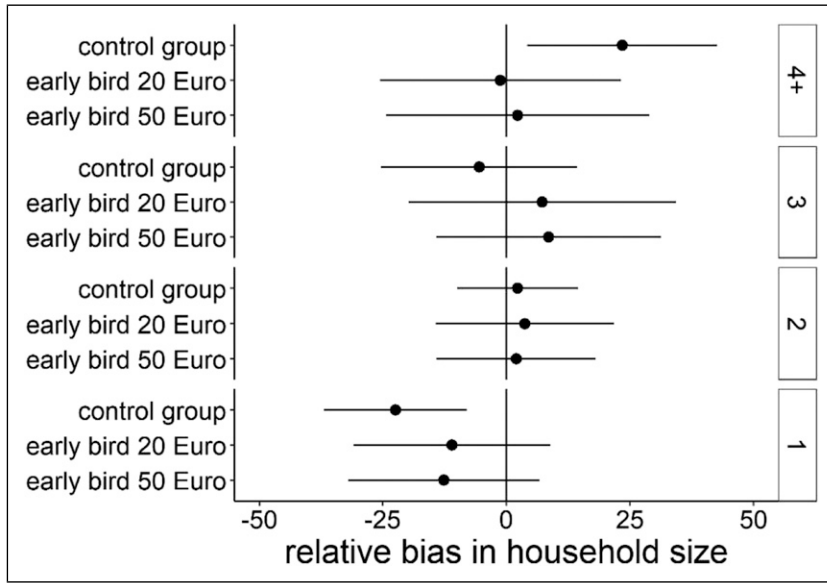

Figure 8. Relative bias in household size. Note: 95%—confidence intervals are denoted by horizontal bars.

boxes overlap, indicating no significant differences across experimental groups. Moreover, our findings indicate no systematic changes in sample representativeness over time.

Cost-Effectiveness

The total costs per registered panel member in the GIP are presented in Table 1. Using the realized early bird take-up rates (control group: 0 € since no early bird incentive was offered, experimental

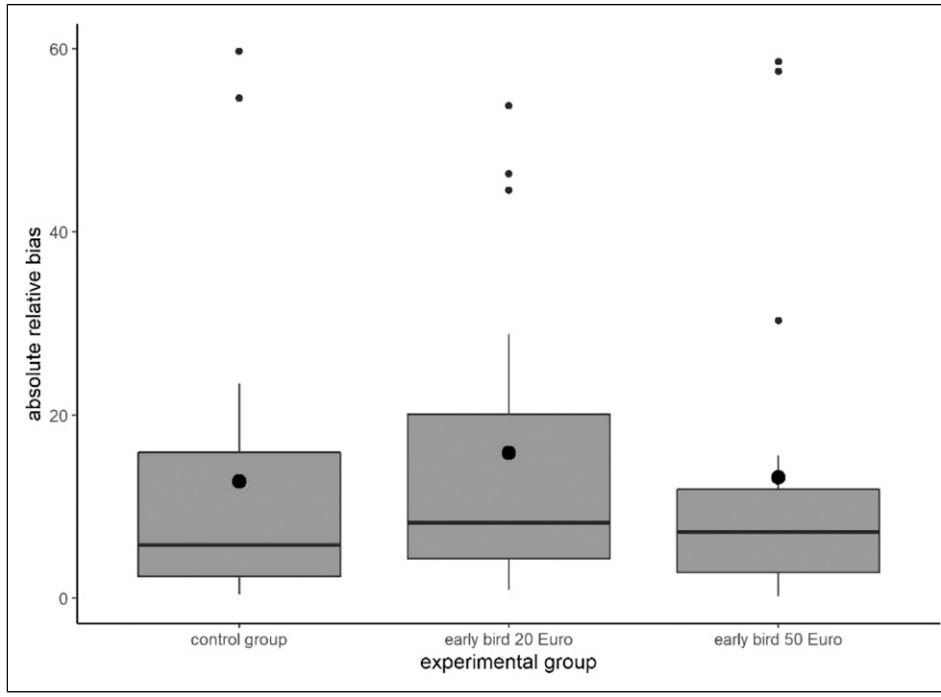

Figure 9. Distributions of absolute relative biases of the socio-demographic variables. Note: The average absolute relative bias (AARB) is given by the mean of the absolute biases (denoted by a black dot).

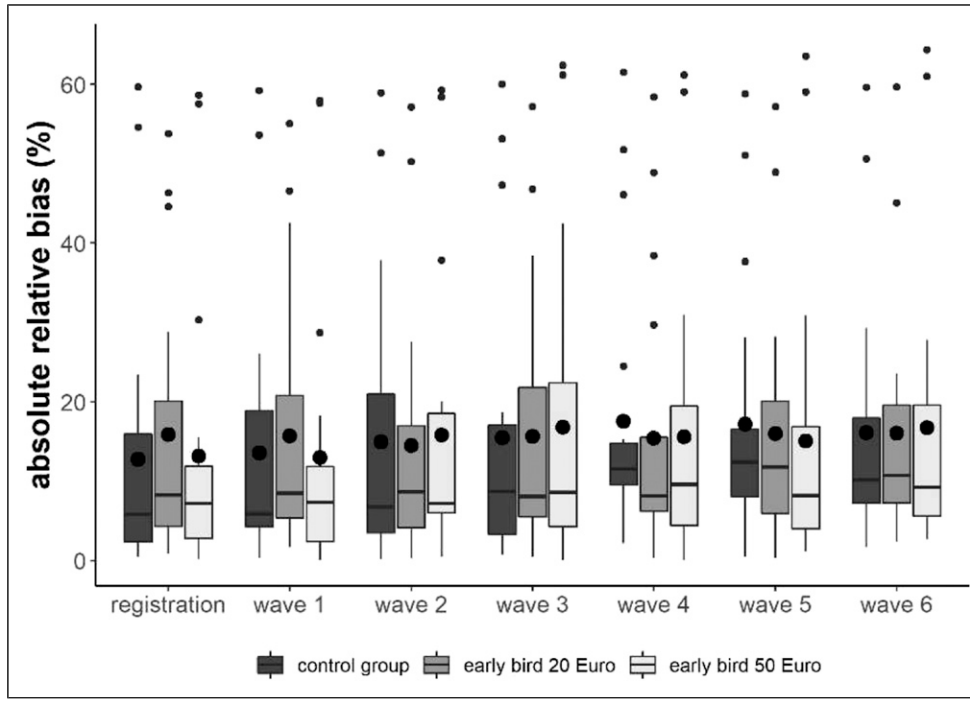

Figure 10. Distributions of absolute relative biases of the socio-demographic variables over the first panel year.

Table 1. Cost Effectiveness of Using Early Bird Cash Incentives in the GIP Registration.

Experimental Group	Early Bird Cash Incentive Value V_e	Early Bird Take-up Rate T_e	Response Rate RR_e	Total Costs Per Registered Panel Member R_e
Control	0 €	0	0.247	139 €
20 €	20 €	0.184	0.294	130 €
50 €	50 €	0.203	0.303	147 €

group of 20 €: 0.184, experimental group of 50 €: 0.203), the response rates (control group: 0.247, experimental group of 20 €: 0.294, experimental group of 50 €: 0.303), the early bird bonus incentive values (0 €, 20 €, and 50 €), and the fieldwork costs (34.4 €), the total costs for each experimental group can be calculated (see equation (6)).

Total costs per registered panel member were highest in the early bird cash incentive group of 50 € (147 €), followed by the control group (139 €). The lowest costs per registered panel member were realized with the early bird cash incentive group of 20 € (130 €). Thus, the early bird cash incentive of 20 € is the most cost-effective condition as it offers the best trade-off between incentive costs and panel recruitment success.

Discussion

In this paper, we examined the impact of early bird cash incentives on the postal mail recruitment of a probability-based online panel. In our analyses, we focused on data quality assessments in terms of whether the early bird cash incentives increased response rates, enhanced sample representativeness, and increased panel recruitment cost-effectiveness.

Overall, we found that panel response rates were significantly higher when offering early bird cash incentives. In addition, fieldwork progressed considerably faster, leading to higher response rates, a more effective use of the gross sample and thus greater cost-effectiveness. This is in line with findings on early bird incentives in other survey contexts (Brown & Calderwood, 2014; Carpenter & Burton, 2018; Fomby et al., 2017; Olsen, 2005). Furthermore, the positive impact of the early bird cash incentive on response rates was not limited to the panel registration phase but could still be observed over the course of the first year of panel survey waves. Sample representativeness was largely unaffected by the early bird cash incentive.

Regarding the offered incentive amount, we found that a 20 € early bird cash incentive was sufficient to exploit the full potential of increasing response rates. A 50 € early bird cash incentive did not offer any significant advantage over the 20 € early bird cash incentive. Moreover, the 20 € early bird cash incentive was not only more cost-effective in recruiting panel members than the 50 € early bird cash incentive, but was also more cost-effective than providing no early bird incentive at all. The reason for this is that the early bird cash incentive led to higher panel registration rates and thus to lower costs per registered panel member.

Based on the results of our study, we can recommend using a 20 € early bird cash incentive in the postal mail recruitment of a probability-based online panel. However, more research is needed on several aspects of early bird cash incentives in the context of recruiting a probability-based online panel via postal mail. For example, in our experiment, we only tested a 20 € and a 50 € early bird cash incentive. Given that the 50 € early bird cash incentive did not provide a significant advantage over the 20 € early bird cash incentive, it can be expected that an even lower early bird incentive may suffice to increase response rates. Therefore, future

research should explore lower amounts of incentives, such as 5 € or 10 €. These lower amounts may also prove to be even more cost effective than the 20 € cash incentive.

Apart from studying further aspects of early bird cash incentives in postal mail online panel recruitments, future research should also explore whether the impact of this incentive type differs in other panel recruitment modes, such as face-to-face and/or telephone recruitment approaches. We expect that early bird incentives can have an even higher impact on response rates in interviewer-mediated panel recruitments, as the interviewers may be able to stress and promote the early bird incentives even better than can be done in a postal mail letter. Overall, in line with the emerging literature on early bird cash incentives in different survey contexts, our findings are encouraging and suggest that early bird cash incentives contribute to a successful online panel recruitment.

Appendix

Table A1. Response rates across the first year of GIP survey data collection waves after recruitment.

Group	Registration	Wave 1	Wave 3	Wave 4	Wave 5	Wave 6
Control	24.7%	23.7%	18.9%	18.5%	18.0%	17.7%
20€	29.4%	28.4%	22.7%	22.7%	22.7%	21.3%
50€	30.3%	29.6%	24.4%	23.7%	23.7%	22.7%
Total	27.4%	26.4%	21.3%	20.9%	20.7%	19.9%

Note: New registered panel members were invited to the first regular wave immediately after the sign-up. Respondents who completed the first wave by the end of October in 2018 were invited to participate in the second wave (November 2018) on November 1st. Sampled individuals who had registered in November or later were not invited to the second wave but were invited to the first wave. Since not every new panel member was invited to the second panel wave, second wave response rates are not reported in the Figure.

Table A2. Fieldwork Efforts Across Experimental Groups.

Experimental group	Total number of reminder letters per 1000 gross sample units	Total number of reminder letters per 1000 registered panel members
Control	1526	6183
20 €	1451	4809
50 €	1526	4644

Note: Number of reminders to both respondents and nonrespondents counted.

Table A3. Proportion of Speeders Across Experimental Groups.

	Control	20 €	50 €	Total	Prob>F
At specific questions:	%	%	%	%	
Technology stay up-to-date	13.12	12.14	11.02	12.25	0.6417
Internet usage	13.86	13.01	11.02	12.81	0.4572
Internet usage different activities	10.17	12.14	11.02	10.96	0.6566
Internet device	11.09	11.85	12.43	11.68	0.8255
More money	11.46	12.72	9.32	11.20	0.3519
Less money	11.65	12.43	8.76	11.04	0.2522
Technology trying is good	12.01	11.27	9.04	10.96	0.3705
Internet communication easier	12.57	11.27	11.58	11.93	0.8215
Internet threat privacy	9.80	11.85	9.89	10.39	0.5799
Internet trust quality news	11.28	12.14	9.60	11.04	0.5498
Internet anonymous opinion	12.57	12.72	10.45	12.01	0.5670
Problem solving devices	12.57	14.16	16.95	14.26	0.1866
Full questionnaire	9.61	10.40	9.32	9.75	0.8810

Note: Speeders were defined on the basis of the distribution of response times across all respondents (control, 20 €, 50 € and all other respondents in the survey). For the purpose of this analysis, all respondents who were faster than the overall fastest 10% were classified as speeders.

Declaration of Conflicting Interests

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Authors' Note

This article uses data from the German Internet Panel (GIP) 2018 recruitment and the following six waves (Wave 37, DOI: 10.4232/1.13584; Wave 38, 1 DOI: 0.4232/1.13391; Wave 39, DOI: 10.4232/1.13585; Wave 40, DOI: 10.4232/1.13463; Wave 41, DOI: 10.4232/1.13464; Wave 42, DOI: 10.4232/1.13465).

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Notes

1. The nine delayed PSUs were not included in our experiment for survey-practical reasons. They are widely spread across the country and there is no indication that the delay in data delivery affected our experiment in any way.

2. Please note: All newly registered panel members were invited to the first panel survey wave immediately after the sign-up. Respondents who completed the first wave by the end of October in 2018 were invited to participate in the second wave (November 2018) on November 1st. Sampled individuals who registered later were not invited to the second wave. Since not every new panel member was invited to the second panel survey wave, we do not report its response rate.
3. For a summary of the differential fieldwork efforts across experimental groups please consult Appendix Table A2.
4. In addition, we investigated whether the incentivized samples may differ from the control group in terms of the care respondents put into answering survey questions. Appendix Table A3 shows that the proportion of speeders (in total and for selected survey questions) did not differ significantly across experimental groups.

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