Understanding Society
Working Paper Series

No. 2023 – 08

March 2023

Short-term impact of increasing the value of unconditional and conditional incentives in *Understanding Society*

Pablo Cabrera-Álvarez[#] and Peter Lynn

Institute for Social and Economic Research, University of Essex

Corresponding Author.

Understanding Society
THE UK HOUSEHOLD LONGITUDINAL STUDY

UKRI Economic and Social Research Council

Short-term impact of increasing the value of unconditional and conditional incentives in *Understanding Society*

Pablo Cabrera-Álvarez and Peter Lynn
Institute for Social and Economic Research, University of Essex

In longitudinal studies, panel attrition and wave nonresponse threaten the quality of survey estimates. Previous research has found that some groups are more prone to attrition than others – for instance, people on lower incomes or ethnic minorities – which endangers the quality of the estimates produced with the survey data. Also, a continuous loss of participants in a longitudinal study reduces the sample size available for the analysis, harming the precision of the survey estimates and the possibility of studying small subgroups in the population.

In the last decades, scholars and practitioners have tested different response maximisation strategies, interventions designed to mitigate the adverse effects resulting from lack of cooperation. One of these strategies is survey incentives, which consist in offering a token to sample members to show appreciation for their effort and time. Survey incentives have been widely studied; however, when it comes to longitudinal studies, some questions about the performance of incentives remain unanswered. This paper, using data from an experiment embedded in wave 12 of *Understanding Society*, addresses one such question: What is the effect of increasing the value of a regular survey incentive after several annual waves (eleven, in this case) on response rates? We also look at whether the higher incentive prompted faster response, thereby potentially saving costs in the context of a design where initial nonrespondents are followed up with a home visit. Finally, we also explore the impact on sample composition.

In the experiment, half of the households in the sample were allocated to the control group receiving the usual £10 incentive, while the other half was randomly assigned to the treatment group, receiving a £20 incentive. The incentives were given unconditionally to the previous wave respondents and conditionally on participation to the nonrespondents. The increase in the value of the incentives resulted in a higher response rate only for the previous wave nonrespondents living in responding households, where at least one other adult completed the adult questionnaire. This effect on response rates did not translate into earlier responses or a change in the profile of the sample.

Short-term impact of increasing the value of unconditional and conditional incentives in *Understanding Society*

Pablo Cabrera-Álvarez and Peter Lynn
Institute for Social and Economic Research, University of Essex

Abstract: This paper explores the effect of increasing the value of survey incentives on response rates in the wave where the increase was applied using data from an experiment embedded in wave 12 of *Understanding Society*. We also investigate whether the higher incentives prompted faster response, which could reduce survey costs, and examine whether the increase in response rates altered the sample profile. In the experiment, the treatment group received £20 incentives instead of the usual £10 received by the control group. The results show that the positive impact of the higher incentive is restricted to the previous wave nonrespondents from households where at least one other adult had completed the interview in the last wave.

Keywords: survey incentives, conditional incentives, unconditional incentives, panel attrition, sequential mixed-modes.

JEL classification: C81, C83.

Acknowledgements: *Understanding Society* is an initiative funded by the Economic and Social Research Council and various Government Departments, with scientific leadership by the Institute for Social and Economic Research, University of Essex, and survey delivery by Kantar Public and NatCen Social Research. The UK Data Service distributes the research data.

Data Citation: Wave 1 to 11 data are available from the UK Data Archive: University of Essex, Institute for Social and Economic Research. (2021). Understanding Society: Waves 1-11, 2009-2020 and Harmonised BHPS: Waves 1-18, 1991-2009. [data collection]. 14th Edition. UK Data Service. SN: 6614, DOI: 10.5255/UKDA-SN-6614-15. Wave 12 data is also available from the UK Data Archive: University of Essex, Institute for Social and Economic Research. (2022). Understanding Society: Calendar Year Dataset, 2020. [data collection]. UK Data Service. SN: 8988, DOI: 10.5255/UKDA-SN-8988-1.

Corresponding Author: Pablo Cabrera-Álvarez, Institute for Social and Economic Research, University of Essex, Wivenhoe Park, Colchester, Essex CO4 3SQ, United Kingdom, pcabre@essex.ac.uk.

Introduction

In longitudinal studies, panel attrition and wave nonresponse threaten the quality of survey estimates. In the last decades, scholars and practitioners have tested different response maximisation strategies, interventions designed to mitigate the adverse effects resulting from lack of cooperation. One of these strategies is survey incentives, which have been shown to be effective in increasing response rates and reducing the dropouts in panel studies (Laurie & Lynn, 2009; Toepoel, 2012). However, in longitudinal studies, the value of incentives may change over time, which can affect their performance. This paper explores the effect of increasing the value of survey incentives on response rates in the wave where the increase was applied for the first time. We also investigate whether the higher incentives prompted response which, in a sequential mixed-mode design that starts with a web survey followed by an interviewer-administered mode, could reduce survey costs. Furthermore, we examine whether the increase in response rates altered the sample profile.

The use of incentives to encourage response in surveys has been extensively studied. Yet some aspects related to the implementation of incentives in longitudinal studies have received little attention. This is the case with regard to changing the value of survey incentives after a number of waves. When longitudinal studies extend over considerable periods of time, the real value of an incentive with a fixed nominal value reduces. As sample members may be aware of this and may therefore feel less well rewarded than at earlier waves, research teams have to decide whether and when to increase the nominal value of the incentive, and by how much. This paper provides new evidence about the reaction to a change in the value of incentives. Furthermore, the experiment was embedded in a wave affected by the covid-19 pandemic, where some participants were moved from CAPI to a web-first sequential mixed-modes design, while others had already experienced the web-first sequential mixed-modes design. This quasi-experimental setting allows us to explore whether the higher incentive helped to smooth the transition between modes.

This paper presents the results of an experiment embedded in wave 12 of *Understanding Society*. In the experiment, the last wave responding households, where at least the household questionnaire and one adult interview were completed, were allocated to two random groups. In the control group, the adults responding to the previous wave received the usual £10 unconditional incentive, included in the invitation mailing, while the nonrespondents were offered a £10 incentive

conditional upon participation. In the treatment group, the value of the unconditional and conditional incentives was raised from £10 to £20. The results show that doubling the incentive had a small effect on the last wave respondents but helped encourage response among the previous wave nonrespondents. The higher incentives did not result in faster response nor alter the sample profile.

In this report, first, we present an overview of relevant research on survey incentives in cross-sectional and longitudinal surveys. Then the experimental design and the methods are detailed. Finally, the results are presented and discussed.

Survey incentives

The general decline in response rates is one of the most studied threats to sample-based estimation (de Leeuw et al., 2018). Since the beginning of survey research, several interventions have been developed to mitigate the effects of nonresponse by increasing the likelihood of location, contact or cooperation. These interventions, called response maximisation strategies, cover the manipulation of some design features such as the number of contact attempts, the calling schedule, the mode or modes of contact or the use of incentives, among others (Lynn, 2017b). This paper focuses on the use of monetary incentives to encourage survey participation.

Different theories explain the causal relationship between monetary incentives and survey response. Economic exchange theory focuses on the calculation component derived from weighing the costs of participating in the survey and the benefits of it in such a way that the incentive should compensate for the time and effort required to participate in the survey (Ajzen & Fishbein, 1980). Social exchange theory states that individuals' actions are motivated by the expected returns that the action may generate (Dillman et al., 2014). This theory suggests that unconditional incentives would have a more significant effect as they activate the reciprocity mechanism – participants are more willing to accept the survey request after receiving something in exchange. Finally, leverage salience theory states that the characteristics of the survey design and contextual factors – including incentives – have a different weight on each individual when deciding on participation in the survey (Groves et al., 2000).

Research shows the effectiveness of survey incentives in increasing response rates in cross-sectional studies (see Singer & Ye, 2013; Toepoel, 2012). This positive effect on the propensity to respond has been found across different modes of administration: mail (e.g., Church, 1993;

Edwards et al., 2009; Jobber et al., 2004), face-to-face (e.g., Mercer et al., 2015; Singer et al., 1999), telephone (e.g., Gelman et al., 2003; Singer et al., 1999), and web (e.g., Göritz, 2006). However, the effectiveness of incentives also depends on their characteristics: conditionality, form (i.e. monetary or non-monetary) and value. Research indicates that unconditional incentives are more effective than conditional ones (e.g., Church, 1993; Messer & Dillman, 2011; Petrolia & Bhattacharjee, 2009; Toepoel, 2012). Regarding the form of the incentive, monetary incentives produce a larger increase in response rates than non-monetary incentives (e.g., donations to charities, lotteries or small gifts) (e.g., Church, 1993; Felderer et al., 2018; Göritz & Neumann, 2016; Ryu et al., 2006; Singer & Ye, 2013). In terms of their value, evidence points to a non-linear relationship between incentives amount and the probability of response in mail, face-to-face, and telephone modes (Mercer et al., 2015).

The higher response rates induced by incentives may also impact sample composition and survey costs. First, if the increase in response rate occurs disproportionately across sample subgroups, it can affect nonresponse bias. The evidence is mixed regarding this effect. In some experiments, no noticeable changes in sample composition have been identified (e.g., Hussemann et al., 2016; Suzer-Gurtekin et al., 2016), while in others, there has been a slightly positive effect (e.g., Felderer et al., 2018; McGonagle & Freedman, 2017; Wagner et al., 2017). Moreover, if the incentive can motivate participants to respond earlier, it may help to reduce the fieldwork efforts – the number of calls needed to reach the sample member or the length of the calls, and thus survey costs. Some studies have shown that incentives can help prompt a faster response, reducing fieldwork efforts and partly compensating for the cost of implementing the incentive (James, 1997; Lynn et al., 1998; Rodgers, 2002; Singer et al., 2000).

Incentives in longitudinal studies

Survey incentives have also been shown helpful in increasing response rates and reducing attrition in longitudinal studies (Booker et al., 2011). In these studies, participants are required to provide information more than once, representing a higher burden than in cross-sectional surveys. This reason would justify using incentives that help compensate for the effort and prevent future dropouts in panel surveys (Laurie & Lynn, 2009). From a design point of view, incentives in longitudinal studies have some differentiating features compared to their use in cross-sectional surveys. First, participants can receive many potential combinations of incentives over waves

because either the value or form of the incentive changes or because the study offers targeted incentives to sample subgroups. For instance, some studies offer different incentives based on the previous wave participation, resulting in multiple potential incentives that change over waves. Second, evaluating the effects of incentives has to consider both the wave in which they are implemented and future waves, as their effects may impact participants' expectations and future behaviour.

The evidence from experiments in longitudinal studies points to some differences compared to the cross-sectional studies. Cash incentives yield higher response rates than no incentive, but Booker and her colleagues (2011) found no clear distinction between cash and a gift of the same value in a meta-analysis of retention methods in panel studies. The inclusion of respondents in lotteries has been shown to be less effective than cash in reducing dropouts in several experiments (Booker et al., 2011; Felderer et al., 2018; Henderson et al., 2010), although Scherpenzeel *et al.* (2002) found that the completion rate of a biographical questionnaire increased after offering to enter in a lottery compared to no incentive in the wave 2 of Swiss Household Panel. Regarding charity donations, they seem to have a null effect on response rates (Felderer et al., 2018; Henderson et al., 2010; Lipps, 2010; Tzamourani, 2000).

Regarding the conditionality of the incentive, there is mixed evidence about which one is more effective in raising response rates and keeping attrition levels low. Castiglioni et al. (2008) experimented with €10 conditional and unconditional incentives in a three-wave face-to-face panel survey, finding that the conditional incentive increased response rates and reduced further panel attrition compared to the unconditional. In contrast, Jäckle and Lynn (2008) found unconditional incentives to be more effective in reducing attrition in a panel of young people in the UK. In the Innovation Panel of *Understanding Society*, Gaia (2017) compared the effect of a £30 unconditional incentive to a £10 unconditional plus a £20 conditional incentive to increase cooperation in a mixed-mode subsample. The differences between the two conditions were relatively small, but the unconditional incentive yielded higher response rates over waves 6 to 9.

The value of the incentives is another feature that impacts their effectiveness. Experiments that tested different amounts show that larger incentives result in higher response rates. James (1997) reported an experiment embedded in wave 1 of the Survey of Income and Program Participation (SIPP) in the US, where $20 and $10 unconditional incentives were compared to the absence of

incentives. The results showed that the $20 incentive had a positive effect on the response and, that this effect endured for the three waves analysed in the paper; in contrast, the $10 incentive was ineffective in increasing response rates. Later, in 2014, after redesigning the survey, another experiment compared the effect of $20 and $40 conditional incentives to no incentives, finding a significant difference between the $20 and $40 incentives (Westra et al., 2015). In the experiment of the Innovation Panel of *Understanding Society*, £30 unconditional and £10 unconditional plus £20 conditional were compared to a £10 conditional incentive. The objective of this experiment was to test whether higher incentives offered to the mixed-mode subsample could minimise the drop in response rates compared to the face-to-face subsample. The results showed that, while the £30 unconditional and £10 + £20 incentives increased the response rate in the mixed-mode subsample compared to the face-to-face subgroup, the £10 conditional incentive did not increase the response rate in waves 6 to 9 (Gaia, 2017).

In longitudinal studies, the positive effect of an incentive can endure for several waves, reducing panel attrition. For instance, Mack et al. (1998) analysed the impact of the $10 and $20 unconditional incentives tested at wave 1 of the SIPP over six waves. They found a positive effect of the $20 incentive reducing attrition over the period under assessment. Castiglioni et al. (2008) found that the positive impact of the conditional €10 incentive offered in wave one was upheld for the three waves of the study. Similarly, Jäckle and Lynn (2008) found that the effects of incentives offered at the recruitment stage lasted for at least three waves, and these long-term effects seemed independent of incentive treatments and mode of data collection in previous waves.

The incentive strategy in a longitudinal design is exposed to changes over time, which, in conjunction with the expectations generated in previous waves, may affect participants' behaviour. There are three possible changes in incentives in a panel survey, 1) the implementation of a new incentive; 2) the withdrawal of an incentive; 3) the change in the form, conditionality or amount of an incentive. Some experimental evidence shows that introducing a new incentive in a panel study might help increase response rates. For example, the previous wave nonrespondents of the National Longitudinal Survey of Young and Mature Women (US) were offered conditional incentives of $20 and $40 for the first time after 20 waves. Both incentives yielded higher response rates compared to the control group, which received no incentive (Zagorsky & Rhoton, 2008). Likewise, the withdrawal of an incentive does not negatively affect the response rates in the

subsequent waves (see Wong, 2020). For example, Lengacher (1995) found no negative effect of offering a sizeable end-of-the-game incentive to a subsample of refusing participants in the subsequent waves when they were offered the usual lower incentive.

This paper focuses on the effect of increasing the unconditional and conditional incentives that participants are offered in the course of a panel study. Although changes in the value of incentives are a recurrent practice in longitudinal studies, there have been a relatively small number of studies examining the effect of these changes on aspects such as response rates, attrition or the fieldwork efforts required to collect the data. In wave 14 of the British Household Panel Survey, incentives were raised from £7 to £10 for adults and from £4 to £5 for children. These changes increased response rates, especially among those who had not responded in the previous wave (Laurie, 2007). Similarly, the Health and Retirement Study (HRS) experimented with increasing incentives from $20 to $30 or $50. The results showed an increase in response rates for those who received the $50 incentive, an effect which persisted over the subsequent four waves (Rodgers, 2011). In wave 6 of the Innovation Panel of *Understanding Society*, increased incentives were offered to a subsample moved from a primarily face-to-face interview protocol to a web-first sequential mixed-modes design (Gaia, 2017). Although the analysis does not allow a direct evaluation of the effect of the change in the incentive value, participants receiving increased incentives in the mixed-mode condition had higher response propensities, consequently achieving similar response rates to the CAPI-only group.

Regarding the impact of the incentives on sample composition in longitudinal surveys, some experiments found no differences between treatment and control groups (Jäckle & Lynn, 2008; Westra et al., 2015). Others found that the incentives slightly reduced response bias by fostering response among the participants less likely to cooperate (McGonagle & Freedman, 2017). For instance, in the analysis of the increase in the BHPS incentive, Laurie (2007) found that the increased amount disproportionately improved the retention rate for male, younger, separated and divorced participants, who are more likely to drop out.

In this paper, we test the effect of increasing the value of the unconditional and conditional incentives received by participants from previous wave responding households. This evidence will contribute to knowledge on the short-term impact of changing the value of incentives in a longitudinal survey.

Research questions

The experiment presented in this paper evaluates the effect of an increase in value of the conditional and unconditional incentives received by sample members in previous wave responding households. The impact of the increase in the incentives is assessed looking at individual response, prompt household response – a proxy to explore the implications for survey costs – and sample composition.

Understanding Society uses a targeted incentive design based on the previous wave outcome. In this design, previous wave respondents receive an unconditional incentive, while the nonrespondents receive a conditional incentive (see methodology). The experiment covered panel members from the previous wave cooperative households, including previous wave respondents, receiving an unconditional incentive, and the nonrespondents living in households where at least one other member completed the household and adult questionnaires, being offered a conditional incentive. Panel members from households where none of the adults responded in the last wave were excluded from the experiment.

The primary purpose of the experiment was to test the effect of increased incentives on survey response. The increase in the value of the incentive was expected to reduce wave nonresponse in the short term and address panel attrition in the medium term. In this paper, we only focus on the short-term impact of the change in the incentive amount, covering the wave when the increase was implemented. The main question for this incentive refers to the final response rate (web + CATI), but we also examine the response at the end of the web stage of the fieldwork.

RQ 1.1) Does the higher incentive increase response rates at the web stage of the fieldwork?

RQ 1.2) Does the overall response propensity (web + CATI) increase for those receiving the higher incentive compared to the control group?

RQ 1.3) Does the effect of the higher incentive on response vary across sample subgroups?

The experiment, embedded in the wave 12 fieldwork, started in April 2020, overlapping with the covid-19 crisis in the United Kingdom. In the previous wave, most of the sample (70%) had been allocated to a sequential mixed-mode design combining web and CAPI. This protocol coexisted with a CAPI-only ring-fenced sample (20%) issued to CAPI, with a few cases completed on the telephone since the initial wave of the study. The pandemic forced the move of the whole sample

to a web-first and telephone sequential design. Previous research has shown that higher incentives can smooth the transition from CAPI to a web-first mixed-mode design, reducing the differences in response rates (Gaia, 2017). This analysis explores whether offering higher incentives would increase the response rate of those transitioning from CAPI to a web-first mixed-mode design.

> RQ 2) Does the higher incentive mitigate the difference in the response rates between those transitioning from CAPI to a web-first mixed-mode design and the panel members already in a web-first design?

The higher incentive could reduce fieldwork costs by encouraging prompt participation. This effect could occur because of the lower cost of a web survey compared to an interviewer-administered mode, CATI, in this case. We expect a higher incentive to increase the percentage of households where all sample members responded (i.e., full household response) during the first five-week web fieldwork time, reducing the number of households needing to be contacted by telephone interviewers.

> RQ 3) Does the full household response rate after the web-only fieldwork stage increase due to the higher incentive?

Finally, the effect of the incentives on response propensities could vary across sample subgroups. If the increase in the response propensities due to the higher incentive is distributed disproportionally across sample subgroups, the composition of the final sample could change. The third research question examines the relationship between the change in the incentive value and sample composition.

> RQ 4) Does the increase in the incentive produce a change in sample composition?

Data and methods

Understanding Society

Understanding Society, the United Kingdom Household Longitudinal Study (UKHLS) is a national probability survey started in 2009 that includes the former British Household Panel Survey (BHPS) since wave two. The UKHLS aims to cover individuals of all ages residing in the United Kingdom. The panel, which is representative of the United Kingdom, includes two boost samples, the Ethnic Minorities Boost (wave 1) and the Immigrant and Ethnic Minority Boost (wave 6) (Lynn, 2009; Lynn et al., 2018). The initial wave of the UKHLS included more than 40,000 households and 100,000 persons. Adults aged 16 or over are invited to participate in the survey every year alongside other household members.

The design of *Understanding Society* has evolved from a mainly face-to-face design to a sequential mixed-mode design. From waves one to six, households were issued to CAPI, with just a few completed on the phone during a mop-up period. The web mode was offered first at wave 7 to wave six nonrespondents. Since wave eight, an increasing number of panel members have been allocated to a sequential mixed-mode design combining web, followed by CAPI for nonrespondents. Before the covid-19 pandemic, three fieldwork protocols coexisted in the survey: 1) a random subsample of 20% of households were issued to CAPI-only ("ring-fenced CAPI"); 2) most other households (70% of the total) were subject to a sequential mixed-mode "web-first" strategy; 3) households outside of the ring-fenced CAPI group but with a low predicted propensity to respond online (Lynn, 2017a), constituting 10% of the total, were allocated to a "CAPI-first" mixed-mode design.

The study uses a targeted incentive strategy based on the previous wave outcome at the household and individual levels. Table 1 summarises the incentive strategy in *Understanding Society* extant prior to the experiment reported here (i.e. until the third month of wave 12, March 2020): the previous wave respondents received a £10 unconditional incentive, while the previous wave nonrespondents living with them were offered a £10 conditional incentive. Last wave nonrespondents in households where no one completed the survey in the previous wave were offered a £20 conditional incentive. In addition, a £10 early-bird bonus was offered to all those completing the survey online during the first five weeks of the field period.

Table 1. Incentive strategy in wave 12 of *Understanding Society*

Previous wave household outcome:	**Responding household**		**Non-responding household**
Previous wave adult interview outcome:	**Responding adult and rising 16**	**Non-responding adult and new entrants**	**Non-responding adult, rising 16 and new entrants**
Unconditional incentive	£10	None	None
Incentive **conditional** on completing individual questionnaire	None	£10	£20
Early-bird incentive conditional on completing web questionnaire during first 5 weeks of fieldwork (web-first protocol only)	£10	£10	£10

The incentives had the form of a *love2shop* gift card valid in some of the most common retailers in the UK. The gift card was included in the invitation letter for those receiving the unconditional incentive and sent after survey completion for the recipients of the conditional incentive.

Experimental design

The *Understanding Society* sample is divided randomly into monthly samples for fieldwork management purposes. The higher incentives experiment was carried out at wave 12 on six monthly samples, those fielded from April to September 2020. The experiment was affected by the outbreak of the covid-19 pandemic, which caused the whole sample to be moved to a web-first sequential mixed-mode strategy combining a web survey and, for initial nonrespondents, a telephone interview (Burton et al., 2020). The social consequences of covid-19, including the general lockdown decreed in the UK, could have affected how participants reacted to the higher incentives. For instance, in a situation of growing economic uncertainty, a higher incentive could be more attractive to some panel members, like those on lower incomes, than it might have been at another time.

For the experiment, previous wave responding households were randomly allocated to the control and higher incentive groups (Table 2). The participants in the control group received the usual £10 unconditional or conditional incentive depending on their previous wave outcome plus a £10 early bird bonus conditional on completing the individual web questionnaire in the first five weeks of the fieldwork. In the second group, "higher incentive" (HI), previous wave respondents received

an unconditional incentive of £20, double that of the control group, while the nonrespondents that lived with them received a £20 conditional incentive, also double that for their counterparts in the control group. Sample members from households where no one participated in the survey at the previous wave were excluded from the experiment – and from our analysis – and all of them were offered the usual £20 conditional incentive.

Table 2. Summary of the experimental design

	Control		**Higher incentive**	
Previous wave adult interview outcome:	**Responding adult and rising 16**	**Non-responding adult and new entrants**	**Responding adult and rising 16**	**Non-responding adult and new entrants**
Unconditional incentive	£10	None	**£20**	None
Incentive **conditional** on completing individual questionnaire	None	£10	None	**£20**
Early-bird incentive conditional on completing web questionnaire during first 5 weeks of fieldwork	£10	£10	£10	£10
N (participants)	3,293		3,354	

Note: Experiment restricted to previous wave responding households.

The invitation letter and email contained references to the increase in the incentive for those allocated to the treatment condition. Figure 1 presents the text excerpt referring to the incentives in the letters sent to participants in the control and treatment conditions.

Control group: Unconditional incentive
We're very grateful that you take part in Understanding Society. To say thank you we've enclosed a £10 gift card which is activated and ready for you to use. If you're able to complete your interview online by [DATE] we will send you an extra £10 gift card as a thank you for completing your survey early.
Control group: Conditional incentive
We're very grateful that you take part in Understanding Society. To say thank you, if you're able to take part this year we will give you a £10 gift card. If you're able to complete your interview online by [DATE] we will send you an extra £10 gift card as a thank you for completing your survey early.

Higher incentive: Unconditional incentive
We're very grateful that you take part in Understanding Society. To say thank you for your long-term contribution we've increased the gift card amount for you this year. Please find enclosed a £20 gift card which is activated and ready for you to use. If you're able to complete your interview online by [DATE] we will send you an extra £10 gift card as a thank you for completing your survey early.
Higher incentive: Conditional incentive
We're very grateful that you take part in Understanding Society. To say thank you, if you're able to take part this year we'll give you a £20 gift card. If you're able to complete your interview online by [DATE] we will send you an extra £10 gift card as a thank you for completing your survey early.

Figure 1. Excerpts of the text referred to the incentives included in the letters and emails sent to participants.

Methods and variables

The first set of research questions addresses the effect of the higher incentives on response rates after the five weeks of web-only fieldwork and at the end of fieldwork (RQs 1.1 to 1.3 and RQ 2). We present response rates for the control and treatment groups, both for previous wave respondents (who received an unconditional incentive) and for previous wave nonrespondents from responding households (who were offered a conditional incentive).

While the effect of the higher incentives is of interest both for those receiving the conditional incentives and for those receiving the unconditional incentives, we cannot compare the effect between the two groups. As panel members were not randomly allocated to the conditional and unconditional incentives, it is not possible to identify whether any differences in effect are due to the conditionality of the incentive or the previous wave response propensity. Also, in households of two or more adults, the reaction to the higher incentive could influence the other panel members in the household. Therefore, in this experiment, we evaluate the joint effect of increasing the survey incentives for households where at least one adult responded at the previous wave.

We also analysed the effect of the higher incentives for some sample subgroups defined by a set of demographic and previous participation moderators. To explore these heterogeneous effects, we fitted two sets of logistic regression models: 1) simple models, which only included the moderator, the experimental group flag and the interaction between the two; 2) multivariate

models, which included all the moderators and the interaction terms with the experimental flag. The reason for producing both sets of models – simple and multivariate – is due to the level of missingness in some of the moderators. In principle, we would prefer to present the controlled estimates of the treatment effects because they account for the effect of the other moderators and, if the moderators explain the outcome, the model estimates would be more accurate (i.e. smaller standard errors). However, for some of the moderators, such as individual income or education, we do not have information for all sample members; specifically, we are more likely to lack that information for previous wave nonrespondents, an essential subgroup in the analysis. In both sets of models, the dependent variables were response at the end of the 5-week web fieldwork and final response at the end of fieldwork. These models were fitted for two sample subgroups: 1) the last wave respondents, who received the unconditional incentive, and 2) the last wave nonrespondents from responding households, who received the conditional incentive. The estimates from the simple models are presented in the results section, while the effect estimates from the multivariate models are in appendix 1.

In this analysis, we have used moderators that might help understand the relationship between the change in the incentive value and the response propensities. In other words, we expected that some sample subgroups might react differently to the incentives. These moderators lie in two groups: demographic characteristics and variables that measure past participation in the study. Regarding the demographic moderators, we included sex and age since previous analyses have shown that these characteristics moderate the effect of increasing the incentive (Laurie, 2007). Also, ethnic background, education and personal income have been found to moderate the effect of incentives in other experiments (Mack et al., 1998). In the context of a longitudinal study, past participation can also help explain the impact of the incentives. In the analysis, we included an indicator of whether the participant is a regular respondent, i.e. responded to at least two-in-three of the waves to which they had been invited.

The second research question addresses whether the higher incentive helped the CAPI-only subgroup to transition to the web-first sequential mixed mode. To answer this question, we compared the performance of the higher incentive in the web-first subsample to the analogous group of the CAPI ring-fenced subsample, which transitioned from CAPI single-mode to web and CATI mixed-mode at wave 12.

The third research question examines the effect of a higher incentive on fieldwork efforts as a proxy of its impact on survey costs (RQ 3). With a web-interviewer-administered sequential mixed-mode design, households in which all members respond online in the initial phase would not need to be issued to interviewers, reducing fieldwork efforts and saving costs. In our study, the cost saved as a result of any increase in complete household response rate is that of telephone interviewers attempting contacts and conducting interviews, but were it not for the covid-19 pandemic the cost saved would have included also travel time and expenses for field interviewers to visit respondent homes. We used a logistic regression model to assess whether an increase in the incentive could boost the full household response rate after the web-only phase and, consequently reduce the fieldwork efforts during the interviewer-administered fieldwork phase.

Finally, we compared the final sample composition across experimental groups for a set of wave 12 target variables (RQ 4). This analysis included demographics, attitudinal and health-related variables. All the analyses reported in this paper were weighted to account for the unequal selection probabilities of the sample allocated to quarters two and three.

Results

This section presents the main results of the experiment, focusing, first, on the impact of the higher incentives on individual response rates; then, we present the findings related to household response after the web-only phase and sample composition.

Response rates

Table 3 presents the response rates for the control and higher incentives groups for all members of previous wave responding households, for respondents to the previous wave individual interview and for the nonrespondents in responding households. The response rate for the group receiving a higher incentive was 1.2 p.p. higher after the web stage and 2.3 p.p. higher at the end of the fieldwork. However, neither of these differences were statistically significant at the 95% level. The higher incentive helped increase the response rate at the end of the fieldwork for the last wave nonrespondents from responding households. This subgroup was offered a higher conditional incentive, and their response rate increased by 7.7 p.p. compared to the control group. In contrast, the higher unconditional incentive sent to the previous wave respondents did not achieve a significantly higher response rate, though the estimated effect size was +2,1 p,p.

Table 3. Individual response rates for the experimental groups; individuals in previous wave responding households

	Web			Web + CATI			
	Control	**HI**	**Dif.**	**Control**	**HI**	**Dif.**	**N**
All in previous wave responding households	59.7	60.9	1.2	79.0	81.3	2.3	6,647
	(1.3)	(1.3)	(1.8)	(1.1)	(1.1)	(1.5)	
Previous wave individual response							
Respondents							
(Unconditional incentive)	65.0	66.1	1.1	85.8	87.8	2.1	5,784
	(1.3)	(1.3)	(1.8)	(0.9)	(0.9)	(1.3)	
Nonrespondents							
(Conditional incentive)	15.6	20.5	4.9	23.3	31.0	7.7*	863
	(2.1)	(2.3)	(3.1)	(2.6)	(2.8)	(3.8)	

Sig. * $p < .05$, ** $p < .01$, *** $p < .001$.

In addition to the main effects of the higher incentives on response, we also explored their impact across the groups formed by a set of moderators (Table 4). These results are presented for two subpopulations: the previous wave respondents, who received the higher unconditional incentive and the previous wave nonrespondents from responding households, who were offered the higher

conditional incentive. Among the previous wave respondents, only those aged 30-44 showed a statistically significant higher response propensity (8.9 p.p.) after receiving the higher unconditional incentive at the end of the web fieldwork. After the CATI fieldwork, people of white British origin presented a 2.5 p.p. higher response rate when offered the higher incentive.

The effect of the higher incentive was more pronounced for those who did not participate in the previous wave and received a conditional incentive at wave 12. The positive effect of the higher incentive after the conclusion of the web fieldwork was significant for females (14.0 p.p.). At the end of the fieldwork, females (16.3 p.p.), participants aged 45-64 (16.2 p.p.) and regular respondents (18.0 p.p.) assigned to the higher conditional incentive condition exhibited higher response rates than the control group. Note that these estimates were not controlled for the effect of the other moderators. The estimates from the multivariate models that control for all moderators simultaneously were consistent with those in Table 4.

Table 4. Heterogeneous effects of the higher incentive by moderators for previous wave respondents and previous wave nonrespondents from responding households

	Previous wave respondents (Unconditional incentive)			Previous wave nonrespondents (Conditional incentive)		
	Web	**Web+CATI**	**N**	**Web**	**Web+CATI**	**N**
Sex						
Male	0.029	0.030		-0.013	0.018	
	(0.022)	(0.018)	2,560	(0.034)	(0.044)	526
Female	-0.004	0.013		**0.140***	**0.163****	
	(0.020)	(0.013)	3,222	**(0.056)**	**(0.063)**	337
Age groups						
16-29	0.018	-0.003		0.034	0.065	
	(0.046)	(0.041)	925	(0.049)	(0.058)	391
30-44	**0.089***	0.042		0.011	-0.006	
	(0.039)	(0.030)	1,096	(0.082)	(0.087)	144
45-64	-0.009	0.019		0.093	**0.162***	
	(0.025)	(0.016)	2,035	(0.054)	**(0.064)**	229
65+	-0.003	0.025		0.057	0.030	
	(0.029)	(0.021)	1,728	(0.071)	(0.086)	96
Education						
No degree	0.013	0.026		0.045	0.066	
	(0.056)	(0.016)	4,154	(0.050)	(0.048)	473
Degree	0.000	-0.001		0.022	0.068	
	(0.029)	(0.017)	1,609	(0.061)	(0.070)	136
Ethnic background						
Ethnic minority	-0.001	-0.007		0.055	0.106	
	(0.056)	(0.047)	824	(0.050)	(0.066)	299
White British	0.013	**0.025***		0.045	0.066	
	(0.018)	**(0.012)**	4,960	(0.037)	(0.044)	564
Individual income						
Q1	-0.005	0.010		-0.004	0.046	
	(0.034)	(0.027)	1,372	(0.051)	(0.063)	236
Q2	0.030	0.021		0.109	0.068	
	(0.031)	(0.022)	1,418	(0.062)	(0.078)	133
Q3	0.000	0.025		0.040	0.141	
	(0.030)	(0.022)	1,515	(0.071)	(0.092)	120
Q4	0.017	0.024		0.065	0.060	
	(0.026)	(0.018)	1,479	(0.086)	(0.091)	133
Response pattern						
Irregular respondent	0.016	0.039		0.027	0.042	
	(0.060)	(0.066)	411	(0.029)	(0.035)	663
Regular respondent	0.009	0.017		0.114	**0.180***	
	(0.017)	(0.011)	5,373	(0.080)	**(0.081)**	200

Sig. * $p < .05$, ** $p < .01$, *** $p < .001$. These estimates are marginal effects expressed as proportions from a set of logistic regression models that included each moderator, the experimental allocation variable and the interaction term.

Transitioning modes and higher incentives

The experiment allows us to explore the effect of the change in the incentive amount on the response rates for those transitioning from CAPI to a web-first mode due to the covid-19 pandemic versus those already in a web-first design. Table 5 presents the response rates for the (previously) web-first households and for the equivalent group amongst the previously CAPI-only (ring-fenced) households. The effect size of the higher incentive on response rates at the end of the fieldwork was greater amongst the CAPI-only sample who were transitioning to web-first for the first time than amongst the previously web-first sample. This was true both for previous wave respondents (+4.6 p.p., compared to +1.8 p.p.) and for previous wave nonrespondents (+19.7 p.p., compared to +7.3 p.p.), As a consequence, final response rates for previous wave respondents with the higher incentive were slightly higher amongst the CAPI-ring fenced sample, whereas with the control treatment they were slightly higher amongst the web-first sample. The reverse was true after the web phase of fieldwork. At that point effect sizes of the increased incentive were greater for the previously web-first sample (+2.5 p.p. v -3.3 p.p. for previous wave respondents; +6.9 p.p. v +4.0 p.p. for previous wave nonrespondents). However, none of these differences was significant at the 95% level.

Table 5. Heterogeneous effects by previous wave fieldwork protocol for previous wave respondents and nonrespondents from responding households

	Web			Web + CATI			
	Control	**HI**	**Dif.**	**Control**	**HI**	**Dif.**	**N**
Previous wave respondents							
Web-first	69.2	71.7	2.5	86.9	88.6	1.8	
	(1.5)	(1.4)	(2.0)	(1.0)	(1.0)	(1.4)	4,152
CAPI ring-fenced	67.4	64.1	-3.3	85.4	90.0	4.6	
	(3.0)	(3.2)	(4.3)	(2.2)	(1.8)	(2.8)	863
Previous wave nonrespondents							
Web -first	12.9	19.7	6.9	22.4	29.6	7.3	
	(2.3)	(2.7)	(3.6)	(3.1)	(3.2)	(4.5)	611
CAPI ring-fenced	25.9	30.0	4.0	26.8	46.5	19.7	
	(6.3)	(7.3)	(9.8)	(6.4)	(8.2)	(10.5)	126

Sig. * $p < .05$, ** $p < .01$, *** $p < .001$. These estimates are predicted from a logistic regression model that included the last wave fieldwork protocol and the interaction term with the experimental allocation. The estimates in this table are from the high web propensity subsample of the CAPI ring-fenced sample, using the same definition that was used to separate the web-first from the CAPI-first web protocols. Thus, 87.5% of the overall sample are included in this analysis.

Household response and fieldwork efforts

Table 6 presents the complete household response rates (all individuals in the household having completed an individual interview) for the control and higher incentive groups before the onset of the CATI fieldwork phase. The difference in complete household response rate between these two groups was 3.6 p.p. but not significant. The positive effect of the higher incentive was more pronounced (4.7 p.p.) for households allocated to the web-first protocol at the previous wave, while for households transitioning from CAPI-only to web-first, the increased incentive induced a slight but not significant drop in response rate (-1.3 p.p.).

Table 6. Full household response rate after 5-week web fieldwork by experimental group.

	Control	HI	Dif.	N
Previous wave responding households	45.6	49.3	3.6	
	(1.4)	(1.4)	(2.0)	3491
Previous wave fieldwork protocol				
Web-first	46.9	51.5	4.7*	
	(1.6)	(1.6)	(2.2)	2725
CAPI ring-fenced	44.0	42.7	-1.3	
	(3.2)	(3.2)	(4.5)	590

Sig. * $p < .05$, ** $p < .01$, *** $p < .001$. The base for the calculations is last wave responding households issued to wave 12 fieldwork (quarters 2 and 3) – weighted estimates. These estimates are predicted from a logistic regression model that included the last wave fieldwork protocol and the interaction term with the experimental allocation. The estimates in this table for the CAPI ring-fenced sample exclude the 12.5% low web propensity subsample, using the same definition that was used to separate the web-first from the CAPI-first web protocols.

Sample balance

The composition of the sample of respondents did not differ between the experimental groups (Table 7). This was foreseeable given the low impact of the higher incentives on the response rates for previous wave respondents, who constituted the majority of the survey participants.

Table 7. Profile of the sample of respondents by experimental group

		Control	HI	
Gender				*χ2 (1)= 0.511*
	Male	43.8	43.0	*F (1.00, 689.00)= 0.474*
	Female	56.2	57.0	*p = 0.491*
Age				*χ2 (3)= 0.221*
	16-29	12.3	12.4	*F (2.83, 1952.25)= 0.030*
	30-44	13.9	14.2	*p = 0.991*
	45-64	37.5	37.4	
	65+	36.3	36.0	
Ethnic background recoded				*χ2 (4)= 1.853*
	White British	89.5	89.6	*F (3.12, 2151.67)= 0.226*
	Black	1.2	1.1	*p = 0.885*
	Asian	4.2	3.9	
	Other white, mixed, and others	5.1	5.4	
	Missing	0.0	0.1	
Marital status				*χ2 (4)= 4.970*
	Single or civil partnership	24.0	25.4	*F (3.80, 2616.25)= 0.530*
	Married or civil partnership	56.9	55.0	*p = 0.705*
	Separated or divorced	11.3	10.8	
	Widowed	7.5	8.4	
	Missing	0.4	0.4	
Children				*χ2 (1)= 1.255*
	No	83.0	84.0	*F (1.00, 689.00)= 0.449*
	Yes	17.0	16.0	*p = 0.503*
Urban or rural area, derived				*χ2 (1)= 3.816*
	Urban area	73.5	71.5	*F (1.00, 689.00)= 1.043*
	Rural area	26.5	28.5	*p = 0.307*
Highest qualification				*χ2 (5)= 8.305*
	Degree	28.5	29.9	*F (4.85, 3339.24)= 0.794*
	Other higher	12.9	14.0	*p = 0.55*
	A level etc	20.7	18.6	
	GCSE etc	20.0	19.3	
	Other or no qual	17.7	17.8	
	Missing	0.3	0.4	
Long-standing illness or disability				*χ2 (2)= 0.749*
	Yes	37.7	38.0	*F (1.98, 1365.76)= 0.166*
	No	62.1	61.8	*p = 0.845*
	Missing	0.2	0.2	

Table 7 (Continued)

	Control	HI	
Long-standing illness or disability			*χ2 (2)= 0.749*
Yes	37.7	38.0	*F (1.98, 1365.76)= 0.166*
No	62.1	61.8	*p = 0.845*
Missing	0.2	0.2	
General health			*χ2 (5)= 12.125*
Excellent	8.0	9.2	*F (4.89, 3370.40)= 1.118*
Very good	34.9	33.4	*p = 0.348*
Good	35.3	34.9	
Fair	15.1	16.5	
Poor	6.4	5.5	
Missing	0.3	0.5	
Benefit recipient			*χ2 (2)= 9.783*
Benefits recipient	29.1	30.8	*F (1.99, 1369.39)= 1.994*
No benefits	69.6	68.5	*p = 0.137*
Missing	1.3	0.7	
N	2,644	2,785	

Discussion

This paper has presented an experiment embedded in wave 12 of *Understanding Society* to test the effect of increasing the value of conditional and unconditional incentives on response rates. Also, we addressed two related questions: whether faster response caused by the increase in the incentives could bring a saving in fieldwork efforts and whether the higher response rates could alter the sample composition. The experiment raised the value of the incentives – from £10 to £20 – to the last wave respondents receiving an unconditional incentive and the last wave nonrespondents living in responding households, who were offered a conditional incentive.

Increasing the unconditional and conditional incentives did not produce a substantial change in the response rates. The slight positive effect of the higher incentive observed among the panel members from the previous wave responding households (2.3 p.p.) was not significant. The previous wave nonrespondents exhibited a higher response rate (7.7 p.p.) after the increase in the amount of the conditional incentive, while the previous wave respondents receiving the higher unconditional incentive had a response rate 2.1 p.p. higher than the control group, a difference that was not significant.

Two different mechanisms can explain the connection between higher incentives and an increase in response rates. First, social exchange theory states that participants appreciate an increase in the amount of the incentive as a reward for their loyalty to the study, which would enhance the reciprocity mechanism (Dillman et al., 2014). In this theory, the fundamental factor is that the value has increased no matter the exact amount. The findings of Laurie (2007) showed that a slight increase from £7 to £10 in the incentives could positively affect response rates. Second, economic exchange theory (Ajzen & Fishbein, 1980) posits that the amount by which the incentive is increased is crucial to determining its effect on the response rates. In this vein, Rodgers (2011) found that the size of the increase explained the change in response rates in the HRS. In the experiment presented in this paper, a substantial increase in the incentive, from £10 to £20, did not produce a significant difference in the response rate. In principle, this finding seems to align more with the results in Rodgers (2011), although we would need an extension of the experiment, including other amounts, to confirm the role of the value of the incentive.

The results of Laurie (2007) and Rodgers (2011) agree that increasing the value of the incentives had a prominent effect on the previous wave nonrespondents. This is partly explained because, in

longitudinal studies, the response rates of the previous wave respondents tend to be high, leaving little room for improvement. The results of this experiment are consistent with the findings of Laurie (2007) and Rodgers (2011) with two caveats. First, this experiment only included the previous wave nonrespondents living in households where at least one other adult had participated in the previous wave. This group might differ from the nonrespondents living in households where no one completed the adult questionnaire in the previous wave. Second, the whole-household design of *Understanding Society* (all household members are sample members) means that we cannot isolate the effect of offering a particular incentive to a particular household member. In other words, individuals may be influenced in their response behaviour not only by the incentive offered to them personally but also by the incentives offered to other household members. We can conclude that offering higher incentives to all household members has a stronger positive effect on previous wave nonrespondents than on previous wave respondents; we cannot conclude that the same effect would be obtained for previous wave nonrespondents if the increase in incentive value were offered only to the previous wave nonrespondents and not to the previous wave respondents.

This analysis also explored whether any effect of the higher incentive might differ between sample groups. In the case of the last wave respondents, only sample members of white British origin exhibited a slightly higher response rate after receiving the higher unconditional incentive. On the other hand, amongst previous wave nonrespondents – from responding households – the increased incentive improved response rates for females (by 16.3 p.p.) but not for males, for participants aged 45-64 (by 16.2 p.p.) but not for other age groups, and for regular respondents (by 18.0 p.p.). The finding for regular respondents is particularly interesting. These are people who had participated in at least two-thirds of the waves at which they were eligible for an adult interview, but not at the previous wave. Such sample members may be particularly susceptible to an additional/improved persuasion technique such as an increased incentive and could usefully be the subject of targeted designs.

The second research question addressed whether the higher incentives helped those allocated to a CAPI mode in the previous waves transition to a web-first design. The findings show that incentives increased the response rates more for the group transitioning from CAPI compared to those already offered a web mode in wave 11, although the differences were not statistically

significant. This is in line with the conclusions of Gaia (2017), who showed that incentives were effective in keeping response rates higher among those transitioning from CAPI to the web.

We also examined whether higher incentives could encourage sample members to response more promptly to an extent that fieldwork efforts and cost could be saved in a web-first sequential mixed-mode design. In household surveys, where all adults in the household are invited to participate, substantial cost savings are achieved only if all household members participate online before the interviewer-administered phase begins. The change in the incentive value slightly increased the full household response rate at the end of web fieldwork, but the 3.6 p.p. difference was not significant. This difference was larger (4.7 p.p.) and significant for the subsample of households that were allocated to a web-first design at the previous wave, in contrast to the households transitioning from a CAPI-only design to the web. In the case of the increase examined in this experiment, the savings derived from the reduction in fieldwork efforts at this wave might not compensate for the cost of the higher incentives and their implementation. Yet in light of the evidence that points to the long-term effects of incentives in longitudinal studies (Castiglioni et al., 2008; Jäckle & Lynn, 2008; Mack et al., 1998; Rodgers, 2011), the savings could possibly outweigh the costs over multiple waves. This requires further assessment.

Higher incentives have the potential to alter the sample composition if response propensities are differentially affected between sample groups. However, examination of the sample distribution with respect to ten variables revealed no differences in the sample profile between experimental groups. This result is not surprising considering the overall small effect of the higher incentives on response propensities and is consistent with the findings of Jäckle and Lynn (2008) and Westra et al. (2015).

This experiment has limitations. First, we are not able to disentangle effects of the incentive conditionality from effects of past response behaviour; we can only draw conclusions about the effects of increasing the value of incentives in the context of offering unconditional incentives to previous wave respondents and conditional incentives to previous wave nonrespondents. Second, we must note that in a household-based survey such as ours, response behaviour can be influenced by the survey protocol administered to other household members. For instance, the reaction of previous wave respondents to a higher incentive could have been influenced by seeing that the increase was also granted to the nonrespondents. Third, since the experiment started in April 2020,

the covid-19 lockdown might have produced an unusual survey-taking context, casting doubt on the generalisability of the findings.

References

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Prentice Hall.

Booker, C. L., Harding, S., & Benzeval, M. (2011). A systematic review of the effect of retention methods in population-based cohort studies. *BMC Public Health*, *11*(1), 249. https://doi.org/10.1186/1471-2458-11-249

Burton, J., Lynn, P., & Benzeval, M. (2020). How Understanding Society: The UK Household longitudinal study adapted to the COVID-19 pandemic. *Survey Research Methods*, *14*(2), 235–239. https://doi.org/10.18148/srm/2020.v14i2.7746

Castiglioni, L., Pforr, K., & Krieger, U. (2008). The Effect of Incentives on Response Rates and Panel Attrition: Results of a Controlled Experiment. *Survey Research Methods*, *2*(3), 151–158. https://doi.org/10.18148/srm/2008.v2i3.599

Church, A. H. (1993). Estimating the Effect of Incentives on Mail Survey Response Rates: A Meta-Analysis. *Public Opinion Quarterly*, *57*(1), 62. https://doi.org/10.1086/269355

de Leeuw, E., Hox, J., & Luiten, A. (2018). International Nonresponse Trends across Countries and Years: An analysis of 36 years of Labour Force Survey data. *Survey Insights: Methods from the Field*, 11. https://doi.org/10.13094/SMIF-2018-00008

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, Phone, Mail, and Mixed-Mode Surveys. The Tailored Design Method.* (4th ed.). Wiley & Sons.

Edwards, P. J., Roberts, I., Clarke, M. J., DiGuiseppi, C., Wentz, R., Kwan, I., Cooper, R., Felix, L. M., & Pratap, S. (2009). Methods to increase response to postal and electronic questionnaires. *Cochrane Database of Systematic Reviews*, *2010*(1). https://doi.org/10.1002/14651858.MR000008.pub4

Felderer, B., Müller, G., Kreuter, F., & Winter, J. (2018). The Effect of Differential Incentives on Attrition Bias: Evidence from the PASS Wave 3 Incentive Experiment. *Field Methods*, *30*(1), 56–69. https://doi.org/10.1177/1525822X17726206

Gaia, A. (2017). The Effect of Respondent Incentives on Panel Attrition in a Sequential Mixed-mode Design. *Understanding Society Working Papers*, *2017*(3).

Gelman, A., Stevens, M., & Chan, V. (2003). Regression Modeling and Meta-Analysis for Decision Making: A Cost-Benefit Analysis of Incentives in Telephone Surveys. *Journal of Business & Economic Statistics*, *21*(2), 213–225. https://doi.org/10.1198/073500103288618909

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

Göritz, A. S., & Neumann, B. P. (2016). The longitudinal effects of incentives on response quantity in online panels. *Translational Issues in Psychological Science*, *2*(2), 163–173. https://doi.org/10.1037/tps0000071

Groves, R. M., Singer, E., & Corning, A. (2000). Leverage-Saliency Theory of Survey Participation. *Public Opinion Quarterly*, *64*(3), 299–308. https://doi.org/10.1086/317990

Henderson, M., Wight, D., Nixon, C., & Hart, G. (2010). Retaining young people in a longitudinal sexual health survey: A trial of strategies to maintain participation. *BMC Medical Research Methodology*, *10*(1), 9. https://doi.org/10.1186/1471-2288-10-9

Hussemann, J. M., Mortimer, J. T., & Zhang, L. (2016). Exploring the Correlates of Parental Consent for Children's Participation in Surveys: An Intergenerational Longitudinal Study. *Public Opinion Quarterly*, *80*(3), 642–665. https://doi.org/10.1093/poq/nfw012

Jäckle, A., & Lynn, P. (2008). Respondent incentives in a multi-mode panel survey: Cumulative effects on nonresponse and bias. *Survey Methodology*, *34*(1), 105–117.

James, T. L. (1997). Results of the wave 1 incentive experiment in the 1996 survey of income and program participation. *Proceedings of the American Statistical Association, Section on Survey Research Methods*, 834–839.

Jobber, D., Saunders, J., & Mitchell, V.-W. (2004). Prepaid monetary incentive effects on mail survey response. *Journal of Business Research*, *57*(4), 347–350. https://doi.org/10.1016/S0148-2963(02)00385-5

Laurie, H. (2007). The effect of increasing financial incentives in a panel survey: An experiment on the British Household Panel Survey, Wave 14. *ISER Working Papers Series*, *2007*(05), 26.

Laurie, H., & Lynn, P. (2009). The Use of Respondent Incentives on Longitudinal Surveys. In P. Lynn (Ed.), *Methodology of Longitudinal Surveys* (pp. 205–233). John Wiley & Sons, Ltd. https://doi.org/10.1002/9780470743874.ch12

Lengacher, J. E., Sullivan, C. M., Couper, M. P., & Groves, R. M. (1995). Once reluctant, always reluctant? Effects of differential incentives on later survey participation in a longitudinal study. *Proceedings of the American Statistical Association, Section on Survey Research Methods*, 1029–1034.

Lipps, O. (2010). Effects of different Incentives on Attrition and Fieldwork Effort in Telephone Household Panel Surveys. *Survey Research Methods*, *4*(2), 10.

Lynn, P. (2009). *Sample Design for Understanding Society—Understanding Society Working Paper 2009-01*.

Lynn, P. (2017a). *Pushing household panel survey participants from CAPI to web*. 28th International Workshop on Household Survey Nonresponse, Utrecht.

Lynn, P. (2017b). From standardised to targeted survey procedures for tackling non-response and attrition. *Survey Research Methods*, *Vol 11*, 93-103. https://doi.org/10.18148/SRM/2017.V11I1.6734

Lynn, P., Nandi, A., Parutis, V., & Platt, L. (2018). Design and implementation of a high-quality probability sample of immigrants and ethnic minorities: Lessons learnt. *Demographic Research*, *38*(1), 513–548. https://doi.org/10.4054/DemRes.2018.38.21

Lynn, P., Thomson, K., & Brook, L. (1998). An experiment with incentives on the British Social Attitudes Survey. *Survey Methods Newsletter*, *18*(2), 12–14.

Mack, S., Huggins, V., Keathley, D., Sundukchi, M., & Mack, S. (1998). Do monetary incentives improve response rates in the survey of income and program participation? *Proceedings of the American Statistical Association, Survey Research Methods Section*, 529–534.

McGonagle, K. A., & Freedman, V. A. (2017). The Effects of a Delayed Incentive on Response Rates, Response Mode, Data Quality, and Sample Bias in a Nationally Representative Mixed Mode Study. *Field Methods*, *29*(3), 221–237. https://doi.org/10.1177/1525822X16671701

Mercer, A., Caporaso, A., Cantor, D., & Townsend, R. (2015). How Much Gets You How Much? Monetary Incentives and Response Rates in Household Surveys. *Public Opinion Quarterly*, *79*(1), 105–129. https://doi.org/10.1093/poq/nfu059

Messer, B. L., & Dillman, D. A. (2011). Surveying the General Public over the Internet Using Address-Based Sampling and Mail Contact Procedures. *Public Opinion Quarterly*, *75*(3), 429–457. https://doi.org/10.1093/poq/nfr021

Petrolia, D. R., & Bhattacharjee, S. (2009). Revisiting Incentive Effects. *Public Opinion Quarterly*, *73*(3), 537–550. https://doi.org/10.1093/poq/nfp038

Rodgers, W. L. (2002). Size of Incentive Effects in a Longitudinal Study. *Proceedings of the American Statistical Association, Section on Survey Research Methods*, 6.

Rodgers, W. L. (2011). Effects of Increasing the Incentive Size in a Longitudinal Study. *Journal of Official Statistics*, *27*(2), 279–299.

Ryu, E., Couper, M. P., & Marans, R. W. (2006). Survey incentives: Cash vs. In-kind; Face-to-face vs. Mail; Response rate vs. Nonresponse error. *International Journal of Public Opinion Research*, *18*(1), 89–106. https://doi.org/10.1093/ijpor/edh089

Scherpenzeel, A., Zimmermann, E., Budowski, M., Wernli, B., & Gabadinho, A. (2002). Experimental pre-test of the biographical questionnaire. *Swiss Household Panel Wrokin Papers*, *5*(02), 1–7.

Singer, E., Groves, R. M., & Corning, A. D. (1999). Differential incentives: Beliefs about practices, perceptions of equity, and effects on survey participation. *Public Opinion Quarterly*, *63*(2), 251–260. https://doi.org/10.1086/297714

Singer, E., Van Hoewyk, J., & Maher, M. P. (2000). Experiments with Incentives in Telephone Surveys. *Public Opinion Quarterly*, *64*(2), 171–188. https://doi.org/10.1086/317761

Singer, E., & Ye, C. (2013). The Use and Effects of Incentives in Surveys. *Annals of the American Academy of Political and Social Science*, *645*, 30. https://doi.org/10.1177/0002716212458082

Suzer-Gurtekin, Z. T., Elkasabi, M., Liu, M., Lepkowski, J. M., Curtin, R., & McBee, R. (2016). Effect of a pre-paid incentive on response rates to an Address-Based Sampling (ABS) Web-Mail survey. *Survey Practice*, *9*(4), 1–7. https://doi.org/10.29115/SP-2016-0025

Toepoel, V. (2012). Effects of Incentives in Surveys. In L. Gideon (Ed.), *Handbook of Survey Methodology for the Social Sciences* (pp. 209–223). Springer New York. https://doi.org/10.1007/978-1-4614-3876-2_13

Tzamourani, P. (2000). An experiment with promised contribution to charity as a respondent incentive on a face-to-face survey. *Survey Methods Newsletter*, *20*(2), 13–15.

Wagner, J., West, B. T., Guyer, H., Burton, P., Kelley, J., Couper, M. P., & Mosher, W. D. (2017). The Effects of a Mid-Data Collection Change in Financial Incentives on Total Survey Error in the National Survey of Family Growth: Results from a Randomized Experiment. In P. P. Biemer, E. de Leeuw, S. Eckman, B. Edwards, F. Kreuter, L. E. Lyberg, N. C. Tucker, & B. T. West (Eds.), *Total Survey Error in Practice* (pp. 155–177). John Wiley & Sons, Inc. https://doi.org/10.1002/9781119041702.ch8

Westra, A., Sundukchi, M., & Mattingly, T. (2015). Designing a Multipurpose Longitudinal Incentives Experiment for the Survey of Income and Program Participation. *Proceedings of the 2015 Federal Committee on Statistical Methodology (FCSM)*, 1–12.

Wong, E. R. (2020). Incentives in longitudinal studies. *Centre for Longitudinal Studies Working Paper*, *2020*(01), 20.

Zagorsky, J. L., & Rhoton, P. (2008). The Effects of Promised Monetary Incentives on Attrition in a Long-Term Panel Survey. *Public Opinion Quarterly*, *72*(3), 502–513. https://doi.org/10.1093/poq/nfn025

Appendix 1. Heterogeneous effects tables

This appendix contains the replication of the heterogeneous effects tables included in the body of the paper (Table 4 and Table 5) using the multivariate models. The tables in the results section present the uncontrolled heterogeneous effects derived from simple logistic regression models, while these include the heterogeneous effect controlled by the rest of the moderators. The simple and controlled heterogeneous effects are almost identical for the analysis of the last wave respondents, where we have complete information for all cases. However, when analysing the previous wave nonrespondents from responding households, there are some critical differences because the estimation samples are also different after excluding the cases with missing values in at least one of the moderators.

Table 8. Heterogeneous effects of the higher unconditional incentive by moderators for last wave respondents and last wave nonrespondents from responding households

	Previous wave respondents (Unconditional incentive)			Previous wave nonrespondents (Conditional incentive)		
	Web	**Web+CATI**	**N**	**Web**	**Web+CATI**	**N**
Sex						
Male	0.029	0.029		-0.034	-0.004	
	(0.021)	(0.016)	2,552	(0.033)	(0.039)	381
Female	-0.002	0.012		**0.178****	**0.202****	
	(0.019)	(0.012)	3,209	**(0.056)**	**(0.063)**	227
Age groups						
16-29	0.016	-0.006		0.044	0.079	
	(0.040)	(0.033)	915	(0.044)	(0.055)	227
30-44	**0.092***	0.040		-0.035	-0.068	
	(0.038)	(0.029)	1,093	(0.078)	(0.075)	106
45-64	-0.009	0.019		0.075	**0.152***	
	(0.024)	(0.015)	2,031	(0.057)	**(0.062)**	194
65+	0.000	0.025		0.061	0.022	
	(0.028)	(0.020)	1,722	(0.066)	(0.085)	81
Education						
No degree	0.013	0.027		0.046	0.067	
	(0.052)	(0.015)	4,152	(0.055)	(0.042)	472
Degree	0.000	-0.001		0.022	0.068	
	(0.028)	(0.017)	1,609	(0.050)	(0.052)	136
Ethnic background						
Ethnic minority	0.005	-0.004		0.077	**0.155***	
	(0.052)	(0.038)	815	(0.055)	**(0.066)**	174
White British	0.013	**0.023***		0.031	0.047	
	(0.017)	**(0.012)**	4,946	(0.034)	(0.040)	434
Individual income						
Q1	-0.003	0.009		-0.005	0.052	
	(0.030)	(0.023)	1,361	(0.047)	(0.053)	229
Q2	0.031	0.020		**0.109***	0.068	
	(0.029)	(0.021)	1,412	**(0.053)**	(0.068)	133
Q3	0.000	0.025		0.037	0.139	
	(0.029)	(0.021)	1,510	(0.073)	(0.092)	116
Q4	0.018	0.025		0.049	0.043	
	(0.025)	(0.017)	1,478	(0.073)	(0.073)	130
Response pattern						
Irregular respondent	0.018	0.041		0.015	0.030	
	(0.059)	(0.064)	406	(0.028)	(0.034)	438
Regular respondent	0.010	0.017		0.119	**0.184***	
	(0.017)	(0.011)	5,355	(0.077)	**(0.084)**	170

Sig. * $p < .05$, ** $p < .01$, *** $p < .001$. These estimates are marginal effects expressed as proportions predicted from a logistic regression model that included all the moderators and the interaction terms with the experimental allocation variable.

Table 9. Response rates for the high web propensity groups by previous wave fieldwork protocol for previous wave respondents and nonrespondents from responding households

	Web			Web + CATI			
	Control	**HI**	**Dif.**	**Control**	**HI**	**Dif.**	**N**
Previous wave respondents							
Web-first	69.2	71.8	2.6	86.9	88.6	1.8	
	(1.4)	(1.4)	(1.9)	(0.9)	(1.0)	(1.3)	4,135
CAPI ring-fenced	67.4	64.5	-2.9	85.4	89.9	4.5	
	(2.9)	(3.2)	(4.2)	(2.1)	(1.6)	(2.7)	859
Previous wave nonrespondents							
Web-first	10.6	16.7	6.1	18.9	26.1	7.2	
	(2.3)	(2.6)	(3.5)	(2.9)	(2.8)	(4.1)	424
CAPI ring-fenced	22.7	22.7	0	23.8	38.7	14.9	
	(5.8)	(6.3)	(8.6)	(5.6)	(8.3)	(10.1)	89

Sig. * $p < .05$, ** $p < .01$, *** $p < .001$. These estimates are predicted from a logistic regression model that included all the moderators and their interaction terms with the experimental allocation. The estimates in this table are from the high web propensity subsample of the CAPI ring-fenced sample that was identified using the same methodology employed to separate the web-first from the CAPI-first web protocols.