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Effects of a Time-Limited Push-to-Web Incentive in a Mixed-Mode Longitudinal Study of Young Adults

Lisa Calderwood, Darina Peycheva, Erica Wong, and Richard Silverwood
University College London
Social Research Institute

This paper describes the impact of a "time-limited" "push-to-web" incentive on response rate and sample composition in a mixed-mode (web, telephone, face-to-face) longitudinal study of young adults in the UK. An "early bird" push-to-web incentive experiment was conducted in the eighth follow-up of the Next Steps cohort study, which follows the lives of a nationally representative sample of around 16,000 people in England born in 1989-90. During the study "soft launch" which tested procedures for the main stage of fieldwork, a randomly allocated group of study members was offered a time-limited £20 incentive to complete the survey online within three weeks of receiving the study invite (treatment group; n = 1107); the incentive dropped to £10 after the three-week period and was no longer conditional on mode of completion. The control group was offered a standard £10 incentive conditional on completing the survey irrespective of mode and time (control group; n = 1108). Here we investigate the impact of the time-limited push-to-web incentive on response rates at three phases of fieldwork: by the end of the time-limited three-week period, by the end of telephone follow-up, and by the end of face-to-face fieldwork (end of fieldwork). We also assess whether the time-limited incentive had a differential impact on subgroups of sample members at any phase of fieldwork, compared to the control group, hence affecting the sample composition. Our analysis shows that the time-limited incentive significantly increased response rates in the treatment group during the first three weeks of fieldwork (27% vs 22%). Response rates in the treatment group remained higher up to the end of telephone follow-up (33% vs 30%), following the withdrawal of the higher value incentive, though this did not reach the conventional level of statistical significance. By the end of fieldwork, however, the time-limited incentive achieved similar response rates to the group offered the standard £10 incentive (52% vs 53%). The web response rates in the treatment group remained higher throughout fieldwork, but at borderline level of statistical significance. We found no evidence for differential impact of the time-limited incentive on the sample composition in terms of key demographic and survey behaviour characteristics at any fieldwork phase, compared to the control group.

Keywords: early-bird, time-limited, incentive, push-to-web, mixed-mode, longitudinal

1 Introduction

Longitudinal studies are increasingly implementing push-to-web sequential mixed-mode (Couper & McGonagle, 2019; Lynn, 2020) as a form of adapted survey design (Tourangeau et al., 2017). In these push-to-web designs, respondents are offered the opportunity to respond via web before being followed up with a different interview mode option (e.g., face-to-face), which aims to reduce fieldwork effort, time, and cost in the follow-up survey modes whilst maximising response rates and minimising survey error.

Contact information: Darina Peycheva, University College London, Social Research Institute, Centre for Longitudinal Studies, 1–19 Torrington Place, London, WC1E 7HB (E-mail: d.peycheva@ucl.ac.uk).

Since web surveys and mixed-mode designs typically have lower response rates (Couper, 2000; Messer & Dillman, 2011), incentives have been used in push-to-web requests to boost participation (Singer & Ye, 2013). Leverage-salience theory posits that different design attributes have different "leverages" on individuals' decision to participate, according to the value they assign to those attributes (Groves et al., 2000). A web survey request may be more easily ignored, so incentives may make salient and increase the benefit of participating via web. For example, an experiment on the Innovation Panel of Understanding Society (the UK Household Longitudinal Study) found that offering higher incentive amounts to sample members allocated to web-then-face-to-face designs increased response rates compared to those found in face-to-face only designs (Gaia, 2017; Jäckle et al., 2015).

More recently, incentives have been used in push-to-web

designs to encourage web response within a short, defined time period, often at the beginning of the data collection. Referred to as "early bird" or "time-limited" incentives, hypothesised benefits include the potential to increase web response rates (particularly if the fieldwork period is relatively short), and the potential for cost-savings reaped from decreased fieldwork effort and follow-ups in other modes. Thus, a primary aim of many of these designs is to maximise web response in the early stages of fieldwork. Regret avoidance decision-making theories provide a framework that helps explain why time-delimited incentives might work; individuals are inclined to avoid regret (Zeelenberg & Pieters, 2007) so will take up early bird incentives in order to avoid missing out on a higher value pay-out. However, the limited available evidence of effects on response rates as well as cost-savings for push-to-web or web-only designs for longitudinal studies is somewhat inconsistent.

Some studies have found that early bird incentives increased response during the time-limited period but did not increase response rates overall. It seems that regret-avoidant behaviour recedes, perhaps because other aspects of the participation decision become more salient, as leverage-salience theory would suggest. In the US National Immunization Survey, a panel survey of mainly teens and young adults, respondents offered early bird incentives in addition to the prepaid incentive logged in more quickly than those not receiving any incentive, but completion rates of those who were offered the early bird incentive did not differ from those not offered an incentive or those only offered a prepaid incentive. The "withdrawal" of the early bird incentive, then, did not negatively affect the response behaviour for those sample members who missed the opportunity to receive the higher value incentive (Ward et al., 2014). Similarly, in a US Panel Study of Income Dynamics (PSID) experiment, time-limited incentives increased the completion rates of those who were calculated to have the highest propensity of nonresponse, effectively increasing their response rates during the incentive period to be similar to those who had initial low probabilities of nonresponse with no negative effect on final response rates (Fomby et al., 2016).

Other studies have found that time-limited incentives successfully increased overall response rates (DeSantis et al., 2016; Friedel et al., 2022; LeClere et al., 2012), particularly by increasing response rates among those sample members who were hard-to-reach or had low response propensities (Goble et al., 2014; Mcgonagle et al., 2022). Leverage-salience theory would suggest that there would be subgroup variability in how valuable an incentive offer was. In another PSID experiment, time-limited incentives increased the final response rates of high-effort re-interview cases at risk for nonresponse, particularly for those in the highest income strata (Mcgonagle et al., 2022). Early bird incentives also effectively improved response rates in a longitudinal study of ethnic minorities in the US but did not differentially affect response rates among different subgroups or by household characteristics (LeClere et al., 2012). These results are not entirely surprising as previous studies have found incentives in general tend to have a stronger effect on sociodemographic groups with typically lower response propensities, such as young people, those of lower socioeconomic status and ethnic minorities (e.g. Felderer et al., 2017; Knibbs et al., 2018; Laurie, 2007; Mack et al., 1998; Martin & Winters, 2001; McGonagle & Freedman, 2016; McGonagle et al., 2013; Ryu et al., 2006), but whether early bird incentives ameliorate nonresponse bias in the responding sample composition is yet unclear.

Findings on the cost-effectiveness of early bird incentives seem to vary by mode, consistent with leverage-salience theory as different modes vary in their suitability or convenience to participants and may vary in the additional "leveraging" design features used, including follow-up strategies. Surveys using early bird incentives to encourage early booking of face-to-face interview appointments found the results and cost savings to be modest. For example, in the US National Longitudinal Survey of Youth 1979 (NLSY79), which first introduced the early bird approach, incentives were offered to those who set up an appointment within four weeks. Response rates were slightly higher and took less interviewer time to complete, but the early bird incentive was only offered to the most cooperative respondents (Kochanek et al., 2010). In 2011, an early bird incentive was used for the first time in a major UK longitudinal survey (the Innovation Panel of the UK Household Longitudinal Survey) to encourage early booking of interview appointments. Take up rates were low, so the overall impact was minimal (Brown & Calderwood, 2014). However, in 2016 a £10 incentive for completing a web survey within the first two weeks of fieldwork was implemented from the second month of Wave 8 of the UK Household Longitudinal Survey. Response rates doubled in this second month as compared to the first month, with a cost savings of £1.14 for every £1 spent to implement the incentive (Carpenter & Burton, 2018). Additional savings came from subsequent use of reminder letters and extension of the deadline for receiving the early bird incentive. Similarly, other studies using web surveys found substantial fieldwork savings in follow-up calls and data collection efforts in piloting and thus adopted the early bird approach for all sample members (Coopersmith et al., 2016; DeSantis et al., 2016; Goble et al., 2014). Greater cost-effectiveness of early bird incentives was also reported in the context of recruitment of probability-based online panels (Friedel et al., 2022). Though direct comparison is difficult because studies differ in cost calculations or do not disclose calculations, these early initial findings suggest that the cost-effectiveness of early-bird incentives may be higher for push-to-web designs than for single-mode face-to-face designs.

Surveys in the UK typically employ modest incentive amounts (e.g. £10 offered in Wave 8 of the UK Household Longitudinal Survey noted above) and both regret avoidance and leverage-salience would suggest that a high early-bird incentive amount would yield higher response rates. However, some experimental evidence suggests the size of the early bird incentive offered may not explain the lack of impact on overall response rates either. In a US panel survey of school principals, four different incentive conditions were tested for a web survey conducted in the second of four waves: $50 standard conditional incentive, an additional $50 early bird incentive, an additional $25 unconditional incentive, or an additional $25 refusal conversion incentive. Despite an early bird incentive that would double the incentive to $100, response rates did not differ between any of the incentive conditions (Coopersmith et al., 2016). Similarly, in a large-scale recruitment experiment for the German Internet Panel (GIP) a 50 € early bird cash incentive had not offered a significant advantage over a 20 € early bird cash incentive (Friedel et al., 2022). It is possible the size of the incentive was not salient or motivating enough, or it may be that social exchange theory is at work here (Dillman, 1978) whereby the incentive offer itself signals an expectation of reciprocity (Gouldner, 1960).

Given the few studies assessing the impact of early bird incentives in mixed-mode push-to-web designs in longitudinal studies, questions remain about the impact on response rates, sample composition, and cost effectiveness. This paper provides new evidence on the effect of a time-limited push-to-web incentive in a mixed-mode (web, telephone, face-to-face) longitudinal study of young adults in the UK. An early bird push-to-web incentive experiment was conducted in the Age 25 survey (eighth wave) of the Next Steps cohort study. A randomly allocated group of study members was offered a time-limited £20 incentive if they completed the survey online within the first three weeks of fieldwork, and £10 if they completed the survey via any mode after the cut-off date. A control group was offered a standard £10 incentive conditional on completing the survey regardless of the mode and time of completion. By offering a higher-value time-limited incentive our aim was to increase participation via the cheaper web mode and thus minimise effort and cost at the follow-up survey phases and modes. Further, we expected to motivate response among "lost to follow-up" study members, and thus decrease sample bias.

In the following sections, we outline our research questions (Section 2), provide an overview of Next Steps, the incentive experiment in the Age 25 survey, and the methods used to address our research questions (Section 3), present the results (Section 4), and discuss the conclusions and implications of the findings (Section 5).

2 Research questions

We address the following research questions:

1. What is the impact of the time-limited push-to-web incentive on response rates at three phases of fieldwork: after three weeks, by the end of telephone follow-up, and by the end of face-to-face follow-up (end of the field period)? In line with previous research, we expected that the incentive would increase response in the treatment group (offered the £20 incentive) compared to the control group (offered the standard £10 incentive) during the time-limited 3-week period. We presumed that withdrawing the incentive in the treatment group after the 3-week period would have a negative "spillover" effect, which will result in lower response rate to the telephone and face-to-face follow-ups and offset the increase in the web response rate achieved by the early bird incentive. We therefore envisaged no difference in the response rates between the groups by the end of the telephone and overall—by the end of fieldwork.

2. What is the impact of the time-limited push-to-web incentive on web response by the end of the telephone follow-up and by the end of face-to-face follow-up (end of the field period)? There is little previous work directly related to this question. We envisaged that the final web response rate by the end of the field period for the treatment group would not differ notably from that achieved within the 3-week period. However, we expected that it would remain higher in the treatment group compared to the control group following the higher response to web during the time-limited period.

3. Does the time-limited push-to-web incentive have a differential impact on subgroups, thus affecting the sample composition at any of the phases of fieldwork: after three weeks of fieldwork, by the end of telephone follow-up, and by the end of face-to-face follow-up (end of the field period)? Consistent with previous research, we expected that by the end of the time-limited period the early-bird incentive would attract more respondents who did not take part in the most recent survey wave (wave 7) as well as more respondents from non-White ethnic background, compared to study members offered the standard incentive. As incentives in general have a stronger effect on sociodemographic groups with lower response propensities, we presumed that the time-limited incentive may motivate more men and more participants last interviewed by an interviewer to take part online within the 3-week period. By the end of fieldwork, however, in line with the hypothesis of no overall effect of the time-limited compared to the standard incentive, we expected no

difference between the experimental groups in terms of individual or survey behaviour characteristics.

One of the main reasons for the implementation of the time-limited incentive is related to cost reductions and aspects related to survey costs are of particular interest. However, investigating cost effectiveness of the early bird incentive is beyond the intentions of this study, which we intend to examine in future research.

3 Data and methods

3.1 Next Steps and the Age 25 survey

Next Steps is a nationally representative longitudinal cohort study following the lives of around 16,000 people in England born between 1st September 1989 and 31st August 1990 and studying in Year 9 in English state, independent or pupil referral units in 2003/2004[1]. The study used a two-stage stratified random sample of schools and pupils, with oversampling of socioeconomically deprived schools[2] and ethnic minority pupils. At the first stage, three systematic samples of eligible schools (those containing at least five eligible Year 9 pupils at the Annual School Census of 2003) were drawn separately from the populations of maintained secondary schools, independent schools, and pupil referral units. At the second stage, samples of pupils were drawn from the selected schools. Samples from the three types of school were drawn such that the proportion of the sample of pupils in each of the three groups was the same as the corresponding population proportion[3] (Department for Education, 2011).

The study began in 2004 when the study members were age 14. They were surveyed annually until 2010 (wave 7) and then in 2015 at age 25 (wave 8)[4] . The interviews for the first four waves were conducted face-to-face, and from wave five onwards the study employed a sequential mixed-mode approach, including web, followed by telephone, and then face-to-face interviews. Next Steps has collected information about study members' education and employment, economic circumstances, family life, physical and emotional health and wellbeing, social participation, and attitudes.

Next Steps study members have been offered an incentive from the onset of the study. The approach to this, however, varied over the years. In wave 1 all young people who completed an interview were given a £5 high street voucher. In waves 2 and 3, unconditional £5 gift voucher incentive was enclosed in the young person's advance mailing; in wave 4 the amount of the unconditional incentive increased to £8. From wave 5 onwards (alongside the changes in the study design when mixed-mode data collection was introduced), incentive was offered to web respondents only (Department for Education, 2011).

Prior to the eighth wave of data collection, eligible to fieldwork cases were those who participated in the previous wave. This has led to a reduction in the original study sample of over 50% by the end of wave 7 in 2010. Extensive efforts were then made at the Age 25 survey to maximise the size and representativeness of the cohort, attempting to trace and contact everyone who had ever taken part in the study between 2004 and 2010 (Centre for Longitudinal Studies, University College London, 2017b). A total of 15,531 study members were issued to field in wave 8 in 2015, achieving a response rate of 51% with 7707 completed interviews (4797 via web, 690 via telephone, and 2220 face-to-face).

This analysis is restricted to 2215 members of the cohort randomly selected from the eligible for fieldwork overall sample ($n = 15,531$) and issued to field in the study "soft launch" (Centre for Longitudinal Studies, University College London, 2021)[5]. The overall study sample was split into four balanced batches, the first of which—a "soft launch"—aimed at testing procedures and response rates, and therefore to inform decisions for the main stage of data collection (batches 2–4) (Centre for Longitudinal Studies, University College London, 2017b).

3.2 Incentives at the Age 25 Survey

Offering an incentive in the Age 25 survey was considered an important tool to encourage participation among study members who last took part in the survey between 5 and 10 years ago. To maximise response over the web and thus minimise survey costs for the follow-up fieldwork stages (as smaller number of cases would be issued to the more expensive telephone and face-to-face survey modes) a randomised incentive experiment was designed and tested experimentally during the study soft launch (batch 1). A time-limited £20 incentive was offered to a random half of the sample (treatment

[1]It excludes that part of the age cohort not on school rolls (estimated at just over 1%) (Department for Education, 2011).

[2]Deprivation was measured by the proportion of students in receipt of free school meals. Schools in the top quintile of this distribution were classified as deprived.

[3]The sample contains boost elements for pupils from an ethnic minority background and those attending schools with high free school meals (FSM) scores.

[4]Before its transfer to the Centre for Longitudinal Studies, University College London, in 2013, the study was funded and managed by the Department for Education. The Age 25 survey (wave 8) was funded by the Economic and Social Research Council (Centre for Longitudinal Studies, University College London, 2017b).

[5]Most of the Next Steps data (e.g., demographic and survey design characteristics used in this study) is publicly available via the UK Data Service (Centre for Longitudinal Studies, University College London, 2021). The incentive experiment data (and derived for the purpose of this study outcome variables per fieldwork phase) has not been released for public use; it can be provided upon request and with permission by the CLS Data Access Committee (CLS DAC) (https://cls.ucl.ac.uk/data-access-training/data-access/accessing-data-directly-from-cls/).

group, $n = 1107$) upon completion of the 45-minute survey online within a 3-week period of receiving the study invite. The amount of this incentive decreased to £10 if the survey was completed after this 3-week period, irrespective of mode. The other half of the sample (control group, $n = 1108$) was offered a standard £10 incentive, only conditional on participation by the end of the fieldwork period, regardless of mode. If response was not achieved online in the first three weeks of fieldwork, interviewers began telephone contact attempts. Incentives were Amazon or Love2shop gift vouchers, with respondents able to choose which they preferred. This experiment aimed to inform the decision about the incentive to be offered to all remaining study members in the subsequent batches of fieldwork.

At the start of fieldwork study members received a letter via the post and via email (if available[6]) inviting them to take part in the survey and describing the incentive and the requirements to receive it. The letter was timed to arrive with the study member on Day 1 of fieldwork. The treatment group, offered the early bird £20 incentive, was informed that to receive their higher value voucher, they needed to complete the online survey within three weeks and after that they will only be given a £10 voucher. The framing of this aimed at minimising the risk of "negative spillover" effects from the withdrawal of the higher value incentive. Specifically, study members were told that the higher incentive was offered because it is cheaper for the study if they completed the survey online (Centre for Longitudinal Studies, University College London, 2017a, p. 41). The control group was informed that they will receive a £10 voucher upon completion of the survey. Otherwise, the letters were identical between groups. They encouraged completion of the survey online in both groups—noting that it is quicker and easier for study members and cheaper for the study team (Centre for Longitudinal Studies, University College London, 2017a, p. 41) and informed study members that they will be contacted by telephone[7] or in person, if they do not take part on the web.

The web-only fieldwork period was three weeks in total, following the survey invite. Over the three weeks following the advance mailing, study members were sent two postal (days 7 and 11), three email (days 4, 11 and 18) and a text reminder[8] (day 11) if they had not started the web survey. The text of the reminders was very similar between the groups, with the difference being the amount of the incentive. The reminders emphasised the time left to complete the survey online before it closed as well as that study members will be contacted by telephone or in person if they do not take part on the web (Centre for Longitudinal Studies, University College London, 2017a). Break-off reminder emails and texts were sent (24 and 48 hours after the point of break-off) to study members, who had started or partially completed the web questionnaire.

After this point, study members who had not yet completed the survey over the web were approached by telephone. Telephone fieldwork ran over a period of 17 weeks. If still unproductive at the end of the telephone follow-up, study members were approached in person. Face-to-face field period run over period of 31 weeks. The web survey, however, remained open throughout the rest of the fieldwork period (i.e., during telephone and face-to-face[9] follow-ups). The overall length of fieldwork was 51 weeks.

Following non-respondents during the subsequent phases of fieldwork required minimum 8 calls during telephone follow up and minimum 6 visits to the household by face-to-face interviewers[10] . Interviewers were not blinded of the experiment tested during the soft launch. Though there was a possibility for study members in the treatment group to require extra effort in the follow-up phases, there was no difference in the interviewer protocol in terms of contacting/interviewing cases between the two groups. There was no difference in the contact protocol between the experimental groups at either phase of fieldwork.

To receive the offered incentive, participants were required to complete all of the questionnaire. An exception was made with the final data linkage module and completions up to this module were eligible to receive the incentive[11] . Survey respondents were provided with their vouchers alongside a thank you letter (or email) sent on a weekly basis.

3.3 Statistical analysis

First, we ensure that there are no differences between the experimental groups in terms of key demographics (sex and ethnicity) and survey behaviour characteristics (mode and wave of last participation), using chi-squared tests. We also use chi-squared tests to ensure that there is no difference between the experimental groups in terms of availability of con-

[6]Email address was available for 52% of the study members in the soft launch sample.

[7]Telephone number was available for 73% and mobile telephone numbers for 60% of study members in the soft launch sample.

[8]A second text reminder on Day 19 was included from Batch 2 onwards (if a valid mobile telephone number was available).

[9]There were three sub-phases within the face-to-face fieldwork—"1 st issue", "mop-up" and "reissue". "1st issue" refers to the initial issue of a case to interviewers within the first fieldwork period for that batch. The "mop-up" phase followed this first period and aimed at completing existing appointments and tracing activities. The "reissue" phase involved re-approaching unproductive cases (Centre for Longitudinal Studies, University College London, 2017b).

[10]Face to face interviewers were encouraged to talk to their fieldwork managers whether attempting telephone or email contact is a suitable approach prior to starting tracing where no contact has been made.

[11]Completions of the survey up to the final Data linkage component were considered partial interviews and were eligible for the provision of the offered incentive.

tact details (emails and telephone numbers) used for making subsequent contacts with study members (for reminders during the three weeks of web interviewing or making contacts during the follow-up modes), following the advance postal mailing sent to everyone issued to fieldwork in the soft launch.

To address the first and second research questions (i.e., the effect of the time-limited incentive on response rate at the three phases of fieldwork and its effect on web response by the end of fieldwork) we report percentages of respondents in the treatment and control groups and associated confidence intervals, overall and via the web, at each phase of fieldwork (3-week, end of telephone, end of face-to-face). We use chi-squared tests to assess whether the observed rates of response differed between experimental groups.

We address the third research question (i.e., the effect of the time-limited incentive on subgroups and sample composition at any of the phases of fieldwork) by fitting logistic regression models relating response at each phase of fieldwork (3-week, end of telephone, end of face-to-face) to individual (sex and ethnicity) and survey behaviour characteristics (wave and mode of last participation) and interactions of those characteristics with experimental group as predictors to understand whether response within the treatment group differs from the control group by subgroups. The individual and survey behaviour characteristics that we considered are those where we expect the greatest chance of a treatment difference. The individual characteristics—sex (coded as: female vs male) and ethnicity (coded as: White vs non-White)—were measured in the baseline sweep (or sweep 4 for boosted sample) and survey behaviour characteristics—wave (coded as: 7 vs 1–6) and mode of last participation (coded as: web vs telephone vs face-to-face)—were derived based on data from wave 7. In Supplementary material we also report crude (unadjusted for other characteristics) and adjusted (for all characteristics) odds ratios (OR) and 95% confidence intervals (CI) for the main effect of treatment, sex, ethnicity, mode, and wave of last participation, on response at each fieldwork phase.

All analyses account for the complex sample design (stratification, clustering, weighting) using SVY commands in Stata.

4 Results

Table A1 in Supplementary material illustrates the individual and survey behaviour characteristics of interest at allocation to experimental groups. As it would be expected, following the random allocation, the treatment and control groups in the soft launch were of approximately equal size and balanced with respect to the presented characteristics.

4.1 Research question 1

Table 1 illustrates cumulative response in the treatment and control groups by fieldwork phase. By the end of the time-limited web-only period, response in the treatment group was significantly higher than in the control group. 27% of the study members in the treatment group had completed their interviews online compared to 22% in the control group ($p = 0.005$), suggesting a positive effect of the early-bird push-to-web incentive on increasing (web) response at the beginning of fieldwork.

By the end of the telephone phase the difference in cumulative response rates was reduced. Response was still higher in the treatment group compared to the control group where the offered incentive remained unchanged (33% vs. 30%) but not statistically so ($p = 0.17$). I.e., at the end of the telephone phase there was an indication of a negative effect of withdrawing the higher value incentive in the treatment group as illustrated by the lower response rate to the telephone phase; however, the difference between the groups was not fully offset.

By the end of fieldwork (end of the face-to-face phase), there was no longer a difference in the overall cumulative response rates between the two groups: 52.3% in the treatment group vs. 52.6% in the control group ($p = 0.89$). This suggests that overall the group in which the higher-value incentive was withdrawn after the web-only phase was as likely as the control group in which the incentive remained unchanged during the entire period of fieldwork to take part in the survey.

In summary, the early bird push-to-web incentive was associated with increased response rates during the time-limited 3-week period, but its effect was then attenuated and overall it was no different from the effect of the £10 incentive in terms of response.

4.2 Research question 2

As the web survey remained open throughout fieldwork, web completion following the 3-week of web-only fieldwork was possible. By the end of the telephone phase the cumulative rate of web completion remained higher in the treatment group compared to the control—27.4% compared to 22% ($p = 0.01$); though for both groups very few additional web interviews were completed during the telephone phase (Table 1). A difference in web response was still observed between the groups at the end of fieldwork—29.2% in the treatment compared to 25.7% in the control group ($p = 0.09$).

4.3 Research question 3

Table 2 illustrates the effects of key demographic (sex and ethnicity) and survey behaviour (wave and mode of last participation) characteristics on response, in the treatment and control groups, at the three stages of fieldwork. There were

Table 1

Cumulative response rates (RRs) by fieldwork phase and experimental group (n, % and 95% confidence intervals (CIs))

	Treatment group				Control group				
			95% C.I.				95% C.I.		
Cumulative RRs by the end of ...	n[a]	%[b]	lower	upper	n[a]	%[b]	lower	upper	p-value[c]
Overall									
3-week period (web)	285	27	24	31	235	22	19	25	0.005
Telephone follow-up[d]	346	33	30	36	313	30	27	33	0.17
Face-to-face follow-up	562	52	49	56	574	53	49	56	0.89
Web only									
3-week period	285	27	24	31	235	22	19	25	0.005
Telephone follow-up	289	27	25	31	244	23	20	25	0.01
Face-to-face follow-up	314	29	26	32	282	26	23	29	0.09
n issued to field	1107				1108				

[a] unweighted number of observations [b] weighted percentages
[c] Pearson χ^2 tests, corrected for survey design (strata and clusters) with the second-order correction of Rao and Scott (1984)
[d] 395 primary sampling units (PSUs) covered in telephone follow-up (396 PSUs in web and face-to-face phases), 2198: 1099 in Treatment group and 1099 in Control group.

no significant interaction effects between the characteristics of interest and experimental group at any fieldwork phase, suggesting no variation in the effects of the treatment compared to the control group on sample composition with respect to these characteristics. In both groups, however, females, White individuals, those who participated in the most recent wave 7, and those who chose web to respond the last time they took part, had higher odds of response throughout the fieldwork period. In other words, the early bird incentive did not differentially impact response at either the time-limited period or by the end of fieldwork, but in both groups response was similarly affected by individual and survey behaviour characteristics.

As we aimed to understand the role of demographic and survey behaviour characteristics in determining response in each group, here we present and interpret a model with interactions which allows the effect of each of these characteristics to vary across experimental groups. However, as we show no evidence for differential impact, we encourage the reader to also refer to Table A2 in the Supplementary material, where we present results from a model without interactions (main effect model) where the estimated effects of these characteristics do not vary across experimental groups.

5 Discussion

Our experimental findings on the effectiveness of an early bird push to web incentive in a longitudinal mixed-mode setting (involving web, telephone, and face-to-face) showed that it significantly increased response rates during the time-limited (web only) period. By the end of fieldwork, however, the time-limited £20 incentive was no more effective than the standard £10 incentive on overall response rates. The web response rates for the group offered the time-limited incentive remained higher throughout fieldwork (though at the borderline of statistical significance) as the web survey remained open during the interviewer follow-up phases. There was no evidence for a differential impact of the time-limited incentive on sample composition compared to the standard incentive in terms of individual or survey behavior characteristics at any phase of fieldwork. In both incentive groups, females, White individuals, study members who took part in the last survey wave, and those who last participated via the web, had higher odds for response throughout the fieldwork period.

To the best of our knowledge, this is the first study to illustrate the effect of early bird push-to-web incentives in a longitudinal sequential mixed-mode study of young adults; furthermore, it is the first study to show patterns of web response during interviewer (telephone and face-to-face) follow-up phases. Our findings support our hypotheses and are consistent with previous web surveys demonstrating a positive effect of an early bird incentive within a time-limited period, but similar effects on overall response rates to that of a standard (lower value) incentive (e.g. Coopersmith et al., 2016; Ward et al., 2014). Although similar overall response rates were achieved in the experimental groups, the fieldwork was considered more cost effective in the treatment group due to the higher web response rate. The higher web response retained throughout fieldwork means that in the treatment

Table 2

Odd ratios (OR) and 95% confidence intervals (CI) of response on respondent and survey behaviour characteristics by end of fieldwork phase

	Response by end of phase								
	Time-limited 3-week period			Telephone follow-up			Face-to-face follow-up (end of field period)		
		95% C.I.			95% C.I.			95% C.I.	
Characteristic	OR	lower	upper	*OR*	lower	upper	*OR*	lower	upper
Experimental group (ref. categ.: control)									
Treated	1.48	0.64	3.41	1.63	0.73	3.60	1.37	0.65	2.89
Sex (ref. categ.: male)									
Female	1.61**	1.15	2.26	1.54**	1.12	2.12	1.36*	1.01	1.84
Ethnicity (ref. categ.: non-white)									
White	1.25	0.83	1.89	1.53**	1.04	2.25	1.17	0.82	1.60
Mode last participation (ref. categ.: web)									
Telephone	0.29***	0.19	0.49	0.35***	0.24	0.51	0.58**	0.39	0.85
Face-to-face	0.21***	0.12	0.36	0.17***	0.10	0.28	0.44**	0.27	0.70
Wave last participation (ref. categ.: wave 1-6)									
Wave 7	3.44***	2.11	5.60	4.13***	2.64	6.45	3.88***	2.54	5.93
Interactions with experimental group									
Female × Treated	0.92	0.56	1.48	0.88	0.55	1.43	1.00	0.66	1.51
White × Treated	1.50	0.87	2.58	0.87	0.49	1.55	1.07	0.65	1.75
Telephone × Treated	0.93	0.52	1.67	1.06	0.61	1.85	0.83	0.47	1.47
Face-to-face × Treated	0.83	0.42	1.64	1.10	0.54	2.25	0.75	0.40	1.42
Wave 7 × Treated	0.78	0.41	1.49	0.90	0.47	1.73	0.75	0.44	1.31
	2213[a]			2196[a,b]			2213[a]		

Presented ORs and CIs are estimated from single model where all interaction terms were included simultaneously. Results from unadjusted (for other characteristics) and adjusted (for all other characteristics) main effect models are presented in Table A2 in Supplementary material. *p*-values from Wald tests, corrected for survey design (strata and clusters).

[a] Ethnic background missing for two study members in "soft launch" sample ($n = 2,213$).

[b] 395 primary sampling units covered by telephone follow-up (396 PSUs in web and face-to-face phases), $n = 2,196$.

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

group a higher proportion of interviews were achieved via the cheaper web mode, and fewer cases were issued to the more expensive telephone and face-to-face modes. This was an important factor in the decision to roll-out the early bird incentive for the main stage fieldwork (Calderwood, 2016). Since one of the main reasons for the implementation of the time limited incentive is related to cost reductions, aspects related to survey costs are of particular interest and we plan to address this in future research and encourage other studies to consider communicating survey cost information as well (Olson et al., 2021).

Previous interviewer-administered surveys have suggested that incentives are especially effective on converting refusals (e.g. Creighton et al., 2007; Fomby et al., 2016), but we found no difference in the sample composition between the experimental groups at any phase of fieldwork. Using the leverage-salience framework, the early-bird incentive might not have provided sufficient "leverage" for other subgroups to choose to participate, whereas existing survey design features may have maintained their value for females, White individuals, and previous wave web responders. Additional research is needed on the motivational factors on response from different sub-groups and the impact of incentives. Our analysis considered limited number of demographic (sex and ethnicity) and survey behavior characteristics (wave and mode of last participation) and did not include a measure of socioeconomic position e.g. income which was found in a previous telephone study to have altered the effect of an early bird intervention (Mcgonagle et al., 2022). Further our results could have been affected by known limitations of subgroup analy-

ses such as small sample size and insufficient power. But we note that the evidence for a differential effect of early bird incentives is contested; for example, a recent experiment in the German online panel also showed no difference in sample representativeness across the early bird incentive experimental groups on the examined socio-demographic characteristics: gender, age, education, marital status, household size, and nationality (Friedel et al., 2022).

Our findings suggest that the withdrawal of the early bird incentive slowed but did not completely discourage response in the telephone and face-to-face phases for those who missed the chance to receive it at its higher value. However, as the experiment did not include a treatment in which the higher value incentive was retained throughout the fieldwork period, we do not observe the counterfactual response rate, but it is reasonable to expect that this may have increased response rate in telephone and face-to-face as well. It is also possible that the difference in incentive amounts between the time-limited incentive and standard incentive may influence the decision to participate after the time-limited period, as evidenced in a recent push-to-web incentive experiment: response rates for those assigned to receive 300% more for early response (£15 v. £5) were lower than those assigned to receive 50% more for early response (£15 v. £10) and lower than those who received the standard £10 incentive (Smith et al., 2021). Taken together, these findings lend support to regret-avoidance decision-making frameworks (Zeelenberg & Pieters, 2007), especially if response rates drop lower when the difference in early-bird incentive and standard incentive is greater. In Next Steps the possibility to receive £10 more for early participation (£20 v. £10) may have not been perceived as the most important factor for some sample members to cooperate during the time-limited period, while other aspects of the participation decision may have been more salient at the interviewer-administered phases, as the leverage-salience theory proposes (Groves et al., 2000). It is also important to consider the kind of messaging provided to respondents. In the Next Steps experiment, communication about the incentive was not framed around the possibility of regret over "missing out" on an opportunity to receive a higher incentive. Rather, the incentive was presented as a "thank you" with a request to return by the earlier date to receive the full amount; that is, the request was framed around social reciprocity. In a longitudinal study like Next Steps, the offer of an early-bird incentive itself may have been interpreted as an expression of goodwill or an extra thanks for helping the survey by sending responses in early, thereby increasing initial response without depressing response after the time-limited period. Future research that varies the messaging around early-bird incentives may help provide better evidence as to how people are motivated to participate.

This early-bird push-to-web incentive design in a longitudinal mixed-mode study of young adults in England increased response to the less expensive web mode, without negative impacts on overall response rates. The early-bird incentive did not have differential effects on any subgroup, however; further research is needed to better retain subgroups with low response propensities. Finally, further evaluation of the reasons behind nonresponse may also greatly improve survey design, particularly in light of declining survey response worldwide.

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