Response burden and survey participation

Experimental evidence on the effect of interview length on non-response conversion

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Abstract

In a context of declining response rates, identifying best practices for non-response conversion is of key importance for achieving adequate sample sizes and augmenting representativity in both cross-sectional and longitudinal studies. This paper examines whether re-contacting non-respondents after completing face-to-face fieldwork in the latest wave of a longitudinal study, which uses a web and face-to-face mixed-mode approach, and inviting them to participate in a web-based non-response conversion survey, can increase participation. In addition, we examine whether reducing interview length at this final stage can lead to a more significant boost in response. We discuss the trade-off in loss of information collected *versus* higher sample size and representation. In order to address our research aims we use experimental data from the Next Steps Age 32 Survey. Three months after the end of fieldwork, a random half of those who had not participated to the survey were re-invited to participate in the full 60 minute version of the survey while the remaining half of the sample was allocated to a 'short' 20 minute version. The full survey instrument included a cognitive assessment, requests for data linkage consents and request to provide a saliva sample for DNA extraction while, the "short" survey instrument did not include these additional requests. Overall, compared to the longer version, the shorter non-response conversion survey led to a higher response rate. Analysing differences by sociodemographic characteristics and previous wave response behaviour, we find that response rates increase significantly for previous wave non-respondents allocated to the "short" version (*versus* "full" version), while no difference on response rates based on survey length is observed among previously cooperative sample members. This finding suggests that the offer of shorter instruments seems a promising practice for obtaining at least some information from the sample members which are particularly hard to convince to take part otherwise.

Keywords: Non-response; Response burden; Non-response follow-up; Non-response conversion strategies; Next Steps.

Introduction

Survey response rates are declining over time (De Leeuw & De Heer, 2002; Lugtig et al., 2023; Luiten et al., 2020). This phenomenon is problematic for two main reasons: first, if respondents differ from non-respondents in key variables of interest non-response bias may arise. Second, non-response leads to reduction in the sample size available for analysis, with negative consequences on the precision of survey estimates.

In longitudinal studies maximising response rates is particularly important both to maintain representativity over time as well as to maximise the value of information collected at previous and subsequent waves of data collection. This is because lack of information at any time point reduces the potential of data collected before and after.

Unit non-response may be categorised in three main subcategories: failure to contact sample members ("non-contact"), unwillingness to take part in the study ("refusal") or inability to participate ("not-able to answer"), which may, for example, be due to illness or inability to understand the language in which the survey is administered (Bethlehem et al., 2011). This paper focuses on survey non-response and non-response "conversion strategies" – i.e. efforts to secure participation from individuals who initially did not respond to a survey invitation request.

In the following paragraphs, we delve into the mechanisms behind survey non-response, with a particular emphasis on survey refusals and non-response conversion strategies. Additionally, we discuss how the duration of a survey influences participation rates, reviewing the literature on the impact of survey length on survey response. A specific focus is given to the effectiveness of offering abbreviated refusal conversion surveys to collect at least some information from participants who might otherwise decide not to participate in the survey altogether.

Survey refusal may be motivated by a number of different factors (or combinations of factors) – including, for example, sample members not having time to fill in the survey, not being interested in the survey topic, not believing in the importance of surveys, having privacy concerns, not trusting the survey institution, or not enjoying

the process of participating in survey data collection (Stoop, 2017). Some authors (e.g. Loosveldt & Joye, 2016) have also mentioned an additional reason for survey refusal: the "survey climate", i.e. public attitudes towards surveys and science and the perceived overabundance of surveys, which results in the general feeling of an unwarranted volume of survey requests, which results in a perception of excessive burden.

In some cases, survey refusals are circumstantial and result from survey invitations being made at a non-optimal time. For example, the survey request may reach sample members while they are busy or temporary ill. Sample members may not react immediately to the invitation request and subsequently forget about it. If this is the case, a successful strategy to secure cooperation might be re-approaching (later in the fieldwork period) cases which initially refused participation to ask them to participate again. This practice is usually referred to as "refusal conversion" (Stoop, 2017).

Refusal conversion strategies have been mainly adopted in cross-sectional surveys, and, to a lesser extent in panel studies (Burton et al., 2006). Also, most refusal conversion strategies are implemented in interviewer administered surveys (Lewis et al., 2019) where sample members who initially refuse are often reapproached and asked to reconsider their decision, usually, but not always, through a more experienced interviewer (Calderwood et al., 2017). Overall, in the context of interviewer administered surveys, in longitudinal studies, refusal conversion strategies have been found to be successful in reducing refusal rates and seem to have some effect in minimising attrition and (to some extent) non-response bias (Burton et al., 2006; Calderwood et al., 2017; Dangubic & Voorpostel, 2017; Lipps, 2011). Refusal conversion strategies however have been less frequently adopted in self-administered surveys and little evidence is available on the effectiveness of the use of web mop-up surveys embedded in mixed-mode studies.

Clearly, survey refusals are not only due to circumstantial reasons. Another possible reason for survey refusal is the burden associated with participating in the survey. There is much evidence that suggests that shorter interviews lead to higher response rates than longer interviews, and this also applies to web surveys (e.g. Crawford et al., 2001; Galesic & Bosnjak, 2009). This idea is consistent both with the

social exchange theory (Dillman et al., 2014) as well as with the Leverage Saliency Theory (Groves et al., 2000). The social exchange theory (Dillman et al., 2014) posits that sample members decide whether to participate in surveys based on an evaluation of the cost of participating in the study *versus* the perceived rewards. The Leverage Saliency Theory states that sample members' likelihood of participation depends on the (subjective) *saliency* of survey attributes (e.g. duration, topic interest, etc.). In both frameworks, survey duration is one of the factors that may enter in the respondents' cost-benefit evaluation when deciding whether to participate in the survey. By lowering survey duration and reducing the number of tasks that the respondent is requested to perform (e.g. provision of biological samples, data linkage consent requests), – hence, ultimately, lowering survey burden – the costs to participation reduce, while the benefits that respondents may gain from survey participation (e.g. contribution to science, monetary incentive, etc.) remain equal.

Besides refusal conversion, non-response follow-up surveys in a mixed-mode context can also secure participation from sample members who have not participated for other reasons. In longitudinal studies, where email addresses and phone numbers are available for sample members before fieldwork, survey invitations and reminders are often sent by post, email and text message. Sometimes, the addresses held by studies may be out of date or sample members may be away or ill during fieldwork. In these circumstances email invitations may still reach sample members so an additional email invitation to complete the survey, after some months from initial contact, might reduce non-response in cases classified by interviewers as non-contact, uncertain eligibility, or "other" non-response. This approach might be particularly effective for interviewing young adults (e.g. those aged 18-35 years old), who might change addresses frequently due to life circumstances.

In this paper we use novel experimental data to examine whether re-contacting non-respondents in a longitudinal study, several months after completion of fieldwork and re-inviting them to participate can improve response rates and representativeness. In addition, we examine whether reducing respondent burden by shortening the interview and removing requests to perform supplementary tasks can result in greater increases in response and representativeness.

Specifically, the experiment took place in the 9th wave of the Next Steps age 32 study, a longitudinal study in England. The study used a sequential mixed mode approach where participants were first invited to take part online with non-respondents after 3 weeks being issued to face-to-face interviewers. The survey takes around 60 minutes to complete online and includes a cognitive assessment, requests for data linkage and a request to provide a saliva sample for DNA extraction. Three months after all face-to-face interview fieldwork was complete, non-respondents were re-invited to participate online, with half randomly allocated to complete the standard 60-minute survey – including all additional elements – and the remainder allocated to a "short" 20-minute version (with no cognitive assessment, data linkage consent requests nor collection of a saliva sample). This experimental design allows us to evaluate the effectiveness of a follow-up interview (*versus* no follow-up interview) – and hence assess the weight of circumstantial factors in survey refusal decisions – as well as to which extent the offer of follow-up interview of shorter duration and with fewer associated tasks (lower burden) is more effective in securing survey participation compared to a standard protocol (higher burden).

Specifically, the experiment aims at answering four research questions:

The first research (RQ1) is: is there a significant difference in response rates between those assigned to the "short" questionnaire and those assigned to the full questionnaire in the non-response survey?

We hypothesize that the "short" questionnaire would lead to a higher response rate, consistent with survey participation theory which posits that the lower the response burden the higher the probability that sample members will agree to participate in the study.

The second research question (RQ2) is: is the "short" questionnaire particularly effective among unproductive sample members with specific outcomes (non-contact, refusal, uncertain eligibility, or other non-response) at the end of the face-to-face fieldwork period?

We hypothesise the non-response conversion survey to be particularly effective in securing participation by sample members who refused to take part in the survey and, among them, we expect higher gains from the "short" *versus* the full non-

response follow-up survey. However, we also expect to improve response rates for sample members who are categorised at the end of the face-to-face fieldwork period as non-contacts, other non-response and uncertain eligibility.

The third research question (RQ3) is: to what extent does the non-response conversion survey improve overall response rates?

We hypothesize that response rates would significantly increase thanks to the non-response conversion phase included at the end of fieldwork; this hypothesis reflects the recognition that the decision to participate in the study may be circumstantial (for example motivated by sample members being approached at an inconvenient time).

The fourth research question (RQ4) is: is the "short" version particularly effective at securing participation from particular subgroups? what is the impact of the non-response follow-up interview on response bias?

Our hypothesis is that the "short" version might be particularly effective among previous wave non-respondents, and among those, specifically to respondents who refuse participation at the previous wave. The rationale behind this hypothesis is that decreasing the survey burden might be particularly important for these respondents, as survey burden might be a motivation for refusal, especially for less engaged sample members. Furthermore, we hypothesise that the non-response follow-up would reduce non-response bias and that this effect will be greater amongst the group allocated to the "short" version. Subgroups of sample members who are harder to convince to take part will be under-represented after completion of face-to-face fieldwork. Providing a further opportunity to participate and reducing the burden of doing so will increase participation amongst these sub-groups which will reduce non-response bias. This hypothesis is consistent with the intuition that non response bias may be reduced by using follow-up surveys, as "early" and "late" survey respondents are significantly different in a number of socio-demographic characteristics – for a review see Gummer and Struminskaya (2023).

In the following we describe the data used in analysis and the experimental design; we then move to the study results and conclude with a discussion and conclusion, where we also discuss the trade-off between number of interviews achieved and volume of information collected on each respondent.

Data

Next Steps is a longitudinal study following approximately 16,000 participants in England, born in 1989-90. The study began in 2004, when participants were aged 14, and it was known as the Longitudinal Study of Young People in England (LSYPE). The target population was young people who were in Year 9 in English state and independent schools and pupil referral units in February 2004. After the first wave of data collection, participants were interviewed yearly until age 20 (wave 7, in 2010), and then again at age 25 in 2015 (wave 8) and at age 32 in 2023 (wave 9). Waves 1 to 7 were run by the Department for Education. During this period, only participants who took part in the prior wave were issued in the following survey wave. The study was then paused for five years until the Age 25 Survey in 2015 when the study was re-launched by the Centre for Longitudinal Studies, University College London (wave 8, in 2015). During the Age 25 Survey efforts were made to trace and contact everyone who ever took part in the study (Calderwood et al., 2021; Centre for Longitudinal Studies, 2017). At the Age 32 survey (wave 9 in 2023), all (living) original cohort members were issued to the field unless they had permanently opted out, become permanently untraced or were known to be in prison or on probation.

Age 32 Survey fieldwork was carried out in four main batches, and the non-response conversion experiment analysed in this study was implemented in the first. The issued sample for the Age 32 Survey was stratified by three variables to allocate the issued sample to batches: i. when the cohort member has last taken part (wave 8, wave 7 or waves 1-6), ii. region of residence (South, London, North, and Midlands), and iii. sex. These stratification variables were based on analysis of the Age 25 survey data, which indicated that they were the most significant predictors of cooperation/refusal rates. A stratified random sub-sample consisting of 25% of all cases to be issued (n=3,113) was selected for issue to the first batch of fieldwork in which the non-response conversion experiment was conducted.[1] The survey used a sequential mixed mode approach where sample members were first invited to

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[1] 3,206 cases were initially assigned to wave 1, however a small share of cases (3%, n=93) was reallocated to the mainstage data collection due to difficulties in assigning interviewers to some areas. The final sample issued to the soft launch was composed of 3,113 cohort members.

complete the survey online. After a three week online only period interviewers started attempting contact with sample members, either by telephone or face-to-face (for unproductive sample members at the prior wave or sample members who did not provide a telephone number). In addition to offering face-to-face interviews, interviewers were also able to offer self-completion of the survey on a tablet handed over to them by interviewers and collected at a later agreed time, video interviews (using Microsoft Teams) and, in exceptional circumstances a telephone interview. The web-survey also remained open during the interviewer-lead fieldwork period.

To maximise response rates monetary incentives were offered to sample members, in the form of vouchers. In the first batch, an incentive experiment was implemented. Half of sample members were randomly assigned to a targeted incentive group and half to a non-targeted incentive group. In the targeted incentive group, prior wave respondents were offered a £15 conditional incentive while prior wave non-respondents were offered a £25 conditional incentive. In the non-targeted group, sample members were offered a £20 incentive regardless of prior wave participation. In addition, all sample members who completed the survey online within the first three weeks of fieldwork received an additional £10 "early-bird" conditional incentive. Allocation to the non-response conversion experiment is independent from allocation to the incentive experiment.

The offer of the monetary incentive was retained in the non-response conversion phase. Hence, the incentive amount offered did not depend on allocation to the "short" or "full" non-response conversion survey (Table 1). Clearly, sample members allocated to the non-response conversion survey are not early-bird respondents and hence, while they were all offered the "early-bird" incentive conditional on survey completion within 3 weeks of fieldwork, none of them was eligible for redeeming it.

Table 1: Incentive group allocation and allocation to "short" versus "standard" survey

	Incentive amounts		
	"Early-bird" incentive + standard incentive (£)	standard incentive (£)	
		"short" survey	"full" survey
Not-targeted	30	20	
Targeted approach			
Prior wave respondents	25	15	
Prior wave non-respondents	35	25	

Note: "early-bird" incentive applies only to respondents who complete the survey in the first three weeks of fieldwork. Sample members allocated to the non-response conversion survey were offered the "early-bird" incentive conditional on survey completion within the first three weeks, but none of them was eligible to redeem it as they are not early-bird participants.

Topics covered in the Age 32 survey included family and relationships, housing, employment and income, education, health and wellbeing, identity and attitudes, childhood and other life events. The median survey duration online (or on a tablet provided by interviewers) was 55 minutes, and 87 minutes for in-person interviews.

In addition to the main questionnaire, sample members were invited to complete a cognitive assessment; to offer consent to provide a saliva sample for DNA extraction, to consent to linkage of administrative records held by various government departments and agencies, and to consent for the study to contact their live-in partner to ask them to consent to linkage of their administrative records.

Experimental design

The experiment was conducted amongst sample members assigned to the first batch of the Next Steps Age 32 Survey (n=3,064). Sample members who were non-respondents (excluding permanent or adamant withdrawals and ineligibles) on completion of face-to-face fieldwork were invited again to complete a web survey three months after completion of face-to-face interviewer fieldwork. Among those, 50% were invited to complete the standard 60-minute survey ("full" version), which included the cognitive assessment, the data linkage consent requests, and the

request for consent to provide a biological (saliva) sample. The remaining 50% of sample members were invited to complete a "short" 20-minute version of the survey (which did not include any of the additional elements). Those sample members who at the end of the face-to-face fieldwork had started the interview but not completed, i.e. usable and unusable partials, and were invited in the survey non-response conversion phase (~60 observations), were allocated to the "short version"; hence, these cases are excluded from the analysis sample. A series of chi square test show no significant difference in allocation to experimental groups, by observable baseline socio-demographic characteristics (sex, ethnicity and parental socio-economic status).

In both the "full" and "short" groups, sample members received an invitation letter for the non-response conversion survey; the communication for the latter group emphasized the shortened survey duration. Letters for both groups are available in the supplementary materials.

The non-response conversion phase started on December 5th 2022 and was set to last until January 16th 2023. However, the possibility to complete the survey remained open until the end of fieldwork (end of August 2023). Over these months, interviewers were attempting to contact a subsample of cases who have not yet responded to the non-response conversion survey (approximately 10% of our analysis sample) for which a new tracing address was made available ("reissue cases") just before the non-response conversion phase. Response rates (after non-response conversion) are calculated before the start of the reissue phase (20th of February 2023) to avoid confounding the effect of the non-response conversion survey with the effect of the reissuing a subsample of cases to face-to-face fieldwork. Only a handful of non-reissue cases in our sample were interviewed online during the reissue phase.

Methods

Research question one (RQ1) – i.e. is there a significant difference in response rates between those assigned to the "short" questionnaire and those assigned to the full questionnaire? – is answered by comparing response rates across the two experimental groups ("long" and "short").

To answer research question two (RQ2) – i.e. whether the "short" questionnaire is particularly effective among unproductive sample members with specific outcomes (non-contact, refusal, uncertain eligibility, or other non-response) at the end of the face-to-face fieldwork period? – we compute response rates across the two experimental groups ("short" and "full") by outcome at the end of the face-to-face fieldwork period.

To answer research question three (RQ3) – i.e. to what extent does the follow-up phase improve response rates? – we compute response rates before and after the mop up phase.

To answer research question four (RQ4) – is the "short" version particularly effective among specific subgroups of sample members (e.g. previous wave non-respondents) and what is the impact of the non-response follow-up interview on response bias? – we run a logistic regression, with survey participation (full response) as an independent variable and as explanatory variables: experimental allocation into the "short" or "long" version of fieldwork, and the interaction between the experimental allocation, socio-demographic characteristics observed at baseline and in earlier waves (sex, ethnicity, and parental socio-economic status) and prior wave outcome (i.e. productive *versus* unproductive).

Also, we compare the distribution of sex, parental socio-economic status and ethnicity (white/ not-white) in the issued sample, among respondents before the non-response conversion phase, and among respondents after the non-response conversion (excluding alternatively responses in the "short" or "long" versions). It should be noted that sex, parental socio-economic status and ethnicity are collected at baseline (and, where not available at baseline, at prior survey waves), allowing us to disentangle between differences in representativity and measurement; indeed, as survey duration may impact on the accuracy of survey responses it would not be possible to disentangle non-response bias from measurement bias, if the comparison is conducted between survey responses across groups (*short* and *full* interview) at the Age 32 survey.

Throughout, response rates are calculated adopting the "Response Rate 2" as defined in the standard definitions of the American Association for Public Opinion

Research (AAPOR, 2023). This is the number of interviews (complete or usable partial) divided by interviews (complete or partial) plus non-interviews (refusal, non-contact, other non-interview) and cases of unknown eligibility.

To answer research question five (RQ5) we compare drop-offs from respondents in the short *versus* full non-response conversion survey. Similarly, to answer research question six (RQ6) we compare item non-response and drop-off rates in the web only stage of fieldwork (first three weeks) *versus* in those in the mop-up phase. It should be noted that we do not include in the analysis respondents who completed the survey during the face-to-face phase to avoid confounding data quality between early/late respondents and mode effects.

Results

In Table 2 we compare response rates across experimental groups (short *versus* full questionnaire). The short non-response conversion survey has a higher response rate compared to the full interview: among all respondents invited to the non-response conversion survey phase participation reached 11.8% in the short questionnaire version, as opposed to 7.6% in the full questionnaire (P=0.010). The short questionnaire was particularly effective in boosting participation among prior wave non-respondents; for this group response reaches 11.3% when the short version non-response conversion survey is administered compared with 5.2% amongst those offered the full version (P=0.002). No significant difference is observed for prior wave-respondents.

Overall, we find support for our hypothesis: the "short" questionnaire would lead to higher response rates, consistently with survey participation theory positing that the lower the response burden the higher the probability that sample members agree to participate in the study. Furthermore, sample members allocated to the "short" questionnaire are significantly less likely to drop-off (19.7% versus 5.2%, P=0.007). However, due to the small sample size (N=148), these findings should be interpreted with caution, and definitive conclusions cannot be drawn.

In Table 2, we also compare the effectiveness of the short/full refusal conversion survey by response outcome after the face-to-face fieldwork period, answering

research question two. We notice that the short non-response conversion survey is significantly more effective than the full non-response conversion survey for sample members who were categorised as "other non-interview" at the end of the fieldwork period; in line with our hypothesis, we also find a higher (and marginally significant) response rate among sample members who refused participation in the face-to-face phase and are allocated to the short (*versus* full) non-response conversion survey (10.4% *vs.* 6.0%, P=0.083). No significant difference is detected for sample members for whom contact was not established at the end of the face-to-face fieldwork period.

We also analyse reasons for survey refusal as provided by sample members to face-to-face interviewers and reported by interviewers in a "tick all that apply" multiple choice question. While only a handful of sample members refusing to take part in the face-to-face phase indicate the survey being too long as a reason for not participating, approximately 6% of them mentioned being too busy as a reason for non-cooperation. Sample sizes do not allow meaningful comparison of response rates after the (short/long) non-response conversion survey by reason for refusal.

Table 2: Response rates in the "full" and "short" non-response conversion survey

| | | Non-response conversion Survey Response rates (%) | | |
	full survey	*short* survey	Total	P
Total sample	7.6	11.8	9.6	0.010
n	*662*	*602*	*1,264*	
Prior wave				
respondents	11.7	12.6	12.2	0.768
n	*239*	*222*	*461*	
non-respondents	5.2	11.3	8.1	0.002
n	*423*	*380*	*803*	
Face-to-face outcome				
Refusal	6.0	10.4	8.2	0.083
n	*233*	*230*	*463*	
Non-contact	7.6	4.7	6.2	0.264
n	*184*	*169*	*353*	
Other non-interview	9.0	18.8	13.4	0.002
n	*245*	*202*	*447*	

Note: P-value from a chi-square test.

As shown in Table 3, the non-response conversion phase led to an increase in response rates of 4 percentage points from 52% to 56%. The increase is particularly marked for prior wave non-respondents: this group reaches a 30.3% response rate at the end of the non-response conversion period (rising from 25% before the non-response conversion survey). For prior wave respondents the difference is less noticeable and not significant (73.6% *versus* 70.4%). If all non-respondents had been allocated to the short follow-up survey we would project that the overall response rate would have reached 57.7%, compared to a projected overall response rate of 55.6% if all had been allocated to the full version. The difference is driven by prior-wave non-respondents (33.5% *versus* 28.9% raising from a pre non-response conversion response rate of 25.0%).

Table 3: Response rates before and after the non-response conversion survey

	Response rate before non response conversion survey			Response rate after non-response conversion survey			
				overall		*full°*	*short°*
	N	%	95% C.I.	%	95% C.I.	%	%
Prior wave							
respondents	1,771	70.4	[68.3-72.5]	73.6	[71.5-75.6]	73.9	74.1
non respondents	1,205	25.0	[22.5-27.4]	30.3	[27.7-32.9]	28.9	33.5
Total	2,976	52.0	[50.2-53.8]	56.0	[54.3-57.8]	55.6	57.7

Note: °projected figures as if all non-respondents were issued to same treatment.

To understand whether the "short" questionnaire is particularly effective at securing survey participation among specific subgroups of sample members we compare response rates among sample members allocated to the short (versus long) questionnaire by socio-demographic characteristic, i.e.: sex, ethnicity (white/non-white), and socio-economic status (Table 4). The "short" non-response conversion survey leads to a significantly higher response rate, as opposed to the full non-response conversion survey, for female respondents (15.2 versus 9.3, P=0.036), for ethnic minorities (6.0% versus 11.6%, P=0.027) and for sample members from "low" parental socio-economic status (7.1% versus 13.2, P=0.022).

Table 4: Response rates in the "full" and "short" non-response conversion survey

| | Non-response conversion Survey Response rates (%) | | | |
	full survey	*short* survey	Total	P
Socio-demographic variable				
Sex: Male	6.3	9.3	7.7	0.137
n	*366*	*322*	*688*	
Sex: Female	*9.3*	*15.2*	*12.1*	0.036
n	*291*	*273*	*564*	
White ethnicity	8.5	12.2	10.3	0.091
n	*400*	*360*	*760*	
Ethnic minority	6.0	11.6	8.7	0.027
n	*251*	*232*	*483*	
Parental Socio-economic status:				
High	5.5	10.2	7.9	0.099
n	*181*	*187*	*368*	
Intermediate	9.9	12.0	10.9	0.620
n	*121*	*100*	*221*	
Low	7.7	13.2	10.3	0.022
n	*339*	*295*	*634*	

Note: P-value from a chi-square test.

To understand whether the follow-up has any impact on response bias, we compare the distribution of the issued sample, with the distribution before the non-response conversion survey and after the non-response conversion survey excluding short questionnaires or excluding long questionnaires (Table 5). The achieved sample before the non-response conversion survey phase underrepresents males, ethnic minorities and respondents with low parental socio-economic status; also, it overrepresents respondents with high socio-economic status. Following-up non respondents in the non-response conversion survey does not lead to major improvements in representativeness in any of the variables considered, however, we do observe some indication of a reduction in the underrepresentation of respondents from ethnic minorities and from low parental socio-economic status. We do not notice any difference in response bias, when we compare estimates obtained including only respondents from the *short* non-response conversion survey, nor when we include only responses to the *long* non-response conversion survey.

However, small sample sizes may play a role in the inability to detect such differences.

Table 5: Sample composition in the issued sample, before and after the non-response conversion survey ("short" and "full")

| | Issued sample | | Before the n.r. survey | | After the r.c. survey | | | | | |
| | | | | | including "full" n.r. survey only | | including "short" n.r. survey only | | including "short" and "full" n.r. survey | |
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Male	49.5	[47.7-51.3]	44.0	[41.5-46.5]	44.0	[41.6-46.5]	43.9	[41.5-46.3]	43.9	[41.6-46.3]
Non-white	33.8	[32.1-35.5]	29.6	[27.4-31.9]	29.7	[27.4-31.9]	30.0	[27.8-32.3]	30.0	[27.8-32.3]
Higher SES	36.2	[34.5-38.0]	41.7	[39.2-44.2]	41.1	[38.7-43.5]	41.1	[38.7-43.5]	40.5	[38.1-42.9]
Intermediate SES	18.8	[17.4-20.2]	19.0	[17.0-21.0]	19.1	[17.2-21.1]	18.9	[17.0-20.8]	19.1	[17.2-21.0]
Routine SES	45.0	[43.2-46.8]	39.3	[36.8-41.7]	39.8	[37.3-42.2]	40.0	[37.6-42.4]	40.4	[38.1-42.8]

Discussion and conclusion

This study analyses the potential of a non-response conversion web survey implemented in the last phase of fieldwork of a large-scale cohort study: the Next Steps Age 32 Survey. Specifically, we test the effectiveness of the non-response conversion survey and compare the impact on response rates of offering sample members the possibility to participate in a survey of shorter duration (*versus* the full survey instrument).

We find that the non-response conversion survey improved response rates. The shorter (20 minutes) non-response conversion survey led to overall higher response rates, than the full 60 minute survey. We infer that response burden might be a significant obstacle to survey participation, which may be overcome by offering surveys of shorter duration in the non-response conversion phase (particularly to prior wave non-respondents). Circumstantial reasons for not-participating, while still present (as evidenced by the increase in response rate amongst those re-invited to the full survey) seem less prominent.

Analysing differences by sociodemographic characteristics and previous wave response behaviour, we find that response rates increase significantly for previous wave non-respondents allocated to the *short* version (versus *full* version), while no difference on response rates based on survey length is observed among previously cooperative sample members.

Also, the shorter survey version seems particularly effective to secure participation among females, ethnic minorities and individuals with low parental socio-economic status. This finding suggests that the offer of shorter instruments seems like a promising practice for obtaining at least some information from sample members which are particularly hard to convince to take part otherwise, such as ethnic minorities and those from lower socio-economic backgrounds.

Analysing response bias, we notice that overall, offering a further opportunity to participate in the survey does not result in major improvements in representativity in any of the variables considered. However, we find some mild indication that the non-

response conversion surveys may lead to a reduction in underrepresentation of sample members from ethnic minorities, which seem encouraging.

Adopting the Total Survey Error Framework, one drawback of refusal conversion strategies is that while these augment response rates, increases in representativity may be coupled with higher measurement error, as reluctant respondents (hard-to-persuade or hard-to-contact) may provide answers of "lower quality" compared to other sample members. While earlier literature finds that low response propensity is associated with lower data quality – e.g. respondents who require more follow-up to secure participation provide less accurate information (Cannell and Fowler, 1963); lack of interest in the survey is associated with item nonresponse (Couper, 1997) and measurement error increases when respondents with lower cooperation propensity are included in the analysis (Olson, 2006) –, more recent evidence (Kreuter et al., 2014) shows, differences between early and late respondents are mainly a result of sample composition effects and memory effects (rather than measurement error) – as respondents who are recruited later in the fieldwork are required to recall events which are further in the past compared to respondents who participate early in fieldwork).

It should be also noted that survey duration may also be associated with data quality, given that respondents motivation to answer survey questions carefully may be greater at the beginning of a questionnaire and decrease over time (Krosnick, 1991). As a matter of fact, the choice of survey duration requires the consideration of multiple trade-offs (e.g. between increasing the achieved samples size but with a reduced amount of information being collected and between data quality and representation) as well as cost implications associated with the extensive efforts to secure participation from late respondents; further research may focus on these aspects specifically.

Furthermore, in longitudinal settings, further research may consider the long-term effects of offering non-response conversion surveys of shorter duration at the end of the fieldwork period. Indeed, sample members who, at the end of fieldwork, have been invited to participate on a survey of shorter duration may delay participation at future survey waves, anticipating an opportunity to participate in a shorter, and hence less burdensome, survey later on (and, potentially, receiving a conditional

monetary incentive of the same amount). In the specific case of the Next Steps cohort study, which typically has an approximately 5 years interval between waves, any detrimental effect on subsequent wave participation may be less pronounced, as opposed to longitudinal studies with shorter time intervals between waves.

Moreover, research on non-response conversion strategies should carefully take into account ethical considerations. Indeed, researchers should reflect on the difference between politely offering a second opportunity to participate in the survey and harassing participants (Stoop, 2017). However, surveys that implement non-response or refusal conversion phases typically target these efforts only at sample members who have not adamantly declined participation. This was the case in the Next Steps Age 32 survey, where adamant refusals were excluded from the follow-up phase.

Finally, researchers may consider the ethical aspect of offering sample members incentives of the same value for completing surveys of different duration. This consideration first within the broader discussion of the fairness of differential incentives (see (Nicolaas et al., 2019)) which is a promising research area for further research.

References

Bethlehem, J., Cobben, F., & Schouten, B. (2011). *Handbook of nonresponse in household surveys*. John Wiley & Sons.

Burton, J., Laurie, H., & Lynn, P. (2006). The long-term effectiveness of refusal conversion procedures on longitudinal surveys. *Journal of the Royal Statistical Society Series A: Statistics in Society, 169*(3), 459-478.

Calderwood, L., Peycheva, D., Henderson, M., Silverwood, R., Mostafa, T., & Rihal, S. (2021). *Next Steps: Sweep 8 – Age 25 User Guide (3rd edition).*

Calderwood, L., Plewis, I., Ketende, S., & Mostafa, T. (2017). Evaluating the immediate and longer term impact of a refusal conversion strategy in a large scale longitudinal study. *Survey Research Methods, 10*(3), 225-236.

Centre for Longitudinal Studies, U. C. L. (2017). *Next steps age 25 survey: Technical report.* https://doc.ukdataservice.ac.uk/doc/5545/mrdoc/pdf/age_25_technical_report.pdf

Couper, M. P. (1997). Survey Introductions and Data Quality. *The Public Opinion Quarterly, 61*(2), 317-338. http://www.jstor.org/stable/2749554

Crawford, S. D., Couper, M. P., & Lamias, M. J. (2001). Web Surveys: Perceptions of Burden. *Social Science Computer Review, 19*(2), 146-162. https://doi.org/10.1177/089443930101900202

Dangubic, M., & Voorpostel, M. (2017). Refusal conversion in the Swiss household panel 1999-2015: An overview.

De Leeuw, E., & De Heer, W. (2002). Trends in household survey nonresponse: A longitudinal and international comparison. *Survey nonresponse, 41*, 41-54.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method.* John Wiley & Sons.

Galesic, M., & Bosnjak, M. (2009). Effects of questionnaire length on participation and indicators of response quality in a web survey. *Public opinion quarterly, 73*(2), 349-360.

Groves, R. M., Singer, E., & Corning, A. (2000). Leverage-saliency theory of survey participation: Description and an illustration. *The Public Opinion Quarterly, 64*(3), 299-308.

Gummer, T., & Struminskaya, B. (2023). Early and late participation during the field period: Response timing in a mixed-mode probability-based panel survey. *Sociological Methods & Research, 52*(2), 909-932. https://doi.org/https://doi.org/10.1177/0049124120914921

Kreuter, F., Müller, G., & Trappmann, M. (2014). A note on mechanisms leading to lower data quality of late or reluctant respondents. *Sociological Methods & Research, 43*(3), 452-464. https://doi.org/https://doi.org/10.1177/0049124113508094

Krosnick, J. A. (1991). Response strategies for coping with the cognitive demands of attitude measures in surveys. *Applied Cognitive Psychology, 5*(3), 213-236. https://doi.org/https://doi.org/10.1002/acp.2350050305

Lewis, T., Gorsak, M., & Yount, N. (2019). An Automated Refusal Conversion Strategy for Web Surveys. *Field methods, 31*(4), 309-327. https://doi.org/10.1177/1525822x19871016

Lipps, O. (2011). *Refusal Conversion in telephone panels: Is it worth it.*

Loosveldt, G., & Joye, D. (2016). Defining and assessing survey climate. *The SAGE handbook of survey methodology*, 67-76.

Lugtig, P., Struminskaya, B., Dickson, S., Kessel, K. v., Henneveldt, C. v., Timmers, A., Groves, R. M., & Peytcheva, E. (2023, 18 July 2023). *The Relation Between Nonresponse Rates and Nonresponse Bias. An Update and Extension of Groves and Peytcheva (2008)* 10th Conference of the European Survey Research Association Conference, Milan,

Luiten, A., Hox, J., & de Leeuw, E. (2020). Survey nonresponse trends and fieldwork effort in the 21st century: Results of an international study across countries and surveys. *Journal of Official Statistics, 36*(3), 469-487.

Nicolaas, G., Corteen, E., & Davies, B. (2019). *The use of incentives to recruit and retain hard-to-get populations in longitudinal studies.* https://www.ukri.org/wp-content/uploads/2020/06/ESRC-220311-NatCen-UseOfIncentivesRecruitRetainHardToGetPopulations-200611.pdf

Olson, K. (2006). Survey participation, nonresponse bias, measurement error bias, and total bias. *International Journal of Public Opinion Quarterly, 70*(5), 737-758.

Stoop, I. A. L. (2017). Unit Nonresponse. In *The SAGE handbook of survey methodology* (pp. 409-424). SAGE Publications Ltd. https://doi.org/https://doi.org/10.4135/9781473957893