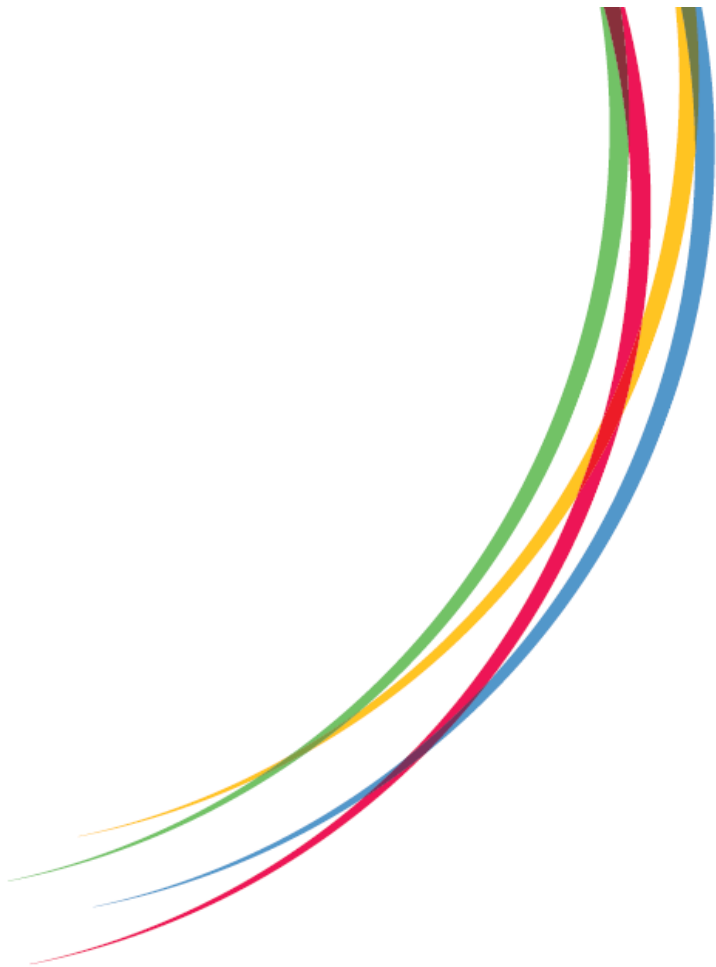




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**The Effect of a Mixed Mode Wave on
Subsequent Attrition in a Panel Survey:
Evidence from the *Understanding Society*
Innovation Panel**

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The Effect of a Mixed Mode Wave on Subsequent Attrition in a Panel Survey: Evidence from the *Understanding Society* Innovation Panel

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Abstract

Previous evidence suggests that a wave with mixed mode data collection in an otherwise face-to-face panel survey will achieve a lower response rate than other waves. But until now there has been no evidence as to whether the response rate can be expected to recover subsequently. In other words, is the hit on response rate temporary or permanent? In this paper we address that question by examining the relationship between response at wave 3 of the *Understanding Society* Innovation Panel and the data collection protocol used at wave 2, when an experiment was carried out with mixed modes.

Key words: longitudinal survey, mixed mode survey, non-response, telephone survey

JEL classifications: C81, C83

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Non-Technical Summary

Understanding Society is a panel survey in which a sample of the general population is approached for interview at annual intervals. The first four annual 'waves' of the survey have been carried out entirely by personal approaches by survey interviewers, requesting a face-to-face interview in the respondent's home. However, there is interest in whether the survey budget could be reduced by switching some of the data collection to other 'modes', such as telephone interviewing or web questionnaires.

The *Understanding Society* Innovation Panel is a modest-scale survey run alongside the main survey, to test both question design and survey procedures. At the second wave of this survey, an experiment was carried out whereby some sample households were approached face-to-face in the usual way, while others were first approached by telephone and asked to participate by carrying out the interview over the telephone. Only if this telephone approach was unsuccessful was a field interviewer then deployed to call on the household in person instead. The hope was that this alternative design of seeking telephone interviews should cost less. However, it was recognised that it may also have detrimental consequences, one of which was the possibility of a lower response rate. But even if a lower response rate was obtained with the telephone approach, there was hope that the response rate may recover at the subsequent wave, if that wave reverted to personal approach.

In this paper we assess the effect of the wave 2 field work design – comparing the 'face-to-face' and 'mixed mode' designs – on response rates at wave 3, when all sample households were approached face-to-face. We find that the mixed mode design harms wave 3 response rates overall, but particularly for men, for older sample members and for those who do not use a mobile phone or the internet.

The Effect of a Mixed Mode Wave on Subsequent Attrition in a Panel Survey: Evidence from the *Understanding Society* Innovation Panel

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1. Introduction

Mixed mode survey designs are increasingly being proposed as means of reducing survey costs or increasing survey quality. While mixed mode designs clearly have the potential to achieve either of these aims, researchers have struggled to identify designs that achieve both ends simultaneously. Instead, in practice the goal is often to reduce costs while minimising damage to survey quality or to improve quality while minimising any increase in costs.

Mixed mode designs can take many forms. They can differ in the modes that are included, the priority given to each mode, and the protocols that determine when a sample unit is switched from being attempted in one mode to another. These choices can have important effects on costs, response rates, and survey measurement. An important distinction can be made between concurrent mixed mode designs and sequential mixed mode designs. Concurrent designs involve approaching a sample member and offering them an explicit choice of modes by which to participate in the survey. Sequential designs involve approaching sample members first in one designated mode and then, when some criterion is met, switching sample members who have not yet responded to an alternative mode. Sometimes there may be a third mode in the sequence too. The mixed mode designs considered in this paper are sequential ones.

There are many aspects of survey quality of interest to researchers (Lynn 2004), but in this paper we focus on survey non-response. The goal of the survey researcher is both to maximise response rates and to minimise variation between sample members in response propensities, in order to avoid non-response bias. Response rate is particularly important for a longitudinal survey such as *Understanding Society* as sample members, once lost, are irreplaceable. The value of the research resource depends on being able to maintain

the sample size over many waves of the survey. We therefore focus in this paper on the effect of mixed mode data collection on response rates and differences in response rates between sample subgroups.

2. Study Design

At wave 2 of the *Understanding Society* Innovation Panel, which was carried out in early 2010, sample households were randomly allocated one-third to each of three groups. In the first group, all field work was carried out face-to-face by CAPI. The second and third groups were both administered mixed mode designs involving both CAPI and CATI. For both groups, field work began in CATI but was then transferred to CAPI to attempt remaining non-respondents. The difference between the two groups was in the criterion determining when a sample household should be switched from CATI to CAPI. In the “early transfer” group, all remaining non-respondents in a household were transferred to CAPI as soon as it was ascertained that at least one household member would require a personal visit by an interviewer, for example because they refused the CATI, or were too ill to talk on the phone. In the “late transfer” group, a household was transferred to CAPI only when all reasonable attempts had been made to complete a CATI interview with every household member. Both the preceding and subsequent waves were carried out entirely by CAPI.

It has already been observed (Lynn et al, 2010) that at wave 2 the CAPI-only design achieved higher response rates than either of the mixed mode designs. However, it was not known whether this difference in response rates would persist when the survey returned to being CAPI-only at wave 3, or whether response rates for the mixed mode groups would recover and return to the level that could have been expected at wave 3 had they been approached by CAPI at wave 2. In other words, we are interested in whether response propensity at wave 3, conditional on participation at wave 1, is independent of the mode of approach at wave 2.

3. Results

In Table 1 we present the individual response rates at both wave 2 and wave 3 for each of the three treatment groups. The analysis base consists of all individuals who participated in wave 1. It can be seen that at wave 2 response was around 8.5 percentage points higher for the CAPI group than for either of the mixed mode groups, differences that are highly statistically significant. At wave 3 the gap closes a little, but is still large (8.0 percentage points for the early transfer group and 4.3 for the late transfer group) and is still statistically significant for the early transfer group. We therefore find evidence that the effect of a mixed mode wave on response rate is not limited to the wave at which mixed modes are employed, but instead persists to the following wave, when the fieldwork protocol was identical for all sample members.

Table 1: Wave 2 and 3 response conditional on wave 1 response

	Wave 2		Wave 3	
	Response %	Odds Ratio (<i>P</i>)	Response %	Odds Ratio (<i>P</i>)
Face-to-face	75.6		65.1	
Mixed Mode (early transfer)	67.1	0.666 (0.005)	57.1	0.740 (0.033)
Mixed Mode (late transfer)	66.9	0.657 (0.002)	60.8	0.868 (0.318)

Notes: Base is all individuals who responded (full, partial or proxy interview) at wave 1. Dependent variable is response at stated wave (full, partial or proxy interview). Odds ratios are relative to the face-to-face treatment. P-values estimated from a logistic regression with treatment as the sole predictor variable. Estimation carried out using SVY commands in Stata, to account for the complex sample design.

It is of interest to establish whether the effect of a mixed mode wave on response rates differs between sample subgroups. We therefore assess the differences between treatment groups in wave 3 response rate for a number of different sample subgroups, defined by characteristics measured at wave 1. To simplify the presentation, we combine the two mixed mode treatments and compare them with the CAPI treatment. Table 2 presents the results.

Table 2: Wave 3 response conditional on wave 1 response, by sample subgroups

	Face-to-face %	Mixed Mode %	Odds Ratio	P
Total	65.1	59.0	0.802	0.08
Male	63.7	56.6	0.746	0.07
Female	65.0	61.4	0.856	0.22
Age 16-25	42.5	42.3	0.994	0.98
Age 26-40	63.0	58.3	0.821	0.35
Age 41-55	65.5	62.9	0.894	0.60
Age 56-65	77.1	62.7	0.498	0.02
Age 66 or over	71.1	61.1	0.737	0.21
Currently employed	62.9	59.5	0.869	0.34
Not currently employed	66.4	58.7	0.720	0.05
Mobile phone user	63.4	59.7	0.855	0.22
Mobile phone non-user	72.6	54.9	0.513	0.01
Internet user	64.1	60.5	0.858	0.28
Internet non-user	66.4	57.0	0.725	0.05

Notes: Base is all individuals who responded (full, partial or proxy interview) at wave 1. Dependent variable is response at wave 3 (full, partial or proxy interview). The two mixed mode treatments are combined. Sample member characteristics are as measured at wave 1. P-values estimated from separate logistic regression for each subgroup. Estimation carried out using SVY commands in Stata, to account for the complex sample design.

A number of interesting differences between subgroups in the effect of the mixed mode wave on response rate are in evidence. It appears that the effect is stronger for men than for women. There is a clear association with age: the effect on response rate is strong for sample members aged over 55 but is weak or non-existent for younger sample members. The effect is also stronger for those who were not currently employed at the time of wave 1 – a group that includes all retired people. Finally, we examine two indicators of technology use, whether the respondent uses a mobile phone and whether they use the internet. We find that in both cases the effect of mixed mode data collection on subsequent response rate is much stronger for non-users of the technology than it is for users. In fact, with the mixed mode design at wave 2, users have a slightly higher wave 3 response rate than non-users, while with CAPI it is the non-users that have a higher response rate.

4. Discussion

We find clear evidence that the detrimental effect of mixed mode data collection on current wave response rate persists at the subsequent wave. Though the effect is weaker at the subsequent wave, it is still substantial. This suggests that the idea that response rates will “bounce back” after a mixed mode wave is unfounded. Instead, caution is needed when considering the implementation of a mixed mode wave in a panel survey as this may have undesired long-lasting effects. Of course, we do not yet know whether the response rate differential will persist at wave 4 or subsequent waves. That remains a question for future research.

Furthermore, we have seen that sample subgroups are not affected equally. The differences are most pronounced for age groups. The wave 2 protocol has no effect at all on wave 3 response rates for 16-25 year-olds, while for 56-65 year-olds there is a highly significant 14.4 percentage point gap in response rates. Both mobile phone usage and internet usage also discriminate in terms of the effect of the mixed mode protocol. Wave 3 response rates are much lower for those allocated the mixed mode protocol at wave 2 amongst sample members who do not use a mobile phone or do not use the internet, while no significant effect is found amongst those who use either a mobile phone or the internet. These findings suggest that there may be scope to target mixed mode data collection at subgroups for whom it may not be detrimental in terms of survey quality indicators such as response rate, while perhaps reducing costs. However, more work is needed to determine exactly how such subgroups could best be identified. Other considerations, such as effects on measurement, must also be taken in account (Dillman, 2009).

References

- Dillman, D.A. (2009) Methods for longitudinal surveys, chapter 8 of *Methodology of Longitudinal Surveys* (ed. P. Lynn), pp. 127-139. Chichester, Wiley.
- Lynn, P. (2004) Measuring and communicating survey quality, *Journal of the Royal Statistical Society Series A (Statistics in Society)* 167, 575-578
- Lynn, P. Uhrig, S.C.N. & Burton, J. (2010) Lessons from a randomised experiment with mixed mode designs for a household panel survey. *Understanding Society Working Paper* 2010-03, Colchester: ISER, University of Essex. Available at <http://research.understandingsociety.org.uk/publications/working-paper/2010-03>.