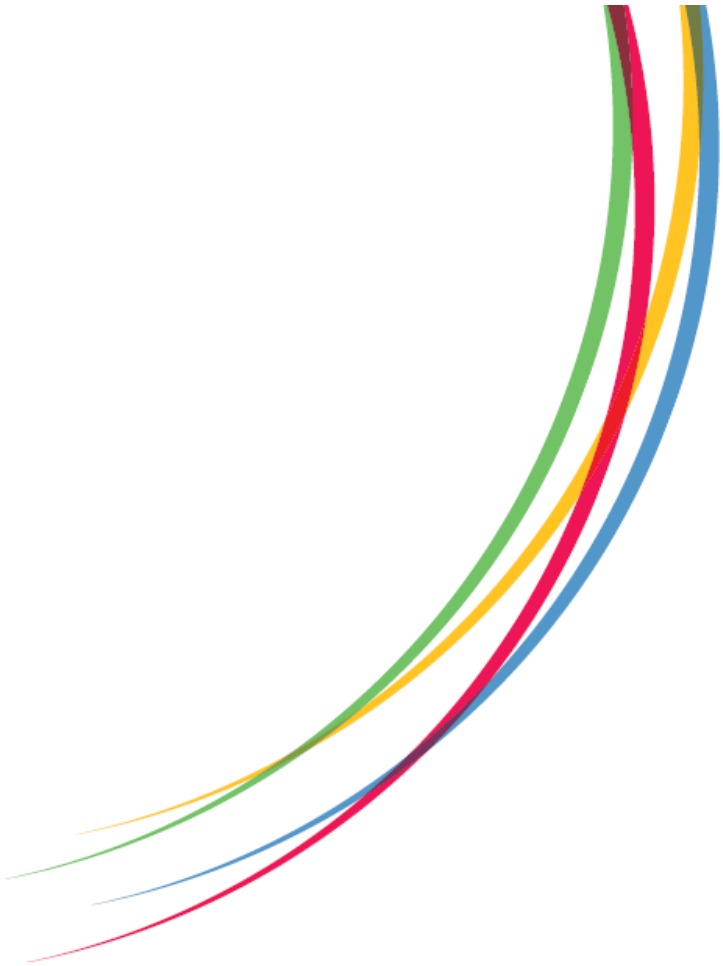

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The role of email addresses and email contact in encouraging web response in a mixed mode design

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Non-technical summary

Web surveys are getting more and more popular. When people are selected for a web survey, they are typically sent an invitation to the survey either by email or by traditional mail. If they do not respond after a certain time, they are then sent one or more reminders. In this paper, we assess the impact of sending the invite and reminders by email in addition to traditional mail on two outcomes that are important to survey researchers. The first is whether or not the sample member participates in the survey and the second is in which mode they respond.

Furthermore, web surveys are sometimes used in combination with other ways of collecting survey data, such as face-to-face interviewing. In our study, sample members are first invited to a web survey and then followed up face-to-face if they do not complete the web survey. A third outcome of interest is therefore whether the sample member is more likely to respond by web rather than face-to-face if they receive an invite by email.

In longitudinal surveys, where people are interviewed repeatedly, researchers can ask people to provide their email address so that future contacts can be made by email. But this is costly and sample members may not like being asked for such personal information. The overall aim of this paper is to assess whether the costs of asking sample members to provide their email address are worth it.

We find that using a respondent-supplied email address to send additional survey invites and reminders does not affect survey response rates compared to using mailed invites and reminders alone, but results in more responses by web rather than face to face, hence lowering survey costs. We find no evidence that these results depend on how long ago the email was provided or how long the respondent has been a panel sample member.

The role of email addresses and email contact in encouraging web response in a mixed mode design

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Abstract

We examine whether propensity to participate in a web-CAPI mixed-mode survey is influenced by being contacted by email in addition to mail. In panel surveys, researchers can ask at each wave for an email address, but there is little evidence regarding the value of doing so. Using data from a large sample with an experimental design (IP5) we find that using a respondent-supplied email address to send additional invites and reminders does not affect response rates compared to using mailed invites and reminders alone, but results in more responses by web rather than CAPI and hence lowers survey costs. We find no evidence that these results depend on time spent in the sample.

Key words: longitudinal survey, mixed mode survey, CAPI, web, email.

JEL Codes: C81, C83.

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1. Background

In longitudinal surveys, researchers can ask sample members to provide their email address in order to contact them by email at subsequent waves. A similar opportunity may also arise in some types of one-time web surveys such as visitor surveys, where visitors may be handed a card or letter asking them to go online and complete a survey. They could at the same time be asked to supply an email address. However, asking sample members to provide an email address is not cost-free. The request may be seen as intrusive and the information as sensitive and private. This could impact negatively on propensity to participate in the survey (though Bandilla et al, 2014, found no effect of asking for an email address on participation in a follow-up survey). Furthermore, resources are required to capture, clean and manage the collected email addresses. Researchers should therefore be reassured of the value of asking for an email address before doing so.

There are two potential advantages of being able to contact sample members by email. First, it could increase the overall propensity for survey participation, perhaps by increasing the chances of the sample member being successfully contacted (in an acceptable and effective way) or by reducing the burden of participation (by being able to click on a link while already online, rather than retaining a letter until a convenient time to go online and then having to type in a URL, and by avoiding the need to have to enter a passcode; Miller and Dillman, 2011). Second, making contact by email might reduce data collection costs for mixed-mode surveys if it results in a higher proportion of response by web mode rather than an interviewer-administered mode. Aside from response propensity and cost, speed of response can also be an advantage of email contact (Mehta and Sivadas, 1995; Schaeffer and Dillman, 1998), but this consideration only applies to single-mode web surveys in which all sample members can be contacted by email. In other situations, the completion of field work generally must await the slowest mode.

In the single-mode web context, both Porter and Whitcomb (2007) and Kaplowitz et al (2012) found no effect of substituting email contacts for mail contacts, but did not assess the effect of email contacts additional to standard mail contacts. Millar and Dillman (2011) also found that replacing a mail contact with an email contact had no effect on response rate. Kaplowitz et al (2004) compared different combinations of email and mail contacts, but all treatments included an email contact. Bandilla et al (2012) found higher response rates with mail rather than email invitations (in the absence of a mailed prenotification letter). Bosnjak

et al (2008) found higher response rates with email invitations rather than SMS invitations. A meta-analysis carried out by Manfreda et al (2008) found that web surveys achieved a higher response rate when the invitation was delivered by email rather than mail, but they too did not assess the marginal effect of email contacts additional to mail contacts. Muñoz-Leiva et al (2010) found that additional email reminders could increase response rate, but did not compare treatments that involved mail contacts. Bosnjak et al (2008) compared mode of prenotification, but not of invitation or reminders.

All the above-mentioned studies assessed the effect of substituting email contacts for mail contacts, but our focus is on the use of email to make *additional* contacts (invitation or reminders), not to substitute mail contacts. We are aware of only one study of the effect of additional email contact. Millar and Dillman (2011) found that adding two email contacts to a design involving three mail contacts significantly increased response rate, but their study was in a single-mode web survey context and was a study of undergraduate students, all of whom had email addresses and were assumed to be web users. We are not aware of any studies of the effects of additional email contact on either response propensity or mode of response in either a mixed-mode or longitudinal context or amongst a general population sample.

2. Research Questions

The focus of this article is the context of mixed-mode longitudinal surveys. Our interest is in the effectiveness of requesting email addresses at each wave and subsequently using the collected addresses to provide an additional channel of communication for survey invitation letters and reminders. Our research questions are:

Does the use of email in this way affect the overall propensity of sample members to participate in the survey?

Does the use of email in this way affect the conditional propensity of sample members to participate in web mode rather than interviewer-administered mode?

Are the effects on either outcome moderated by characteristics of sample members or by the nature of the sample members' response to the request for an email address (how recently they supplied an email address, whether other members of their household did so)?

Are the effects on either outcome moderated by time in sample?

3. Study Design

We use data from a randomised experiment implemented at wave 5 of the Innovation Panel component of Understanding Society, the UK Household Longitudinal Study (UKHLS-IP). The UKHLS-IP (Uhrig, 2011) is designed specifically for methodological development and testing, primarily to inform the design of the main UKHLS, which is the UK's largest social science research resource investment (Buck & McFall, 2012; Hobcraft & Sacker, 2012). It is based on a stratified, clustered, probability sample of residential addresses in Great Britain (Lynn 2010). All current residents at sample addresses in April to June 2008, when interviewers visited to carry out wave 1 of the survey, were designated sample members and were followed up for subsequent waves at approximately one-year intervals. A refreshment sample, selected to exactly the same design, was added at wave 4. At each wave, data are collected from all adult members of the household of each sample member, even though not all such people are themselves sample members[1]. At each wave, respondents are asked to provide a range of contact information, including email addresses. Waves 1, 3 and 4 involved single-mode CAPI data collection, while wave 2 had an experimental CATI-CAPI mixed mode design (Lynn 2013).

Field work for wave 5 took place in May to July 2012. A random two-thirds of sample households were allocated to a web-CAPI sequential mixed-mode design, while the other one-third were administered single-mode CAPI. In the mixed-mode treatment, each sample member aged 16 or over was sent a letter with an unconditional incentive, inviting them to take part by web. The letter included the URL and a unique user ID, to be entered on the welcome screen. A version of the letter was additionally sent by email to all sample members for whom an email address was known (just over half of the sample). For people who had indicated at previous waves that they do not use the internet regularly for personal use, the letter informed them that they would have an opportunity to do the survey with an interviewer. Up to two email reminders were sent at three-day intervals. Sample members who had not completed the web interview after two weeks were sent a mail reminder and interviewers then started visiting to attempt CAPI interviews. The interviewer visits began in the same week that the reminder letter would have been received in order to constrain the overall field work period. The web survey remained open throughout the fieldwork period.

[1] This study is concerned with response by adults (persons aged 16 or over) to the individual interview, which averages around 35 minutes. The UKHLS-IP also involves a self-completion questionnaire for children aged 10 to 15 and a household enumeration and questionnaire, which averages around 12 minutes and is completed by one adult in each household. We do not consider here response to either of those instruments.

Copies of the invitation and reminder letters are included in the additional online material associated with this paper. The contact sequence for each sample group is summarised in Table 1.

Table 1: Survey contact sequence for each sample group

Treatment	Email address	Day 1: Mail invite	Day 2: Email invite	Day 5: Email reminder	Day 8: Email reminder	Day 14: Mail reminder	Day 15-35: CAPI fieldwork	N
Single-mode CAPI (MODE=0)	Yes or No (ERESP=1 or 0)						✓	857
Mixed mode web-CAPI (MODE=1)	Yes (ERESP=1)	✓	✓	✓	✓	✓	✓	889
	No (ERESP=0)	✓				✓	✓	776

The present study is based on sample members issued to the field for wave 5. The outcomes of the wave 5 fieldwork are our dependent variables of interest. The sample issued at wave 5 is estimated to be 45.65% of all potentially eligible sample members (AAPOR RR1)[2].

4. Data and Methods

Our dependent variables are indicators of whether the sample member completed the individual interview at wave 5 and, if so (for the mixed-mode sample), whether they completed it in web mode or by CAPI. Our key independent variables are dichotomous, taking the value 1 if a design feature applies and 0 otherwise. ERESP indicates whether an email address was known for the sample member prior to wave 5; EPART indicates whether an email address was known for the sample member's partner; MODE indicates whether the

[2] As outlined above, the sample issued at wave 5 consisted of two components: the original sample, participating for the fifth time, and the refreshment sample, participating for the second time. Estimated response rate to the wave 1 enumeration was 60.85% (AAPOR RR1). Of all persons aged 16 or over enumerated at wave 1 and not known to have become ineligible prior to wave 5, 66.00% were issued to the field for wave 5, the rest having been lost due to a failure to trace following a move, persistent non-contact, or refusal. Estimated response rate to the wave 4 enumeration of the refreshment sample was 61.44% (AAPOR RR1), all of whom were issued at wave 5. The present study is therefore based on around 40.16% of original sample members and 61.44% of refreshment sample members. This corresponds to 45.65% of all sample members (the refreshment sample represents 25.81% of the total sample size).

sample member was allocated to the mixed-mode treatment rather than the single-mode CAPI treatment; SAMPLE indicates membership of the original sample rather than the wave 4 refreshment sample. For sample members with ERESP=1, EWAVE is a categorical variable that indicates the (most recent) wave at which an email address was supplied. Fifteen additional variables are included in our models as controls. These include socio-demographic indicators such as age, gender, education and ethnicity, and a set of variables expected to be associated with propensity to respond in web mode. The latter set includes the presence of home broadband, regular internet use, and stated mode preference. All fifteen variables are described in the annex.

Three logistic regression models are developed:

Model 1 predicts survey participation conditional on being in the mixed mode treatment. This allows us to test the effect of ERESP, and interactions between this and other respondent characteristics, in the mixed mode context in which we are interested. Estimation of interactions will allow us to identify whether there are particular sample subgroups for whom the treatments are either effective or detrimental. *Model 2* predicts participation based on the full sample (single mode and mixed mode treatments). Here we exploit the random allocation to test the interaction between ERESP and MODE, which should help us to understand whether knowing an email address simply indicates a generally co-operative sample member or whether it actually aids the response process (in which case the effect should be stronger for the mixed mode group). *Model 3* predicts response mode conditional on participation, based on the mixed mode group alone. For parsimony, we include all fifteen control variables in each model, regardless of significance.

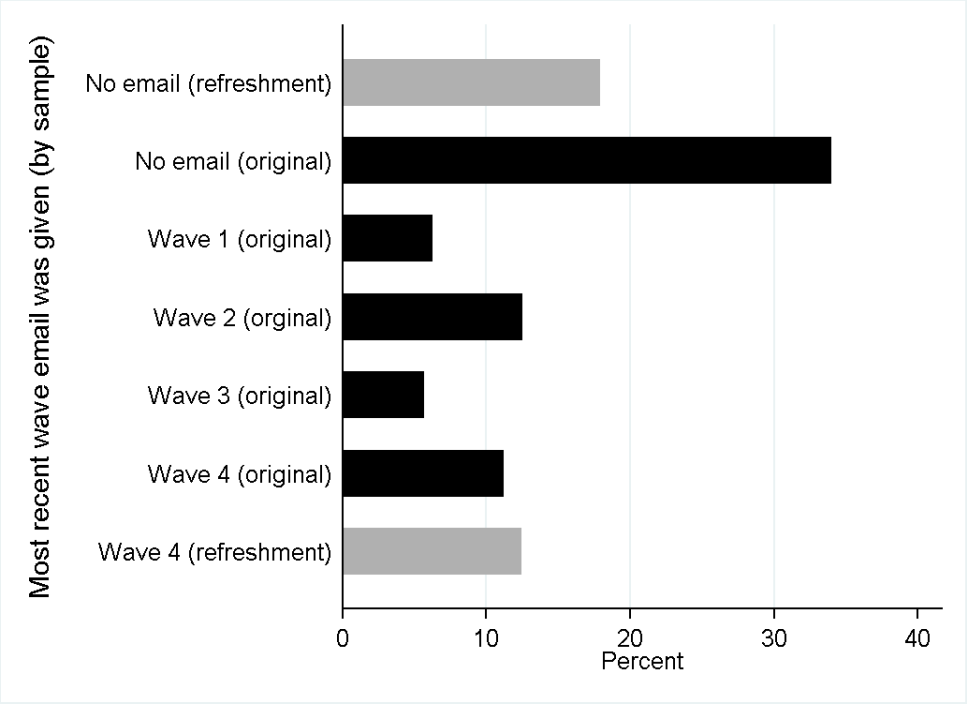
In each model, we perform two additional types of tests. We test interactions of ERESP and EPART with SAMPLE as a test of whether any effect of knowing an email address depends on time in sample. We also test to see whether EWAVE is significant, as a test of whether effects depend on how long ago the email address was supplied. (Figure 1 presents the proportion of people who provided an email address and, if they did, at which wave.)

5. Results

Effect of having and using the respondent's email address

The main effect of ERESP is not significant in model 1 (Table 2). This reflects the net effect of knowing the respondent's email address and using it to send the survey request and reminders by email, in a web-CAPI mixed-mode context. To separate the effect of knowing the address from the effect of using it in survey administration, we must look at the interaction between ERESP and MODE in model 2. This too is not significant, indicating no evidence that the effect on propensity to participate of having the respondent's email address differs between the mixed-mode treatment (where the email address was used in the survey administration) and the CAPI treatment (where it was not used at all). There is therefore no evidence that using the respondent's email address is helpful in terms of gaining co-operation with a web-CAPI mixed mode survey. However, the significant main effect of ERESP in model 3 indicates that, conditional on participating in the mixed-mode survey, sample members with known email addresses were more likely to respond in web mode rather than face-to-face.

Figure 1: Wave at which respondents supplied an email address



Effect of having and using a partner's email address

The main effect of EPART is significant in model 1 (P < 0.01) but not in models 2 or 3. This indicates that knowing the partner's email address is positively associated with overall response propensity in a mixed-mode context, but is not associated with the propensity to respond by web rather than CAPI conditional on participating in a mixed-mode survey, over and above the effect of knowing the respondent's email address. Note that this effect is net of the effect of having a partner and of having broadband at home (which may be associated with the probability of the partner having an email address), as indicators of both these characteristics are included as controls.

Interactions and other effects

None of the interactions between either ERESP or EPART and any of the fifteen other indicator variables were significant ($P > 0.05$) in model 2. Thus, there is no evidence that any effect of ERESP or EPART acts differentially between sample subgroups or is moderated by whether the sample member has broadband internet access at home or whether they are a regular internet user. Furthermore, interactions with SAMPLE were not significant, so there is no evidence that effects depend on time in sample. EWAVE is not significant when substituted for ERESP in models 1 or 2, so effects are not dependent on how recently the email address was supplied.

The strongest predictor of response in the mixed mode sample is whether or not the sample member has broadband access (OR 1.63, P < 0.01, model 1). The effect remains significant in the total sample, (OR 1.73, P < 0.001, model 2), implying that the effect is no stronger with a web-CAPI mixed-mode design than with a single-mode CAPI design. Two significant interactions of EPART with socio-demographics are identified for model 1: the positive effect of EPART is present only for men (EPART*FEMALE $\hat{\beta} = 0.54; P = 0.02$) and only for those who do not own their own house (EPART*OWN $\hat{\beta} = 0.39; P = 0.01$). In model 3, the effect of ERESP is stronger for those not in rural areas (ERESP*URBAN $\hat{\beta} = 0.48; P = 0.04$)and for those who do not own their own house (ERESP*OWN $\hat{\beta} = 0.30; P = 0.01$).

6. Discussion

It does not appear that knowing a sample member's email address and using it to send a copy of the invitation letter and additional reminders affects response propensity in a web-CAPI mixed mode survey in which all sample members are sent a mail invitation to the web survey and one mail reminder. However, email contact increases the likelihood that those who respond will do so in web mode, thereby bringing potential cost savings.

There are alternative explanations for the absence of an effect on participation propensity. Panel members may be relatively committed respondents and consequently less sensitive than others to influences on their participation propensity. However, we doubt this explanation for two reasons. First, the proportion of persons issued to field at wave 5 who completed the individual interview was only 70.6% (see annex table), suggesting some scope for influence. Second, the absence of an interaction between ERESP and SAMPLE implies that our results hold equally at the second and fifth annual waves of inclusion in the sample. An alternative explanation may be that encountering URLs while offline and having to retain them until a suitable occasion when one is online, and entering passwords online, may have become common and routine activities that are no longer a big barrier to participation (if they ever were). The extra convenience of being able to click a link may be rather trivial. Additionally, we do not know how many sample members actually received our emails. Some emails may have been diverted by spam filters (Fan and Yan, 2010) and others may simply have been left unopened. The email addresses provided by respondents may in some cases relate to accounts set up primarily for receipt of commercial mailings and the like. At wave 6, only 30% of our invitation emails were opened by the recipient (Wood & Kunz, 2014)[3].

Intriguingly, knowing the email address of the sample member's partner appears to increase response propensity (though not for women or home owners). This may indicate that making contact by email with both members of a couple has a positive effect (from the researcher's perspective) on both (recall that in most cases, the partner of a sample member will themselves be a sample member too in our design), whereas email contact with just one person has no effect on the response behaviour of that person.

[3] 13% bounced and 57% were unopened. For technical reasons we were unable to capture equivalent paradata at wave 5, the wave of the experiment reported here.

Table 2: Odds ratios from logistic regression models of response and mode of response

Model	1	2	3
Dependent variable	**Response**	**Response**	**Response in web mode**
Analysis base	**Mixed mode sample**	**Total sample**	**Mixed mode respondents**
MODE		0.75+	
ERESP	1.17	1.72**	1.77***
MODE * ERESP		0.70	
EPART	1.63**	0.79	1.27
MODE * EPART		2.01**	
Education			
A levels	0.84	0.85	1.44
GCSE or CSE	0.89	0.97	0.98
Vocational/none	0.76	0.77+	0.65*
Missing	0.33	0.74	0.29
Urban	1.36*	1.12	1.30
Female	1.10	1.13	1.02
Age	1.03+	1.05**	1.03
Age^2	1.00	1.00*	1.00
In couple	1.06	1.16	1.82**
White British	1.40*	1.44*	1.10
Employed	0.79	0.72**	0.86
Own house	1.33*	1.43**	2.43***
HH size	0.84***	0.85***	0.87*
Has mobile	1.61*	1.26	1.46
Broadband	1.63**	1.73***	3.60***
Daily internet	1.02	1.08	1.70**
Mode preference			
CATI	0.87	0.97	1.18
Postal	0.79	0.69*	1.48+
Web	0.62**	0.61***	1.88**
No preference	0.14***	0.12***	1.63+
Not by web	1.02	1.32+	0.54**
Pseudo R-squared	**0.16**	**0.18**	**0.24**
N. of cases	**1,665**	**2,522**	**1,142**

Notes: For email wave the reference is no email; for education the reference category is higher degree; for mode preference the reference category is CAPI; *** $P \leq 0$ .001; ** $0.001 \leq P \leq 0.01$; * $0.01 \leq P \leq 0.05$; + $0.05 \leq P \leq 0.10$

In conclusion, the benefits of knowing the email address of sample members may be less than one might think. Researchers should evaluate carefully whether the intrusion and effort implied by a request to supply an email address are warranted. In a mixed mode context, as a

means to improve participation, collecting email addresses may not be worthwhile. But as a means to save costs by increasing the proportion of respondents who respond in web mode, the use of emails could be effective.

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Annex Table: Descriptive Statistics

		Freq.	Percent
Full response	**No**	742	29.4
	Yes	1780	70.6
MODE	**F2F**	857	34.0
	Web/F2F	1665	66.0
ERESP	**No**	1176	46.6
	Yes	1346	53.4
EPART	**No**	1684	66.8
	Yes	838	33.2
Education	***Degree***	576	22.8
	A levels	237	9.4
	GCSE or CSE	752	29.8
	Vocational/none	941	37.3
	Missing	16	0.6
Urban	**No**	612	24.3
	Yes	1910	75.7
Female	**No**	1158	45.9
	Yes	1364	54.1
Has partner	**No**	946	37.5
	Yes	1576	62.5
White British	**No**	359	14.2
	Yes	2163	85.8
Employed	**No**	1118	44.3
	Yes	1404	55.7
Owns house	**No**	657	26.1
	Yes	1865	74.0
Has mobile	**No**	195	7.7
	Yes	2327	92.3
Has broadband	**No**	502	19.9
	Yes	2020	80.1
Uses internet daily	**No**	1449	57.5
	Yes	1073	42.6
Would not answer by web	**No**	1861	73.8
	Yes	661	26.2

	Mean	Std. Dev	Max
Hh. Size	2.84	1.44	10
Age	48.185	18.15	65

Note: Item missing values for categorical variables – generally small proportions – were combined with "none" categories.