Tailoring mode of data collection in longitudinal studies

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Abstract

Longitudinal studies provide possibilities to tailor future wave design to respondent's preferences, among them mode of interview. Assigning preferred mode to each respondent can potentially be efficient in terms of effort (e.g. number of attempts), and advantageous in retaining respondents. Our study explores whether self-reported mode preference predicts participation in different modes. As part of a longitudinal experimental study called Innovation Panel (UK) we asked respondents about their most and least preferred interview modes (face-to-face (F2F), postal, telephone or web), and to rate the chance that they would participate in the next wave if they are contacted via each mode (except F2F as this was the mode of interview). In the following wave respondents were randomly assigned to F2F protocol or web with F2F follow-up protocol. All three types of questions perform well in predicting participation in web part of the mixed-mode protocol, but less well the difference in participation between MM and face-to-face protocols. We provide an example of cost and quality considerations in assigning difference mode preference groups to MM or face-to-face mode protocols.

Introduction

An optimal balance between survey costs and participation rates might be achievable if we knew the mode(s) in which each sample member was most likely to participate and would then administer the survey in the optimal mode(s) for each sample member. In other words we would use a cheaper mode for those sample members predicted to be just as likely to respond in that mode and we would use a mode with a higher predicted response propensity for sample members predicted to be less likely to respond in the standard mode. This study assesses the feasibility and effectiveness of such mode tailoring.

At its simplest, this could involve asking a single question about mode preference, as some previous studies have done. The strength of this approach is its simplicity. The limitations of the approach include an inability to identify the ranking of modes other than the preferred one and an inability to identify the magnitude of differences in preferences between modes. A slight refinement would be to ask separate questions about the likelihood of responding in each mode, to provide a simple estimate of response propensity in each mode. We asked both forms of the question, as in principle they provide complementary information.

The questions on mode preference were administered in face-to-face mode at wave 4 of the Innovation Panel. At wave 5 the sample was randomly assigned to either face-to-face mode or a mixed mode (MM) protocol. The MM protocol invited panel members to participate via web mode first, and followed with face-to-face mode for those who didn't respond to web mode within two weeks.

Results 1: selecting best measure of mode preference

Respondents were asked about mode preferences using five questions. Two general questions ask respondents to pick their most and least preferred modes among four modes (face-to-face, telephone, postal self-completion and web). The other three specific questions, using a scale from 0 to 10, ask respondents to rate their likelihood of responding in the future if contacted in each of three modes: telephone, postal and web.

Overall, we find that face-to-face is rated as the most preferred mode (54.6%; with only 2.5% rating it as least preferred) among the four modes; and telephone mode is rated as the least preferred mode (with only 1.2% saying that telephone is their preferred mode, and 59% rating it as the least preferred mode). Telephone received also the lowest rated likelihood of participation if a respondent is contacted in this mode the following year (likelihood rated as 2.62 on average on a 0 to 10 scale if a person is contacted on the telephone, in comparison to 5.68 if contacted via post or 4.88 if contacted on web).

As we were concerned about possible context effects, we randomized the order of the two types of questions (general and specific). In form A the three specific questions asking about likelihood of participation in each mode were asked before the general most and least preferred mode questions. In form B the order was reversed – the specific questions followed the general questions.

Interestingly, we find that general questions are prone to context effects with face-to-face mode being more preferred and web less preferred if specific questions are asked before the general questions (table 1). Unlike for general questions, no significant context effect on specific questions is observed (table 2). This suggests that asking likelihood to respond in each separate mode is less prone to context effects and may be a more suitable measure of mode preference

Table 1. Context effect on general questions of most and least preferred modes

	Most preferred mode		Least preferred mode	
	form A	form B	form A	form B
Face to face	66.27	55.42	2.65	2.97
Telephone	1.74	0.86	64.05	67.46
Post	12.98	17.64	9.67	10.91
Web	19.01	26.08	23.63	18.66
	Pearson chi2(3) = 32.9; Pr = 0.000		Pearson chi2(3) = 8.18; Pr = 0.043	

Table 2. Context effects on mean scores of likelihood to respond for specific questions

Form	Telephone	Postal	Web
A	2.73 (0.1)	5.66 (0.11)	4.78 (0.12)
B	2.58 (0.1)	5.78 (0.11)	5.07 (0.12)
	$t(2155)=1.05$; $p=0.15$	$t(2160)=-0.83$; $p=0.41$	$t(2160)=-1.71$; $p=0.96$

Results 2: predictive power of mode preference on participation in different modes

The most interesting question is whether self-reported mode preference in a previous wave can predict response likelihood in the following wave. We analyse three types of response rate: response rate for a face-to-face condition, for MM condition and for web part only in the MM condition (Table 3).

Table 3 Response rate in face-to-face, mixed-mode (MM) and web part of mixed mode conditions depending on mode preferences

	RR f2f	RR MM	RR web	RR difference	cost rate	N	percent
Web participation likelihood							
Definitely would not do 0	87.1	77.3	15.3	9.9	1.37	672	28.4
1	88.0	81.3	25.0	6.8	1.50	57	2.4
2	76.2	80.0	36.0	-3.8	1.60	71	3.0
3	84.0	80.0	27.3	4.0	1.51	80	3.4
4	87.5	83.0	51.1	4.5	2.36	55	2.3
5	82.0	72.5	44.0	9.5	2.50	159	6.7
6	74.1	82.8	57.8	-8.7	2.41	91	3.9
7	82.2	76.8	51.2	5.4	2.68	127	5.4
8	74.7	76.0	51.2	-1.4	2.50	196	8.3
9	81.5	78.9	61.5	2.7	3.48	169	7.2
Definitely would do 10	83.5	77.5	52.0	6.1	2.72	466	19.7
Most preferred mode							
Face-to-face	87.0	80.0	32.6	7.0	1.72	1286	54.4
Telephone	90.0	72.2	33.3	17.8	2.13	28	1.2
Self-completion	75.8	74.5	36.2	1.3	1.81	324	13.7
Web	78.0	73.8	55.8	4.2	3.30	480	20.3
no preference (vol)	83.3	63.2	47.4	20.2	4.06	31	1.3
Least preferred Mode							
Face-to-face	66.7	64.4	33.3	2.2	1.94	60	2.5
Telephone	81.8	77.9	44.7	4.0	2.18	1405	59.4
Self-completion	80.0	74.1	38.1	5.9	2.01	219	9.3
Web	89.8	81.5	20.3	8.3	1.42	438	18.5
no preference (vol)	90.0	60.0	33.3	30.0	3.00	25	1.1

As can be seen, mode preference is a good predictor of participation in web part of the mixed mode data collection. Among respondents who rate their likelihood to participate via web above 6 on a 0 to 10 scale, have response rate in web part of MM protocol over 50%, while those who say that they definitely will not participate have response rate of 15.3%. Similarly, respondents whose most preferred mode is web have 56% of chance to respond via web in the following wave, compared to 33% among those who prefer face-to-face or telephone modes. And respondents who prefer web mode least have 20% of chance to participate, which is 1.5 to 2 times lower than response rate among respondents reporting other modes as least preferred.

Nevertheless, mode preference seems to be a less useful predictor for overall mixed mode response rate in which web mode is followed by face-to-face mode. For example, while response rates for MM and face-to-face protocols are similar (less than 3%) for those who rate their likelihood to participate via web as 8 or 9, the difference is 6.1% for those whose reported likelihood is 10. The difference in response rates between face-to-face and MM conditions ranges from 9% in the gain of MM condition to 30% in the gain of face-to-face condition.

The decision about whom to assign to MM or face-to-face condition should depend on 2 factors: the cost and the difference in response rate. It is hard to compare costs between conditions as the web cost often has high starting cost, but very little cost per each additional interview, unlike face-to-face where each interview requiring interviewer time and travel expenses. The cost function for face-to-face mode is further complicated by interviewing whole households versus separate individuals within a household with the need to come back or resulting incomplete households. Nevertheless, for demonstration we assume that the cost per interview is constant and that a face-to-face interview is 10 times costlier than a web interview. For each mode preference category we thus calculate the cost for face-to-face protocol and for MM protocol, given fixed number (e.g. 100) of issued respondents and the response rates presented at the table. We then calculate the rate of the costs which indicates by how much MM condition is cheaper than face-to-face condition. For example, because only 15% of respondents who rated their likelihood to participate via web as 0 responded via web, an interviewer had to visit and interview the remaining 62%. This results in only 1.4 times cost gain. One can observe that the gain increases with higher reported likelihood of web participation, staying above 2.3 times for those reporting likelihood of web participation as 4 or higher.

It's not only the cost that is important in the decision of tailoring mode assignment, but also the response rate loss. For example the cost gain for people who indicate that they would definitely participate via web (10) is 2.7 times, but the response rate for this group via face-to-face mode is 6.1% higher than for MM group. A data collection organization may therefore have a rule, for example, of assigning groups that have the cost rate of at least 2, but the maximum response rate loss of no more than 5%. In this case the groups with web participation likelihood of 6, 8 and 9 would be assigned to MM condition. If we use most preferred mode measure, the group reporting web as most preferred mode would be assigned. Alternatively, the groups preferring telephone least can be assigned to MM condition.

Results 3: Improvement in prediction

In practice when comparing participation likelihood between modes it makes sense to use all variables available for the purpose. Because participation in web mode may depend on lifestyle, which in turn is related to age, gender, social economic status and other demographic variables it would be inefficient to leave out those variables that we have for panel members from previous waves. Therefore, the real question of interest is not whether reported mode preference is related to participation in different modes, but whether mode preference variables add predictive power to the model which already has demographic variables included.

The important distinction is that while demographic variables are available 'for free', i.e. as part of previous wave questionnaire, asking mode preference may have no substantive interest and therefore will involve extra cost. The question is therefore whether this extra cost of asking mode preference is justified.

To answer this question we compare models that predict participation in different modes using only demographic variables and using the same demographic variables with extra mode preference questions. Thus, we run logistic regression predicting response in CAPI group, in Web mode only in MM group, and overall response likelihood in MM group. All three mode preference questions are used simultaneously: a rating question about likelihood to participate in web, and questions on most and least preferred modes.

As shown in table 4, prediction of participation improves in each of the model with addition of mode preference questions, but R^2 increases most of the model predicting participation in CAPI. The bottom three lines in the table show the lowest p-value for each of mode preference variables when they are included in the model. Interestingly, different mode preference variables are significant in different models. While in most preferred mode is important in the model for CAPI, it is web rating and least preferred mode that are important for prediction of web and MM participation.

Table 4. Improvement in prediction due to mode preference variables: model comparison

	CAPI	Web	Web+CAPI
#vbles in M1	7	13	11
R^2: Model 1	0.059	0.192	0.081
R^2: Model 2 (+ 3 mode pref)	0.094	0.21	0.092
P: Web rating	0.32	0	0.02
P: Most preferred mode	0.02	0.43	0.2
P: Least preferred mode	0.36	0.04	0.05

Table 5 presents values for the mode preference variables in the models with demographic variables. As can be seen, knowing that a panel member prefers CAPI most is highly related to high chance of participation in CAPI. Controlling for a number of demographic variables, web rating and least preferred mode variables are still significant for web participation prediction. In particular, rating the chance of participation on web and preferring CAPI least are both related to higher participation in web. Finally, MM participation is best predicted with web rating question with higher scores related to higher participation in MM.

Table 5 Improvement in prediction due to mode preference variables: variable comparison

	CAPI	Web	Web+ CAPI
Web rating (ref=0)			
1-4	-0.39	0.29	0.3
5	-0.35	0.60*	-0.13
6-9	-0.21	0.94***	0.49*
10	0.22	0.96***	0.66*
Preferred mode (ref other)			
Face-to-face	0.65*	-0.15	0.2
Web	0.01	-0.02	-0.3
Least preferred mode			
Face-to-face	-0.55	-0.78*	-0.47
Web	0.3	0.06	0.40*

Conclusion

Overall, mode preference questions improve models predicting participation in different modes. Importantly, statistical power of models increases even when a number of demographic variables are used as predictors. In contrast to our expectations, we could not identify one best version of mode preference questions that would have low measurement error and strong predictive power in all models for participation in all modes. Instead, we found that the three questions explored in this paper seem to have complementary information, and that each is important in different situations. Future research should explore the importance of mode preference questions for prediction of participation is other modes than web and CAPI.