



Working Paper

## **Predicting response rate a natural experiment : note**

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**Note**

## **Predicting response rate: A natural experiment**

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## 1 A natural experiment

While the literature on survey methods (see Richardson et al, 1995 or Dillman, 2000 for relevant textbooks) discusses response burden, there seems to be no literature on its ex-ante prediction, nor on the resulting response rates. Still, market research firms have to estimate their interviewers' time requirements in advance to be able to calculate a budget for a study. Using its point system, Ursula Raymann of the Zurich-based Gesellschaft für Sozialforschung, rated a series of self-administered surveys (Table 1), which had been conducted by Axhausen and his collaborators at the Institute for Transport Planning and Systems (IVT).

Table 1 Response burden: Points by question type and action

Item	Points
Question or transition (up to 3 lines)	2
Each additional line	1
Closed yes/no answers	1
Simple numerical answer (e.g. year of birth)	1
Rating with up to 5 possibilities	2
Rating with more than 5 possibilities	3
Left, middle, right rating	2
Scales with 3 and more grades	2
Best of ranking with cards	4
Second and each additional best ranking	3
Answer to subquestions of up to 5 words	1
Answers to subquestion of up to 2 lines	2
a) Response to half-open question with $\leq 8$ possibilities	2
Each additional one	2
b) Response to half-open question with $\geq 8$ possibilities	4
Each additional one	3
Answer to "please specify"	2
First answer to an open question	6
Each additional answer to the open question	3
Mixing showcards	6
Giving/showing a card to the respondent	1
Per response category on a showcard	1
Filter	0.5
Branching	0.5

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These surveys (see below) range from simple and short stated preference (SP) surveys to extensive surveys on the respondent's social networks or moving behaviour (Table 2). They are a natural experiment as they were not designed as a survey methods experiment, but arose from the on-going work of the IVT.

Table 2 Response rate and ex-ante assessment of response burden

Content of the self-administered surveys	Ex-ante assessment of respondent burden	Response rate [%]		
		No prior recruitment		With recruitment
		Motivation call	No motivation call	
National SP survey on railway services	84.00		68.00	
Regional mode and route choice SP	84.00		70.87	
National SP on value of travel time savings	152.90		52.70	
Regional SR on value of statistical life	197.00	49.30		
Regional SR on value of statistical life	223.60		34.00	
Home ownership and use of local facilities	230.70		36.10	
National SP on the impacts of road pricing	264.79		47.00	
Mobility biographies and regular travel	521.00		12.49	
Mobility biographies	529.00	30.80	14.70	
Mobility biographies and home ownership	655.40		19.90	
Social networks and mobility biographies	991.75	11.17	4.35	

Sources in the order listed: Vrtic and Axhausen, 2004; Vrtic and Fröhlich, 2006; Axhausen *et al.*, forthcoming; Locatteli, 2004; Beige, 2004; Jäggle, 2006; Waldner *et al.*, 2005; Vrtic *et al.*, 2007; Schiffmann, 2005; Beige and Axhausen, 2005 (main study and pre-test) (also Beige, 2006); Axhausen, Frei and Ohnmacht., 2006

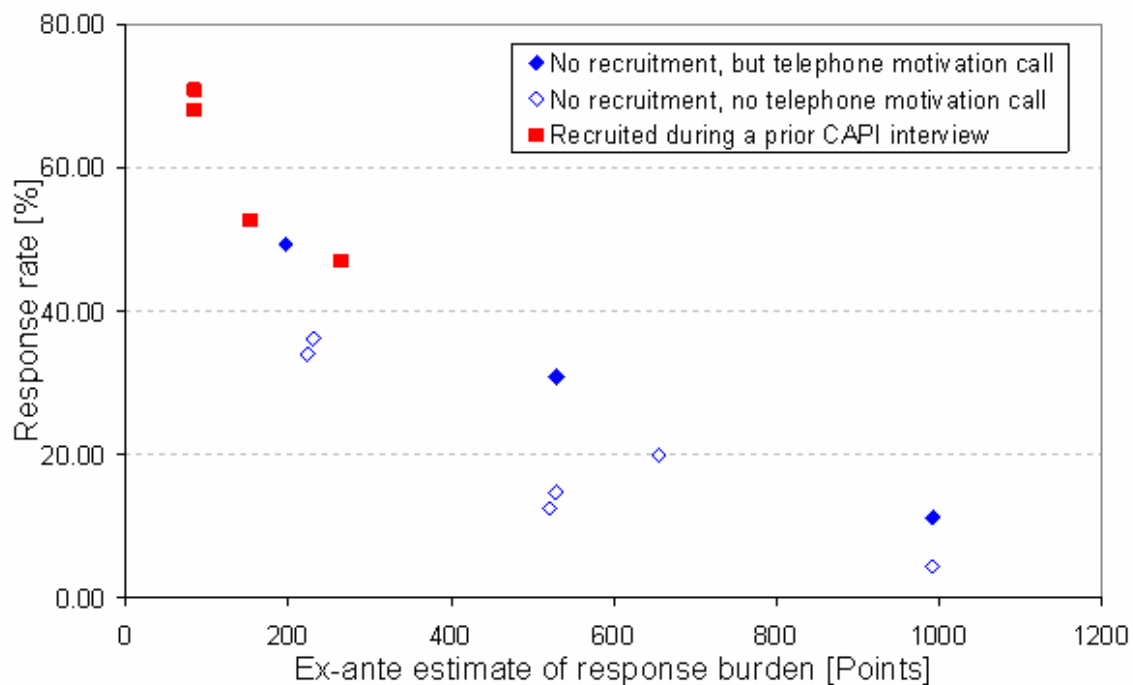
Response rates are calculated as usable response divided by the difference of the surveys mailed minus the usual sample loss (deaths, wrong address, respondent moved)

The range of respondent burden is unusually large, as the sample contains both experimental work, especially that on social networks and mobility biographies, as well as quasi-commercial work, for which the optimisation of the response rate and therefore focus on the essential questions are crucial, here the various SP experiments. In a number of cases, the re-

spondents were recruited as part of computer-aided telephone survey undertaken for the Swiss Federal Railroads by a local market research firm. This prior recruitment will increase response for equal response burdens, as the respondents have shown a willingness to participate. In two cases, subsamples of the respondents were reached by phone for a motivation call explaining the purpose, answering any questions and stressing the importance of the survey to the research projects.

For this small sample of self-administered surveys, there is a very strong link between the independent assessment of respondent burden and the response rate (Figure 1). Two initial trends are visible: the response rate declines with the ex-ante estimate of the response burden and prior recruitment seems equivalent to a motivation call in building the commitment of the respondents. The author is not aware of any similar results in the literature.

Figure 1 Response rate and ex-ante assessment of response burden



## 2 Outlook

If this result were to be confirmed with other surveys, it would be a breakthrough in the planning and design of surveys. In many surveys, the response burden varies from respondent to

respondent as the number of units varies for the respondents. Prominent examples are trips in travel surveys, spells of unemployment in labour market surveys, incidents of sickness, moves between firms. In this context, these results could be used to estimate the number of non-reported units, which is crucial in these contexts. Still, one should not forget, that the content of a survey has an impact itself, as shown for example by the differential response rates to different sets of Stated Preference experiments in a recent Swiss value of travel time savings study (Axhausen *et al.*, 2004), where there were significant differences by task and the preferred mode of the traveler.

The results presented ask for replication across fields, countries, survey organizations. Otherwise it will be very difficult to obtain the range of response burdens, which is necessary to see its effect in the first place. This will be more than a meta analysis, as the calculation of the response burdens will need to be performed for the first time.

### 3 Literature

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<sup>1</sup> Written under the supervision of the author at the IVT, ETH Zürich.