

An Investigation of Interviewer Effects on Household Nonresponse Using a Multilevel Modelling Approach

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3-Year Research Project

- “Hierarchical Analysis of Unit Nonresponse in Sample Surveys”
- Funded by Economic and Social Research Council (ESRC), UK
- Team: University of Southampton, University of Bristol (UK)
- Collaborators: Netherlands, US

Introduction

- **Concern:** falling response rates
 - effects on nonresponse bias
- **We need to:**
 - understand nature and causes of non-response
 - understand factors influencing the nonresponse process

Key Questions

- Better understanding of the **role of interviewers** for gaining cooperation in face-to-face surveys
 - What are the attributes of interviewers that affect response rates?
 - Are different interviewer attributes important for the participation of different sample persons? (interaction effects)
 - How large is interviewer variability relative to other components in response process?

The Data

- Interviewer Attitude Survey of all ONS face-to-face interviewers in 2001
- Interviewer characteristics including:
 - Socio-demographic characteristics
 - Work experience
 - Workload planning and organisation
 - Attitude
 - Interviewing strategies
 - Behaviour

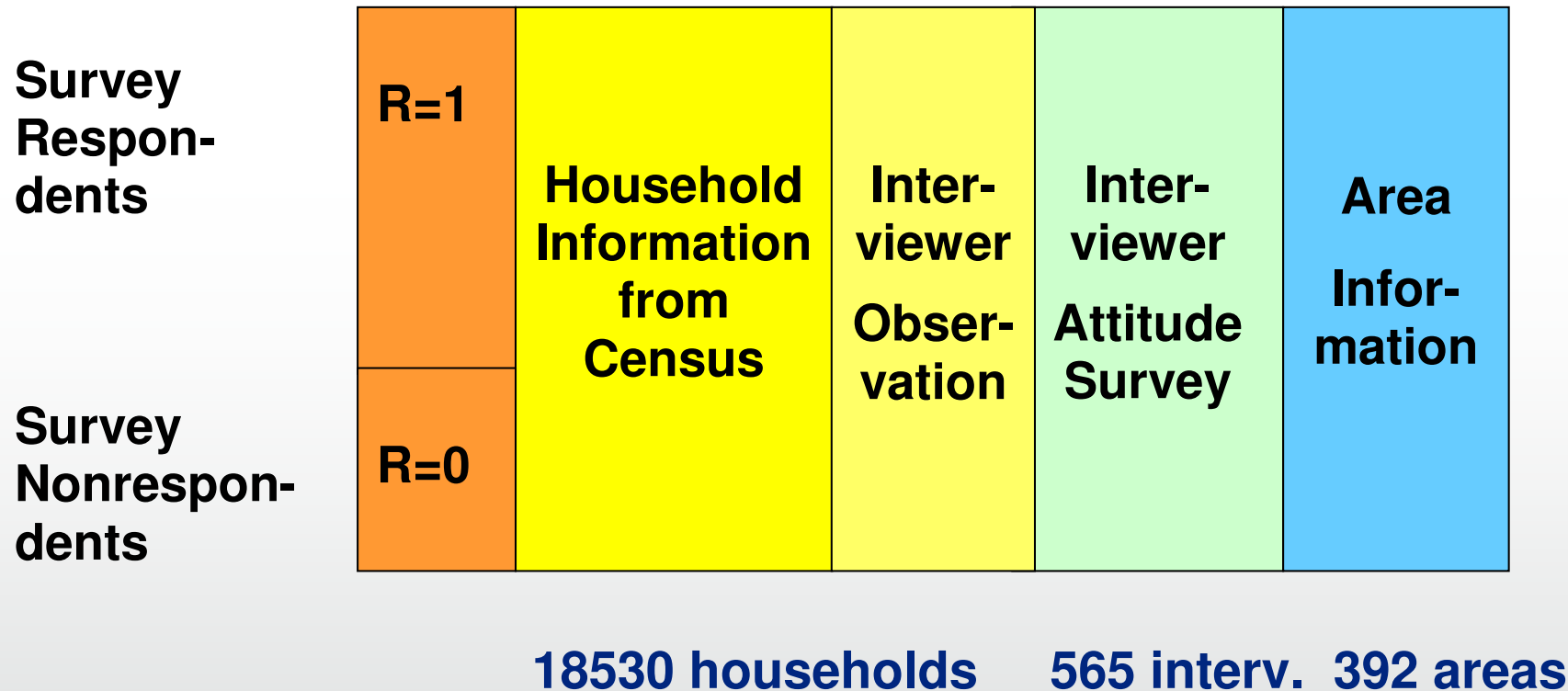
The Data

Response outcome from 6 major UK household surveys in 2001 (indicator if household refused to survey or not)

linked to:

- Rich information on interviewers working on these 6 surveys
- Rich information on responding and nonresponding households (UK 2001 census and interviewer observation data)
- Area information

The Linked Data



The Data

- + Rich information on interviewers available
- + Linked to household information
- + Several surveys
- Not an interpenetrated sampling design
- Information available on interviewing strategies and behaviours are general (not at contact level)
- Self-selection of interviewers

Methodology

Multilevel logistic cross-classified model:

$$\log \left(\frac{\pi_{i(jk)}}{1 - \pi_{i(jk)}} \right) = \bar{\beta}^T \bar{x}_{i(jk)} + u_j + v_k$$

i = households, j = interviewer, k = area

$$y_{i(jk)} = \begin{cases} 0 & \text{cooperation} \\ 1 & \text{refusal} \end{cases}$$

$$\pi_{i(jk)} = P(y_{i(jk)} = 1)$$

$$u_j \sim N(0, \sigma_u^2) \quad v_k \sim N(0, \sigma_v^2)$$

Specification of Models

- Guided by **theoretical framework** of survey participation and influence of interviewer
- Households effects
 - Discussed in separate paper (Durrant and Steele, 2009, JRSSA)
 - Guided by sociological/psychological concepts: social exchange, civic duty, opportunity-cost, leverage-salience theory etc

Results:

Interviewer and Area Random Effects

	Interviewer variance	SE	Area variance	SE	DIC
Model 1 (only survey indicator)	0.077 (0.047; 0.112)	(0.017)	0.026 (0.007; 0.052)	(0.011)	18735
Model 2 (Model 1 + household variables)	0.081 (0.049; 0.118)	(0.018)	0.013 (0.001; 0.037)	(0.010)	18338
Model 3 (Model 2 +interviewer variables)	0.040 (0.012; 0.070)	(0.015)	0.012 (0.001; 0.033)	(0.009)	18321

Estimated Multilevel Logistic Cross-Classified Model

Variable (0 = Reference category)	Categories	$\hat{\beta}$ ($ste(\hat{\beta})$)
Interviewer level variables		
Pay grade (0 Interviewer)	1 advanced interviewer and merit 1 and 2	-0.117 (0.070)
	2 merit 3 and field manager	-0.382 (0.094)**
Years of experience (0 Less than 1 year)	1 1 to 2 years	-0.021 (0.073)
	2 3 to 8 years	0.060 (0.090)
	3 9 years or more	0.267 (0.114)**
...

Interviewer Characteristics

Main Effects:

- Socio-demographic variables:
 - Age not sign
 - Gender
 - Qualification
- Work experience:
 - Pay grade
 - Interviewer experience (in years)

Estimated Multilevel Logistic Cross-Classified Model

Variable (0 = Reference category)	Categories	$\hat{\beta}$ (<i>ste</i> ($\hat{\beta}$))
Interviewer level variables		
Should persuade reluctant respondent (0 strongly agree, agree)	1 neither agree nor disagree 2 disagree, strongly disagree	-0.155 (0.082)* 0.106 (0.065)*
Can persuade when others can't (0 disagree, strongly disagree)	1 neither agree nor disagree 2 strongly agree, agree	-0.105 (0.049)** -0.300 (0.096)**
Can convince reluctant respondents † (0 Less confident)	1 more confident	-0.648 (0.204)**
Refusal affects how behave (0 Rarely, never)	1 always, frequently, sometimes	-0.135 (0.054)**
No matter what I do, some will never agree to participate (0 strongly agree, agree)	1 str disagree, disagree, neither nor	-0.212 (0.109)**
If respondent refused send different interviewer † (0 str disagree, disagree, neither nor)	1 strongly agree, agree	0.154 (0.078)**
...

Interviewer Characteristics

Interviewer Attitudes

- Persuasion of reluctant respondents
- Indicators of confidence
 - can persuade when others can't
 - can convince reluctant respondents
 - disagreement with 'No matter what I do, some respondents will never agree'

Interviewer Characteristics

Interviewer behaviours and strategies

- Indication of tailoring:
 - No matter what I do, some respondents will never agree to participate
 - Refusal affects how behave (indication of being able to adapt?)
 - Better to send a different interviewer if respondent refused
 - Can deal with everybody in the same manner
 - Persuasion skills

Interviewer Characteristics

Not significant in final model:

- Many doorstep approach variables (e.g. need unique approach, can modify approach, topic should interest etc)
- Many specific interviewing strategies (e.g. complement household; if likely to refuse withdraw)

Cross-Level Interactions

- Rationale: interaction of household and interviewer characteristics
- Potential implications:
 - Tailoring of interviewing strategies to type of respondent
 - Matching of interviewers to households

Results: Cross-level interactions

- Gender at first contact marginally significant
- Gender of HRP found significant

Gender of householder at first contact	Interviewer Gender	
	Male	Female
Male	23.9	23.0
Female	23.5	20.8

Results: Cross-level interactions

- Qualification:
 - If interviewer has low or no qualification and HRP of household has a degree/higher qualification then indication that refusal higher

Interaction between interviewer qualification and qualification of HRP				
		Interviewer qualification		
		Degree or postgraduate	Academic below degree	Other or no qualifications
Qualification of HRP	No academic qualification	26.8	25.7	17.9
	O/A levels, GCSEs	22.7	22.5	16.4
	First/Higher degree	17.5	18.1	20.4
	Other qualifications	21.6	21.5	36.2

Summary

- Socio-demographic characteristics
- Attitude and confidence important
- Some support found for matching of interviewers to certain types of households (cross-level interactions)
- We may not be able to identify specific interviewing strategies that work best
- Area effects negligible (once controlled for household and interviewer effects)

Implications for Survey Practice

- A better understanding of interviewer effects is important for the improvement of
 - interviewer training and recruitment
 - survey design (how best to approach certain subgroups in the population; allocation of interviewers to households?)
 - informing strategies to maximise response
 - data quality

Further Research

- Interviewer effects in longitudinal surveys
- Models based on interviewer call and survey process data (paradata)
- Use of models to improve adjustment (e.g. weighting)

References

- Durrant and Steele (2009): Multilevel Modelling of Refusal and Noncontact Nonresponse in Household Surveys: Evidence from Six UK Government Surveys, *Journal of the Royal Statistical Society, Series A*, 172, 2, 1-21.
- Durrant, G.B., Groves, R.M., Staetsky, L. and Steele, F. (2009): Effects of Interviewer Attitudes and Behaviors on Refusal in Household Survey, *Public Opinion Quarterly*, to appear.

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Thank you.