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Using Call Record to Analyze the Process Leading to Cooperation or Refusal: Experience from Six Household Surveys

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Introduction

- In face-to-face surveys effective interviewer calling behaviours are critical in achieving cooperation and reducing likelihood of refusal
- In recent years paradata have been collected:
  - interviewer call record data
  - interviewer observations

Aims

- Aim: to analyse such data to inform best calling practices
- Modelling the process leading to cooperation or refusal, across interviewer calls to households (conditioning on contact made with household)
- Role of the interviewer-householder interaction at the doorstep
- Influence of time variant variables on the outcome of each call (How does the call history affect the outcome of future calls?)

Aims

- Effects of both time variant and time invariant correlates
- Methodological development in the analysis and modelling of call record data
- Explore usefulness of call record data and interviewer observations (paradata)

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Data and Methodology

Data

- Relatively rich paradata available
- Interviewer call record data (time variant) (40,000 contact calls)
  - Date and time of call, time between calls, contact strategy used, outcome of call, …
  - Interaction between interviewer and householder
  - Characteristics of person at doorstep
- Interviewer observations about each household (time invariant)
  - Type of accommodation, physical barriers, security device, indications if children present, observations about neighbourhood, …

Data (cont.)

These linked to:

- Information about each household from UK 2001 Census (for both respondents and nonrespondents) (16,000 households)
- Interviewer information (565 interviewers)
- For 6 UK household surveys

⇒Data has a multilevel structure

Limitations

- Not fully randomized calling times
  - Not possible for face-to-face surveys
  - Model controls for household characteristics and previous outcome (call history)
- Limitations on causal effects

Methodology

- Multilevel multinomial logistic discrete-time hazard model

$$\log\left(\frac{\pi_{tij}^{(s)}}{\pi_{tij}^{(4)}}\right) = \boldsymbol{\beta}^{(s)}\mathbf{x}_{tij}^{(s)} + \lambda^{(s)}u_{ij} + \gamma^{(s)}v_j$$

$$\mathrm{t} = \text{call},\ i = \text{household},\ j = \text{interviewer},\ s = \text{outcome}\,(1,2,3)$$

$$y_{tij} = \begin{cases} 1 & \text{refusal} \\ 2 & \text{appointment made} \\ 3 & \text{other forms of postponement} \\ 4 & \text{full or partial cooperation} \end{cases}$$

λ, γ random effects' outcome-specific coefficients

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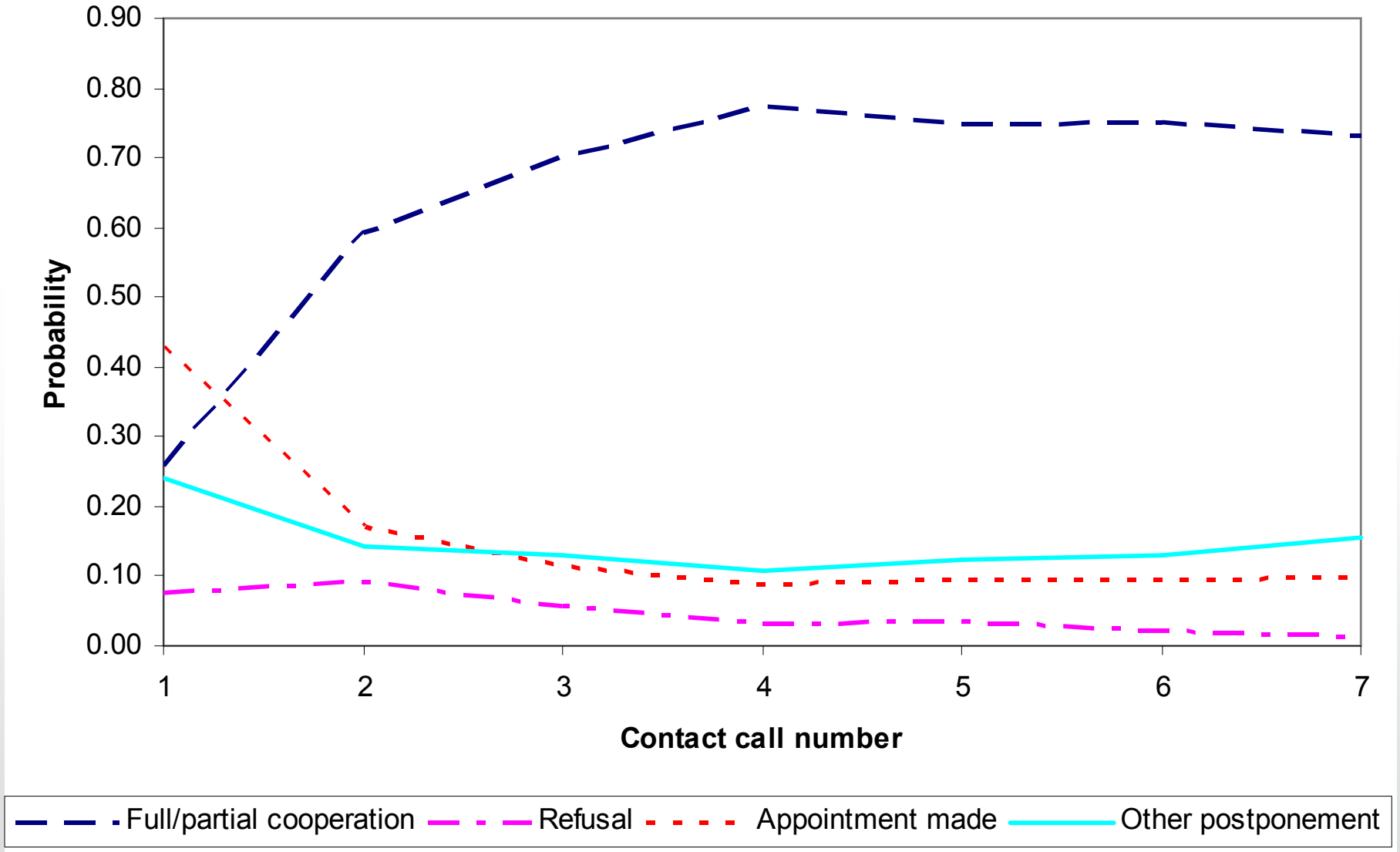
Results

Results


0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Probability
1
2
3
4
5
6
7
Contact call number
Full/partial cooperation
Refusal
Appointment made
Other postponement

Results

Call record data (time variant)

Variable	**Categories**	$\hat{\beta}$ $(ste(\hat{\beta}))$ ***Refusal***	$\hat{\beta}$ $(ste(\hat{\beta}))$ ***appointment made***	$\hat{\beta}$ $(ste(\hat{\beta}))$ ***other postponement***
Previous contact indicator (ref = First contact)	Contact previously made	-0.251 (0.108)***	-1.606 (0.076)***	-1.849 (0.089)***
Number of contacts previously made	-	-1.403 (0.051)***	-1.191 (0.036)***	-1.177 (0.038)***
Number of intermediate non-contact after first contact was made	-	0.532 (0.034)***	0.449 (0.026)***	0.387 (0.032)***
Number of non-contact calls made until first contact	-	-0.051 (0.021)**	-0.162 (0.015)***	-0.261 (0.020)***

Results

Call record data (time variant) cont.

Variable	**Categories**	$\hat{\beta}$ $(ste(\hat{\beta}))$ ***Refusal***	$\hat{\beta}$ $(ste(\hat{\beta}))$ ***appointment made***	$\hat{\beta}$ $(ste(\hat{\beta}))$ ***other postponement***
Question made by householder during introduction (ref = No question made)	At least one question made	-1.483 (0.075)***	-0.430 (0.049)***	-1.278 (0.064)***
Comment made by householder during intro. (ref = No comment made)	Positive/neutral comment At least one negative comment	-0.668 (0.139)*** 5.704 (0.119)***	0.547 (0.051)*** 2.128 (0.082)***	-0.784 (0.065)*** 3.266 (0.091)***
Age of main person the interviewer talked to (ref = 60 and over)	Less than 16 16-34 35-59	3.109 (0.490)*** 0.794 (0.120)*** 0.627 (0.099)***	2.753 (0.305)*** 1.080 (0.082)*** 0.764 (0.071)***	6.144 (0.282)*** 1.660 (0.103)*** 0.870 (0.090)***
Gender of main person the interviewer talked to (ref = Male)	Female	-0.023 (0.066)	0.244 (0.045)***	0.138 (0.056)**

Results

Timing of call

Interaction between day and time of call and previous appointment made						
		Prior appointment made	**Outcome at current call**			
			Cooperation	Refusal	Appointment made	Other postponement
Day and time of call	Sun, Mon, Tue morning	Yes	71.75	2.43	14.24	11.58
		No	20.96	11.89	39.13	28.02
	Sun, Mon, Tue afternoon	Yes	69.27	1.61	16.33	12.79
		No	30.21	9.25	34.26	26.28
	Sun, Mon, Tue evening	Yes	69.95	1.83	16.69	11.53
		No	9.29	13.79	46.07	30.85
	Wed, Thu, Fri, Sat morning	Yes	72.96	1.82	14.82	10.40
		No	33.29	9.64	33.86	23.21
	Wed, Thu, Fri, Sat afternoon	Yes	71.31	2.04	14.43	12.22
		No	23.94	10.25	37.76	28.05
	Wed, Thu, Fri, Sat evening	Yes	70.74	1.64	15.54	12.08
		No	12.89	11.98	44.06	31.07

Summary of Results

- Time variant call record information (call history and characteristics of current call) play a key role in predicting outcome of each call
- Interaction process between interviewer and householder significant (how contact was established, characteristics of the householder at the doorstep, if household asked questions or made comments)
- Interviewer observation variables useful (e.g. type and condition of the house, presence of dependent children)

Summary of results (cont.)

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- Calling times:
  - Best times of contact (evenings; weekends) are not necessarily best times to establish cooperation
  - For first contact and if no appointment: evenings are not a good time to establish cooperation; but high probability of appointment
  - Most appointments are made for afternoons and evenings; then probability of refusal very low

Implications for survey practice

- May inform design of efficient and effective calling behaviours, follow-ups, adaptive survey designs
- Model may be used to predict cooperation at future calls based on data collected at previous calls (responsive survey designs)
- Guidance on which additional data to collect (call record data and interviewer observation data); which variables are useful
- Guidance on how best to use and model paradata

Thank you!