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Modelling group-specific interviewer effects on nonresponse

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Introduction

While there is ample evidence of interviewers affecting nonresponse, the literature is sparse on how interviewers differentially affect specific groups of sample units regardless of its importance in terms of nonresponse bias.

1. How can we parameterize group-specific interviewer effect size?
2. Is the interviewer variance for one group bigger than for the other?
3. If the answer is yes, which interviewer characteristics influence interviewer effects on nonresponse differentially among different groups of respondents?

Summary

- Whether interviewer effects on nonresponse differ across specific groups of respondents or not can yield insights on whether interviewers introduced potential nonresponse bias.
- The multilevel model with separate coding of random coefficients makes it possible (1) to estimate how the size of interviewer effects varies across types of respondents, and (2) to investigate how interviewer characteristics affect respondent groups differently.
- Investigating nonresponse during the recruitment of a probability-based online panel separately for persons with and without prior internet access, we detect that the size of the interviewer effect differs between the two respondent groups.

Method

- Multi-level model with different codings of random slopes (see Verbeke & Molenbergs, 2000)
- 2-levels: respondents are nested in interviewers



Result 1 - Parameterization

- The random slopes with contrast coding (dummy coding) indicate how the gap in response between group 1 and group 2 is different for interviewers.

Contrast coding

$$\text{logit}(\pi_{ij}) = \gamma_{00} + \gamma_{10} \text{Group}_{ij} + \underbrace{u_{1j} \text{Group}_{ij}}_{\text{contrast coding}} + u_{0j}$$



- Estimate a model that retains contrast coding in the fixed part, but separate coding in the random part (dummy for each category, intercept is omitted).
- The variance components of the two random slopes reveal the size of the interviewer effect for each group separately.

Separate coding

$$\text{logit}(\pi_{ij}) = \gamma_{00} + \gamma_{10} \text{Group}_{ij} + \underbrace{u_{1j} \text{Group}1_{ij} + u_{2j} \text{Group}2_{ij}}_{\text{separate coding}}$$



Result 2 - Interviewer variance

- 25% of the overall variance of response to the online panel is located at the interviewer level.
- Interviewer variance is sig. larger for onliners than for offliners. Thus, there is less variation between interviewers when recruiting offliners compared to onliners.

Variance components

Var($u_{1j}OFF_{ij}$)	0.49*	}	***
Var($u_{2j}ON_{ij}$)	1.71***		

- Positive covariance of random slopes indicate that interviewers who are good at gaining response from onliners are also good at gaining response from offliners and vice versa.

Result 3 - Interviewer characteristics

- Cross-level interactions showed, that interviewers' tendency to deviate from standardized interviewing protocols is more relevant when recruiting offliners than when recruiting onliners.
- No other cross-level interaction was significant.

Application

As an example for this parametrization strategy we used...

- A probability-based online panel (German Internet Panel)
- With f2f recruitment interviews from 2012 and 2014
- Low response rates for non-Internet households (see Blom et al., 2017)
- Total of 3,842 respondents
 - 2,970 onliners (households with Internet access)
 - 872 offliners (non-Internet households)
- 214 interviewers
- Overall question: Are interviewers the reason for these differences in sample composition and could we do something about it?

Practical implication

- Separate coding informs us on the size of interviewer variance for specific-groups of respondents.
- Depending on the results, interviewer-related response-enhancement strategies can improve the sample composition or deteriorate the sample composition.
- Depending on the size of the variance, researchers need to identify successful and unsuccessful interviewers and investigate whether the these interviewers are equally distributed across the sample units.

References

- Blom, A. G., J... (2017). Does the recruitment of offline households increase the sample representativeness of probability-based online panels? Evidence from the German Internet Panel. *Social Science Computer Review* 35(4), 498-520.
- Verbeke, G. and G.Molenberghs (2000). *Inference for marginal model*, pp. 55-76. New York, NY; Springer.

Data availability

The data used, can be accessed at the Onsite Data Access (ODA) facilities of the GIP Secure Data Center (SDC) at the collaborative Research Center 884 «Political Economy of Reforms» at the University of Mannheim, Germany.

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