Disentangling mode-specific selection and measurement bias in social surveys

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Outline

- The MEPS experiment
  - Mode-effecten in persoonsstatistieken/
  - Mode Effects in Social Surveys
- Disentangling mode effects
- Results

The impact of survey mode

Data collection steps:

1. Persons need to be reached (coverage)
2. Persons need to respond (response)
3. Persons need to provide valid answers (measurement)

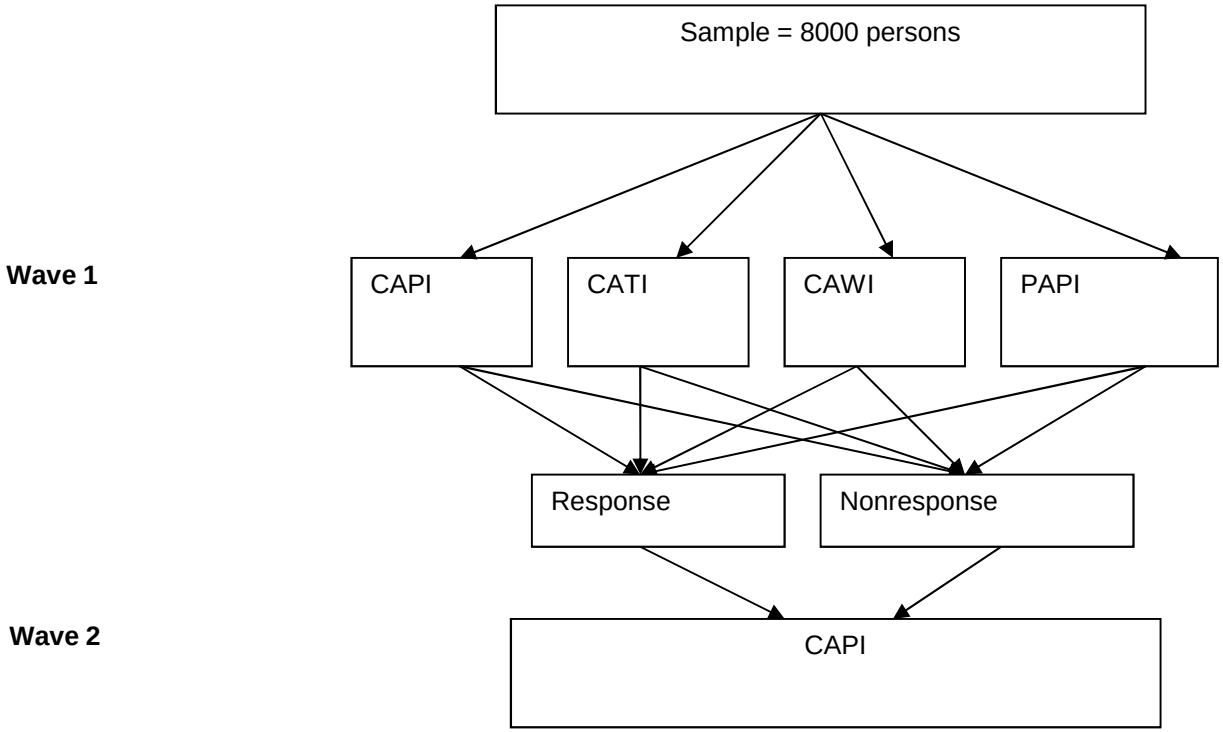
selection

The MEPS experiment

Objectives

1. Measurement bias for number of key statistics
2. Relation between person, nature of survey question and mode effect
3. Recommend improvements to mixed-mode methodology

The MEPS experiment



The MEPS experiment

Wave 1:

- Random assignment to survey mode
- Questionnaire is Safety Monitor with small modifications
- Regular data collection strategy for each mode

Wave 2:

- Questionnaire repeats main wave 1 questions
- Additional questions about general survey attitudes, attitudes towards politics and survey design features.

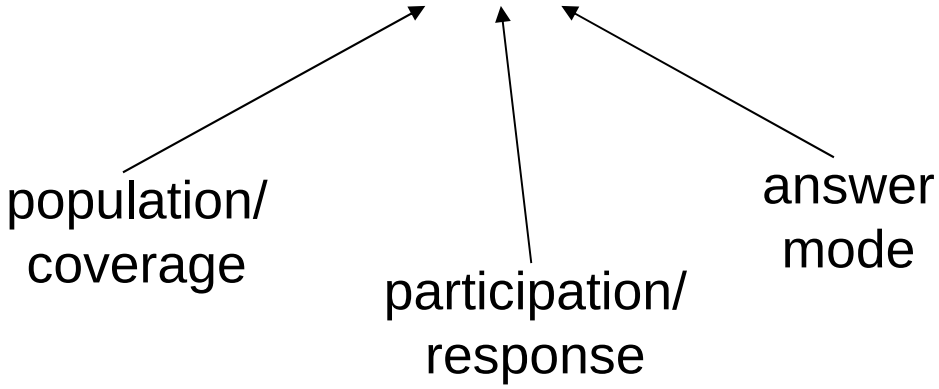
Response

	CAPI	CATI	Paper	Web	Total
Sample	2182	2200	2200	2199	8781
Wave 1	1338	993	1076	631	4038
	61%	45%	49%	29%	46%
Wave 2	1077	1036	1099	1084	4296
	49%	47%	50%	49%	49%
Both	933	700	726	444	2803
	42%	32%	33%	20%	32%

Disentangling mode effects

Total relative mode effect:

$$M_{tel}(y) = y_{tel,tel,tel} - y_{tot,f2f,f2f}$$

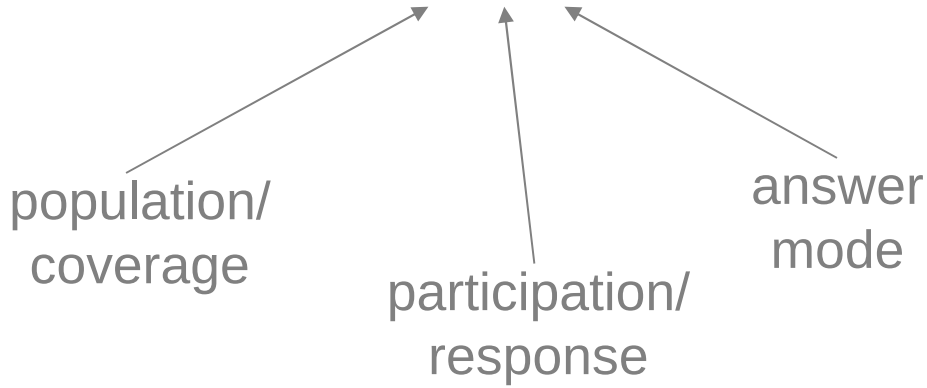


Disentangling mode effects

Decomposition 1:

$$M_{tel}(y) = (y_{tel,tel,tel} - y_{tel,f2f,tel}) + (y_{tel,f2f,tel} - y_{tel,f2f,f2f}) + (y_{tel,f2f,f2f} - y_{tot,f2f,f2f})$$

$$NR_{tel}(y) + ME_{tel}(y) + CO_{tel}(y)$$



Estimation of components

$\hat{y}_{tel,tel,tel}$ = Wave 1 CATI mean

$\hat{y}_{tel,f2f,tel}$= Wave 1 CATI response weighted to Wave 2 CAPI response of telephone owners

$\hat{y}_{tel,f2f,f2f}$ = Wave 1 CAPI mean of telephone owners

$\hat{y}_{tot,f2f,f2f}$ = Wave 1CAPI mean

Decomposition 1:

$$M_{tel}(y) = (y_{tel,tel,tel} - y_{tel,f2f,tel}) + (y_{tel,f2f,tel} - y_{tel,f2f,f2f}) + (y_{tel,f2f,f2f} - y_{tot,f2f,f2f})$$

$NR_{tel}(y)$

$ME_{tel}(y)$

$CO_{tel}(y)$

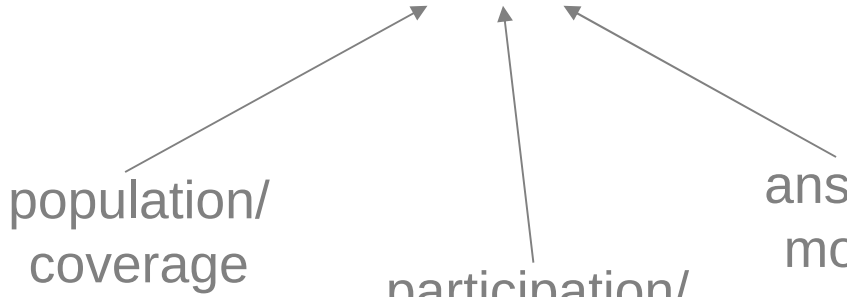
Decomposition 2:

$$M_{tel}(y) = (y_{tel,tel,tel} - y_{tel,f2f,tel}) + (y_{tel,f2f,tel} - y_{tot,f2f,tel}) + (y_{tot,f2f,tel} - y_{tot,f2f,f2f})$$

$NR_{tel}(y)$

$CO_{tel}(y)$

$ME_{tel}(y)$



Assumptions

1. The response to wave 2 is similar to the response to a regular CAPI survey
2. The answering behaviour to wave 2 is CAPI
3. The nonresponse to wave 1 relative to wave 2, is missing at random
4. The mode effects in wave 2 between CATI and CAPI have a negligible impact

Models

empstat	inctype + regempl + income + hhpos
offtot	w2_offtot + w2_nuisance + age6 + w2_contpol + w2_offbike + w2_victviol
victim	w2_victim + w2_nuisance + w2_contpol + inctype + w2_offtot + w2_offviol
nuisance	w2_nuisance + w2_unsafe + urban + w2_victviol
unsafe	w2_unsafe + w2_nuisance + age3 + betr3
educlev	income + inctype + intpol + hhsize + betr3 + satt9

Mode effect LFS

Variable	Mode	Mean	CAPI	NR	CO	ME
Employ	Tel.	56.5%	56.1%	0.1%	-1.2%	1.5%
	Web	65.1%	56.1%	5.5%	2.5%	1.0%
Unemploy	Tel.	4.9%	7.9%	-1.1%	-0.8%	-1.1%
	Web.	5.3%	7.9%	-0.9%	0.0%	-1.7%

Variable	Mode	Mean	CAPI	NR	CO	ME
#crimes	Tel.	35.5	41.6	-2.0	0.3	-4.6
	Paper	50.8	41.6	-3.6	-	12.8
	Web	56.2	41.6	-3.7	2.6	15.7
victim	Tel.	22.7	26.5	0.0	0.0	-3.8
	Paper	28.2	26.5	-1.8	-	3.5
	Web	32.0	26.5	0.4	1.3	3.8
nuisance	Tel.	1.27	1.47	-0.01	-0.04	-0.16
	Paper	1.41	1.47	-0.01	-	-0.06
	Web	1.68	1.47	0.01	-0.02	0.21
unsafe	Tel.	18.3	22.4	-1.1	-0.2	-2.8
	Paper	23.5	22.4	-0.1	-	1.2
	Web	28.5	22.4	-0.6	0.4	6.3

Summary

Crime victimization survey

- Measurement effect dominate
- Web: negative; Telephone: positive

Labour Force Survey

- Significant differences web, telephone and face-to-face
- No dominant component
- Relative selection effects can be explained by regular register variables

Variable	Mode	Mean	CAPI	NR	CO	ME
educlev - 10	Tel.	14.0%	12.7%	-1.1%	-0.3%	2.8%
lowest	Web	12.7%	12.7%	-1.0%	-3.2%	4.2%
educlev – 20	Tel.	19.3%	21.1%	-0.6%	-0.1%	-1.1%
	Web	19.8%	21.1%	-1.6%	-0.1%	0.4%
educlev – 30	Tel.	34.3%	38.3%	0.4%	0.0%	-4.4%
	Web	25.0%	38.3%	-0.2%	1.4%	-14.5%
educlev – 40	Tel.	24.8%	19.7%	0.2%	0.1%	4.8%
	Web	24.6%	19.7%	0.8%	2.1%	1.9%
educlev – 50	Tel.	7.0%	8.1%	0.8%	0.3%	-2.1%
highest	Web	9.5%	8.1%	0.5%	-0.1%	1.1%
unkown	Tel.	0.5%	0.1%	0.4%	-0.1%	0.0%
	Web	8.4%	0.1%	1.5%	-0.1%	6.9%