gesis

Leibniz Institute for the Social Sciences





Does the mode matter?

An experimental comparison of survey responses between face-to-face and mixed-mode surveys

Pablo Christmann (pablo.christmann@gesis.org), Tobias Gummer, Sascha Hähnel, Christof Wolf **GESIS – Leibniz Institute for the Social Sciences**

> 2019 ESRA Conference Zagreb, 17th of July 2019





Introduction

- In comparative survey programs the gold standard for data collection is the face-to-face (F2F) mode (coverage, literacy)
- *Challenge*: decreasing response rates in F2F surveys
 - Increased risk of non-response error
 - Longer field periods
 - Increasing costs
- Biases introduced by interviewers
 - Social desirability
 - Fraudulent interviews
- Self-administered mixed-mode surveys (mail + web) as part of the EVS in 5 countries: CH, DE, DK, IS, NL





Research questions

- How does a *self-administered* mixed-mode survey (mail + web) perform compared to a F2F survey?
 - Response rate
 - Fieldwork
 - Survey costs
 - Representativeness/ Sample Composition
 - Data quality







Study design

Probability based *register* sample was **randomly** assigned to different modes of data collection

European Values Study (EVS) sample

Randomization

Face-to-Face Mixed-Mode Mixed-Mode (Full Length) (Matrix, Phase 2) (Full Length) 1,494 interviews 1,171 Interviews 675 interviews RR: 28.0% RR: 42.2% RR: 35.3% Ø 59 min Ø 38 min (Web) \emptyset 55 min (Web) Fieldwork: 4 Oct 2017 Fieldwork: 20 Sept

- 4 Apr 2018

Fieldwork: 25 Jan 2018 - 20 Mar 2018

4

2018 - 28 Nov 2018



Fieldwork & costs





Response rates by fieldwork week and mode



Notes: Response Rate RR6 (AAPOR).





Costs by mode



Notes: For N = 3,000 realized interviews.

Projected costs include: staff costs, sampling, programming & layout, data collection (incl. print of letters, postage, incentives, data input).





Sample composition





Sample balance/ coefficient of variation (CV)



Notes: Adjusted Coefficient of Variation (CV) of predicted response propensities (logistic regression) dependent on age, gender, nationality, municipality size and East-/West Germany. With 95%-CI. N face-to-face= 5,314; N mixed-mode matrix (Phase 2) = 2,752; N mixed-mode full (sim*pre) = 1,917.

Based on: Shouten, B., Cobben, F. and Bethlehem, J. (2009). "Indicators for the representativeness of survey response." In: Survey Methodology 35 (1), 101-113.



Representation bias of age

Age group Population		Face-to-face	Mixed-mode (matrix)	Mixed-mode (full)		
18-29 years	16.8%	16.5%	11.0%***	13.4%*		
30-39 years	15.1%	14.0%	15.2%	11.2%**		
40-49 years	15.5%	15.5%	15.9%	17.2%		
50-59 years	19.3%	19.3%	20.8%	20.9%		
60-69 years	14.6%	18.3%***	16.6%*	17.6%*		
70+ years	18.8%	16.3%*	20.6%	19.8%		

Source: *Statistisches Bundesamt, Bevölkerungsfortschreibung 2017. *Notes*: X² Test of difference, * p < 0.05, ** p < 0.01, ***p < 0.001.



Representation bias of gender

Gender	Population*	Face-to-face	Mixed-mode (matrix)	Mixed-mode (full)
Men	49.1%	49.9%	48.6%	50.6%
Women	50.9%	50.1%	51.4%	49.4%

Source: *Statistisches Bundesamt, Mikrozensus 2016.

Notes: X² Test of difference, * p < 0.05, ** p < 0.01, ***p < 0.001.





Representation bias of citizenship

Citizenship	Population*	Face-to-face	Mixed-mode (matrix)	Mixed-mode (full)
German	87.9%	91.2%***	93.2%***	93.5%***
non-German	12.1%	8.8%***	6.8%***	6.5%***

Source: *Statistisches Bundesamt, Bevölkerungsfortschreibung 2017. *Notes*: X² Test of difference, * p < 0.05, ** p < 0.01, ***p < 0.001.





Representation bias of urbanity

Urbanity	Population*	Face-to-face	Mixed-mode (matrix)	Mixed-mode (full)
Cities	35.9%	33.7%	37.0%	36.0%
Towns and suburbs	41.5%	39.7%	39.7%	41.3%
Rural areas	22.7%	26.6%***	23.4%	22.7%

Source: *Eurostat "DEGURBA" classification, 2018.

Notes: X² Test of difference, * p < 0.05, ** p < 0.01, ***p < 0.001.





Representation bias of household size

HH size	Population*	Face-to-face	Mixed-mode (matrix)	Mixed-mode (full)
1 member	20.9%	20.4%	18.7%	20.8%
2 members	33.5%	39.7%***	41.9%***	41.5%***
3 members	18%	17.7%	16%	15.8%
4 members	18.5%	15.3%**	16.9%	16.1%
5+ members	9 %	6.9%**	6.5%**	5.7%**

Source: *Statistisches Bundesamt, Mikrozensus 2017, 20 years and older. Notes: X^2 Test of difference, * p < 0.05, ** p < 0.01, ***p < 0.001.





Representation bias of education

ISCED level	Population*	Face-to-face	Mixed-mode (matrix)	Mixed-mode (full)
0-2	18.7%	11.5%***	18.3%	13.6%**
3-4	57.0%	53.7%**	41.4%***	47.4%***
5+	24.3%	34.8%***	40.3%***	39.0%***

Source: *Statistisches Bundesamt, Mikrozensus 2016.

Notes: X² Test of difference, * p < 0.05, ** p < 0.01, ***p < 0.001.





Employment	Population*	Face-to-face	Mixed-mode (matrix)	Mixed-mode (full)
Active	56.5%	57.8%	61.4%**	59.2%
Unemployed	2.1%	3.7%***	1.7%	2.1%
Not in labor force	41.3%	38.6%*	36.9%**	38.8%

Source: *Statistisches Bundesamt, Mikrozensus 2017, 20 years and older.

Notes: X² Test of difference, * p < 0.05, ** p < 0.01, ***p < 0.001.



gesis

Leibniz Institute for the Social Sciences



Data quality (33 questions & 138 items)



The EVS questionnaire

	Question Number [*]	N Items ⁺
By Thematic Block		
Environment	Q56	5
National Identity	Q40, Q41, Q45, Q51, Q52,	26
	Q53, Q54, Q55, Q62	
Perception of Life	Q1, Q2, Q3, Q8, Q9, Q10	16
Politics and Society	Q29, Q31, Q32, Q38, Q39,	59
	Q42, Q43, Q50, Q58, Q60,	
	Q61	
Religion and Morale	Q21, Q23, Q27, Q44	25
Work	Q12, Q26	7
By Scale Type		
3 Point Scale	Q56	6
4 Point Scale	Q1, Q2, Q8, Q29, Q38,	65
	Q43, Q45, Q50, Q53, Q54,	
	Q58, Q62	
5 Point Scale	Q3, Q12, Q26, Q27, Q51,	26
	Q56, Q60, Q61	
10 Point Scale	Q9, Q10, Q21, Q31, Q32,	41
	Q39, Q40, Q41, Q42, Q44,	
	Q52, Q55	
Total	33	138
[*] The questionnaire can	be accessed under: <u>https://europeanvalu</u>	esstudy.eu/methodology-data-
documentation/survey-2017/.		

⁺All items of the EVS questionnaire on an ordinal rating scale are considered for comparison (3pt, 5pt, 7pt and 10pt).





Comparison of Means and Standard Deviations





Notes: All variables have been rescaled to a scale ranging from 0 (low) to 1 (high). N=138 items. Full dots indicate significant differences (p<0.05) between the survey modes based on t-tests and tests on the equality of standard deviations.



Effect size: Cohen's D and dissimilarity index





Notes: Histogram of Cohen's d and dissimilarity indices (based on Duncan Segregation Index). Based on a comparison with the face-to-face survey. N=138 indices.

Summary of mode effects

	Mixed-Mode	Mixed-Mode	
	Matrix Design	Full Survey	
Comparison of means			
Average of differences*	0.00	0.01	
Absolute average of differences**	0.03	0.03	
%-significant differences***	58.7%	49.3%	
Comparison of standard deviations			
Average of differences [†]	-0.01	0.00	
%-significant differences ^{††}	34.8%	31.%	
Comparison of distributions			
Average of Dissimilarity Indices [‡]	0.07	0.07	
%-significant Differences ^{‡‡}	65.2%	60.1%	
Effect size			
Average of Cohen's d [§]	0.04	0.04	
Absolute Average of Cohen's d ^{§§}	0.11	0.11	

Notes: Based on comparisons with the face-to-face survey. N=138 items or indices. All variables are rescaled to a scale ranging from 0 to 1 and are coded in the same direction..





Diff. of Mode Effects with Socio-Dem. Controls



Notes: Difference (Δ) in β_i of the mode effect (constraint model – full model with demographic control variables). Based on pooled linear regression models for 138 items (mixed-mode and face-to-face). Arrows symbolise size and direction of the differences in the mode effects.





Conclusions





Conclusion

- Mixed-mode surveys (web + mail) are a viable alternative to face-to-face surveys
 - achieve higher response rates (in Germany)
 - nearly comparable degree of representativeness (although F2F has an edge)
 - similar substantive results as the F2F mode
 - being much faster
 - being considerable cheaper
- Results from Denmark, Iceland, Switzerland and Germany indicate that <u>long surveys are also feasible</u> in self-administered modes





Thank you for your attention.

gesis

Leibniz Institute for the Social Sciences



Supplemental Information





Response Rates



Mode	СН	DE	DK	IS	NL
CAPI (F2F)	48%	28%	52%	41%	43%
MM matrix design	44%	43%		44%	(81%)
MM matrix panel (follow up)	34% (77% of resp.)			14% (30% of resp.)	(68%) (84% of resp.)
MM full length	44%* /40%	36%	40%	41%	
Contact mode	Sequential: paper with 2nd reminder	Simultaneous: web + paper	Sequential: paper with 1st reminder	Sequential: paper only if no Internet at all	Web only: LISS-panel
Incentive	8.6 € prepaid + lottery for follow-up	5€ prepaid	None	lottery cond. on response	

Source: Pollien, A., Ernst Stähli, M., Ochsner, M., Milbert, P., Joye, D. (2018). "How to run long web surveys: a real-life experiment with the European Values Study." General Online Research Conference, 1.3.2018.

Notes: *Announced as short (25 min).





Mixed-mode – "matrix design"

- assumed challenge when applying a long face-to-face questionnaire into an online questionnaire
 - length Ø 59 min for full EVS survey in face-to-face
- Solution? shorten the questionnaire using a matrix design
 length now Ø 38 min for questionnaire splits (web)



