

# gesis

Leibniz Institute  
for the Social Sciences



Using response patterns in a panel  
survey to explain panel dropout

Isabella Minderop & Bernd Weiß  
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# Agenda

- 1 Introduction
- 2 Theory
- 3 Data and Methods
- 4 Results
- 5 Conclusion

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# Problem

- Drop-out as substantial threat to panel data quality
- Solution: Identify respondents at risk to attrit & implement interventions (adaptive design)
- Previous research:
  - Survey motivation and available time influence attrition
  - Response behavior, such as response timing
- Research gaps:
  - Lack of longitudinal research about response timing
  - Lack of information about stability of response timing
- Response time patterns:
  - Easily available for every survey wave
  - Proxy for influences of unobserved variables such as survey motivation or available time

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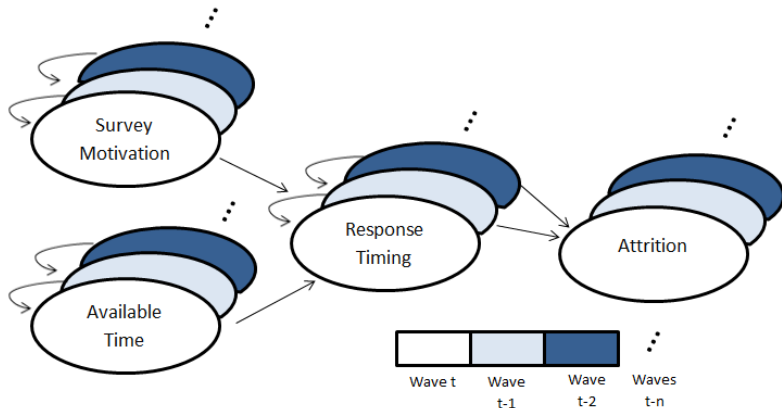
## Rational Choice Theory

- Actors choose the alternative that promises them the most utility
- Respondents with few available time or survey motivation will participate later and are more likely to drop out

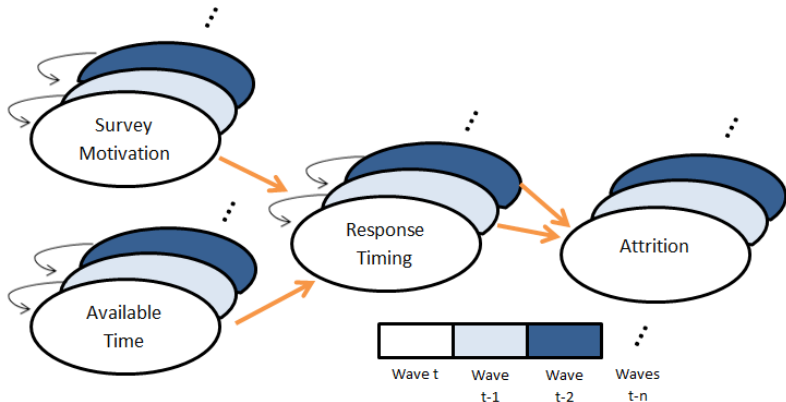
## Model of Frame Selection

- Actors behave in an automatic or reflective mode
- Automatic mode:  
Respondents do not reflect participation
- Reflective mode:  
Reflections lead to changes in behavior, respondents consider attrition

# Theoretical model

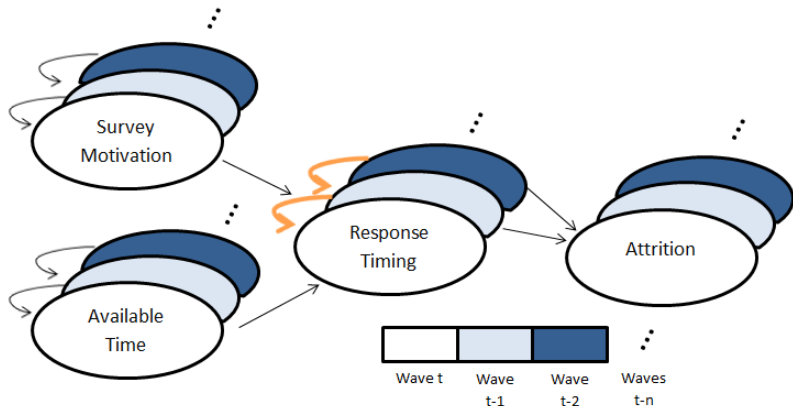


# Theoretical model, Rational Choice





# Theoretical model, Frame Selection



# Hypotheses

H1: If respondents return their surveys habitually late, then they have a higher likelihood of dropping out of the panel.

H2: If respondents show inconsistent response time behavior, then they have a higher likelihood of dropping out of the panel.

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# Data: The GESIS Panel (waves 1-28, 2013-2018)

- Probability-based access panel
- Start in 2013, refreshments in 2016 and 2018
- Bi-monthly data collection
- Web and mail mode
- Two reminder e-mails in web mode
- Prepaid 5 EUR incentive
- About 5000 panelists
- Attrition (waves 1-28): 28 %

# Variables

- Attrition, binary: Participated at least once dropped out until the 28th wave
- Response timing:  $\frac{\text{Number of responses 14 days or later after field start}}{\text{Number of responses}}$
- Response instability:  $\frac{\text{Number of changes in response behavior}}{\text{Number of invitations}}$

## Response time patterns

ID	Waves									Timing	Instability
1	1	1	0	9	1	1	0	0	0		
2	1	9	1	1	9	9	9	-	-		
3	0	0	0	1	0	1	1	0	0		
4	0	0	0	0	0	0	0	0	0		
5	1	1	1	9	9	9	-	-	-		
6	0	0	0	0	1	1	1	0	0		
7	9	0	0	0	1	0	1	0	1		
8	0	0	0	0	0	0	0	-	-		
9	0	9	0	9	1	1	9	9	9		

0= 0-14 days

1= 15-61 days

9= unit nonresponse

- = panel dropout

## Response time patterns

ID	Waves									Timing	Instability
1	1	1	0	9	1	1	0	0	0	4/8	
2	1	9	1	1	9	9	9	-	-	3/3	
3	0	0	0	1	0	1	1	0	0	3/9	
4	0	0	0	0	0	0	0	0	0	0/9	
5	1	1	1	9	9	9	-	-	-	3/3	
6	0	0	0	0	1	1	1	0	0	3/9	
7	9	0	0	0	1	0	1	0	1	3/8	
8	0	0	0	0	0	0	0	-	-	0/7	
9	0	9	0	9	1	1	9	9	9	2/4	

0= 0-14 days

1= 15-61 days

9= unit nonresponse

- = panel dropout

## Response time patterns

ID	Waves									Timing	Instability
1	1	1	0	9	1	1	0	0	0	4/8	4/9
2	1	9	1	1	9	9	9	-	-	3/3	3/7
3	0	0	0	1	0	1	1	0	0	3/9	4/9
4	0	0	0	0	0	0	0	0	0	0/9	0/9
5	1	1	1	9	9	9	-	-	-	3/3	1/6
6	0	0	0	0	1	1	1	0	0	3/9	2/9
7	9	0	0	0	1	0	1	0	1	3/8	6/9
8	0	0	0	0	0	0	0	-	-	0/7	0/7
9	0	9	0	9	1	1	9	9	9	2/4	5/9

0= 0-14 days

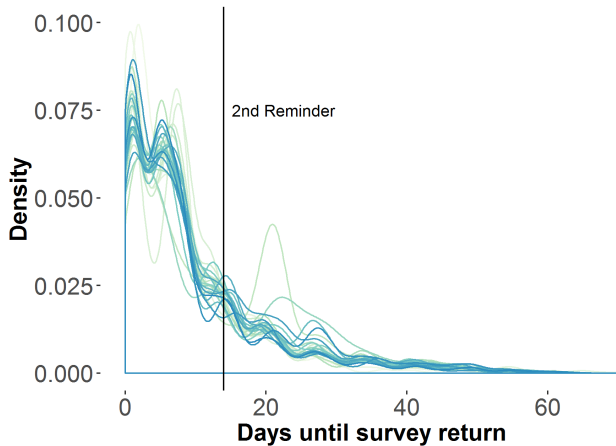
1= 15-61 days

9= unit nonresponse

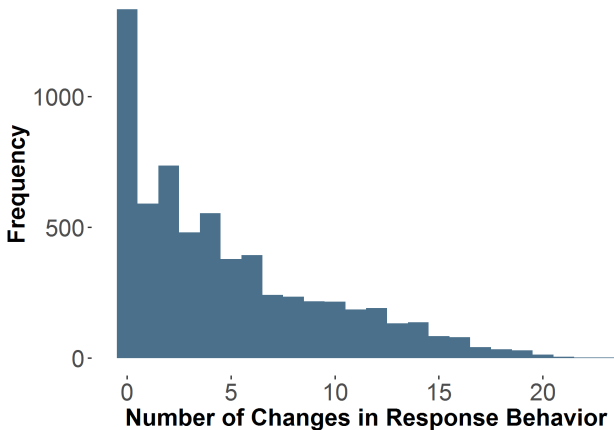
- = panel dropout



# Survey return among all waves



# Changes in response patterns



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## Average marginal effects on attrition

	Timing	Instability	Timing & Instability
Response timing	0.39 * **		0.19 * **
Response instability		0.69 * **	0.53 * **
AIC	6580.3	6357.6	6278.4
Pseudo R <sup>2</sup>	0.07	0.10	0.11
n	6074	6074	6074

\* =  $p < 0.5$

\*\* =  $p < 0.1$

\*\*\* =  $p < 0.01$

	Timing & Instability	Available time & Survey motivation
Response timing	0.19 * **	
Response instability	0.53 * **	
Full time job		0.00
Partner		-0.05 * **
Children		0.07 * **
Mode		0.09 * **
Survey evaluation: interesting		-0.11 * **
Survey evaluation: important		0.03 * **
Survey evaluation: long		0.10 * **
Survey evaluation: difficult		0.01
Survey evaluation: diverse		0.03 * **
Survey evaluation: private		0.01
AIC	6278.4	6105.6
Pseudo R <sup>2</sup>	0.11	0.14
n	6074	6074

\* = p<0.5

\*\* = p<0.1

\*\*\* = p< 0.01

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# Conclusions

- Response times can easily be collected for every respondent
- Response times allow us to calculate number of late responses and the stability of late responses
- It is important to investigate the development of response times longitudinally

Thank you for your attention!

[isabella.minderop@gesis.org](mailto:isabella.minderop@gesis.org)



	Timing & instability	Available time & survey motivation	Full model
Response timing	0.19 * **		0.15 * **
Response instability	0.53 * **		0.42 * **
Full time job		0.00	-0.01
Partner		-0.05 * **	-0.04 * **
Children		0.07 * **	0.04 * *
Mode		0.09 * **	0.03 * *
Survey evaluation: interesting		-0.11 * **	-0.10 * **
Survey evaluation: important		0.03 * **	0.03 * **
Survey evaluation: long		0.10 * **	0.08 * **
Survey evaluation: difficult		0.01	0.01
Survey evaluation: diverse		0.03 * **	0.03 * *
Survey evaluation: private		0.01	0.01
AIC	6278.4	6105.6	5606.3
Pseudo R <sup>2</sup>	0.11	0.14	0.21
n	6074	6074	6074

\* = p<0.5

\*\* = p<0.1

\*\*\* = p< 0.01