EIGHT SECONDS FROM OPINE TO CLICK

Respondent and Question Effects on Response-Times in a large scale web-panel

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BigSurv18 conference
Research and Expertise Centre for Survey Methodology (RECSM)
@ Universidad Pompeu Fabra
October 25-27, Barcelona, Spain

HOCHSCHULE RHEIN-WAAL
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Agenda

- Research Objectives
- Theoretical Considerations
- Literature
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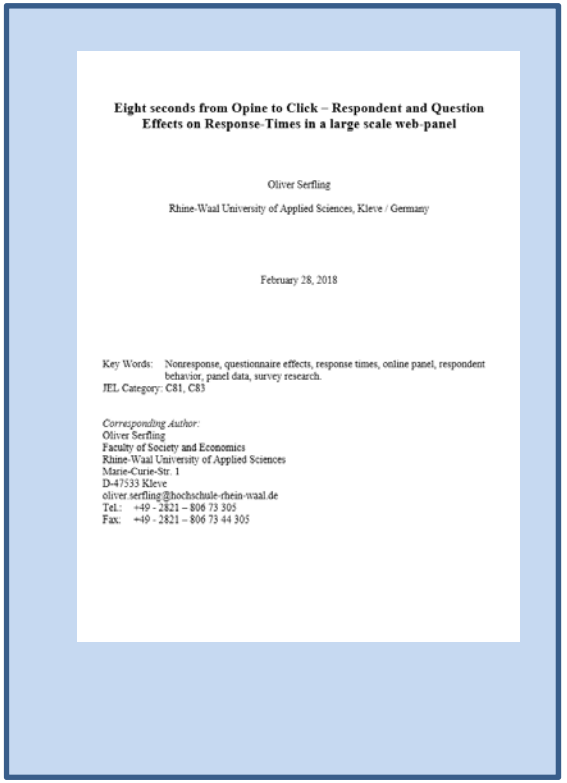
  - Data Analysis
- Results
  - Response Times
  - Sociodemographics
    - Experience
    - Weekday and Time
  - Question Effects
  - DK – RT Interaction
- Outlook: Way forward

Paper (forthcoming)



Eight seconds from Opine to Click – Respondent and Question Effects on Response-Times in a large scale web-panel

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February 28, 2018

Key Words: Nonresponse, questionnaire effects, response times, online panel, respondent behavior, panel data, survey research.
JEL Category: C81, C83

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Data Quality Aspects in Web Surveys

- (Non-probability) Web surveys are becoming increasingly popular for public opionion research
  - self-administered: absence of interviewers, unknown/uncontrollable interview-setting
  - mostly open access, with only limited information about the respondent‘s characteristics
  - unavailability of record-data or other means of verification
    - detecting biases
    - informing imputation methods

- However, „**Interviews** are **data construction** through **interaction** between the interviewer and the interviewee“ (Roulston et al. 2003: 645).

- Thus, any (limited) knowledge about characteristic of the interview situation might be indicative for the revealed **data quality**

Research Objective

- Research on RT goes back to cog. psychologist Donders (1868)
- is increasingly being researched with the availability of web surveys (see e.g. Yan and Tourangeau (2008), Malhorta (2008)
- However, the interaction btw. personal and question(naire) characteristics, DK-options and RT is still not fully understood

- Aims:
  1. Reveal the personal (socio-demographic) effects on RT
     - incl. Interview experience and situation (weekday and time of day)
  2. Question(naire) characteristics
  3. Interaction of „don‘t know“ (DK) and Response Time (RT)

Survey Methodology

Data is being surveyed by Civey, Berlin

- Civ-Tech start-up focussing on public opinion polls
- Hosting a **web-access panel** with 1.25 mio. active, verified, registered users in Germany
- **Polling-widget** is embedded in > 25.000 webpages, generating 300k votes per day, i.e. 10 mio. per month; avg. active user: 50 votes per month.
- **newspapers and blogs**: Spiegel Online, Welt, Wirtschaftswoche, Cicero, T-Online; 6/10 of Germanys biggest news webites

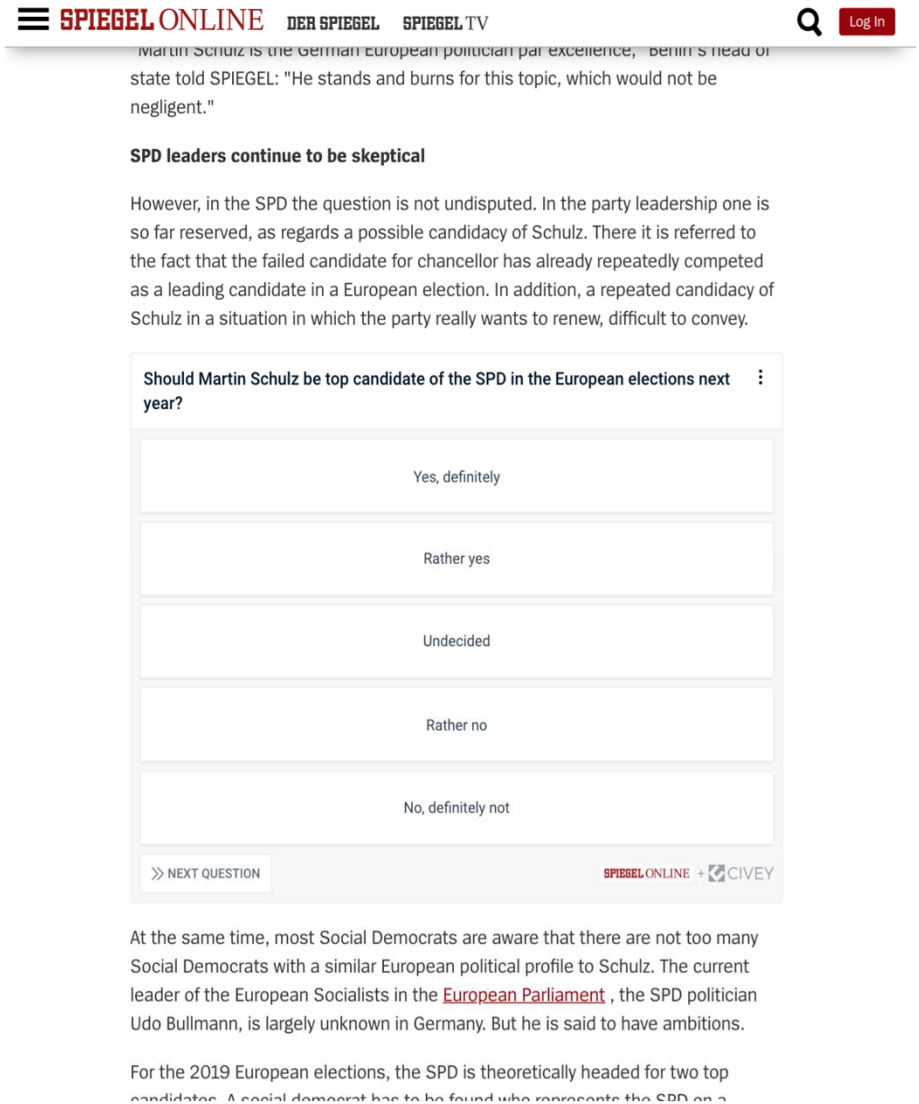


Figure 1: Screenshot of Civey Widget embedded in a news article on spon.de

Survey Methodology

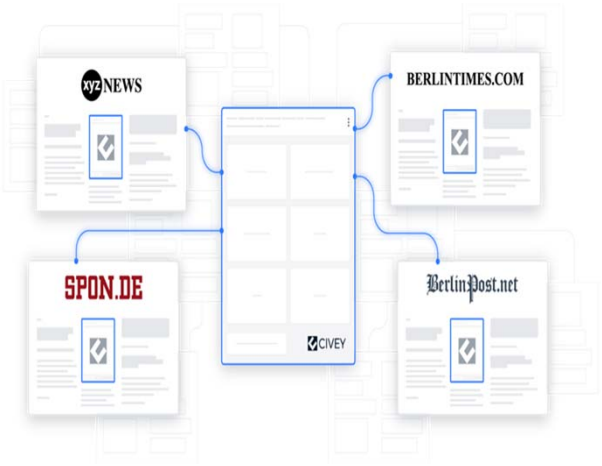
Non-Probability Samples have to deal with sampling and selection bias:

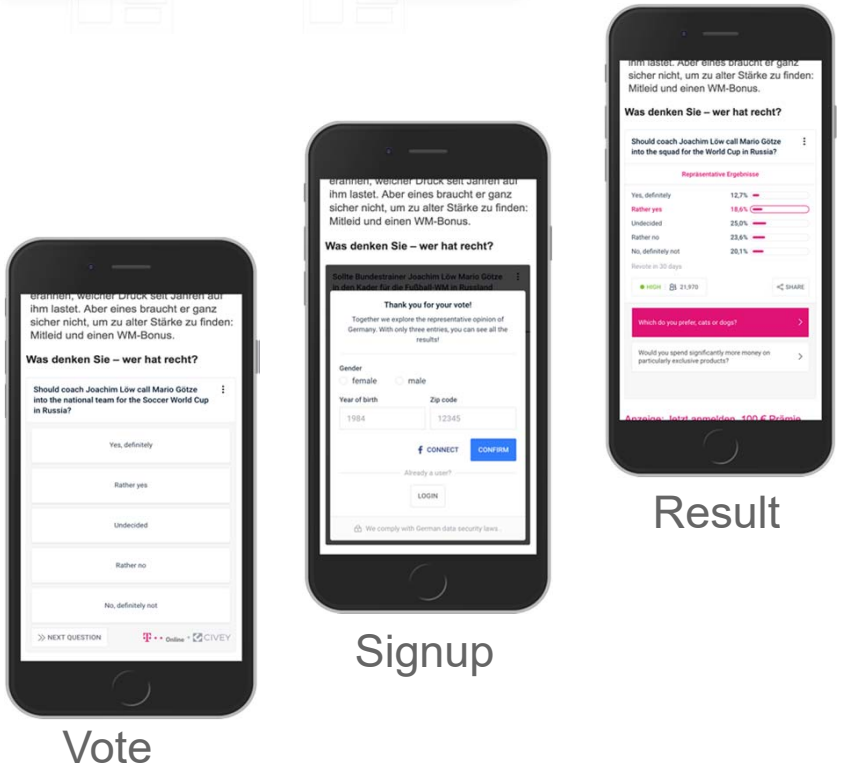
1. “Riversampling”

- Polling-widget is imprinted in a variety of 16.500 websites, with different audiences (socio-demography, attitudes)
- Quasi-randomization: polls are directed by a relevance algorithm to users to reduce bias
- Votes are only counted after login
- As a reward to the interviewee: representative results and analytics are shown

2. Post-stratified quota sample and weighting

- a quota sample of 5.000 votes is drawn
- Pop. weights (german federal electorate) account for remaining biases in user sociodemographics





Econometric Model

- We draw a stratified sample of 5.000 active Civey-Users
  - stratified on: gender, age (5 cats.), population density and purchasing power (both on ZIP-code level)
  - and analyse their in total 2,034,917 Responses
    - i.e. 407 on average per user

- Estimation of WLS-models of ***RT*** and ***ln(RT)*** on sets of explanatory variables:

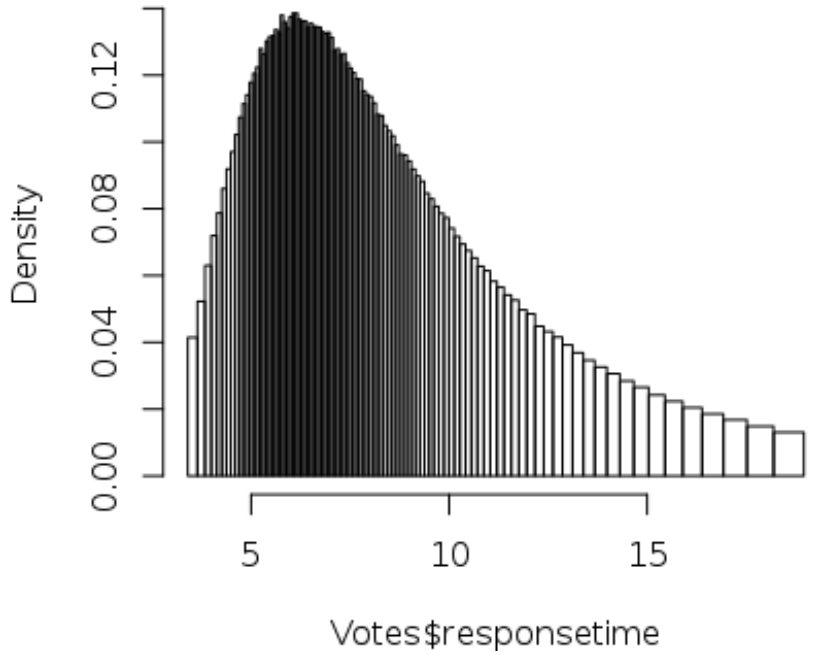
$$RT_i = \alpha_{1,2}\begin{bmatrix}1\\ Male_i\end{bmatrix} + \beta_{1,2}\begin{bmatrix}Age_i\\ Age_i^2\end{bmatrix} + \gamma_{1\dots5}[Educ_i] + \delta_{1\dots7}[Employ_i] + \phi_{1\dots4}[Family_i] + \mu_i$$

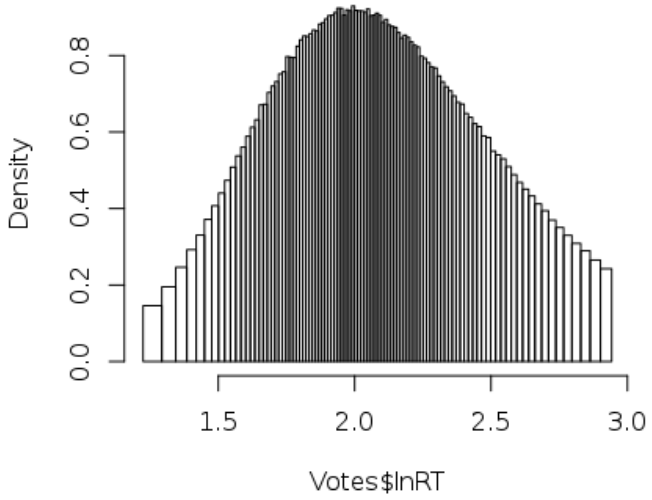
  - dummy specification of categorical variables
  - marginal effects are reported
  - standard errors are heteroscedasticity-robust and adjusted by cluster (i.e. User)
  - adjusted $R^2 = 0.137$

Data: Average Response Times

- The median web-survey participant needs 8 seconds to
  - read
  - comprehend
  - select one out of up to 10 alternative answer options
- For the following analysis we truncated response time (RT) at
  - 1.5% (1.5 sec)
  - and 87.5% (340 seconds)

1%	10%	25%	50%	75%	90%	99%
3.64	4.78	5.96	7.89	10.72	13.99	18.20





(1a) Sociodemographics

$$RT_i = \alpha_{1,2}\begin{bmatrix}1\\ Male_i\end{bmatrix} + \beta_{1,2}\begin{bmatrix}Age_i\\ Age_i^2\end{bmatrix} + \gamma_{1\dots5}[Educ_i] + \phi_{1\dots4}[Family_i] + \delta_{1\dots7}[Employ_i] + \mu_i$$

Constant	5.187***
	(0.141)
Male	0.085***
	(0.005)
Nat:non-German	-0.035**
	(0.018)

Age	-0.046***
	(0.001)
Age^2	0.001***
	(0.00001)

Reference cat.: n/a	
DIVORCED	-0.050
	(0.032)
MARRIED	-0.320***
	(0.031)
SINGLE	-0.304***
	(0.032)
WIDOW	0.123***
	(0.033)

Reference cat.: n/a	
FULL-TIME	-0.089***
	(0.031)
NOT LABOURFORCE	0.441***
	(0.034)
PART-TIME	0.331***
	(0.032)
RETIRED	0.529***
	(0.030)
SELF-EMPLOYED	0.092***
	(0.031)
STUDENT	0.058*
	(0.033)
UNEMPLOYED	0.746***
	(0.035)

- Men are on average slower by 0.1 sec.
- Age: Nonlinear, inverse U-shaped effect with low in the 30´s
- Family Status:
  - compared to non-providers of fam. status, only widows are slower in responding
- Employment:
  - Compared to n/a's, full-time employees are faster
  - All others take their time, with those in fragile employment being slowest

→ Non-providers of (voluntary) soc.dem. information provide quicker ,less reliable (?) answers.

(1b) Respondents‘ Experience

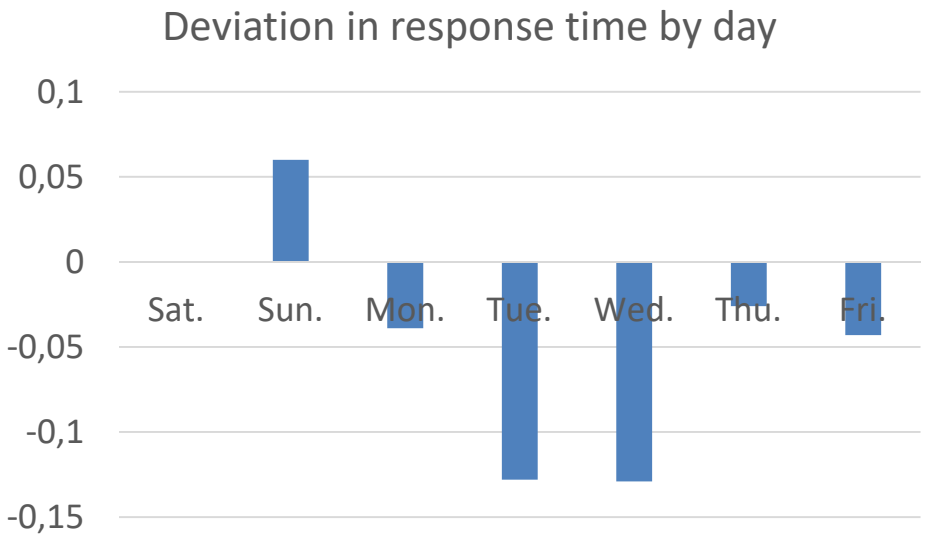
Both measures for the Experience of Civey Users, having the expected negative effect on Response Time:

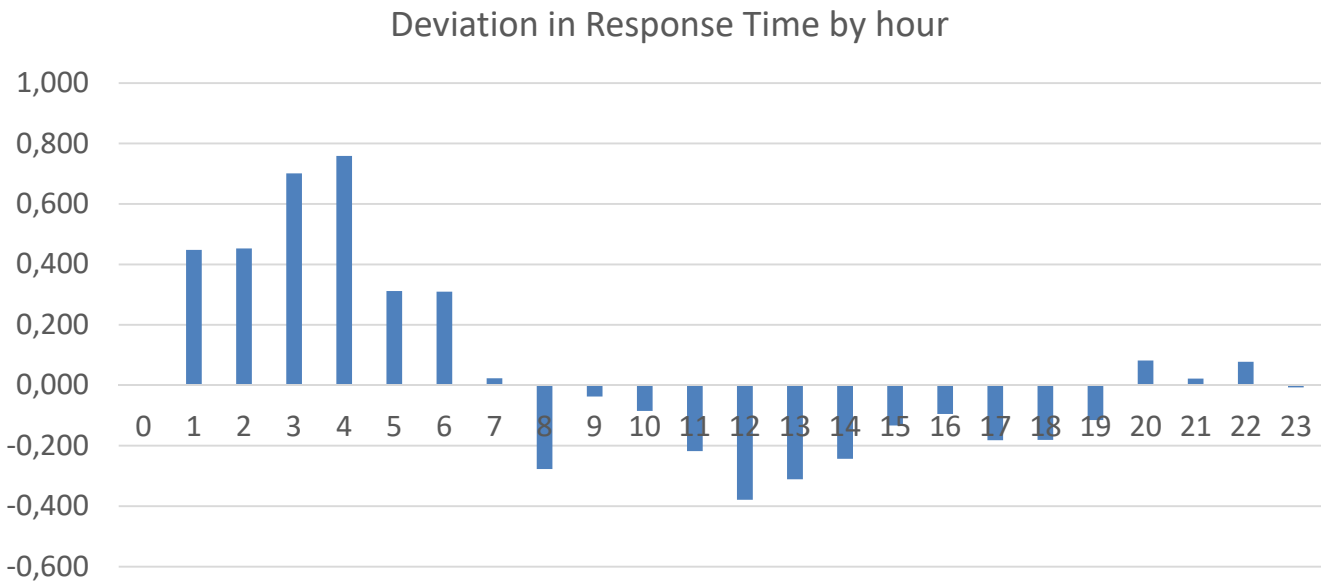
- the time (in days) since they signed up
  - per 100 days of membership, the average RT is reduced by 0.04s

- the number of polls conducted (in thousands)
  - per 1.000 conducted polls, the average RT is reduced by 1/10s

Experience (days)	-0.001***
	(0.00002)
Numpolls/1000	-0.110***
	(0.001)

(1c) Weekday- and Time of Day-Effects





(2) Question Effects

- Stat. significant but negligible
  - separated by: (1) Question and (2) Answer options
  - Longer text needs time be processed
  - But more words are faster processed

	Question	Answer Options
Textlength	0.032***	0.025***
	(0.001)	(0.0005)
Num. words	-0.008	-0.030***
	(0.005)	(0.003)
s.d. word length	-0.057***	0.070***
	(0.003)	(0.004)

- Answer Options
  - more options take time
  - known scales reduce RT
  - Yes-No answers increase RT
- Don‘t Know:
  - DK-option reduces RT
  - But selection of DK increases RT by nearly a second
  - informed „don‘t know“?

A.optnum	0.098***
	(0.019)
A.typeLikert5	-0.508***
	(0.013)
A.typeLikert5wEx	-0.809***
	(0.019)
A.typeother	0.817***
	(0.012)
A.typeYN	0.367***
	(0.012)
A.dontknow	-0.238***
	(0.008)
dontknow	0.783***
	(0.018)

(3) RT – DK Interaction

- Are the determinants of higher response times also associated with the likelihood to choose DK?
- Comparison of previous results with that of a Logit-regression: $\Pr(DK) = \ldots.RT\text{-}model\ldots$
  - Restricting sample to polls with DK-option provided: n=1.5 mio.
  - Comparison of sign and significance only, no marg. Eff.
- Results:
  - in general: Yes, i.e. the determinants of DK are also positively related to RT
  - same nonlinear effect of age
  - Exceptions:
    - Men take longer RT but choose fewer DK
    - same for part-time employees and non-employed (oppt. cost?)
    - Wordier questions (textlength) decrease DK-prob but increase RT

Conclusion & Outlook

- We find significant respondent, question and interaction effects that are mostly in line with hypotheses of cognitive psychology and results from survey research
  - Education
  - Lengthy texts can easier be processed if split up onto fewer, longer words
- With respect to reliability of answers:
  - Non-providers of (voluntary) soc.dem. information provide quicker, less reliable (?) answers
  - The use of the “don’t know” option seems to be an informed decision, on average

- Way forward:
  - Deeper analysis of Question - **Interaction Effects**
  - Analysis of the use of **DK**-option, **INR** (skip-button), and **panel attrition**:
    similar determinants?, endogeneity?
  - **Question Fixed-Effects**
  - Develop **User Reliability Score**

Questions? Dissussion.

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