A presentation for Dalia

Election Forecasting with Online Polling Data

Evidence from Dalia Europulse Survey

Alexander Sacharow | Moritz Hemmerlein

November 1, 2017

Outline

1. Intro to Election Forecasting: Methods
2. State of the Art Polling
3. Employing Dalia Data: Our Methodology
4. Our Forecasts
5. Take Aways

Election Forecasting: Methods

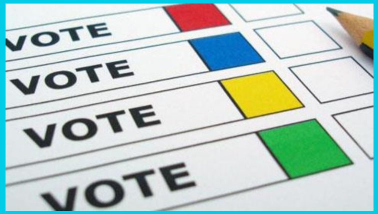
Fundamental Models

Vote = f (politics, economics)

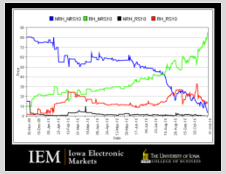
e.g. Party popularity

e.g. GDP

Polling / Surveys



Wisdom of the Crowd



Markets,
Competitions,
Aggregated
Forecasts

Digital Trace Models

Combining Forecasts

FiveThirtyEight

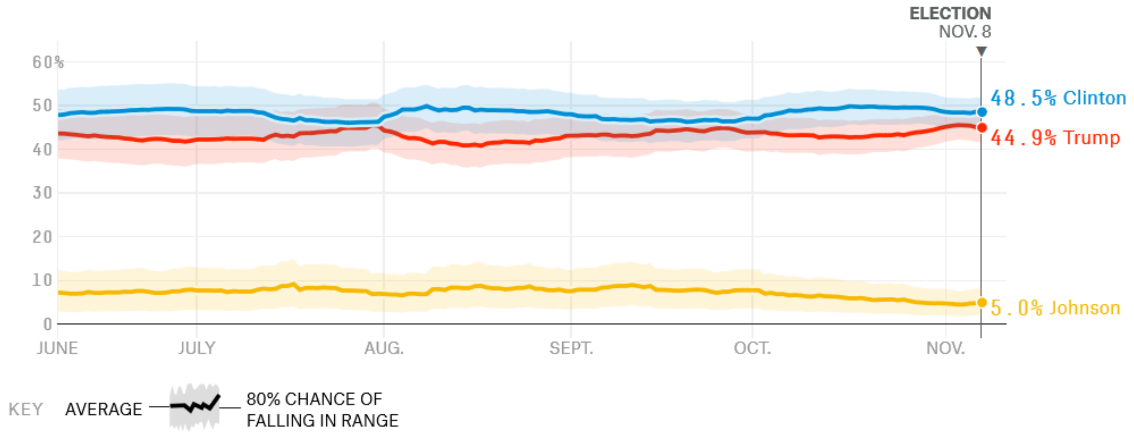
Süddeutsche Zeitung

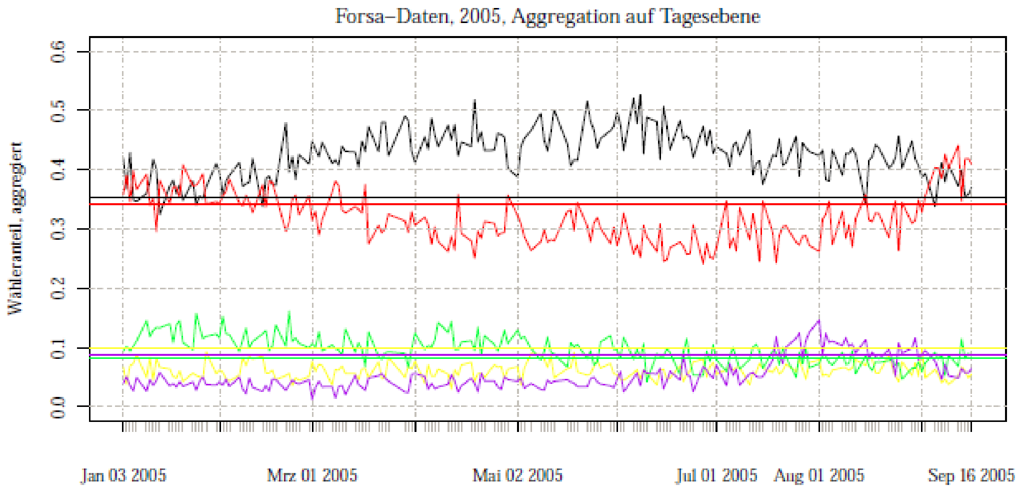
Hybrid Models

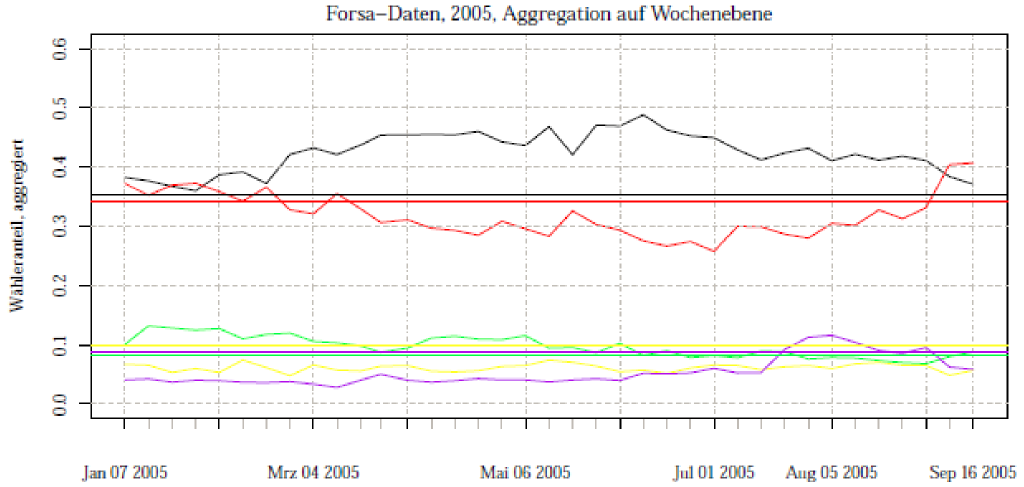
zweit
stimme.org

Polling: Extracting the signal

- Single polls can vary strongly
  - Noise due to simple sample variation
- Uncertainty often not representated
- Tendency to horse race journalism
  - Reporting any change of party support
  - Statistical standard errors are ignored

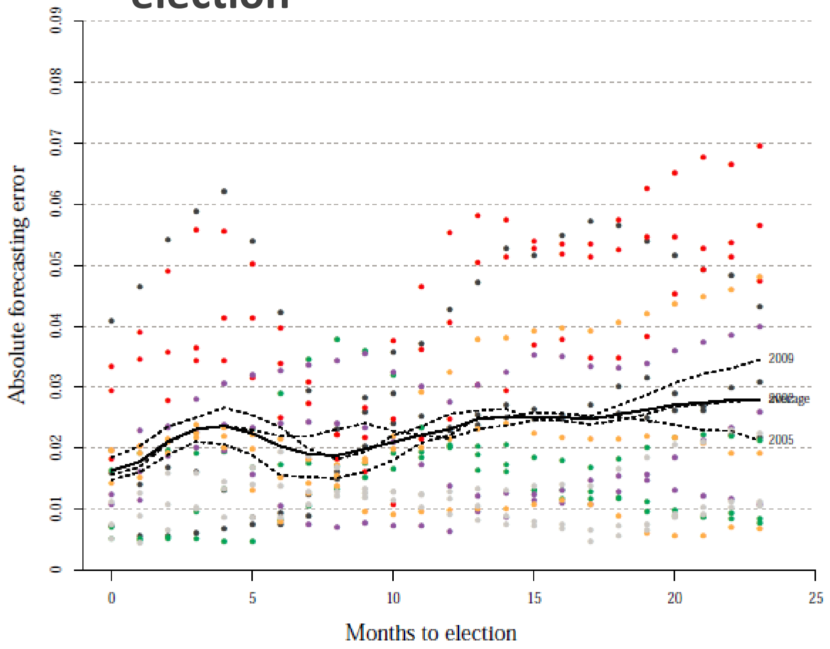






Polling: Accuracy and Confidence

- Generally: Accuracy increases as elections approach
- But: Campaign noice before elections
  - More accurate polls 8 months before actual election



- Most election polls are based on small samples (n=1000)
- Showing robust change in voter support is difficult

$$\hat{v}_p \pm 1.96\sqrt{\frac{\hat{v}_p(1-\hat{v}_p)}{n}}$$

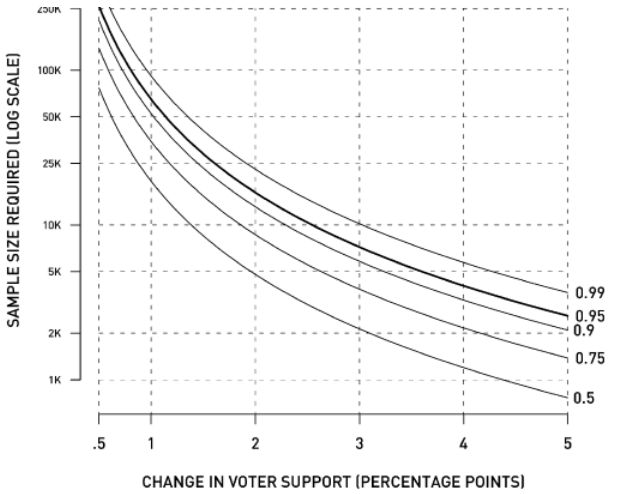


Figure 1. Sample size requirements. *Notes*: Each curve shows the sample size (vertical axis, log scale) required to detect the indicated change in support (horizontal axis, assuming a baseline level of 50%), with probability given by the label next to each line. In each instance it is assumed that the researcher's decision problem is whether to reject the null hypothesis of no change in favour of a two-sided, alternative hypothesis, using a 95% confidence level or better (ie a *p*-value of 0.05).

Polling: Collection vs. Analytics

Data Collection

Mandatory Response
e.g. Census

Random Person
e.g. House-door

RDD
e.g. IntraTest

Sub-Sample Panel
e.g. YouGov

Pre-Stratification
e.g. DaliaResearch

Response „on Street“
e.g. zeit.de

Data

Analytics

Raking
Marginal Distribution

Post-stratification
Combined Distribution

Model-based Post-Stratifcation
Logistic Regression

Adjusting Europulse Data: Methodology

Data

Surveys:

Europulse Wave December 2016 and March 2017
Variables: last vote, next vote

Post-stratification: two variations

1. Census 2011 with gender, age and religion
2. Exit-polls with age, gender and vote (combined probabilities)

Benchmark data:

Aggregated polls from Sueddeutsche

Combined probabilities: explained

	Catholic	Protestant	Total
Men	?	?	7
Women	?	?	13
Total	17	3	20

	Catholic	Protestant	Total
Men	6	1	∑
Women	11	2	∑
Total	∑	∑	∑

Adjusting Europulse Data: Methodology

Post-stratification approach

- Combined distribution of demographics: age, gender, education, rural/urban, religion etc…
- Weights for every cluster: e.g. Women above 60 from rural settlement
- 4% of population, but only 2% in sample

→ Weight: 2

General problems of post-stratification

Exponential growth of clusters:

1. Small cluster (n<30) => large errors
2. Empty cluster => no weights

⇒ Ad hoc solution: Combining categories (e.g. merge age categories)

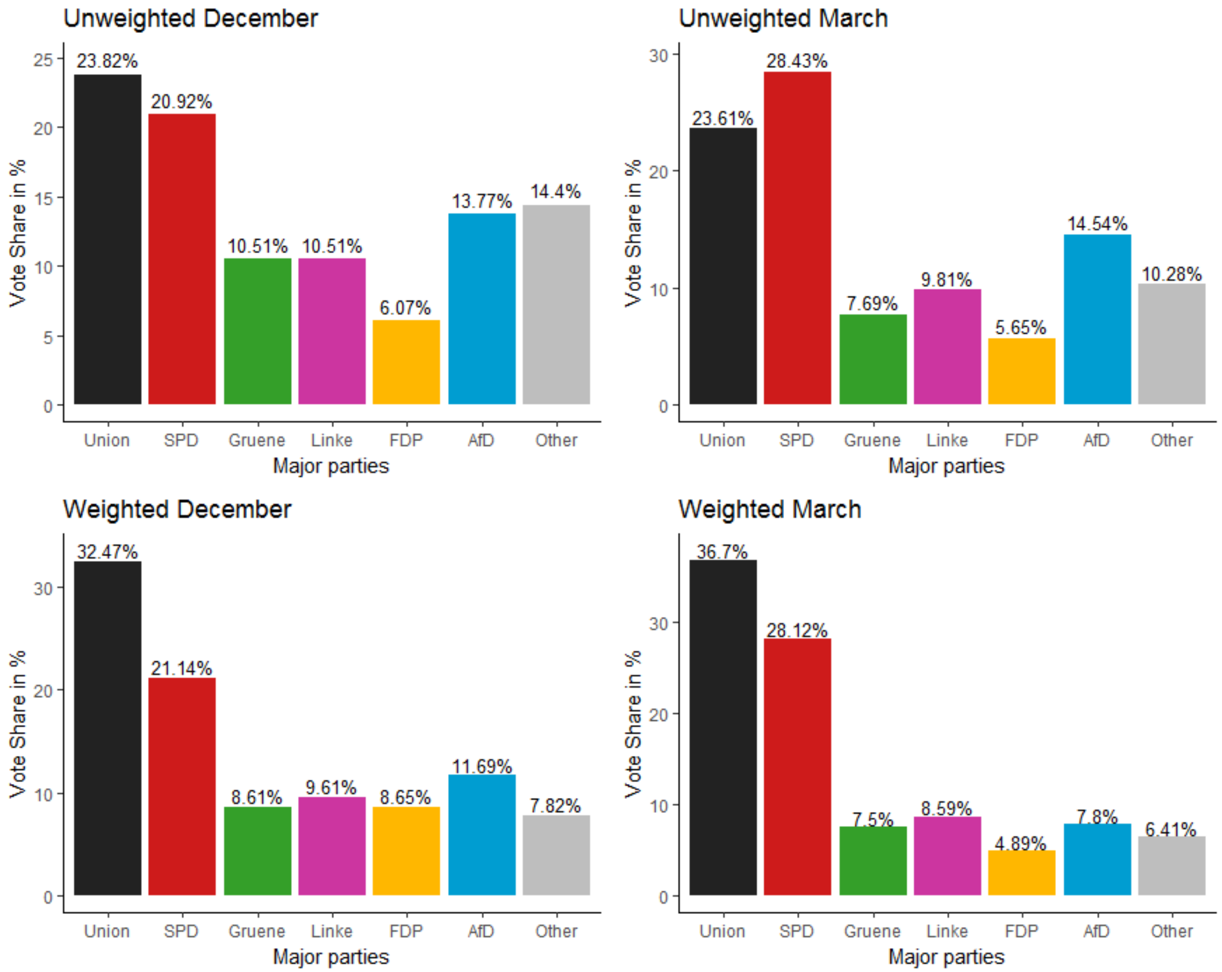
Weights Calculation

DALIA POLL	SPD	CDU	Total
Men	2	8	
Women	6	5	
Total			

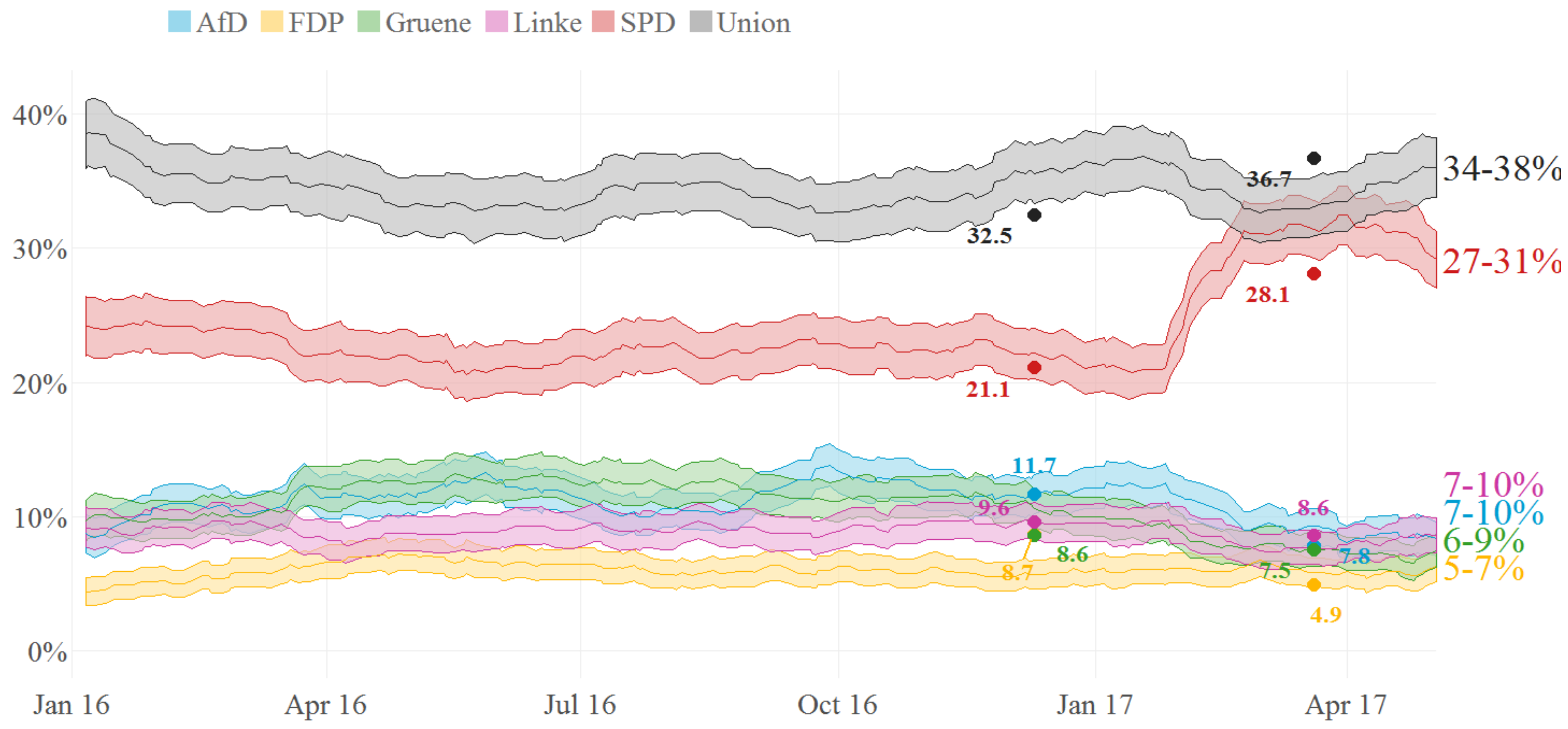
EXIT POLL	SPD	CDU	Total
Men	4	6	
Women	4	7	
Total			

Weight: MEN+SPD = 2

Adjusting Europulse Data: Results



Adjusting Europulse Data: Results



=> Post-stratification with publicly available exit polls lead to quite good results compared to benchmark data

Adjusting Europulse Data: Take aways

1. **Pre-stratification not sufficient for election polling (likely voter)**

2. **Post-stratification with past-vote is promising**

3. **No improvements from census-only post-stratification**

4. **Further fine-tuning: Disaggregated data + more waves**

Papers and Sources

- **Bernstein, Robert, Chadha Anita, and Robert Montjoy. 2001.** "Overreporting Voting: Why It Happens and Why It Matters." Public Opinion Quaterly 65: 22–44.
- **Dalia Research. 2016.** "Dalia Research Methodology." https://daliaresearch.com/wp-content/uploads/2016/08/Methodology-PDF-1.pdf.
- **Gallup. 2010.** "Understanding Gallup's Likely Voter Models." http://www.gallup.com/poll/143372/understanding-gallup-likely-voter-models.aspx?version=print.
- **Gelman & King 1993.** „Why are american presidential campaign polls so variable when votes are so predictable?, British Journal of Political Science 13(04), pp. 409 – 451.
- **Goel, Sharad, Adam Obeng, and David Rothschild. 2017.** "Online, Opt-in Surveys: Fast and Cheap, but Art They Accurate?" Working Paper.
- **Jackman, Simon. 2005.** "Pooling the Polls over an Election Campaign." Australian Journal of Political Science 40 (4): 499–517. doi:10.1080/10361140500302472.
- **Keeter, Scott, Ruth Igielnik, and Rachel Weisel. 2016.** "Can Likely Voter Models Be Improved? Evidence from the 2014 U.S. House Elections." Pew Research Center.
- **Keeter, Scott, Courtney Kennedy, Michael Dimock, Jonathan Best, and Peyton Craighill. 2006.** "Gauging the Impact of Growing Nonresponse on Estimates from a National Rdd Telephone Survey." The Public Opinion Quarterly 70 (5): 759–79. http://www.jstor.org/stable/4124225.
- **Linzer 2013.** "Dynamic Bayesian Forecasting of Presidential Elections in the States", Journal of the American Statistical Association 108(501): 124 – 134.

Papers and Sources

- **Mellon, Jonathan, and Chris Prosser. 2015.** “Investigating the Great British Polling Miss: Evidence from the British Election Study.” SSRN Electronic Journal. doi:10.2139/ssrn.2631165.
- **Murr 2011.** “’Wisdom of crowds’? A decentralized election forecasting model that uses citizens’ local expectations”. Electoral Studies 30 (2011) 771-783.
- **Perry, Paul. 1960.** “Election Survey Procedures of the Gallup Poll.” Public Opinion Quaterly 24:
- **Pew Research Center. 2012.** “Assessing the Representativeness of Public Opinion Surveys.” Pew Research Center. http://www.people-press.org/2012/05/15/assessing-the-representativeness-of-public-opinion-surveys/.
- **Rothschild 2015.** “Combining forecasts for elections: Accurate, relevant, and timely”. International Journal of Forecasting, 31 (2015) 952-964.
- **Skibba, Ramin. 2016.** “The Polling Crisis: How to Tell What People Really Think.” Nature 538 (7625): 304–6. doi:10.1038/538304a.
- **Squire, Peverill. 1988.** “Why the 1936 Literary Digest Poll Failed.” The Public Opinion Quarterly 52 (1): 125–33. http://www.jstor.org/stable/2749114.
- **Wang, Wei, David Rothschild, Sharad Goel, and Andrew Gelman. 2015.** “Forecasting Elections with Non-Representative Polls.” International Journal of Forecasting 31 (3): 980–91. doi:10.1016/j.ijforecast.2014.06.001.
- **Yeager, D. S., J. A. Krosnick, L. Chang, H. S. Javitz, M. S. Levendusky, A. Simpser, and R.Wang. 2011.** “Comparing the Accuracy of Rdd Telephone Surveys and Internet Surveys Conducted with Probability and Non-Probability Samples.” Public Opinion Quarterly 75 (4): 709–47. doi:10.1093/poq/nfr020.

Q&A

What can be the role of election forecasting for Dalia?

APPENDIX

Digital Trace Models

Twitter:

- **Idea**: # of mentioning
- Some successes (Tumasjan et al. 2010)
- But:
  - Not replicable (Jungherr et al. 2012)
  - Twitter usage very low, in particular in Germany

Wikipedia

- **Idea**: Information seeking before election
  - Tested by Yasseri and Bright (2016) for European Elections
- Little insight into absolute vote outcomes
- Good information about changes in both overall turnout at elections

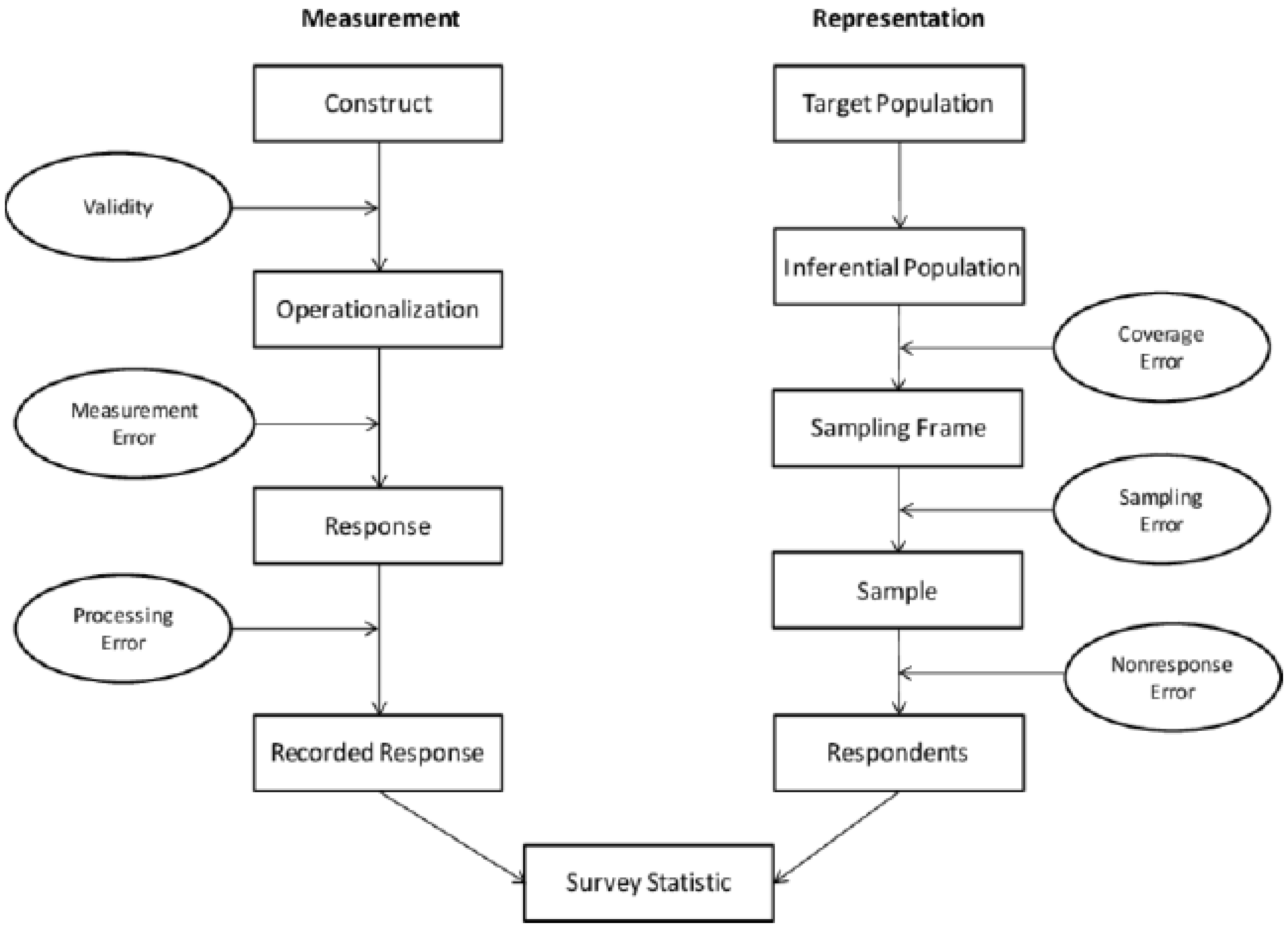
Google Search

- **Idea**: Compare # of searches of parties / candidates
- Result: Good measure of public attention

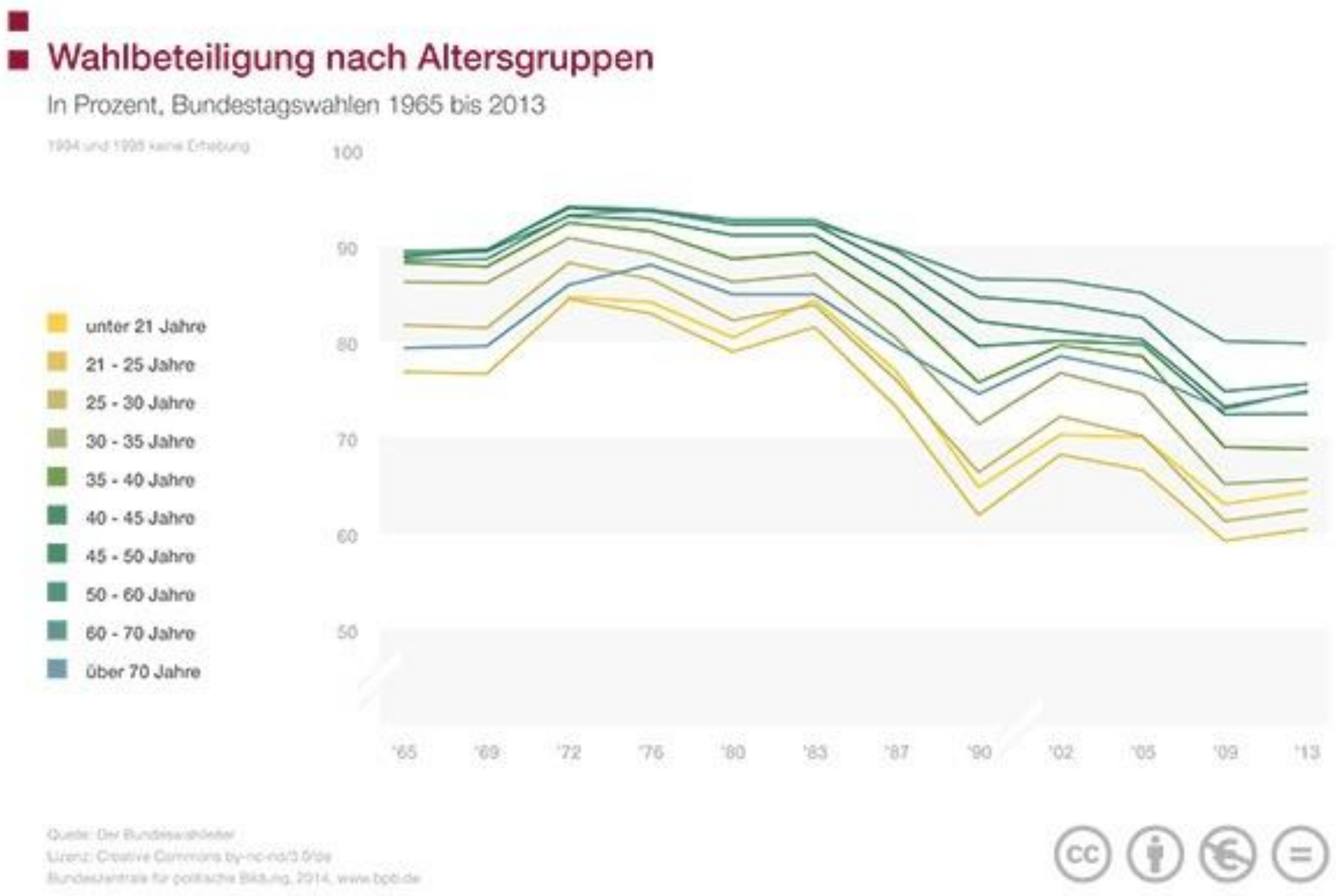
Fields of applications

- Influenza incidence
  - E.g. Google Flu Trends
  - But relation broke down
- Product sales
  - E.g. Books, films
- Stock markets
  - Online follows market and not the otherway
- Elections

Sources of Error



Turnout


Wahlbeteiligung nach Altersgruppen
In Prozent, Bundestagswahlen 1965 bis 2013
100
90
80
70
60
50
unter 21 Jahre
21 - 25 Jahre
25 - 30 Jahre
30 - 35 Jahre
35 - 40 Jahre
40 - 45 Jahre
45 - 50 Jahre
50 - 60 Jahre
60 - 70 Jahre
über 70 Jahre
'65
'69
'72
'76
'80
'83
'87
'90
'02
'05
'09
'13

Statistical Models

Example

Kanzlermodell by Gschwend und Norpoth (2010)

STIM = –5,93 + 0,75 × (PAR) + 0,38 × (KAN) – 1,52 × (AMT)

STIM: Stimmenanteil der Regierungsparteien bei einer Bundestagswahl
PAR: Langfristige Parteiunterstützung (Mittel der Stimmenanteile der Regierungsparteien bei den letzten drei Bundestagswahlen)
KAN: Kanzlerunterstützung (Mittelwert, unter Ausschluss von Unentschlossenen, ein und zwei Monate vor der Wahl)
AMT: Amtsperiode der Regierung

Table 2

Summary of the 2016 PS Presidential Election Forecasts

Forecasters	Model(s)	Predicted Two-Party Popular Vote for Clinton	Certainty of Popular Vote Plurality	Days Before Election
Abramowitz	Time for a Change	48.6%	66%	102
Campbell	Trial Heat and Economy Convention Bump and Economy	50.7% Labor Day/Economy	69%	60
		51.2% Con. Bump/Economy	75%	74
Graefe, Amstrong, Jones, and Cuzan	Pollyvote (combining forecasts)	52.7%	–	63
Holbrook	National Conditions and Trial Heat	52.5%	81%	61
Jerôme and Jerôme-Speziari	State-by-State Political Economy	50.1%	50%	121
Lewis-Beck and Tien	Politics, Economics and Institutions Presidential Forecast	51.1%	83%	102
Lockerbie	Economic Expectations and Political Punishment	50.4%	62%	133
Norpoth	The Primary Model	47.5%	87%	246
Wlezien and Erikson	Leading Economic Indicators and the Polls	52.0% Post-Conventions	82%	83
		51.8% Pre-Conventions	72%	119