# Predictors of AfD party success in the 2017 elections

A Bayesian modeling approach

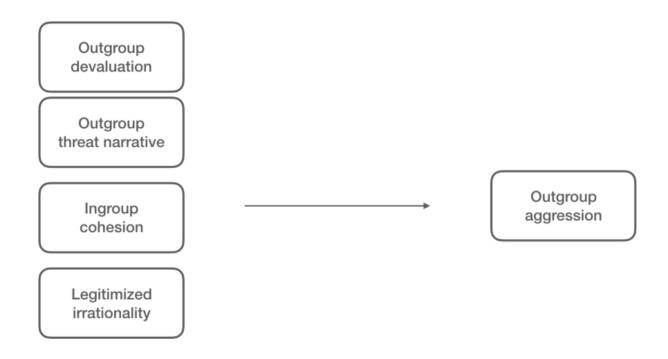
Sebastian Sauer, Oliver Gansser

FOM ECDA 2019

#### Menace to society

Right-wing populism then and now

#### A model of *rough populism*



Cf. Kershaw, I. (2016). To hell and back: Europe 1914-1949. New York City, NW: Penguin. Welzer, H. (2007). Täter. Wie aus ganz normalen Menschen Massenmörder werden. Frankfurt: Fischer.

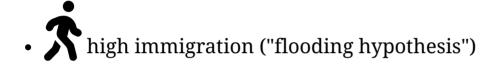
## AfD as a nucleus of the German right-wing movement?

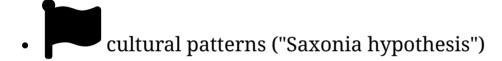


Source: Decker, F. (2003). Der neue Rechtspopulismus. Wiesbaden: VS Verlag für Sozialwissenschaften. Nicole Berbuir, Marcel Lewandowsky & Jasmin Siri (2015) The AfD and its Sympathisers: Finally a Right-Wing Populist Movement in Germany?, German Politics, 24:2, 154-178, DOI: 10.1080/09644008.2014.982546

#### Popular theories on AfD success

• weak economy ("rust belt hypothesis")





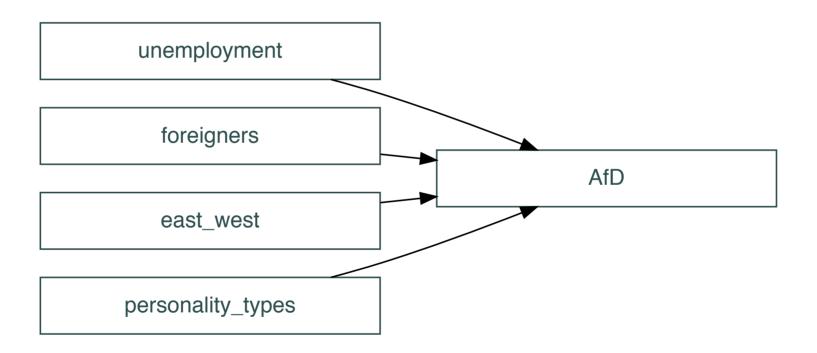
Source: Franz, Christian; Fratzscher, Marcel; Kritikos, Alexander S. (2018): German right-wing party AfD finds more support in rural areas with aging populations, DIW Weekly Report, ISSN 2568-7697, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin, Vol. 8, Iss. 7/8, pp. 69-79

#### Behavior types model *CHOUGHS*

- Seven behavior types according to CHOUGHS model
  - Conformism
  - H edonism
  - O ut of responsibility
  - U nderstand
  - G ourmets
  - H armony
  - S elf-determined
- based on approx. 100k face-to-face interviews (stratified by sex and age)
- Multidimensional scaling was used to devise types
- CHOUGHS builts on Schwartz' values model

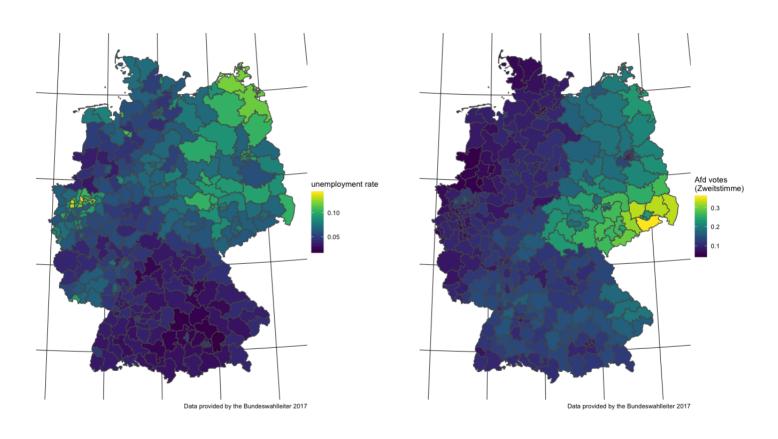
Source: Gansser, O., & Lübke, K. (2018). *The development of new typologies of behaviour based on universal human values and purchasing behavior*, in: Archives of Data Science, Series B, in submission. Gebauer, H., Haldimann, M., & Saul, C.J. (2017). Service innovations breaking institutionalized rules of health care. *Journal of Service Management*, 28(5), 972-935.

#### Our research model

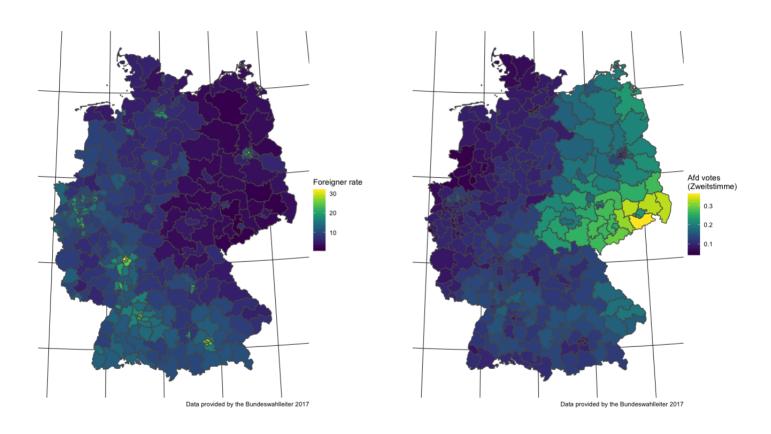


# AfD votes, and socioenomic factors at the Bundestagswahl 2017

## Unemployment and AfD votes



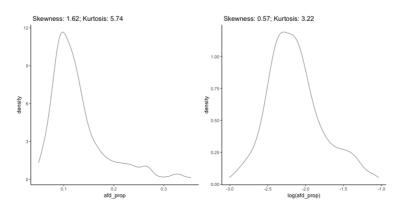
## Foreigners and AfD votes



## data analysis

#### Data preparation

- Election related data were obtained from Bundeswahlleiter 2017, n = 299 electoral units
- Behavior types data (n = 12444) were collected by the authors (for n = 2755 zip codes), summarised per electoral unit
- Only n = 79 electoral units could be matched to behavior typ data
- Data and analysis are accessible at Github: https://github.com/sebastiansauer/afd\_values
- Outcome variable: proportion of votes for AfD was log-transformed for better approximation to normality



#### Bayes modeling

- Stan via the R package rethinking
- Hamiltonian Markov Chain Monte Carlo (MCMC)
- 2000 iterations, 2 chains, 1/2 warmup
- Multi level regression modeling (varying intercepts)
- The WAIC was used for to compare model performance:
  - is an estimate for *out-of-sample* model performance
  - based on information theory
  - WAIC is similar to the AIC but less restrictive

Cf. McElreath, R. (2016). Statistical rethinking. New York City, NY: Apple Academic Press Inc.

#### Model specification

```
egin{aligned} a &\sim \mathcal{N}(\mu, \sigma) \ \mu = eta_0 e + eta_1 f + eta_2 u + eta_3 t_1 + eta_4 t_2 \cdots eta_{10} t_8 \ \sigma &\sim \mathcal{C}auchy(0, 1) \ f, u, t_1, t_2 \cdots t_8 &\sim \mathcal{N}(1, 0) \ e &\sim \mathcal{N}(0, \sigma_2) \ \sigma_2 &\sim \mathcal{C}auchy(0, 1) \end{aligned}
```

#### Model specification in R

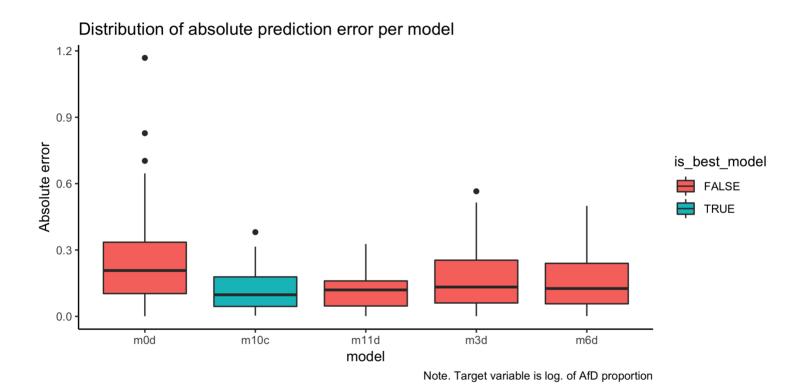
```
# likelihood:
afd_prop_log ~ dnorm(mu, sigma),
d$
# regression:
mu <- beta0[state_id] + beta1*for_prop_z + beta2*unemp_prop_z +</pre>
  beta3*enjoyer + beta4*harmony_seeker + beta5*self_determined
  beta6*appreciater + beta7*conformist + beta8*type_unknown +
  beta9*responsibility denier + beta10*hedonist,
# priors:
sigma ~ dcauchy(0, 1),
beta1 \sim dnorm(0, 1), beta2 \sim dnorm(0, 1), beta3 \sim dnorm(0, 1),
beta4 \sim dnorm(0, 1), beta5 \sim dnorm(0, 1), beta6 \sim dnorm(0, 1),
beta7 ~ dnorm(0, 1), beta8 ~ dnorm(0, 1), beta9 ~ dnorm(0, 1),
beta10 \sim dnorm(0, 1),
beta0[state_id] ~ dnorm(0, sigma2), # multi level
sigma2 ~ dcauchy(0, 1)
```

## Results: Model comparison

#### State is the strongest predictor

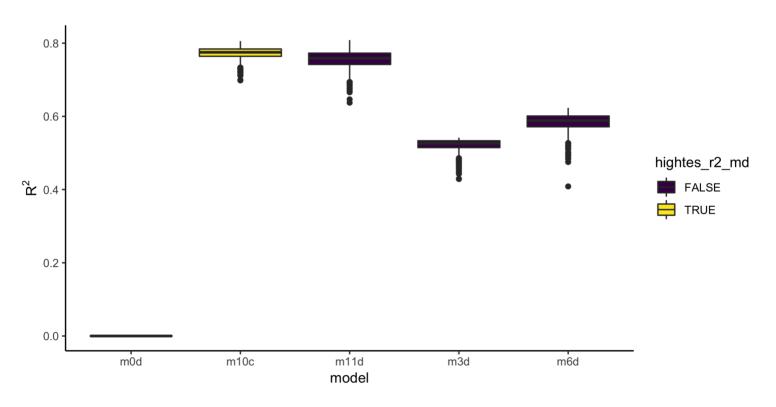
name	predictors	type	WAIC	SE	weight
<b>m10c</b>	unemp, foreign, state	Gaussian	<b>-50.9</b> 7	10.74	1
m11d	unemp, foreign, state, 8 consumer types	Gaussian	-39.02	10.31	0
m06d	unemp, foreign, east, 8 consumer types	Gaussian	-6.96	12.50	0
m03d	unemp, foreign, east	Gaussian	-1.24	12.44	0
m00d	none	Gaussian	54.39	16.13	0
m12d	unemp, foreign, state, 8 consumer types	Poisson	64311.15	10241.34	0
m09b	unemp, foreign, state	Poisson	64453.60	9016.30	0
m00e	none	Poisson	211670.94	51582.24	0

#### Comparing model errors



#### R squared estimates for each model

Beware: Unadjusted  $\mathbb{R}^2$  estimates, prone to overfitting



#### Results: Most favorable model

#### Model specification of most favorable model

Model predictors: state (as multi level) + foreign + unemp

```
# Likelihood:
afd_prop_log_z ~ dnorm(mu, sigma),

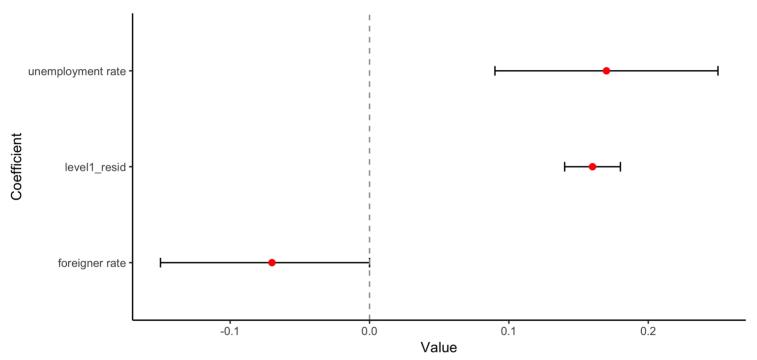
# regression:
mu <- beta0[state_id] + beta1*for_prop_z + beta2*unemp_prop_z,

#priors:
beta0[state_id] ~ dnorm(0, sigma2),

sigma ~ dcauchy(0, 1),
sigma2 ~ dcauchy(0, 1),
beta1 ~ dnorm(0, 1),
beta2 ~ dnorm(0, 1)</pre>
```

#### Coefficients level 1

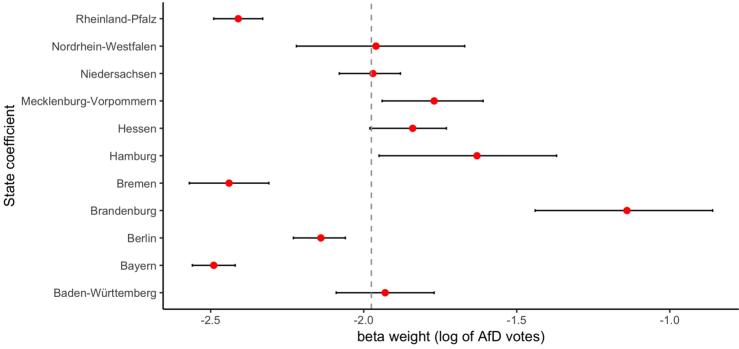
Model predictors: state (as multi level) + foreign + unemp



Note. Error bars indicate 89% percentile intervals. Red dots refer to the mean.

#### Coefficients level 2

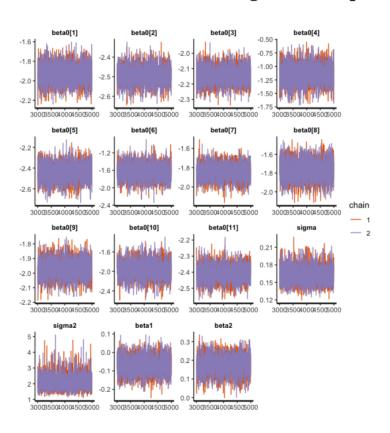
Model predictors: state (as multi level) + foreign + unemp



Note. Error bars indicate 89% percentile intervals. Red dots refer to the mean. The dashed line shows the mean of the state slopes.

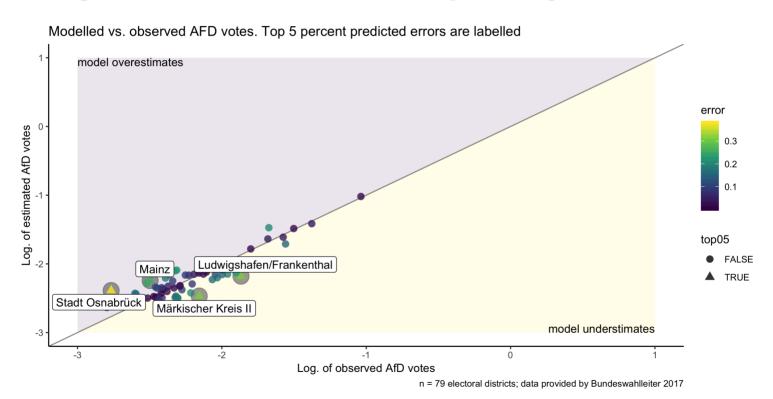
#### Big fat hairy catterpillars, as it should be

Model predictors: state (as multi level) + foreign + unemp

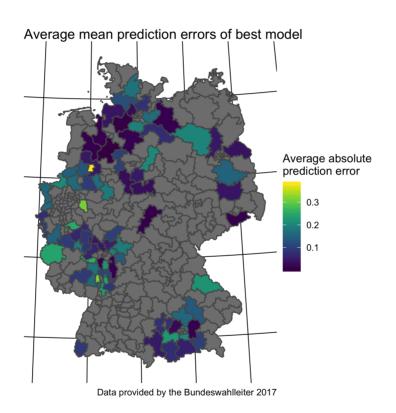


#### Observed vs. estimated AfD votes

Model predictors: state (as multi level) + foreign + unemp



## Regional patterns of prediction errors



#### **Conclusions**

#### Theoretical implications

- Region related patterns appear to play an important role
  - more than unemployment rate and foreigner rate
  - not yet well understood
  - rural? aged society?
- The present model is *simplistic*
- (The proposed) personality pattern didn't show strong impact
- Personality data representative?
- Let's model *future elections*
- Pathways of voter behavior remains opaque

Nicole Berbuir, Marcel Lewandowsky & Jasmin Siri (2015) The AfD and its Sympathisers: Finally a Right-Wing Populist Movement in Germany?, German Politics, 24:2, 154-178, DOI: 10.1080/09644008.2014.982546

#### Statistical implications

- Observational research is a very limited guide for causal interpretations
- *Overfitting* (and underfitting) is to be expected
- Reduced sample size of electoral disctricts warrants further investigation
- Explorative study, no strong conclusions warranted
- *More models* are possible (but inject researchers' degree of freedom)

#### Thank you

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