



## The Geocoded German Longitudinal Election Study: Analyzing Place Based Effects on the 2021 German Federal Election

Meet the Experts – GESIS online talks

*Anne-Kathrin Stroppe, 12th January 2023*

## Speaker

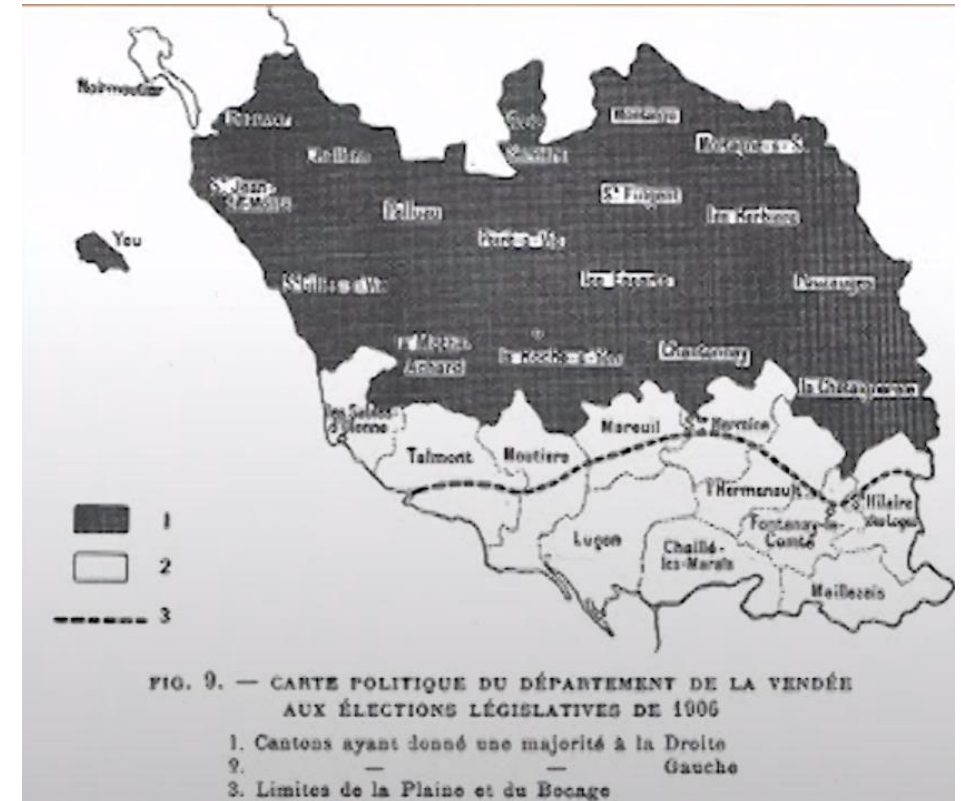


### Anne-Kathrin Stroppe

- Doctoral Researcher
- Data Curator for the German Longitudinal Election Study (GLES)
- Research interests: Electoral geography, (political) attitudes
- Contact: [anne-kathrin.stroppe@gesis.org](mailto:anne-kathrin.stroppe@gesis.org)

# Place-based explanations in the social sciences

- Long tradition of place-based explanations (Siegfried 1913, Allport 1954)
- Mechanisms at work:
  - interactions and events occur in place (Johnston/Pattie 2017)
  - identities, social capital and culture can be tied to places (Agnew 2002)
  - local context can serve as heuristics for evaluations and decision-making (Cho/Rudolph 2008)



André Siegfried. *Tableau politique de la France de l'ouest sous la troisième République*. A. Colin, Paris 1913.



## What are geocoded survey data?

- Survey data with direct and indirect spatial references
- Sometimes already enhanced with spatial data attributes
- General goal: analyze interactions between individual behaviors and attitudes and the environment
- Data access usually restricted due to data protection regulations



ALBUS



## What are geocoded survey data?

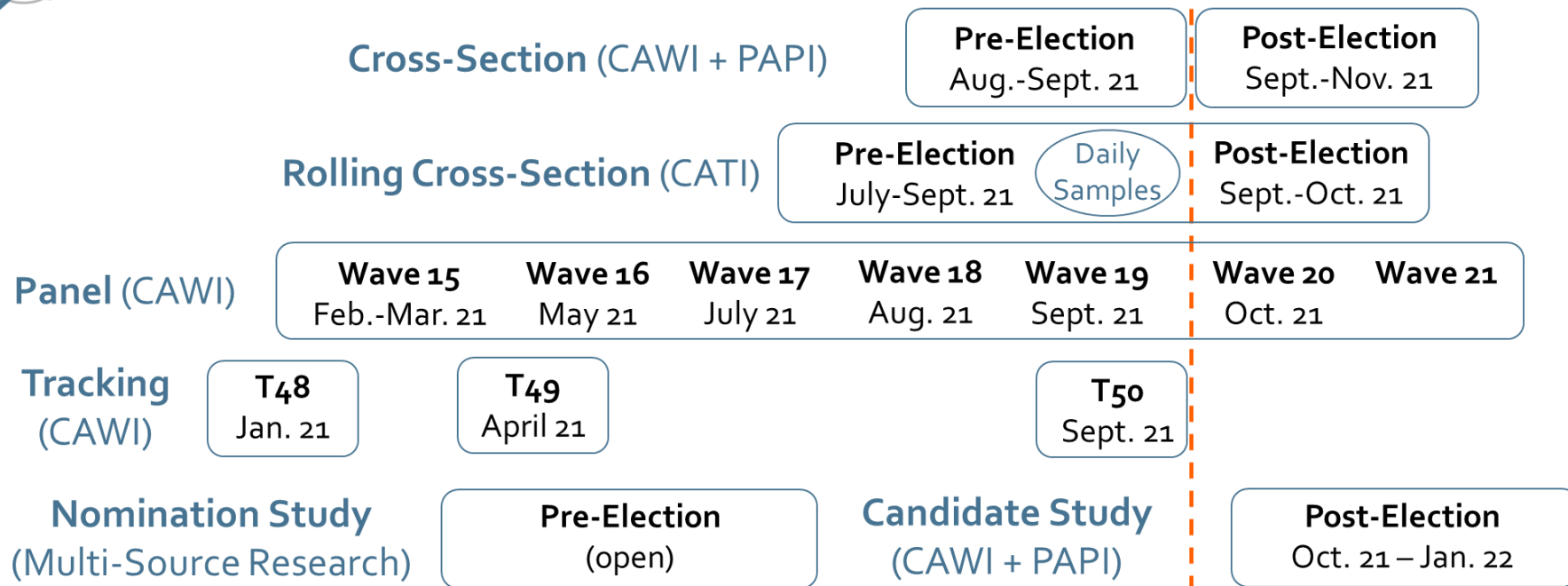
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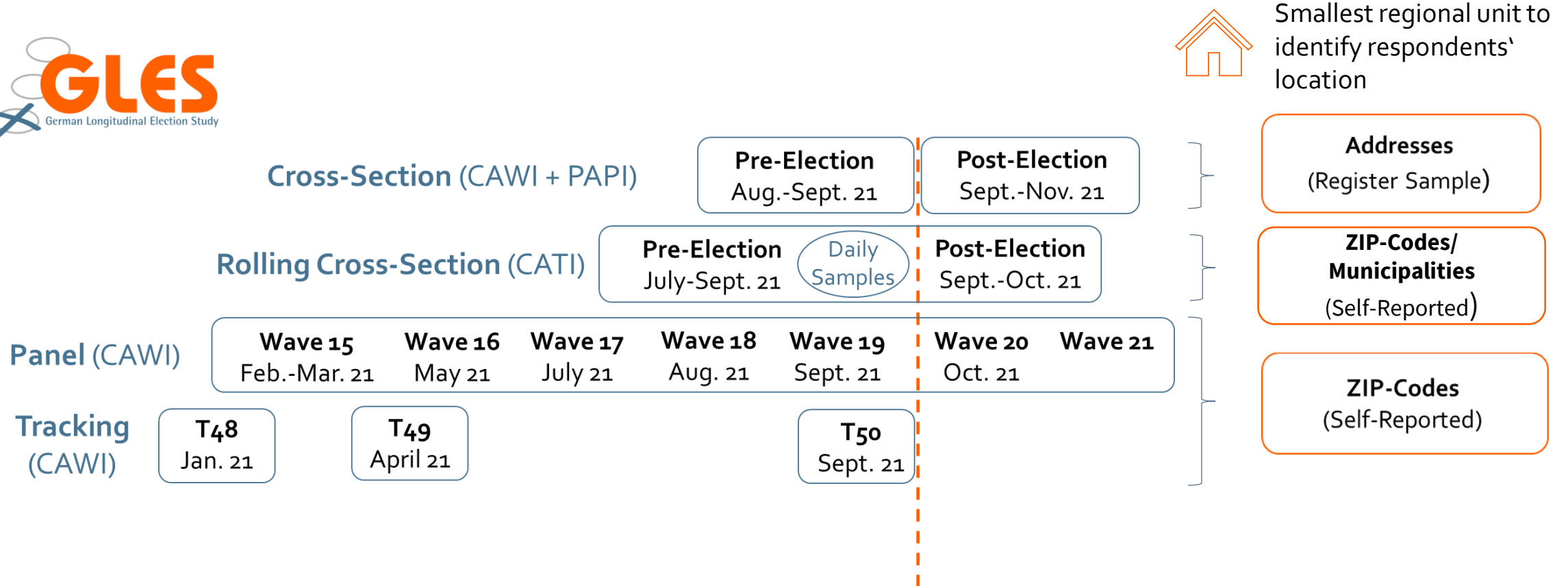


# Design Overview 2021 and Respondents' Location



**German Federal Election 26.09.2021**

# Design Overview 2021 and Respondents' Location





# Respondents' Location: Sources of Uncertainty & Errors



Smallest regional unit to  
identify respondents'  
location

**Addresses**  
(Register Sample)

**ZIP-Codes/  
Municipalities**  
(Self-Reported)

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## **Self-Reporting**

## **Matching Administrative Units in Germany**

## **Relocations and Changes over Time**

# Respondents' Location: Sources of Uncertainty & Errors



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## Self-Reporting

- ZIP codes in CAWI surveys: ~1 – 1,5% not existent
- No control mechanism whether it is correct
- Reporting difference between gender, education level and age might appear (Gladden et al. 1997)
- Inclusion of self-report measures on characteristics of living place (housing, urbanization etc.) but no linking (Brinkerhoff et al. 2021)

Matching Administrative Units in Germany

Relocations and Changes over Time

# Respondents' Location: Sources of Uncertainty & Errors



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(Register Sample)

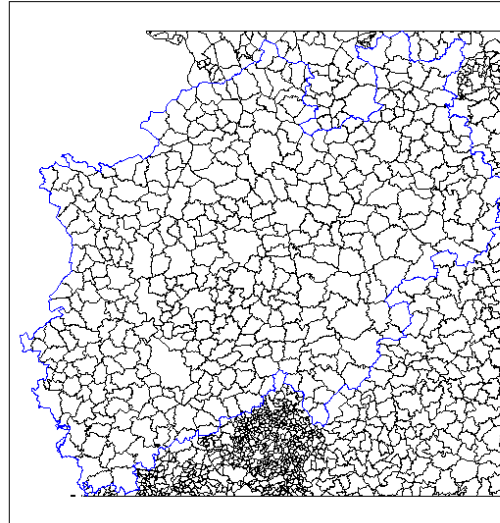
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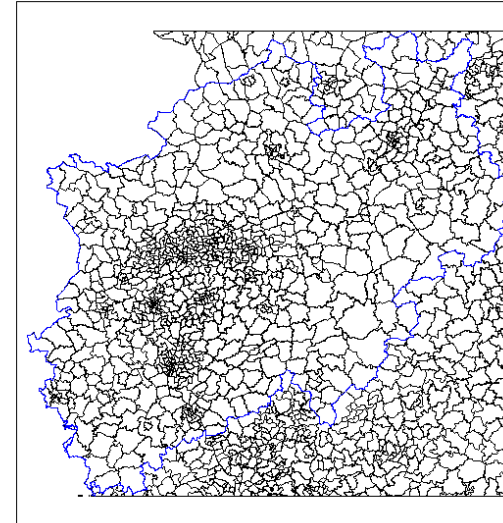
## Self-Reporting

### Matching Administrative Units in Germany

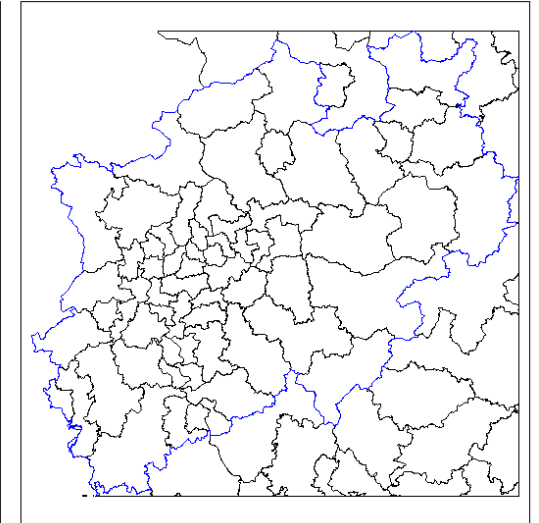
Municipalities



ZIP Code (5 digits)



Constituencies



Relocations and Changes over Time

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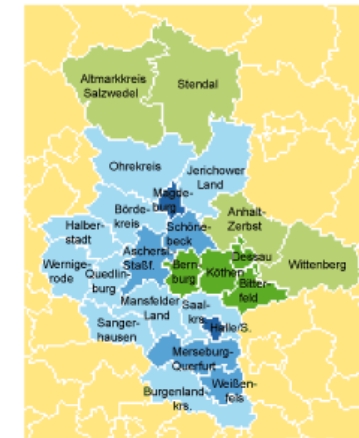
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Matching Administrative Units in Germany

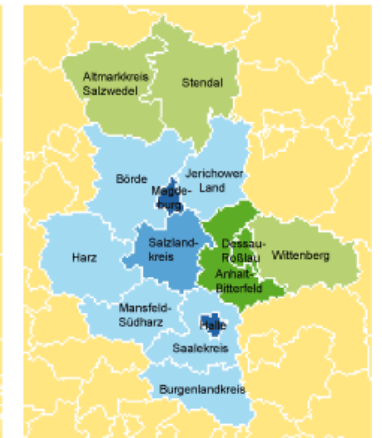
## Relocations and Changes over Time

- Respondents move between sampling, survey and survey waves
- Redistricting over time
- Match of survey year and context information

Kreistypen in Sachsen-Anhalt  
30.06.2007



01.07.2007



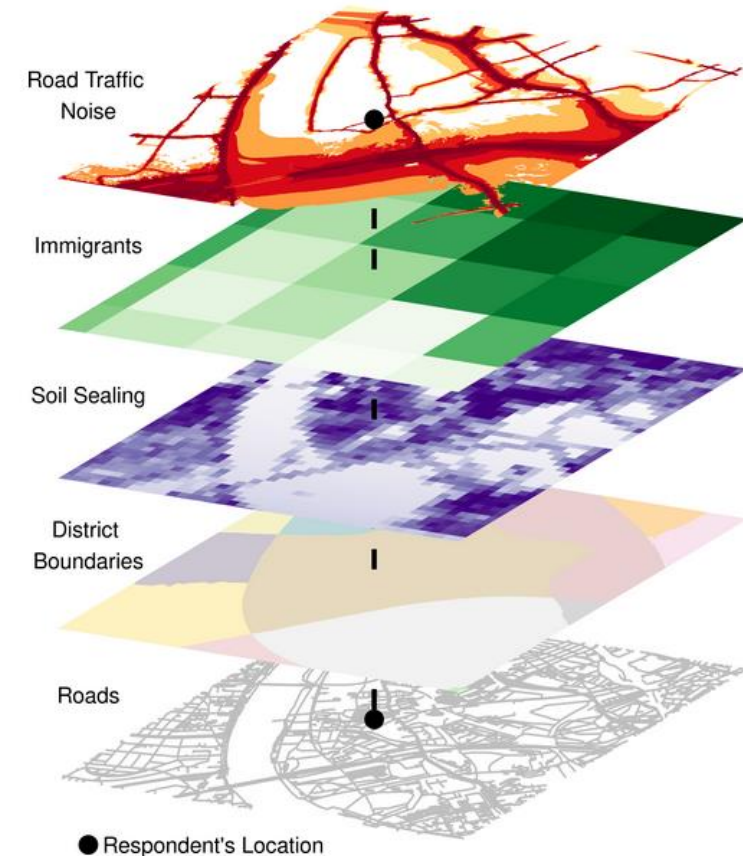
Datenbasis: Laufende Raumbeobachtung des BBR, Geometrische Grundlage: BKG, Kreise, 31.12.2006; eigene Fortführung 31.12.2006

## Benefits of Working with Address Data

- No self-report bias
- Small spatial scale
- Once geocoded, complete tool box of spatial linking methods available:
  - 1:1 linking to different administrative units across time
  - Definition of own spatial zones (filter techniques, buffer zones, neighboring units, ..)
  - Distance measures

### Remaining Challenge:

Availability of geospatial information

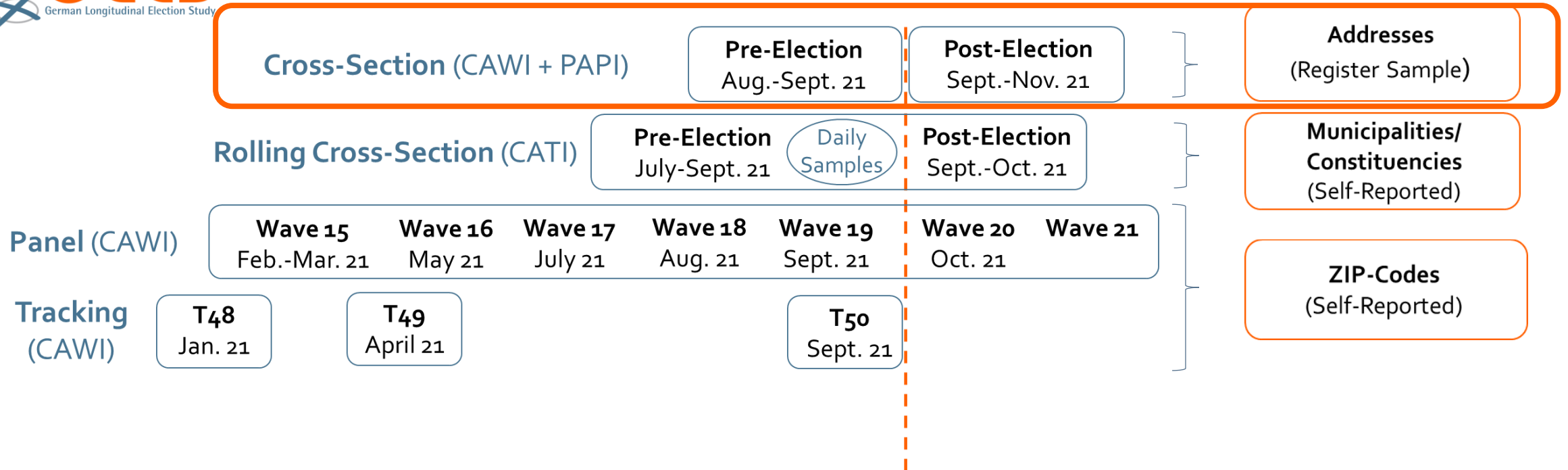


@OSM/GEOFABRIK, @Stadt Köln, @IÖR Monitor,  
@Zensus 2011, @Umweltbundesamt/@EIONET  
Central Data Repository/ Jünger, 2019

# GLÉS Design Overview 2021

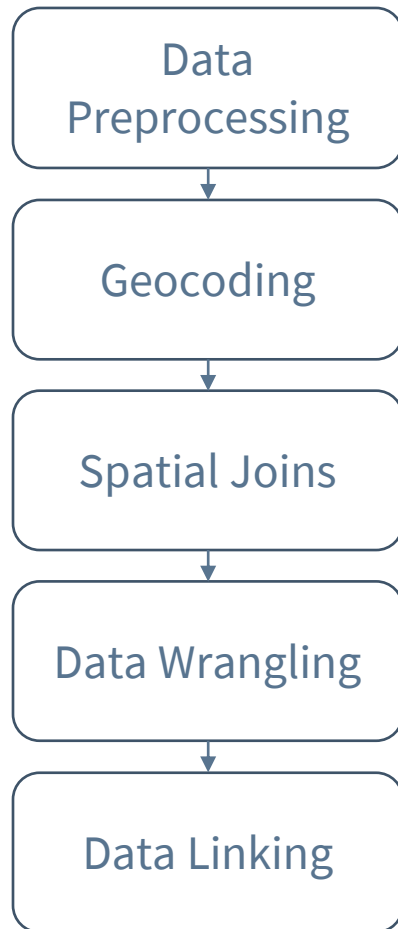


Smallest regional unit to identify respondents' location



German Federal Election 26.09.2021

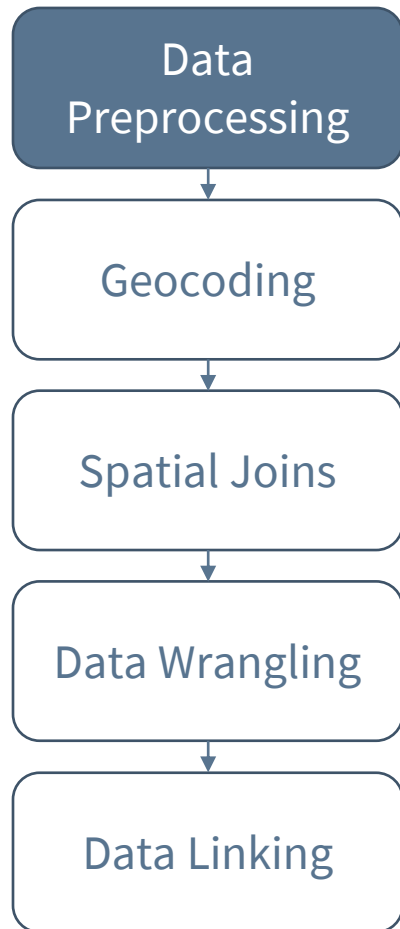
# Sensitive Regional Data: Creating the Dataset



GESIS (2022): GLES Cross-Section 2013-2021, Sensitive Regional Data. GESIS, Cologne. ZA6828 Data file Version 2.0.0, doi:[10.4232/1.14031](https://doi.org/10.4232/1.14031)

- R used for nearly all steps (GIS tool, data wrangling...)

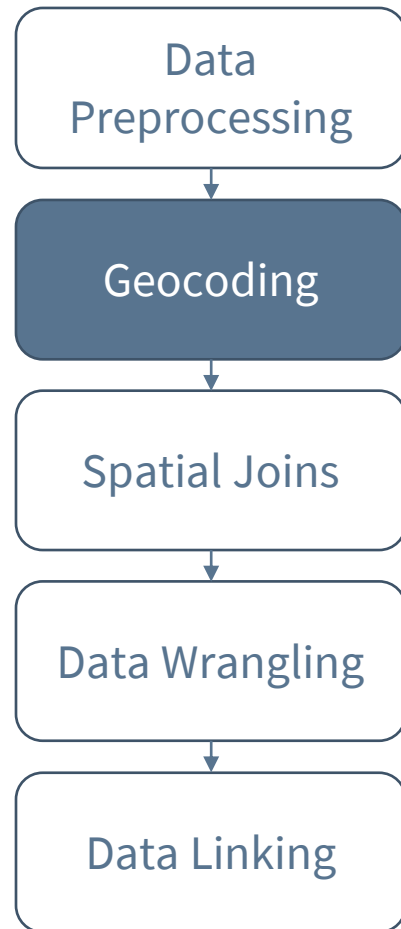
## Sensitive Regional Data: Creating the Dataset



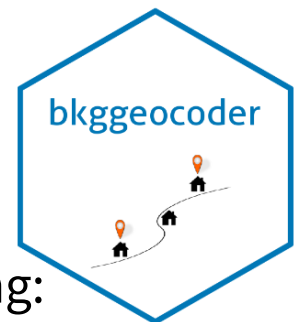
- Three main data sets saved in separate locations:
  - survey data with attributes
  - address data
  - correspondence table to match data sets
- Cleaning of address data in table format (e.g. removing additional information)



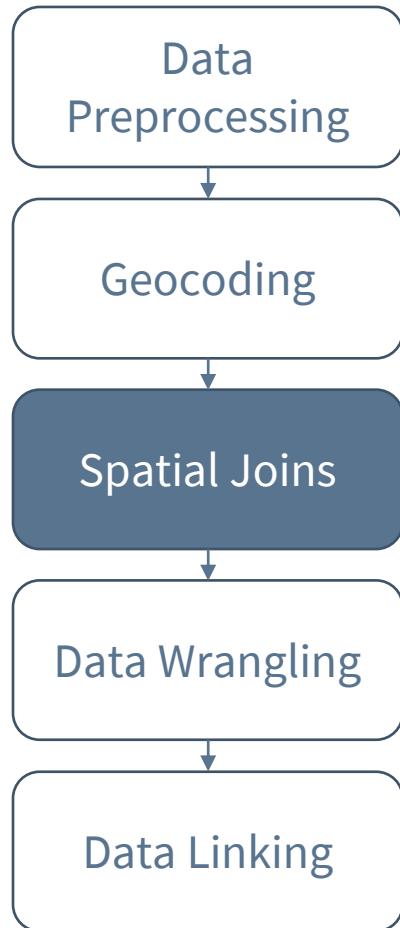
# Sensitive Regional Data: Creating the Dataset



- Conversion of indirect spatial reference (e.g. addresses) into direct spatial reference (e.g. geocoordinates)
- Several providers but again: data protection issues and quality concerns
- Federal Agency of Cartography and Geodesy (BKG):
  - Online interface and API for online geocoding
  - Offline geocoding possible based on raw data
  - Data and service are restricted
- R package [bkggeocoder](https://github.com/StefanJuenger/bkggeocoder) developed at GESIS for (offline) geocoding:  
13.04.2023, Dr. Stefan Jünger, bkggeocoder: a geocoding tool for survey data (in Englisch)  
<https://github.com/StefanJuenger/bkggeocoder>



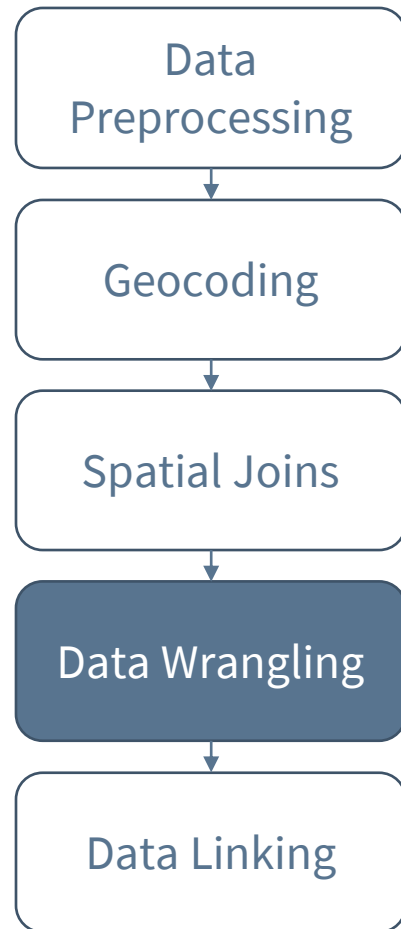
## Sensitive Regional Data: Creating the Dataset



- Geocoding retrieves: point coordinates, administrative unit keys, INSPIRE\* id
- Spatial joins based on coordinates for:
  - constituencies
  - administrative units across time (for GLES: 31.12.2015 as harmonized territorial status)

\*defined and harmonised grid net for Pan-Europe with standardised location and size of grid cells. Examples of cell sizes could be 10x10 m, 100x100 m, 1x1 km (<https://inspire.ec.europa.eu/theme/gg>)

## Sensitive Regional Data: Creating the Dataset



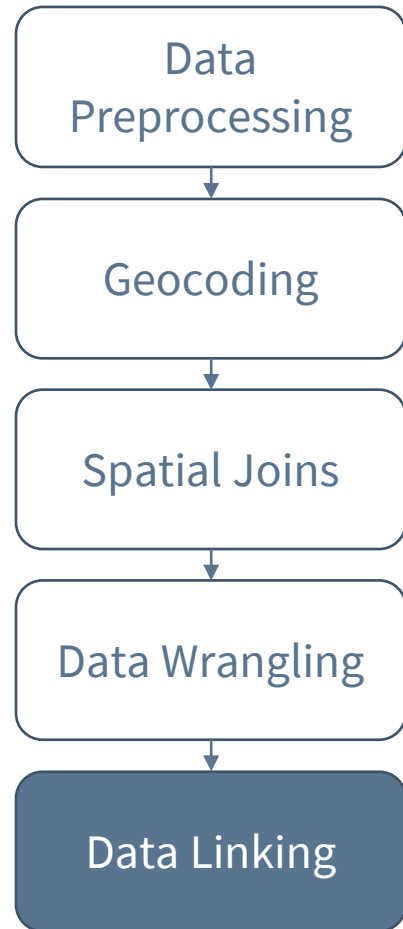
- Missing coding, additional variables, data checks, and cumulation
- Deletion of addresses and point coordinates

Figure: Information on Geocoding Results of GLES Cross-Section 2021, Pre- and Post-Election

Code	Percent
Geocoded reaching target quality	96.31
Geocoded after manual check	2.05
Geocoded after manual correction	0.14
Geocoding not possible	0.60
Address deleted by respondent	0.90



# Sensitive Regional Data: Creating the Dataset

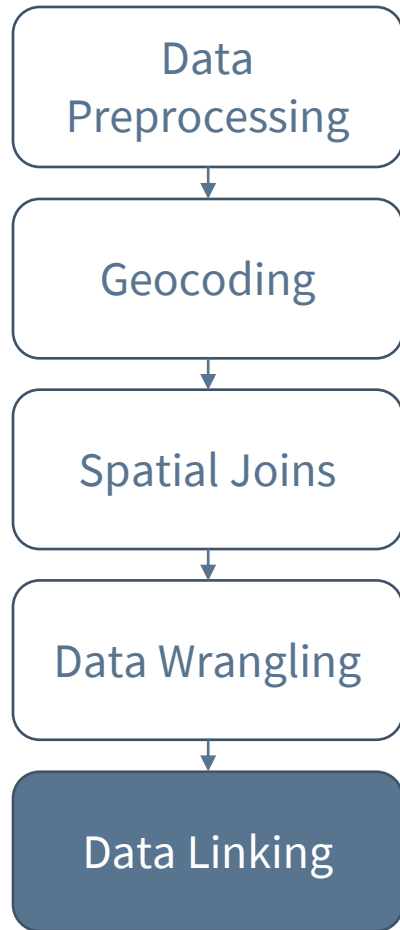


id	Admin. Unit: Sampling Year	Admin. Unit: Sampling Year	Admin. Unit: Sampling Year	Admin. unit: Harmonized Year	Admin. unit: Harmonized Year	GRID Cell	Context Data
<b>lfdn</b>	<b>municipality</b>	<b>district</b>	<b>constituency</b>	<b>municipality</b>	<b>district key</b>	<b>INSPIRE ID 1km</b>	<b>Mun. Size</b>
1	05315000	05315	13 ,Köln 1‘	05315000	05315	1kmN2684E4334	7 ‘500.000 and more‘
...	....	...	...	...	...	...	...

id	Political attitudes & behavior	Political attitudes & behavior	Sociodemographics	Sociodemographics
<b>lfdn</b>	<b>party_vote</b>	<b>dem_satisfaction</b>	<b>age</b>	<b>gender</b>
1	322 ,AfD‘	7 ,not satisfied at all‘	63	1 ,male‘
...	....	...	...	...



# Sensitive Regional Data: Creating the Dataset



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lfdn	party_vote	dem_satisfaction	age	gender
1	322 ,AfD'	7 ,not satisfied at all'	63	1 ,male'
...	....	...	...	...



Admin. unit	Context Data
municipality	share_unemployed_2021
05315000	0.093
...	....

Grid Cell	Context Data
inspid_1km	population
1kmN2684E4334	18199
...	....

## Sensitive Regional Data: Data access

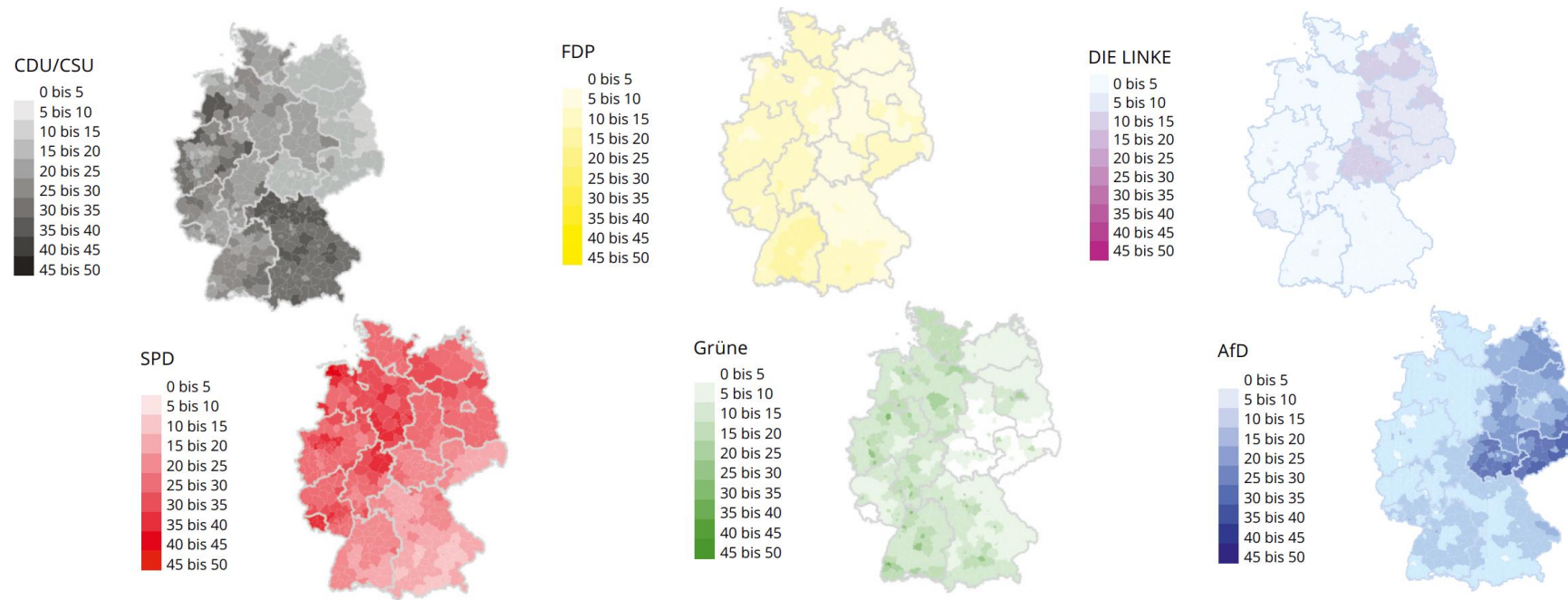
- On-site Access to sensitive, restricted-access GESIS data via the [GESIS Safe Room](#)

In short:

- Survey data linked with requested identifier (principle of data parsimony)
- Researchers have the possibility to link their own geospatial data
- Consulting and completion of data use agreement via [gles@gesis.org](mailto:gles@gesis.org)

# A Geographic Perspective on the 2021 German Federal Election

Figure: Share of votes in the 2021 federal election by district



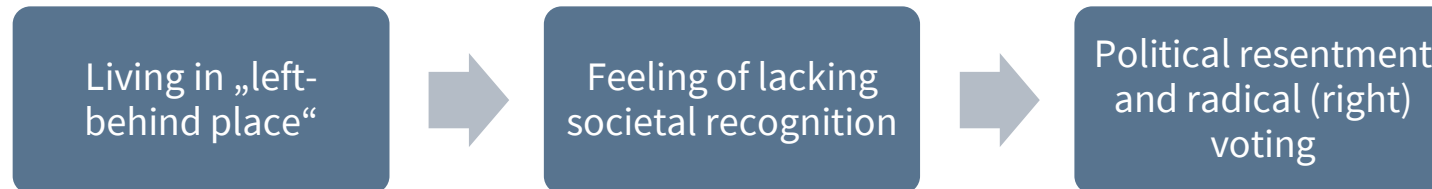


## Research Question & Framework

Does living in a left-behind place affect voting for the AfD in the 2021 German Federal Election?

### Framework:

- „the geography of discontent“ and the study of „left-behind places“ (Broz et al 2021; Cramer 2016, Gordon et al 2018; Harteveld et al 2021; McCann 2020; Rodríguez-Pose 2018)

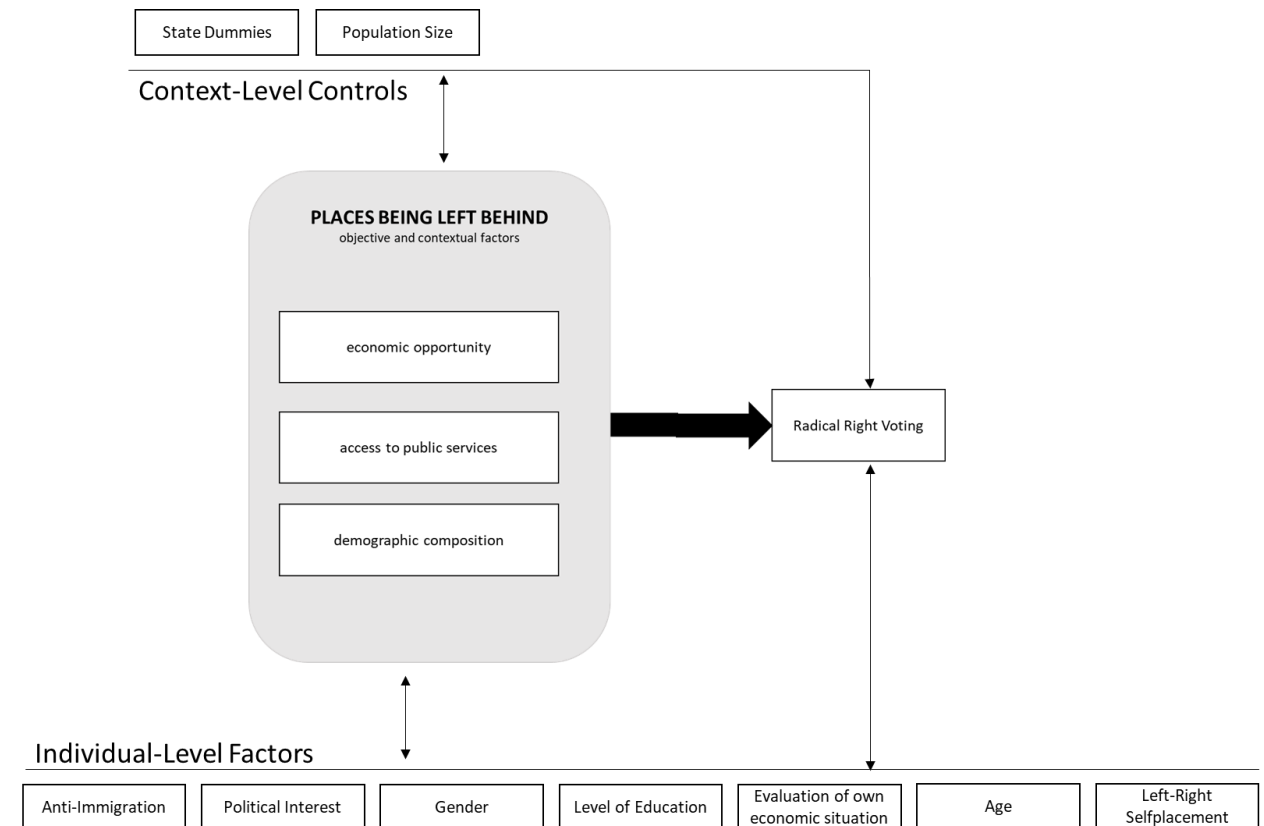


### In Germany:

- some evidence for spatially polarized voting behaviour in 2021 (Haffert (2022), Klärner and Osigus (2021), Träger (2022) Stroppe and Jungmann (2022))
- in previous years mixed findings for the relation of AfD success and local (economic) disadvantages in Germany (Deppisch, Osigus, and Klärner 2021; Diermeier 2020, Förtner, Belina, & Naumann, 2020; Kurtenbach, 2019)

# Methodological Approach: Linking Geocoded Survey Data

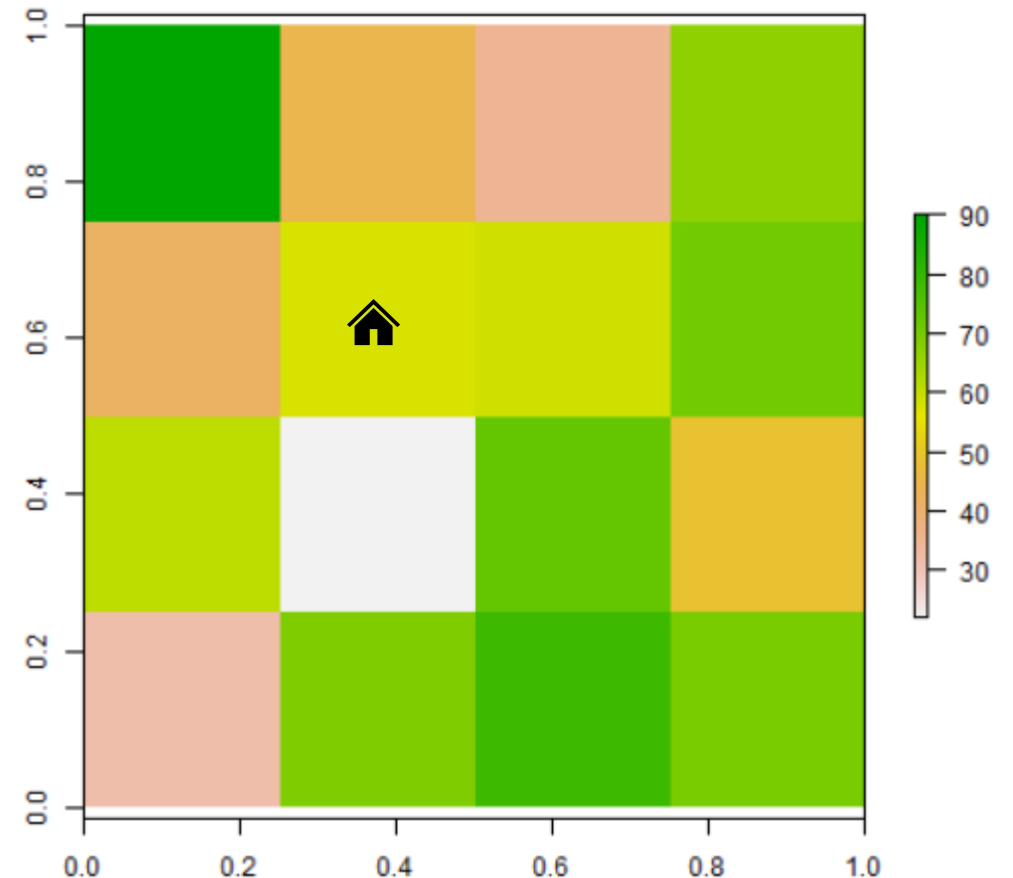
- Individual-level survey data:
  - GLES 2021 Cross-Section, Pre- and Post-Election
- Geospatial data to operationalize „left-behind places“:
  - Economic Situation
  - Demographic Composition
  - Access to Public Services



## Methodological Approach: Places Being Left Behind

### 1km\*1km Grid Level Data (Microm 2021):

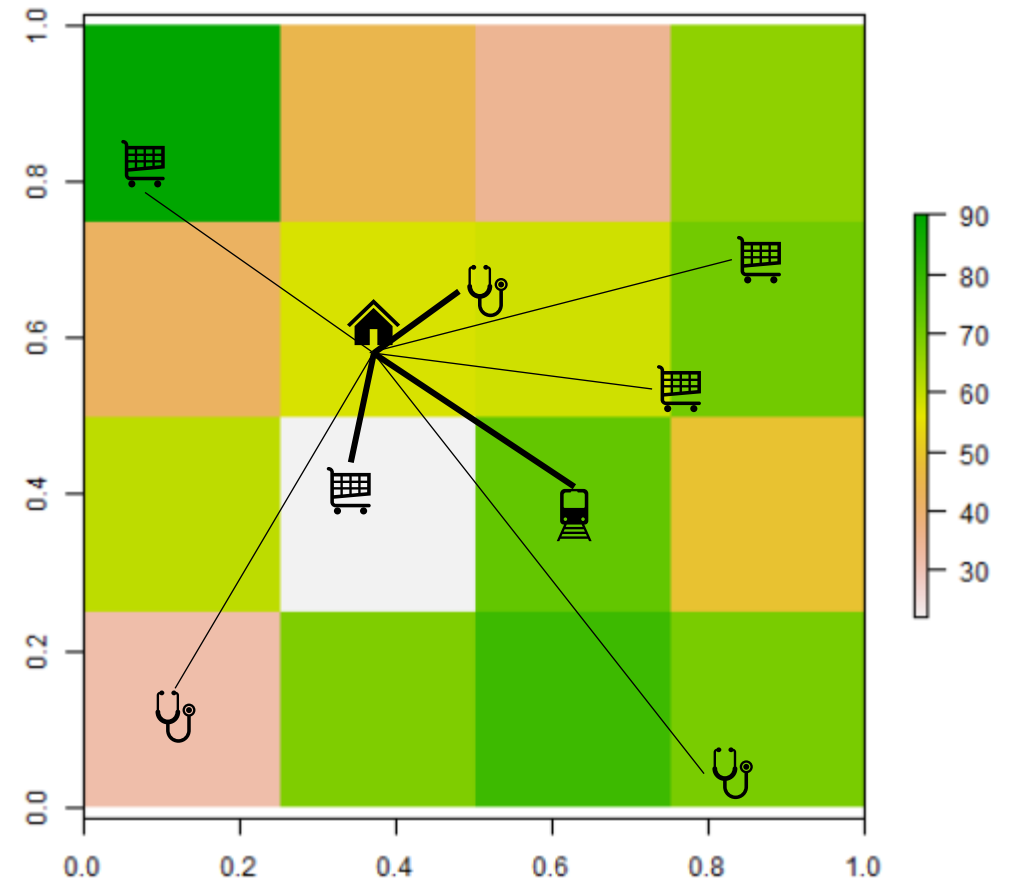
- **Economic Situation:** Share of households with an average income less than 60% of the German median income (risk of poverty)
- **Demographic Composition:** Share of over 60 year olds



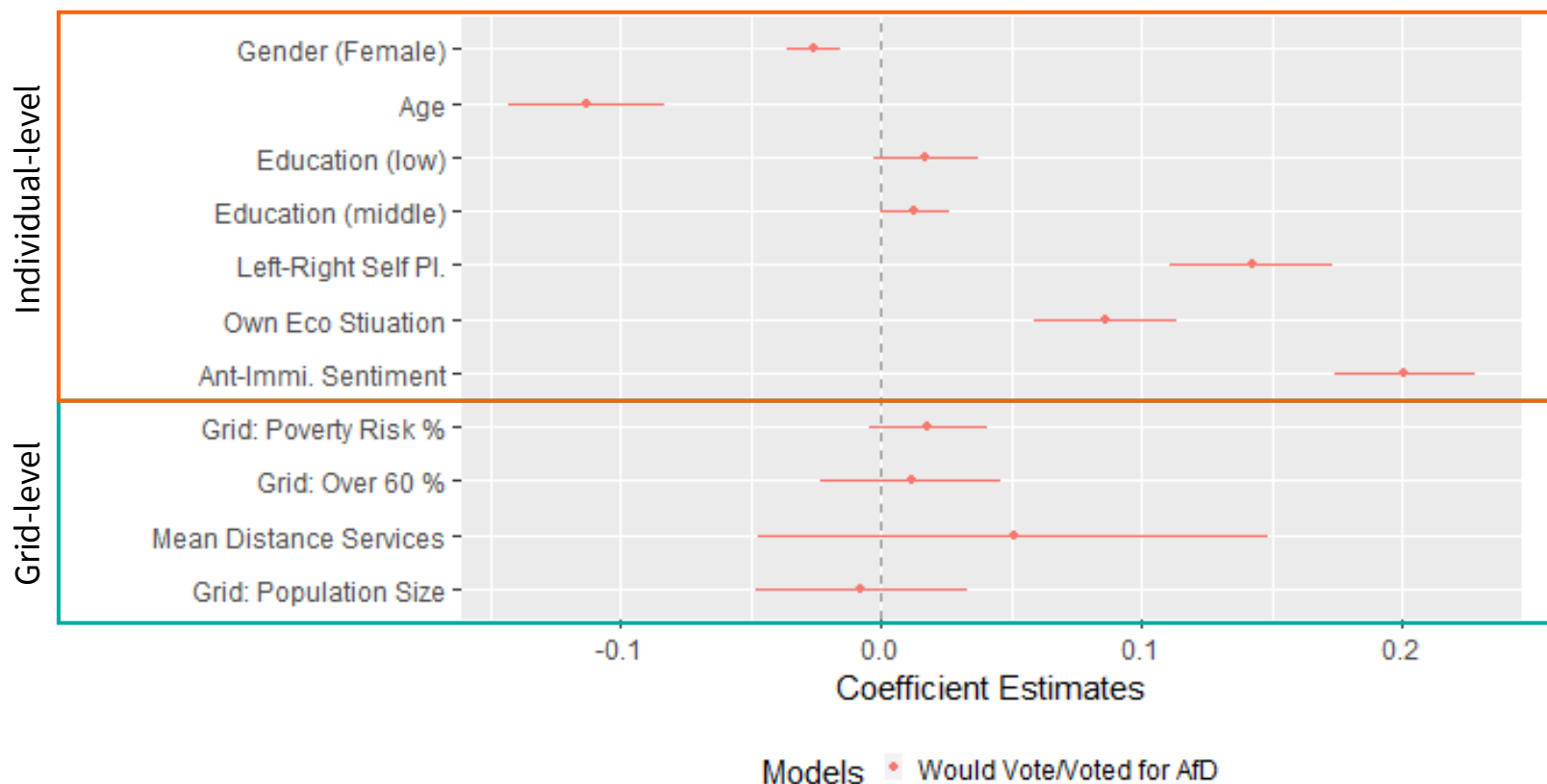
## Methodological Approach: Places Being Left Behind

Distance Measure (BKG 2021, DB 2021):

- **Access to Public Services:** Mean distance from grid centroid to the closest general practitioner, train station, supermarket, post office, and pharmacy

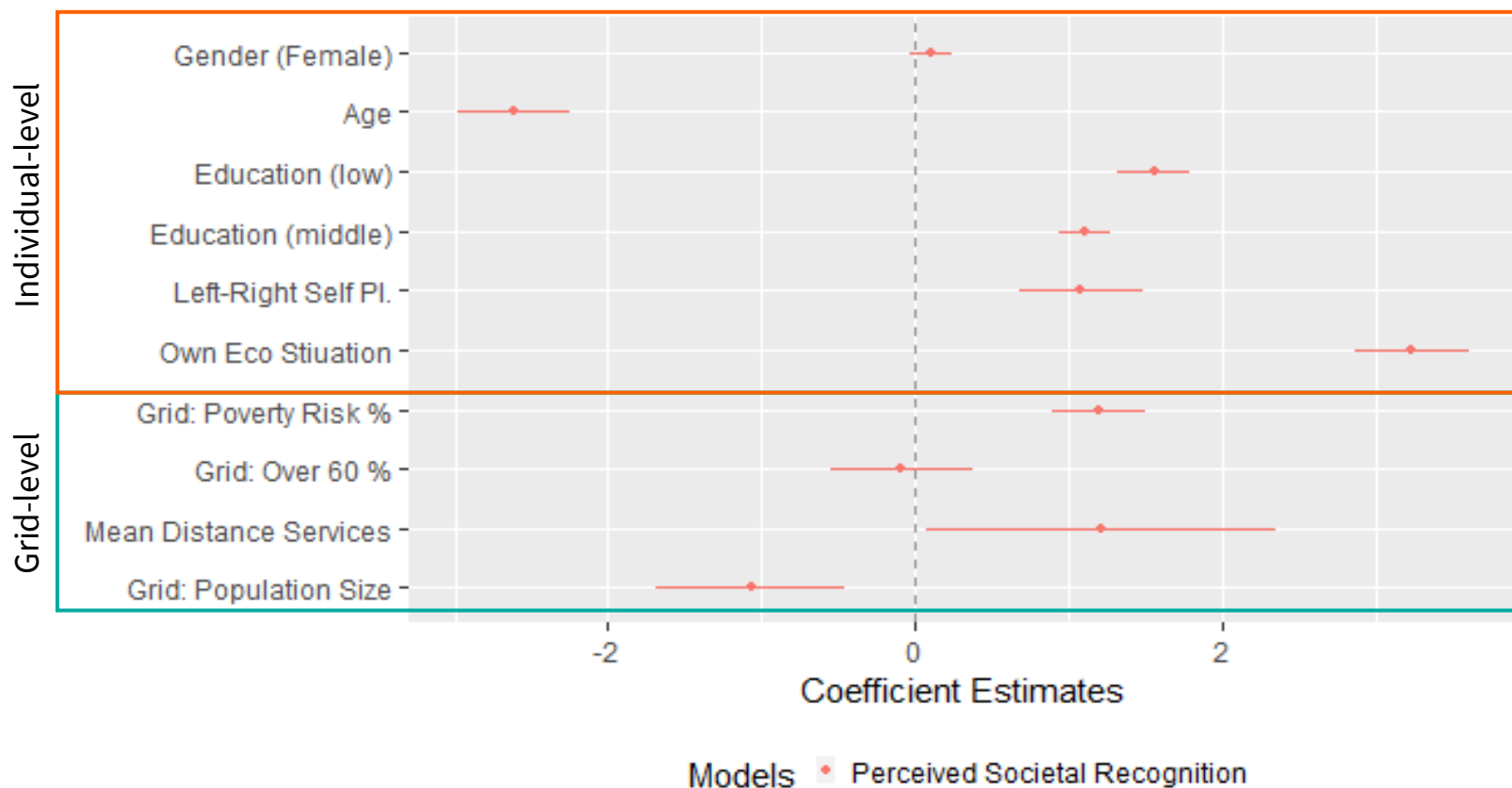


# Preliminary Results: AfD Vote



Fitted Models: Logit model with clustered standard errors on grid level. Fixed effects for German states. N = 6427. Adj. R2 = 0.13. Design weights are applied.

# Preliminary Results: Perceived Societal Recognition



Fitted Models: Logit model with clustered standard errors on grid level. Fixed effects for German states. N = 7262. Adj. R2 = 0.13. Design weights are applied.

## Conclusion

- Geocoded surveys allow to look into the mechanism at work
- Flexibility to operationalize place (characteristics)
- Still many challenges:
  - Definition of relevant neighbourhood(s) and indicators
  - Availability of geospatial information on small spatial scale
  - Self-selection biases (in surveys and place)
  - Methodological challenges (modifiable area unit problem, spatial autocorrelation...)
- Growing availability and curation of geocoded survey data

# Expert contact & GESIS consulting



## Contact:

you can reach the speaker via personal e-mail:

[anne-kathrin.stroppe@gesis.org](mailto:anne-kathrin.stroppe@gesis.org)

you can reach the GLES team via e-mail:

[gles@gesis.org](mailto:gles@gesis.org)

**GESIS Consulting:** GESIS offers individual consulting in a number of areas – including survey design & methodology, data archiving, digital behavioral data & computational social science – and across the research data cycle.

Please visit our website [www.gesis.org](http://www.gesis.org) for more [detailed information](#) on available services and terms.



# Upcoming talks

- Please visit our meet-the-experts website:
  - <https://www.gesis.org/en/services/sharing-knowledge/consulting-and-guidelines/meet-the-experts>

09.02.2023, Dr. Boris Heizmann, Meet the Eurobarometer (in Englisch)

09.03.2023, Dr. Sonja Schulz, Meet the ALLBUS cumulation (in Deutsch)

13.04.2023, Dr. Stefan Jünger, bkggeocoder: a geocoding tool for survey data (in Englisch)

Thank you for participating!