

European Parties Explorer

Visual Analytics project

Stefano Bonetti, 1764624

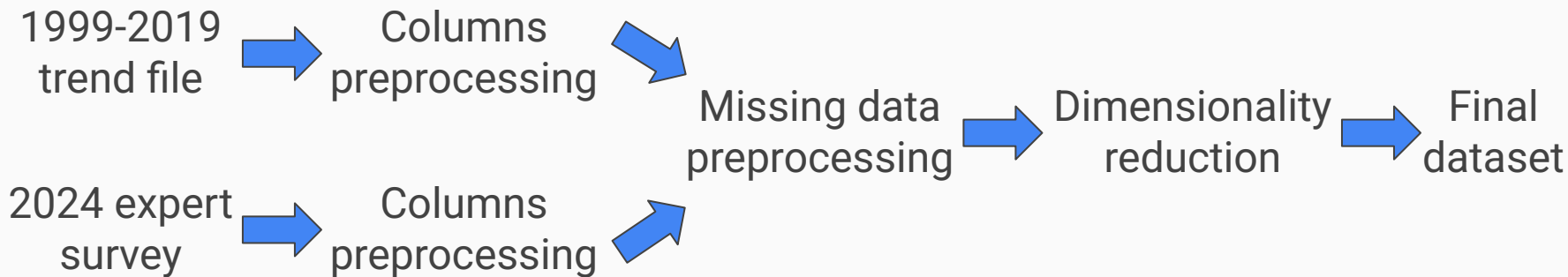
Visualizing European politics

- Europe and the EU have faced many challenges in the last 25 years.
- Politics is ever more present in the lives of European citizens.
- EU politics is a complex topic.

European Parties Explorer: visual analytics application for studying the evolution of European parties and their beliefs, comparing parties and countries.

The Chapel Hill Expert Surveys

- Surveys conducted in 1999, 2002, 2006, 2010, 2014, 2019, 2024 compiled by political scientists specialized in European politics.
- Surveys data stored in [two csv files](#).



1999-2019 trend file

- One row = one party in one of the years.
- Columns = data about the party or expert evaluations.
- 1996 rows, 84 columns (but we need only some of them).

Data we care about:

- parameters essential for the application;
- important and non-redundant topics;
- topics evaluated in a good number of consecutive years.

1999-2019 trend file preprocessing

- country
- year
- party_id
- party
- vote
- seat
- epvote
- family
- eu_position
- eu_intmark
- eu_foreign
- lrgen
- lrecon
- spendvtax
- deregulation
- redistribution
- civlib_laworder
- sociallifestyle
- religious_principles
- immigrate_policy
- multiculturalism
- environment
- regions
- ethnic_minorities
- nationalism

2024 expert survey preprocessing

- Similar structure, but only 2024 data.
- 279 rows, 54 columns (again only need some of them).

Use same data and:

- add **year**;
- compute and add **sociallifestyle** (charts confirm it works fine);
- make **country** and **family** coherent.

Finally, **merge in one single dataset file!**

Operations on the new dataset

Remove data about some countries (not ideal, but necessary):

- Türkiye, Norway, Switzerland, Iceland (no EU);
- Malta (too much missing data in 2024, only two parties);
- Luxembourg (too much missing data, no 2024 data).

Handle missing data:

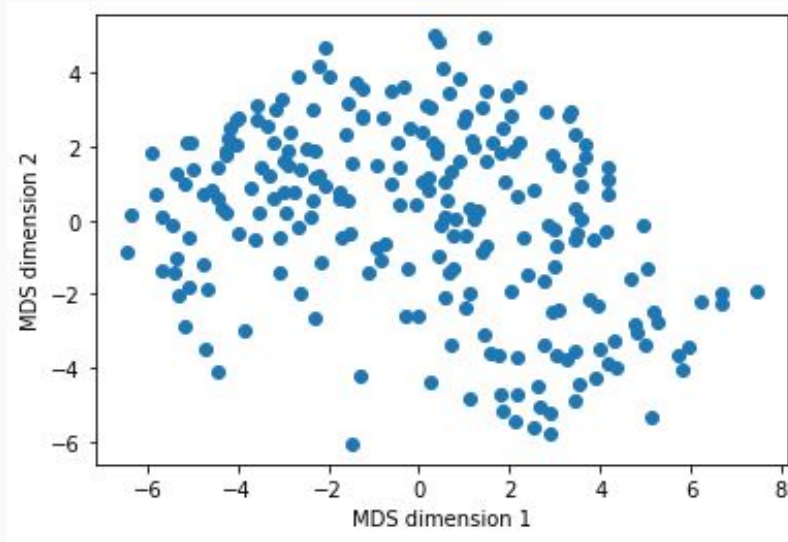
- replace missing vote, seat, epvote with 0;
- delete rows with missing data for attributes that should be evaluated.

Luckily, we're talking about parties with 0-2% vote share.

Dimensionality reduction

Multidimensional scaling
applied for each year,
using the attributes
evaluated by the experts.

Dissimilarity matrix on the
expert evaluations, add
computed coordinates in
the dataset.



(Less data for
older years!)

Why not t-SNE?

Shapes too different for each year and too stretched on one dimension (parties on top of each other, worse use of space).

Despite left-right shape, parties are mixed and on the opposite side (e.g. [KSCM](#), [BSW](#)).

Dataset summary

- **Countries** from 1999: Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Netherlands, UK, Portugal, Austria, Finland, Sweden.
- From 2002: Bulgaria, Czechia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia.
- From 2006: Estonia.
- From 2014: Croatia, Cyprus.
- **Attributes** from 1999: country, year, party_id, party, vote, seat, epvote, family, eu_position, eu_foreign, lrgen, lrecon, mds1, mds2.
- From 2002: eu_intmark.
- From 2006: spendvtax, deregulation, redistribution, civlib_laworder, sociallifestyle, religious_principles, immigrate_policy, multiculturalism, regions, ethnic_minorities.
- From 2010: environment.
- From 2014: nationalism.

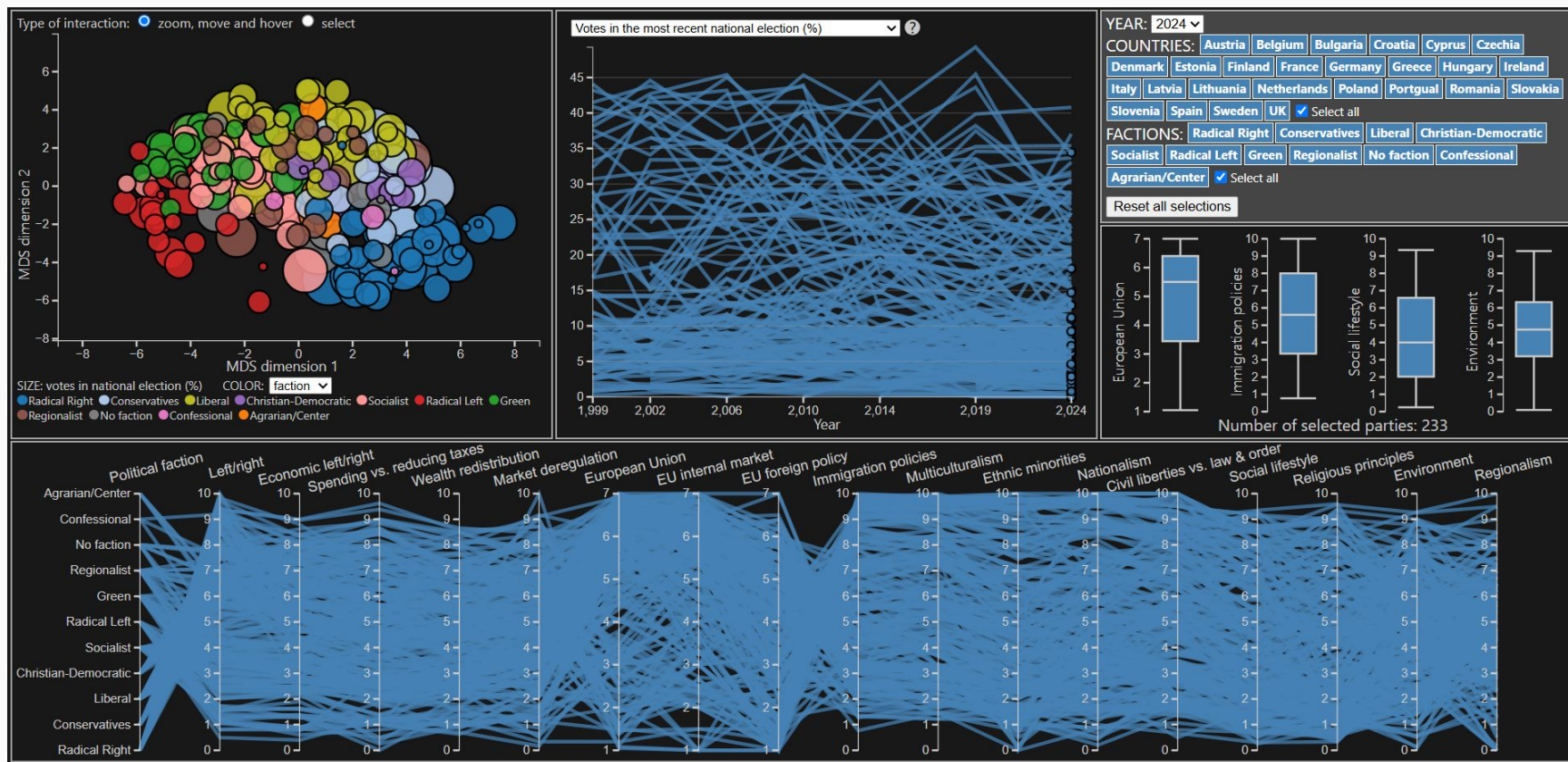
Discarded topics: russian_interference and anti_islam_rhetoric (only 2019/2024 and too much missing data), urban_rural (too much missing data).

Dataset summary

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	country,year,party_id,party.vote,seat,epvote,family,eu_position,eu_intmrk,eu_foreign,lrgen,lrecon,spendtax,deregulation,redistribution,civlib_laworder,sociallifestyle,religious_principles,immigrate_policy,multiculturalism,environment,regions,ethnic_minority																						
2	1,1999,115,FN,1.5,0.7,1.52,1,2.142857074737549,,2.0,9.88888931274414,8.75,,,,,,,,,,,,,-1.8447321509067973,2.7463563021237243																						
3	1,1999,109,CVP,14.1,14.7,13.49,4,6.888888835906982,,6.55555534362793,5.77777671813965,5.75,,,,,,,,,,,,,-0.9871147649674273,-1.3686735452930403																						
4	1,1999,107,PVV/VLD,14.3,15.3,13.61,3,6.66666507720947,,6.55555534362793,7.11111164093018,7.625,,,,,,,,,,,,,-1.9320114979411431,-0.9360657897062357																						
5	1,1999,106,PRL,7.7,9.0,6.69,3,6.55555534362793,6.55555534362793,6.66666507720947,7.0,,,,,,,,,,,,,-1.5994298002111393,-1.0051732746224182																						
6	1,1999,110,VU,5.6,5.3,7.57,8.5,0,,4.875,5.125,5.0,,,,,,,,,,,,,-0.09585461041727476,-0.2617026473735409																						
7	1,1999,111,FDF,2.4,3.0,3.34,8,6.142857074737549,,6.285714149475098,6.11111164093018,6.25,,,,,,,,,,,,,-1.115835465438679,-0.9189179456071788																						
8	1,1999,103,SP,9.6,9.3,8.84,5,6.66666507720947,,6.55555534362793,3.33333253860474,3.125,,,,,,,,,,,,,0.5283740215086614,-1.8775563700693836																						
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12	1,1999,102,PS,10.2,12.7,9.59,5,6.66666507720947,,6.55555534362793,3.11111164093018,2.625,,,,,,,,,,,,,0.7544615656310631,-1.9608111860498398																						
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21	1,2002,112,VB,9.9,10.0,9.39,1,2.73,2.88,2.75,9.55,7.9,,,,,,,,,,,,,2.77715891960703,-2.1118279418725865																						
22	1,2002,103,SP,9.6,9.3,8.84,5,5.45,4.0,6.55,3.5,3.0,,,,,,,,,,,,,-1.1545583883717,1.5597263475290495																						
23	1,2002,110,NVA,5.6,5.3,7.57,8.5,0,5.0,5.0,6.22,5.67,,,,,,,,,,,,,-0.1523986979576264,-0.6517593095662619																						
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Original files: AS = 115530
Preprocessed dataset: AS = 34925
With MDS coordinates: AS = 37719

European Parties Explorer



Filters

Affect all the other views

Years are the ones of the expert surveys

Can reset brushes on all other views

YEAR: 2024 ▾

COUNTRIES: Austria Belgium Bulgaria Croatia Cyprus Czechia
Denmark Estonia Finland France Germany Greece Hungary Ireland
Italy Latvia Lithuania Netherlands Poland Portugal Romania Slovakia
Slovenia Spain Sweden UK ☒ Select all

FACTIONS: Radical Right Conservatives Liberal Christian-Democratic
Socialist Radical Left Green Regionalist No faction Confessional
Agrarian/Center ☒ Select all

Reset all selections

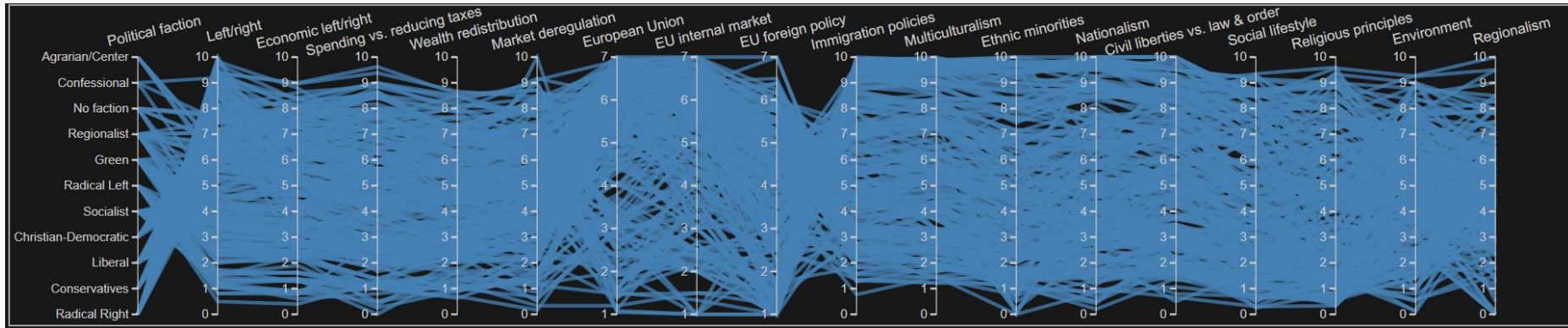
YEAR: 2010 ▾

COUNTRIES: Austria Belgium Bulgaria Croatia Cyprus Czechia
Denmark Estonia Finland France Germany Greece Hungary Ireland
Italy Latvia Lithuania Netherlands Poland Portugal Romania Slovakia
Slovenia Spain Sweden UK ☐ Select all

FACTIONS: Radical Right Conservatives Liberal Christian-Democratic
Socialist Radical Left Green Regionalist No faction Confessional
Agrarian/Center ☒ Select all

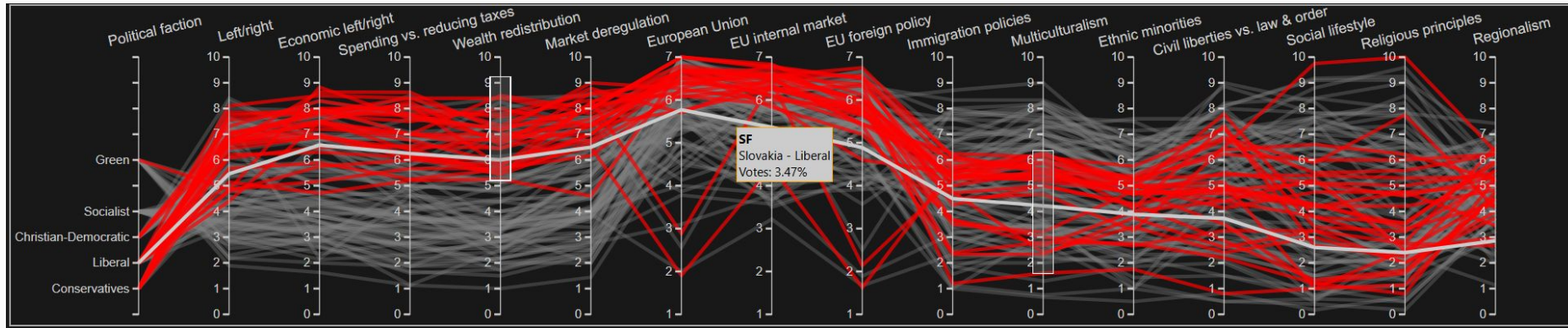
Reset all selections

Parallel coordinates



- A “picture” in the selected year of all filtered parties.
- Axes reordered so that we can find trends (political families - economy - EU - immigration - other).

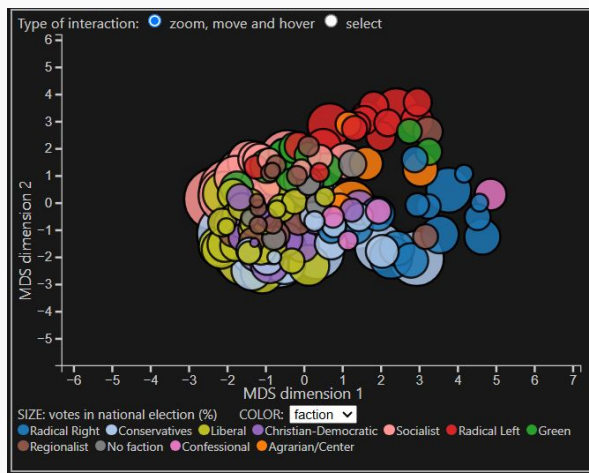
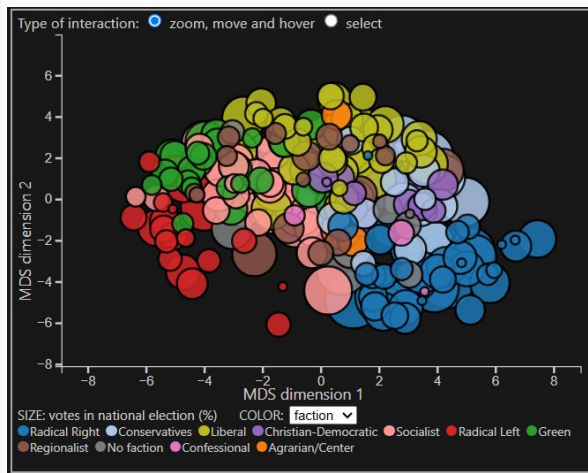
Parallel coordinates



- Influenced by filters; displayed axes update according to the year.
- Brushing and hovering.
- Axes name hovering gives information about that topic.

Scatter plot

- A “picture” like the parallel coordinates.
- Uses MDS data to show similar parties.
- Parties are less spread out in older years (but you can zoom).
- Size = votes%, smaller bubbles on top like Gapminder, slightly overrepresented.



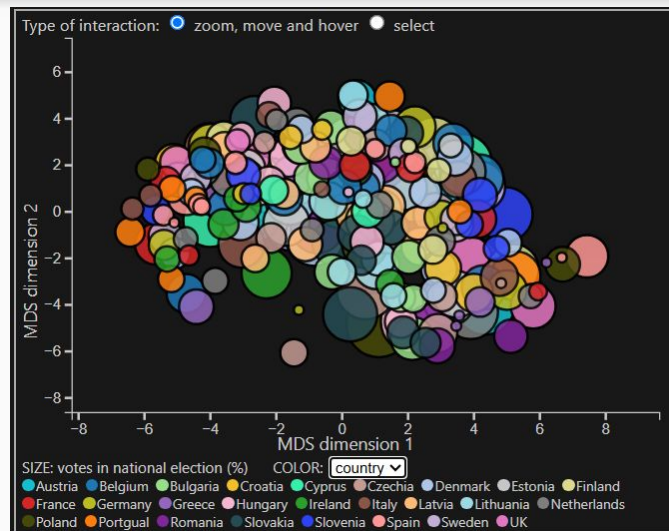
Scatter plot - colors

Color by [political faction](#) or [country](#) (lots of colors! - more useful when confronting few nations).

d3's [category20](#) (only scale with so many colors):

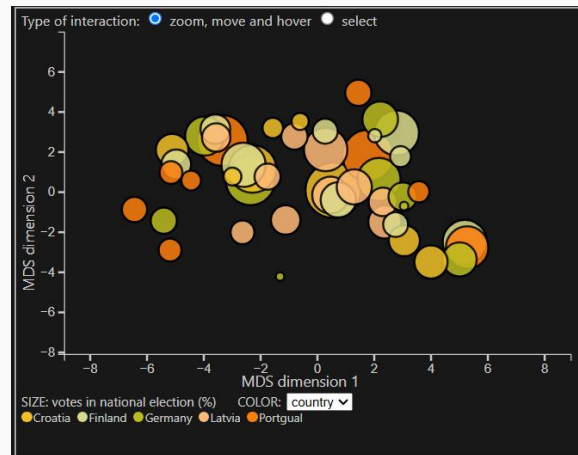
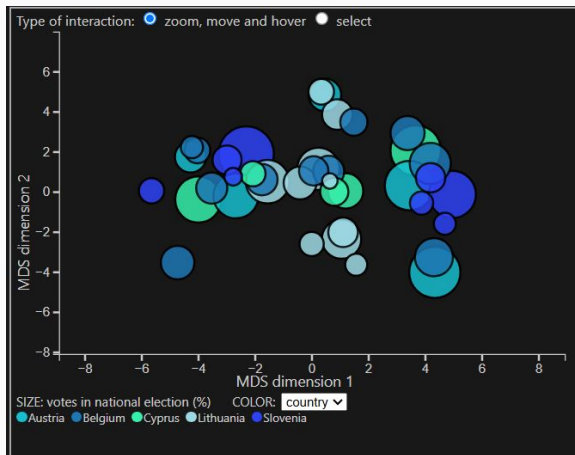
D3 no longer provides the `d3.schemeCategory20*` categorical color schemes. These twenty-color schemes were flawed because their grouped design could falsely imply relationships in the data: a shared hue can imply that the encoded data are part of a group (a super-category), while relative lightness can imply order. Instead, D3 now includes [d3-scale-chromatic](#), which implements excellent schemes from ColorBrewer, including [categorical](#), [diverging](#), [sequential single-hue](#) and [sequential multi-hue](#) schemes. These schemes are available in both discrete and continuous variants.

This issue is probably not present here, especially for political factions (mostly colors typically associated to each family) - most colors resemble ColorBrewer.



Scatter plot - colors

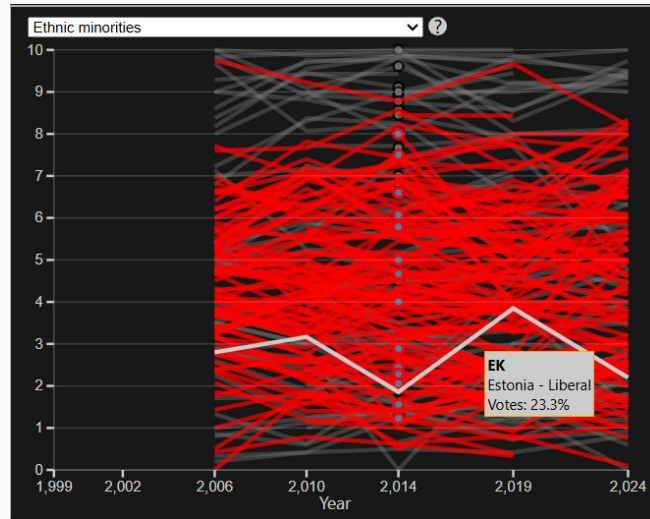
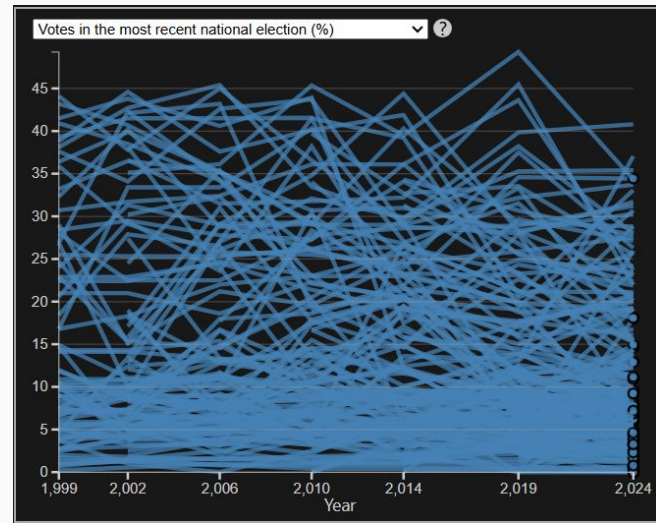
Remaining colors from [colorgorical](#).



Finally: **zooming, hovering, brushing**

Line chart

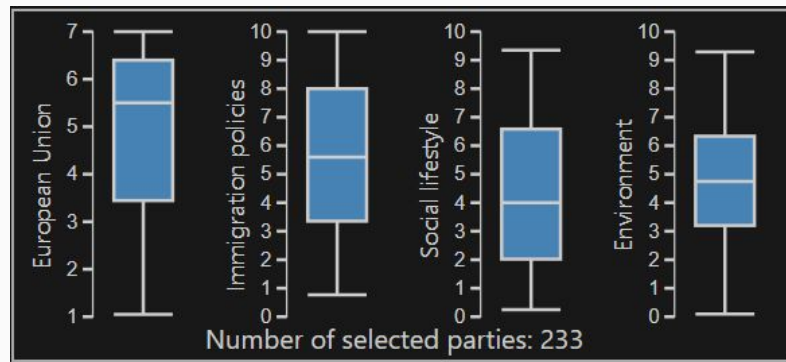
- Quick overview over the years on one topic.
- Shows parties existing only in the selected year, uses points if it's the only year.
- Same topics as parallel coordinates + electoral results.



Allows party hovering
and hovering on the
legend

Boxplots

- One for each “macro-topic”.
- Useful for showing how much parties agree or are polarized.
- They update with filters and brushes.
- Additional counter.
- Legend hover like parallel coordinates.

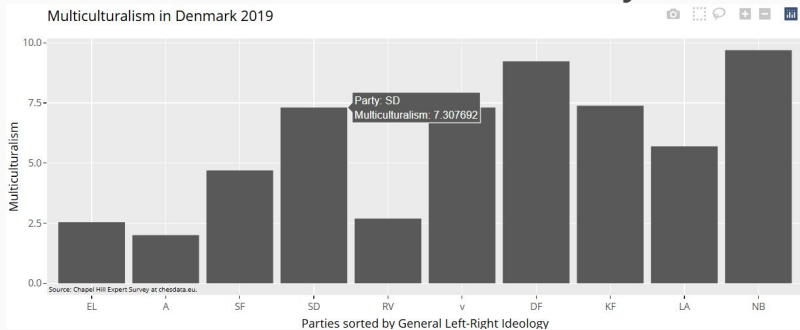


Related work - CHES Interactive

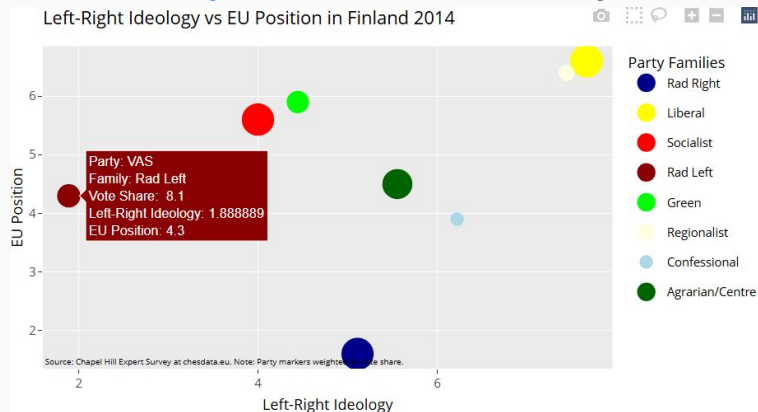
Not much to be found (niche dataset?) - Most visualizations are about **electoral results** - Papers use CHES dataset only as a reference, no visualizations.

CHES interactive

- **Bar chart** on one country

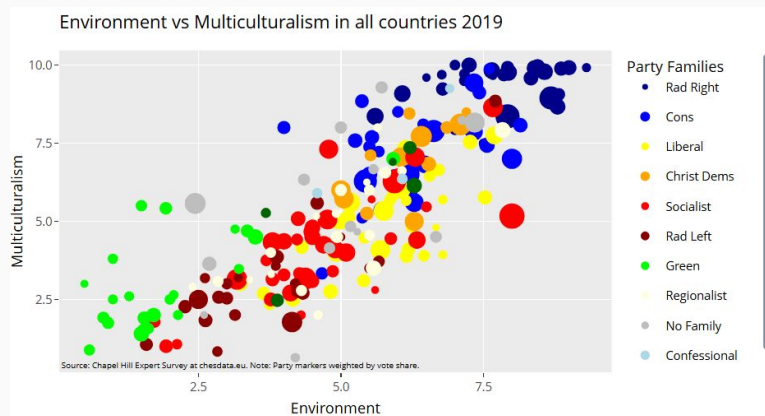


- **Scatter plot** on one country



Related work - CHES Interactive

- Scatter plot on all countries

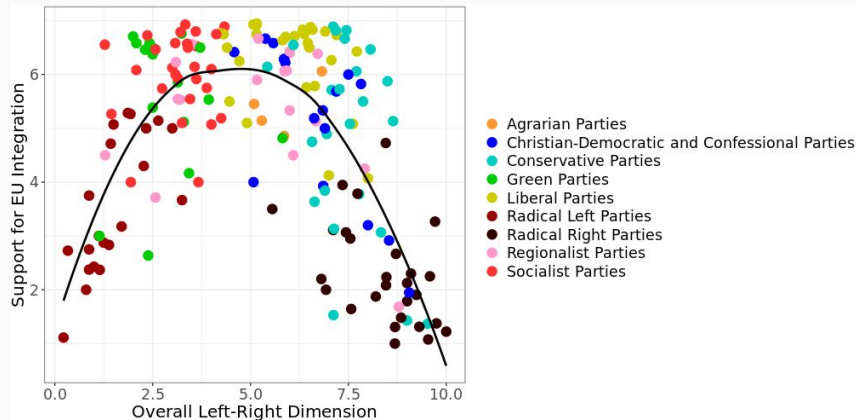


Good for comparing parties and finding correlations.

- Filters on year and country (one at a time), no 2024.
- Only two dimensions at a time.
- Hard to see changes over time.
- Scatterplot places using two attributes instead of a more “universal” positioning.

Related work - Foundations of European Politics

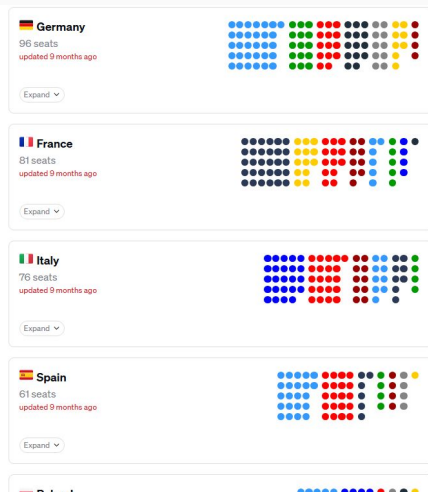
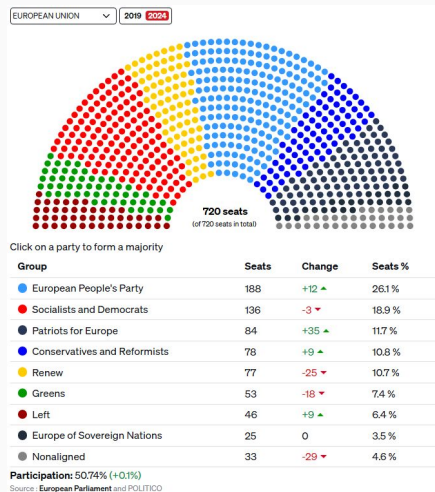
Foundations of European Politics - A Comparative Approach: textbook about research on European politics.



The only available feature is the comparison between two selectable topics.

Interesting functionality: [line](#) highlighting correlations!

Related work - Politico



Not really on topic, but a great inspiration.

- Highly interactive.
- Compare 2024/2019.
- Data about single countries and their seats.
- Suggested colors.

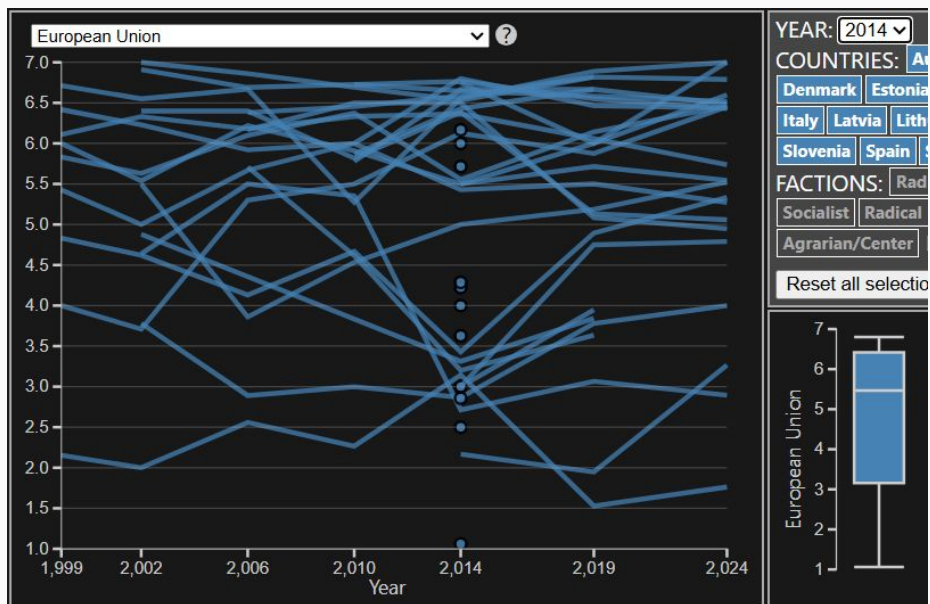
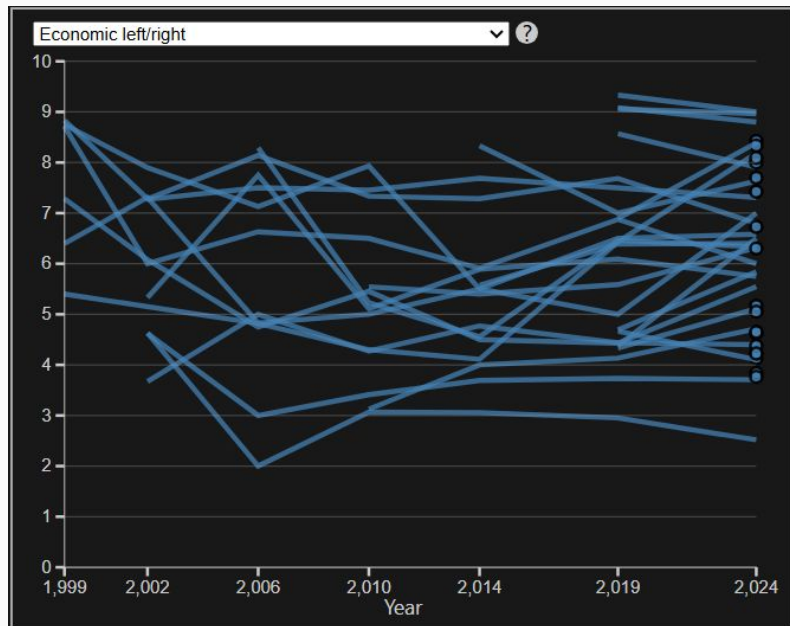
Possible users

- **Political science researchers, experts or students** (ideological evolutions, comparing countries, finding trends).
- **Journalists** (historical data).
- **Citizens who are about to vote.**

Insights - Differences between factions

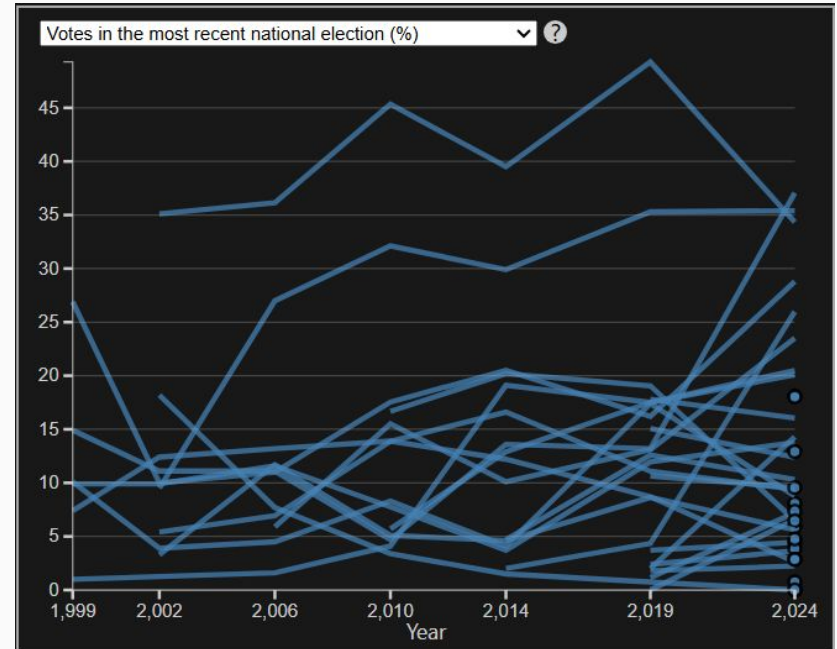
- **Radical Right**: both center and right-leaning, Eurosceptic, extremely against liberal policies, undecided on religious principles and regionalism.
- **Conservatives**: right-leaning, Europeanist, conservative.
- **Liberals**: center-right, most Europeanist, liberal.
- **Christian-Democratics**: center- right, Europeanist, conservative.
- **Socialists**: convincingly left-leaning, Europeanist, liberal but increasingly more undecided.
- **Radical Left**: convincingly and extremely left-leaning, undecided on EU, more liberal.
- **Greens**: center-left, went from undecided to increasingly Europeanist, more liberal.
- **Other**: no common trends - generally favor EU, “most regionalist” are Spanish.

Interesting trends



Insights - The rise of the Radical Right

- More and bigger dark blue points.
- Most numerous group (43) in 2024 to the detriment of Conservatives (38 in 2014, 22 in 2024).
- More voted than ever.



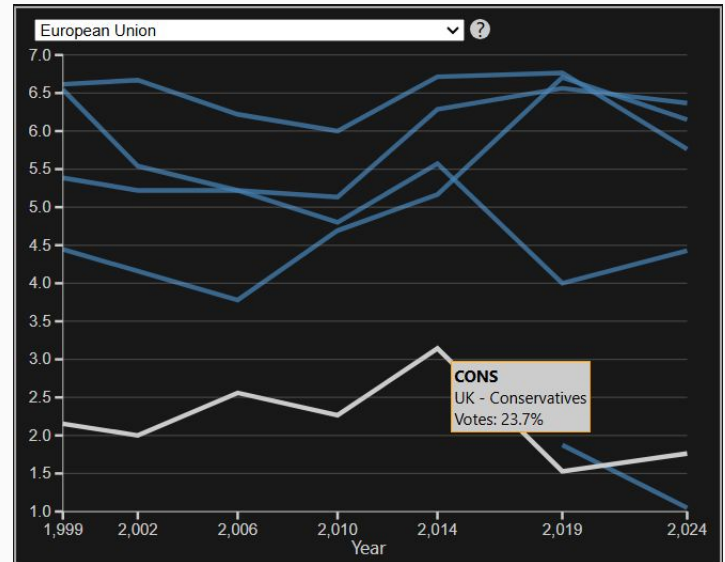
Insights - Europeanism

The **level of Europeanism** is stable - Just Radical Right being more voted.

UK after Brexit is still pretty Eurosceptic.

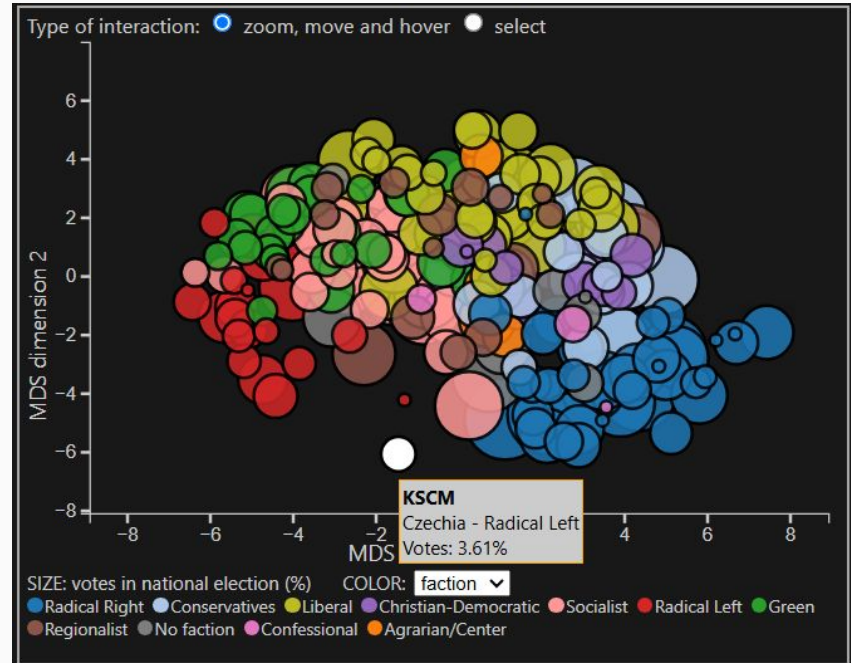
- In 2019, the two main parties increased their vote share while being more Eurosceptic.
- In 2024, Conservatives halved their votes in favor of Reform UK.

East Europe is generally more pro EU.



Insights - Some outlier parties

- KSCM (Czechia), BSW (Germany), SMER-SD (Slovakia)
- SDS (Bulgaria)



Thank you for your attention!