

# Harmonizing and linking party information: The ESS as an example of complex data linking

Version 2023-10-09

## **Paul Bederke and Holger Döring**

Both authors contributed equally, and names are in alphabetical order.

## **Contact Information**

Paul Bederke (University of Konstanz, Germany) – [paul.bederke@uni-konstanz.de](mailto:paul.bederke@uni-konstanz.de)

Holger Döring (GESIS – Leibniz Institute for the Social Sciences, Germany) – [holger.doering@gesis.org](mailto:holger.doering@gesis.org)

## **Corresponding author**

Holger Döring

GESIS – Leibniz-Institut für Sozialwissenschaften

Unter Sachsenhausen 6-8

50667 Köln, Germany

## **Authors contributions** – Contributor Roles Taxonomy (CRediT)

Paul Bederke — Data Curation, Software, Writing - Review & Editing

Holger Döring — Writing - Original Draft, Software, Writing - Review & Editing

## **Declarations of interest**

None

## Data availability

Code and data available on GitHub – <https://github.com/hdigital/ess-linking>

## Appendix A. Supplementary data

Supplementary material for the article can be found online. – <https://hdigital.github.io/ess-linking/>

## Acknowledgments

The initial idea for this paper came through an exchange with Ruth Dassonville, and we want to thank her for the encouragement. We would like to thank Alexander Gattig for comments on the paper and methodological advice. For detailed comments on the paper, we thank Jan Schwalbach. The initial version of the ESS import code in Party Facts from 2014-15 benefited from contributions by Jan Fischer and Tomasz Żółtak.

## Contents

Abstract .....	3
Introduction.....	4
Linking datasets with Party Facts .....	5
ESS party data structure .....	6
Performance of Party Facts linking.....	9
Expert survey validation .....	10
Party-voted-for in government .....	11
Summary.....	14
References .....	15

## Abstract

Combining party information from multiple sources is a work-intensive challenge for quantitative studies of political representation. Differences in the definition of political parties and difficult data structures can make linking party information across datasets challenging. The European Social Survey (ESS) is an example of a prominent data source in political science research whose party information is particularly difficult to work with. Here, we demonstrate how Party Facts, an online infrastructure for combining party information, can be used to link different social science datasets and assess the performance of the linking process. In this article, we discuss the difficulties of complex linking tasks and show how the ESS can be combined with other sources. We have updated the database to include appropriate links for the recent Round 10 of the ESS and provide two examples of complex linking by combining the ESS with the Chapel Hill Expert Survey (CHES) and with the Parliament and Government Database (ParlGov).

**keywords** – comparative politics, data management, survey data, voting behavior, expert surveys, validation

## Introduction

Research on democratic representation increasingly draws on combined datasets from multiple sources. These datasets may combine citizen information from public opinion surveys at the individual level with information about elections and country-level sources. Information about political parties, such as voting decisions, the ideological profiles of partisans and their satisfaction with democracy, is a prominent example of party-related information widely used to study democratic representation. This party information is particularly useful when it is combined with other information, such as political positions from expert surveys, elite information from text analysis, and structural information, such as election results or party-level social media sources. However, combining information about political parties from multiple sources remains a challenge to scholars of political representation. Often, this is a complex, time-intensive and error-prone process that makes empirical work with multiple sources of party information particularly challenging.

One approach to make combining information from multiple sources more accessible is the online resource, Party Facts (Döring and Regel, 2019). The project links information about political parties across more than 60 datasets and has facilitated combining different data sources. However, extracting and combining party information with Party Facts is sometimes challenging due to the peculiar structure of party information in datasets. Parties, as observational units, may be difficult to identify uniquely within a data source. Additionally, conceptual definitions may differ across datasets. The linking of two datasets within Party Facts may also include complex time dimensions that require substantial data programming.

For studies of political representation and partisan dynamics in Europe, the European Social Survey (ESS) is a particularly prominent and widely used source of information on the attitudes of European citizens. With ten rounds since 2002 and up to 30 countries per round, the ESS is an interesting and important source that can be enriched with further data at the election and country level (c.f. European Social Survey 2020). All waves include questions about party preferences and voting decisions that are widely used within the research community. However, it is very difficult to combine the ESS party information with other sources due to the particular structure of party information in the ESS.

Here, we provide a detailed account of how Party Facts can be used to link ESS party information with other sources. We have harmonized and updated the party links in Party Facts for ESS 2020. In this article, we first discuss the challenging structure of the ESS party data and demonstrate the challenges of using the party variables. We provide two detailed examples of complex ESS linking processes with the Chapel Hill Expert Survey (CHES) trend file (Jolly et al., 2022) and the Parliaments and Governments Database (ParlGov, c.f. Döring 2016). We evaluate the performance of Party Facts in linking the ESS with the CHES and ParlGov datasets and assess the challenges of linking these sources. First, we use the CHES expert judgments to conduct a validation of the ESS-based placement of voters along the left-right continuum. Second, with ParlGov, we prepare a multilevel model to study the differences in satisfaction with democracy by voters of government and opposition parties.

With this research note, we aim to provide a better understanding of the challenges in linking complex party datasets and want to enable students of political attitudes in Europe to combine ESS party data with multiple other sources more easily. Our discussion provides a broader understanding of how to integrate complex datasets, such as the ESS, that are potentially linked by multiple indicators such as party IDs, election results and government participation.

## Linking datasets with Party Facts

One approach is Party Facts, which is also a starting point to link party variables across social science datasets (Döring and Regel, 2019). In the project, information that identifies political parties (e.g., names, vote share) is extracted from datasets that include information about national-level parties from countries across the world. For each external dataset, a unique party key is either taken from the dataset or created based on information in the dataset. These unique identifiers of parties from external datasets are linked to a set of core parties in the Party Facts database. A core party is the entry in Party Facts to which party observations from external datasets are linked.<sup>1</sup>

Currently, Party Facts includes approximately 45000 parties from 65 datasets and links them to approximately 5800 core parties in 223 countries. Party Facts includes party information from the major expert surveys, election results, cabinet compositions, and public opinion surveys. Many of the datasets included in Party Facts cover party dynamics in Europe so that the continent is particularly well covered. Party IDs from Party Facts are also used by major large-scale data infrastructures such as the Varieties of Party Identity and Organization (V-Party) dataset (Lindberg et al. 2022) and the The Comparative Study of Electoral Systems (2022).

Linking party information is easier with Party Facts, which allows the combination of multiple party sources. The approach enables more detailed studies of democratic representation and party politics that combine multiple sources. However, political parties are defined differently across datasets, and there may not be a one-to-one relation between parties in different datasets. For most parties included in Party Facts, the defi-

---

<sup>1</sup> For detailed information on inclusion criteria and party linking, see the codebook on the Party Facts website (<https://partyfacts.org>).

nitions of parties overlap between datasets. However, some sources strive for continuity in coding political parties, whereas others use indicators such as name changes or temporary alliances as an indicator for a new party.

For example, the ParlGov project sets a high threshold for defining new parties and aims at generating continuity within parties as much as possible (Döring, 2016). In contrast, the Manifesto Project tends to create new parties with each name change and uses names as a criterion to define new parties (Lehmann et al., 2023). Electoral alliances are a similar challenge; datasets that focus on elections, such as the Manifesto Project, tend to record an alliance only. Datasets that investigate legislative dynamics will focus on party groups in parliaments. Consequently, linking the records of legislative dynamics with data sources of electoral results may result in missing links due to differences in unit specifications.

Among the party information from public opinion surveys included in Party Facts is the ESS. The ESS has a particularly challenging structure for recording and integrating party information, and we have updated the information uploaded to Party Facts to include the most recent round from 2020 for this article. Later, we show how well Party Facts performs when linking ESS party information to the CHES and ParlGov datasets.

## ESS party data structure

The ESS includes questions about the political attitudes of European citizens and their views on democratic representation. The survey has been conducted biannually in most European countries since 2002 and is a high-quality research source. Two ESS questions include information about political parties. One question asks for the voting decision in the last election, and a second question asks which party a respondent is close to (e.g., European Social Survey (2020)):

- prtv\* — Which party did you vote for in that (last national) election?
- prtc\* — Is there a particular political party you feel closer to than all the other parties?

Figure 1 summarizes the number of parties reported in the *party-voted-for* question in the ESS. For countries with multitier electoral systems, there are several variables with a *party-voted-for* question in each electoral tier. For Germany, for example, there is a variable for the party vote (second tier) and for the district candidate party vote (first tier). Lithuania has three variables, one for the proportional tier and two for the single-seat tier (two rounds).

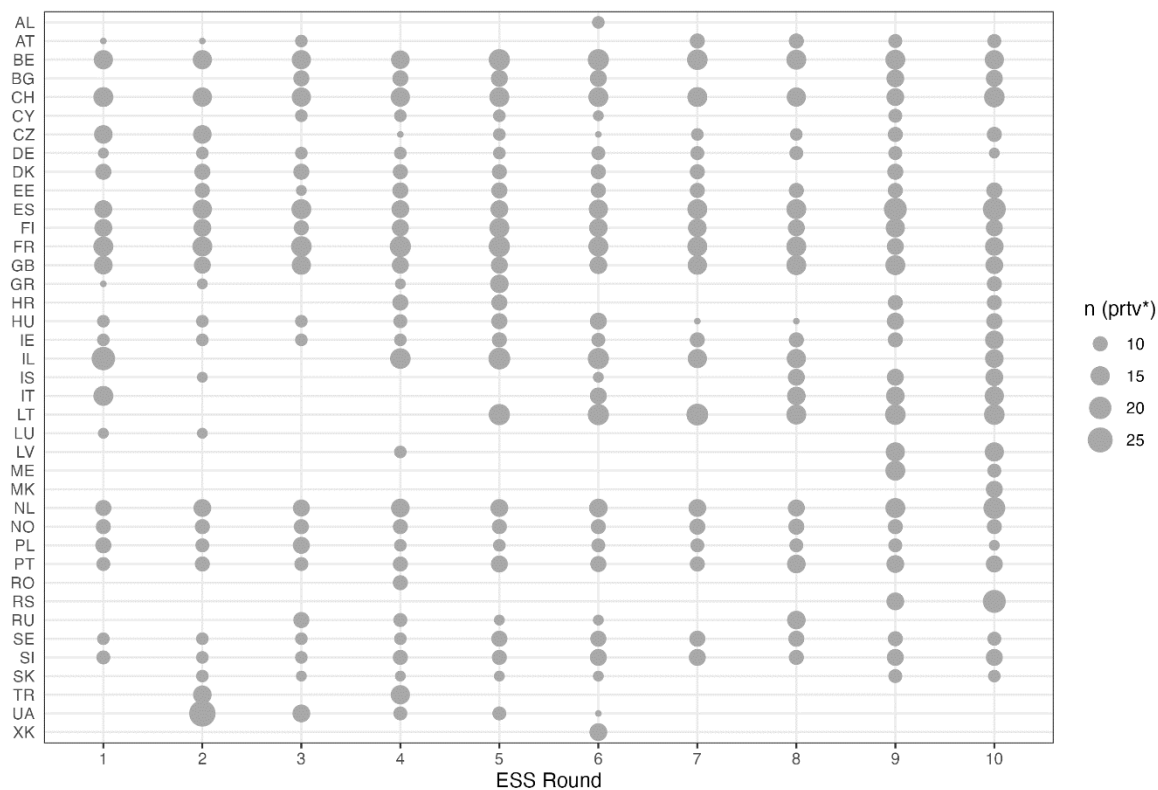


Figure 1 – Number of parties per country in ESS rounds; see details in Online Appendix Section 1.

The structure of the party variables in the ESS is complex, and several aspects are difficult to account for. First, each of the questions has variables that are unique to each country. Second, the party keys may differ between the *party-voted-for* and *party-close-to* questions within one ESS round. Third, no coherent party keys are used between ESS rounds, and there is no unique party key list provided by the ESS. In the ESS, party IDs are only coded coherently within one country variable in an ESS round. Table 1 gives an example for Finland and shows the incoherent coding of party IDs across the different ESS rounds and variables. For the *party-voted-for* (prtv\*) and *party-close-to* (prtc\*) ESS variables, party ID 10 is used for three different parties across rounds 8, 9, and 10.

ESS Round	ESS party ID	prtv* party	prtc* party
8	10	Green League	Green League
9	10	Green League	Independence Party
10	10	Pirate Party	

Table 1 – Example of incoherent coding of party IDs across ESS rounds and party voted-for/close-to (prtv\*/prtc\*) variables (Finland, ESS rounds 8–10, party ID 10).

We harmonized the ESS party IDs in Party Facts. First, we created a *unique ESS party ID* for each party in an ESS Round. Second, we harmonize these unique keys into *harmonized ESS party IDs* that identify each party across ESS variables and rounds. This harmonized ESS party ID is imported into Party Facts and thereby linked to other data sources about political parties. From the ESS dataset, party variables need to be collapsed into one variable with the unique ESS party ID and then be linked to other data sources through the harmonized ESS party ID and the Party Facts ID.<sup>2</sup>

We have recently updated the Party Facts database with the ESS data for Round 10, which was conducted between 2020 and 2022. The updated version of the ESS Rounds 1-10 includes 6283 ESS party IDs and combines them into 1825 harmonized ESS party IDs (see Online Appendix Section 2 for country details and examples). We use this updated ESS party information in Party Facts to prepare two examples linking the ESS with other sources. First, we validate the party positions based on ESS left-right self-placements of voters with the CHES left-right party positions. Second, we prepare a multilevel model that compares the satisfaction with democracy between ESS respondents who voted for government parties and those who voted for opposition parties. These two examples are presented in the last part of this article. In the next section, we assess how well the ESS party IDs and the two examples can be linked through Party Facts.

---

<sup>2</sup> For detailed information on the harmonization process, see the Party Facts GitHub repository (<https://github.com/hdigital/partyfactsdata>).



## Performance of Party Facts linking

Party Facts provides a valuable source to combine datasets with party information. When combining two datasets, most of the parties can be directly linked via Party Facts. However, the definition, operationalization, and coding of parties differ between the data sources that Party Facts links. There is a general debate in party research about what constitutes a genuinely new party (Barnea and Rahat, 2011). The definition of a new party depends on the research question for which the data source was created. For example, after the German reunification, the German Greens legally formed a new party with Alliance-90/Greens, an East German party that formed out of the opposition movement. However, ParlGov records a single party due to elite continuity within the party.

Differences in the definition of parties and the coding of electoral alliances are the main reason why party units differ between datasets. There cannot be a unique definition of all political parties across data sources. Hence, some parties cannot be linked directly via Party Facts. It is not a goal of the Party Facts project to offer direct and harmonized links between data sources. Party Facts provides a generative set of core parties and links datasets through these core parties (c.f. Döring and Regel 2019). Hence, some parties may be unmatched.

We summarize the uncovered parties that remain unlinked after combining the ESS rounds with the CHES trend file and the ParlGov cabinet data. All three sources cover European countries and include the main parties with representation in parliament and relevance in national politics. We can assess the coverage of party linkages by looking at the share of ESS observations whose information is linked to CHES and ParlGov parties. Using the share of ESS responses instead of using the share of ESS parties linked allows us to focus on medium and larger parties.

Table 2 provides the share of *party-voted-for* entries from the ESS that have Party Facts based links to CHES or ParlGov. The share of covered parties is calculated for each country in an ESS round. For approximately half of the country/ESS-round entries, a minimum of 96% of the party entries are matched with the respective party in CHES or ParlGov. Overall, the table shows that most relevant political parties can be directly combined through Party Facts. However, there are a few country/ESS rounds with very low coverage. Here, some additional and manual harmonization within a research project would improve coverage.

As mentioned above, differences in the definition of parties and the coding of electoral alliances are the main reason for nonmatches between different datasets. A good example is the alliance between the *Christian Democratic Union* (CDU) and the *Christian Social Union* (CSU) in Germany. The two parties are legally independent and compete in elections, whereas only the CSU runs candidates in Bavaria. However, these two parties have formed a single parliamentary group after each postwar German election.

Quantiles	CHES match	ParlGov match
0%	11.4	11.4
10%	54.6	65.4
25%	87.7	81.9
50%	98.4	95.8
75%	99.9	99.2
100%	100.0	100.0

Table 2 – Summary of ESS party coverage by CHES and ParlGov based on raw Party Facts links. Quantiles for covered shares of *party-voted-for* ESS observations at the country level per ESS round presented.

In the ESS, respondents can select the alliance of CDU/CSU as the party they voted for in the last national election. However, CHES experts code the party positions on key policy dimensions separately for the CDU and CSU. This results in a nonmatch for over 5600 entries when linking the data of the ESS and CHES datasets. Correcting for this nonmatch requires manual harmonization of the different alliance members.

Another reason for nonmatches is the difference in the definition of a new party. The ESS and Party Facts define the Christian People's Party (CVP) and the Christian Democratic and Flemish (CD&V) in Belgium as two entities. In the CHES dataset, the CVP and the CD&V are recorded as one observation over the entire period. Due to the structure of the Party Facts linking table, the CHES observation can only be linked directly to either the CVP or CD&V through Party Facts, which distorts the linkages correspondingly with the ESS. This results in a nonmatch for the CVP and a loss in information for approximately 250 respondents in the ESS in 2002. Some manual harmonization and supplementary information can address the issues and further improve the linking of different data sources.

## Expert survey validation

Our assessment of the Party Facts linking performance has demonstrated that most of the parties in our two examples (CHES and ParlGov) can be directly linked via Party Facts. Now we provide two brief applications for the linking of these datasets. In our first example, we combined the ESS survey rounds with the CHES trend file. CHES is an example of a valuable data source that can enrich information from the ESS. It

includes information about party positions on key policy dimensions, such as economic, social, and cultural dimensions, based on expert assessments. Six rounds of the CHES have been conducted since 1999 for European democracies.

Validating party positions based on ESS voters' left-right self-placements with CHES party positions is a straightforward application of the two datasets. For the ESS rounds, we calculated the left-right positions of parties based on the left-right self-placement of those respondents who reported voting for the party in the last election. We combined this information with CHES left-right positions by combining the two sources through Party Facts party IDs and by adding a year variable that links an ESS round to the previous CHES survey.

Table 3 provides a summary of the country-year correlations between left-right party positions based on ESS voter self-placements and CHES expert assessments of party positions. A correlation coefficient is calculated for each country and each ESS round with at least 3 parties and a minimum of 10 respondents to calculate the ESS left-right party positions. The results demonstrate that the left-right party positions from ESS self-placements and CHES expert assessments correlate strongly. Approximately 90% of the country-year ESS round correlations have a correlation coefficient of approximately 0.8 or higher. Section 4.3 of the Online Appendix provides further country-level details for the results.

## Party-voted-for in government

For our second example, we draw on a line of work on citizens' attitudes toward democracy that investigates the *loser's consent* (Anderson, 2005). In a democracy, it is important that those who lose an election, citizens and elites, accept the outcome of the election. Studies of the loser's consent have looked at the satisfaction with democracy by those who lose elections. Among citizens, these are voters who voted for a party that did not become part of the government after the election. Andersson et al. have shown that opposition party voters are less satisfied with democracy than the voters of political parties that became government members after the election.

Creating a combined dataset for a study of the loser's consent on the basis of all ESS surveys is an interesting challenge. We need to add information about the government status of a party after the last election at the time of the ESS interview. This is an example of a complex linking procedure where we cannot directly add information based on party IDs or party-year IDs only. For each interview date in a country, we need to determine which parties went into government after the most recent election before the interview and need to add this information to the ESS survey data.

ESS year	0%	10%	25%	50%	75%	100%
2002	0.82	0.87	0.94	0.95	0.99	1.00
2004	0.77	0.83	0.87	0.91	0.99	1.00
2006	0.63	0.86	0.89	0.93	0.98	1.00
2008	-0.35	0.79	0.90	0.94	0.98	1.00
2010	0.45	0.78	0.91	0.96	0.97	0.99
2012	0.55	0.76	0.92	0.96	0.99	1.00
2014	0.73	0.83	0.88	0.91	0.95	0.98
2016	0.77	0.87	0.90	0.92	0.95	1.00
2018	0.26	0.81	0.90	0.93	0.98	1.00
2020	0.35	0.56	0.82	0.93	0.98	0.99

Table 3 – Country-year validation of left-right self-placement by ESS respondents for *party-voted-for* (Rounds 1–10) with left-right positions from CHES (2002–2019). Quantiles (0%, 10%, 25%, 50%, 75%, and 100% level) of country-year correlation coefficients for each ESS Round presented.

For the ESS rounds, we can add this information from the ParlGov dataset (Döring, 2016). ParlGov has provided information on parties, elections, and cabinets for European democracies since 1900, including the party composition of cabinets. Therefore, we can determine the first cabinet after an election, excluding caretaker cabinets, and can link this information to the ESS via Party Facts. Doing so requires a significant amount of nontrivial data programming to transform the ParlGov, ESS and Party Facts datasets into a format that can be combined into a single source.

We prepared a simplified version of the classical Anderson et al. (2005) model based on ESS rounds 1-10 and ParlGov. For the model, we chose left-right self-placement, education, age (all centered), gender, and *party-voted-for* from the ESS surveys. We added the government–opposition status for the first regular cabinet after the last election at the date the interview was conducted based on ParlGov cabinet information. Details about the model, summary statistics and alternative specifications are provided in Section 5 of the Online Appendix.

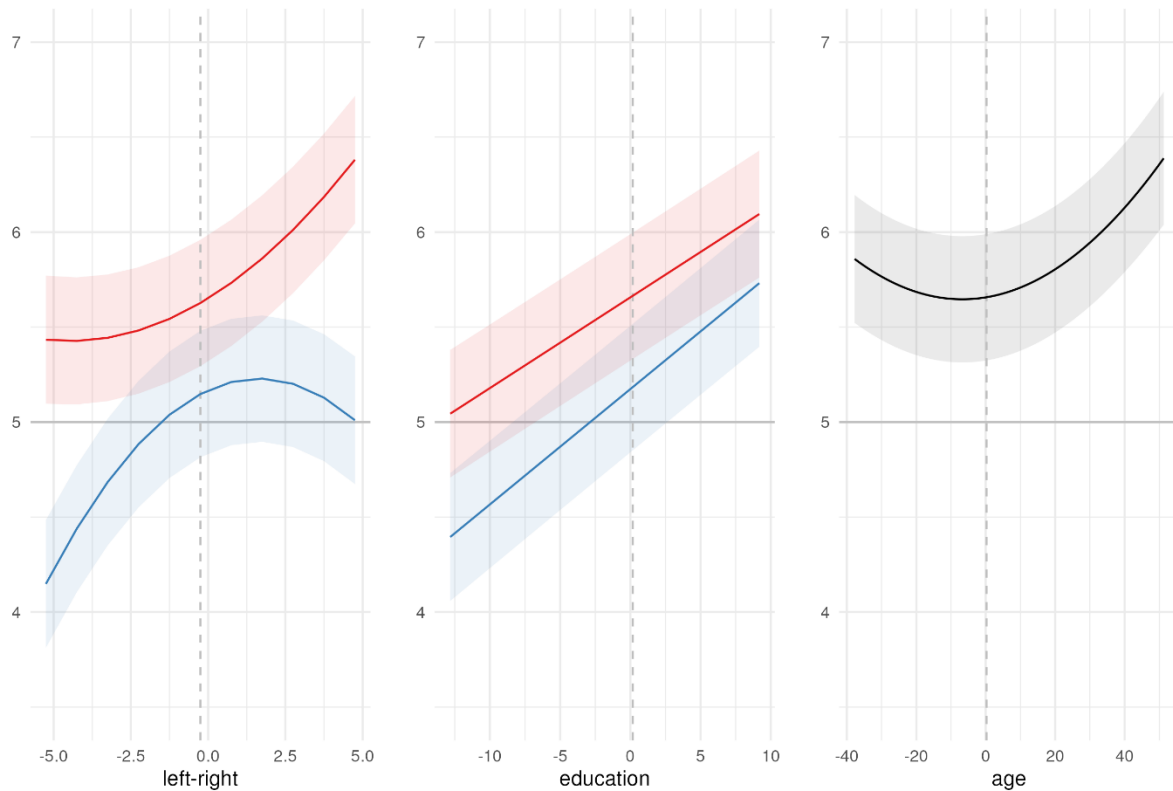


Figure 2 — Multilevel model of satisfaction with democracy by government (red, upper line) and opposition (blue, lower line) voters (centered ESS variables: left-right, education, age). ESS Rounds 1–10 and government–opposition status from ParlGov.

We used a multilevel model where countries are nested within ESS rounds. The results of the model showed that losers are indeed less satisfied with democracy than those respondents who voted for government parties. Figure 2 visualizes the results of the model and shows, for example, that this effect varies across left-right self-placement. Opposition voters are less satisfied with democracy than government voters. More-left-leaning opposition voters are particularly dissatisfied compared to moderate and right-leaning opposition voters. Satisfaction with democracy increases with the level of education, but government voters are more satisfied with democracy than opposition voters.

The findings of our simple model are in line with the results of empirical studies of the loser’s consent. We keep the model as an illustration of building a dataset and a simple multilevel model by combining the ESS and a second source in a nontrivial way.

## Summary

“Mapping is by far the most important – and the most work-intensive – step of our data processing effort” (Denis Cohen, Werner Krause, and Tarik Abou-Chadi 2023, A-3); this quote is the summary of a recent study of vote switching based on 254 national postelection surveys. A similar strong conclusion can be made for working with party information from the ESS, which is important but very work intensive.

In this research note, we have demonstrated that Party Facts makes linking political party information with other datasets significantly easier. In the ESS, party IDs differ within and between ESS rounds. Party Facts provides a harmonization of all those different ESS party IDs. We have recently updated this information to include the latest ESS Round 10 so that all ESS rounds are covered by Party Facts. Here, we have demonstrated how the complex ESS party ID structure can be combined with other sources. We have provided two examples by linking the ESS parties to CHES and ParlGov. The example of linking the ESS to ParlGov demonstrates a more challenging linking example. It shows how to combine the ESS party a respondent voted for with information on the cabinet status of that party. For this linking, we take into account the interview date and the first cabinet that formed after the preceding election.

Our examples and assessment demonstrate that most parties can be combined via Party Facts with other sources. However, our examples also demonstrate that electoral alliances, party changes and smaller parties can be challenging to track when using Party Facts and demand manual harmonization to improve the linking of different data sources. Overall, our note demonstrates that social scientists should make more effort to coherently identify and technically record key units of analysis. In our view, social science datasets should include unique identifiers that allow entities to be linked across datasets. It may be worthwhile for social scientists to use broader linked data environments such as WikiData to include unique identifiers for entities (Erxleben et al., 2014). Political parties are a particularly prominent example of complex data linking in political science research. Identifying, harmonizing, and structuring party information from existing data sources globally remains a challenge to be tackled for the next years, particularly for smaller, regional, and historical party information used in social science research.

## References

- Anderson, C. (Ed.), 2005. *Losers' consent: Elections and democratic legitimacy*. Oxford University Press, Oxford.
- Barnea, S., Rahat, G., 2011. Out with the old, in with the 'new': What constitutes a new party? *Party Politics* 17, 303–320. <https://doi.org/10.1177/1354068810369148>
- Denis Cohen, Werner Krause, Tarik Abou-Chadi, 2023. Comparative vote switching: A new framework for studying dynamic multi-party competition. *The Journal of Politics* forthcoming.
- Döring, H., 2016. Mapping established democracies: Integrated data on parties, elections and cabinets. *Electoral Studies* 44, 535–543. <https://doi.org/10.1016/j.electstud.2016.07.002>
- Döring, H., Regel, S., 2019. Party Facts: A database of political parties worldwide. *Party Politics* 25, 97–109. <https://doi.org/10.1177/1354068818820671>
- Erxleben, F., Günther, M., Krötzsch, M., Mendez, J., Vrandečić, D., 2014. Introducing Wikidata to the Linked Data Web, in: Mika, P., Tudorache, T., Bernstein, A., Welty, C., Knoblock, C., Vrandečić, D., Groth, P., Noy, N., Janowicz, K., Goble, C. (Eds.), *The Semantic Web – ISWC 2014, Lecture Notes in Computer Science*. Springer International Publishing, Cham, pp. 50–65. [https://doi.org/10.1007/978-3-319-11964-9\\_4](https://doi.org/10.1007/978-3-319-11964-9_4)
- European Social Survey, 2020. ESS Round 10: European Social Survey Round 10 Data (2020). Data file edition 3.0. Sikt - Norwegian Agency for Shared Services in Education and Research, Norway – Data Archive and distributor of ESS data for ESS ERIC. <https://doi.org/10.21338/NSD-ESS10-2020>
- Jolly, S., Bakker, R., Hooghe, L., Marks, G., Polk, J., Rovny, J., Steenbergen, M., Vachudova, M.A., 2022. Chapel Hill Expert Survey trend file, 1999–2019. *Electoral Studies* 75, 102420. <https://doi.org/10.1016/j.electstud.2021.102420>
- Lehmann, P., Franzmann, S., Burst, T., Matthieß, T., Regel, S., Riethmüller, F., Volkens, A., Weßels, B., Zehnter, L., Wissenschaftszentrum Berlin Für Sozialforschung (WZB), Institut für Demokratieforschung Göttingen (IfDem), 2023. Manifesto Project Dataset. <https://doi.org/10.25522/MANIFESTO.MPDS.2023A>
- Staffan I. Lindberg, Nils Düpont, Masaaki Higashijima, Yaman Berker Kavasoglu, Kyle L. Marquardt, Michael Bernhard, Holger Döring, Allen Hicken, Melis Laebens, Anja Neundorf, Saskia Ruth, Keith R. Weghorst, Nina Wiesehomeier, Joseph Wright, Ora John Reuter, Nazifa Alizada, Paul Bederke, Lisa Gastaldi, Sandra Grahn, Garry Hindle, Nina Ilchenko, Johannes von Römer, Daniel Pemstein, Brigitte Seim, 2022. Varieties of party identity and organisation (V–Party) dataset V2. <https://doi.org/10.23696/vpartydsv2>
- The Comparative Study of Electoral Systems, 2022. CSES Module 5 Advance Release 4. <https://doi.org/10.7804/CSES.MODULE5.2022-03-01>

# **ESS party linking**

Holger Döring and Paul Bederke

2023-08-28



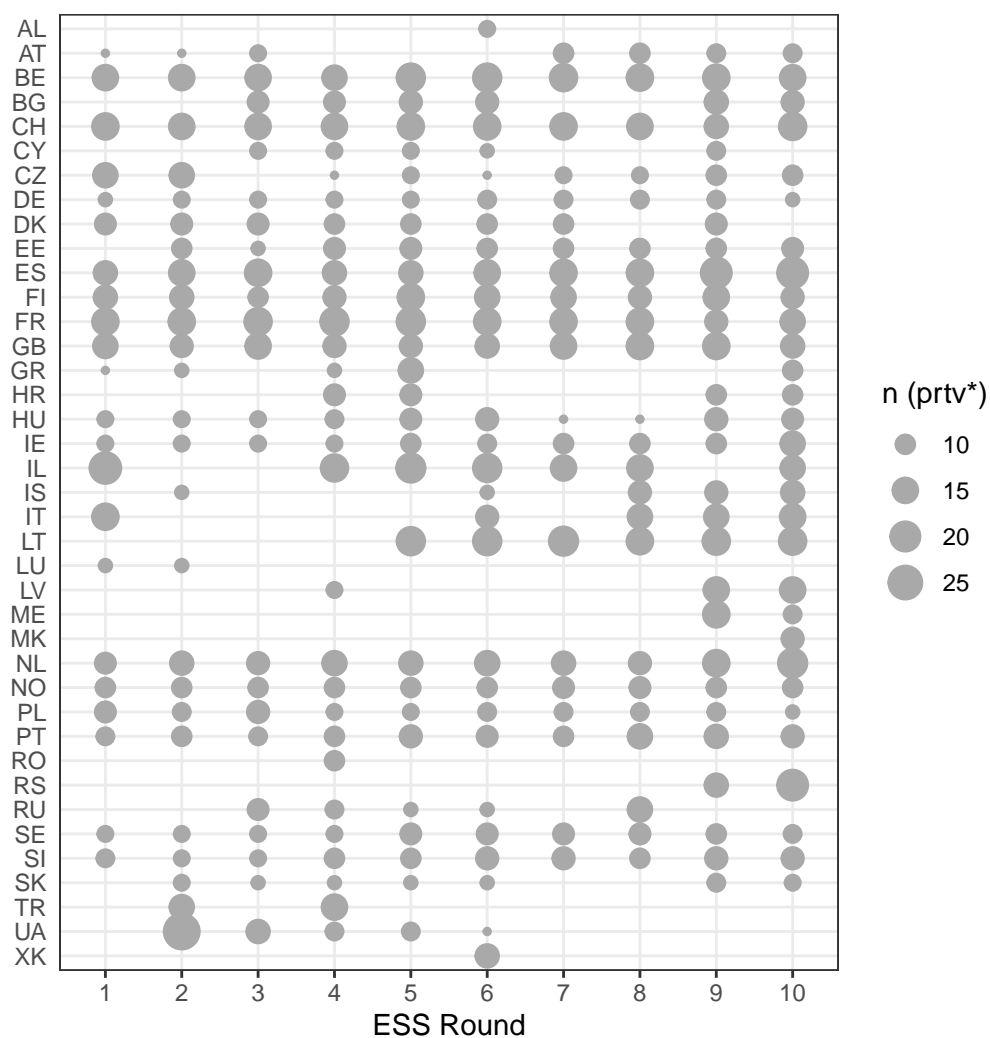
# Table of contents

<b>ESS party linking</b>	<b>3</b>
<b>1 ESS data sources</b>	<b>4</b>
1.1 ESS data sources . . . . .	4
1.2 ESS rounds . . . . .	5
1.3 Countries . . . . .	5
<b>2 prt* party variables</b>	<b>7</b>
2.1 prt* variables . . . . .	7
2.2 ESS-9 example . . . . .	7
2.3 prt* ID differences . . . . .	8
2.4 prt*/prtc ID differences . . . . .	9
<b>3 Party Facts harmonization</b>	<b>10</b>
3.1 ESS party IDs . . . . .	10
3.2 Parties per country . . . . .	10
<b>4 CHES left-right validation</b>	<b>12</b>
4.1 CHES information . . . . .	12
4.2 CHES and ESS . . . . .	12
4.3 Country-year correlation . . . . .	13
4.4 Share covered . . . . .	15
<b>5 ParlGov losers' consent</b>	<b>17</b>
5.1 Losers' consent models . . . . .	17
5.2 Variables . . . . .	17
5.3 Summary statistics . . . . .	18
5.4 Multi-level models (ML) . . . . .	19
5.4.1 Three ML models . . . . .	19
5.4.2 Effects plot ML-1 . . . . .	21
5.5 Linear effects (ML) . . . . .	22
5.6 Fixed effects model . . . . .	24
5.7 Share covered . . . . .	25

# ESS party linking

Code and supplementary information for: Paul Bederke and Holger Döring. 2023. “Harmonizing and Linking Party Information: The ESS as an Example of Complex Data Linking.”

*Note* — pdf-version of notebook, see also html-version with Tidyverse-R code used to create content



# 1 ESS data sources

Information on ESS data sources used – see also section “ESS party data structure” in manuscript.

## 1.1 ESS data sources

ESS data sets from [europeansocialsurvey.org/data](https://europeansocialsurvey.org/data)

DOI references

- ESS Round 1 – [https://doi.org/10.21338/ess1e06\\_6](https://doi.org/10.21338/ess1e06_6)
- ESS Round 2 – [https://doi.org/10.21338/ess2e03\\_6](https://doi.org/10.21338/ess2e03_6)
- ESS Round 3 – [https://doi.org/10.21338/ess3e03\\_7](https://doi.org/10.21338/ess3e03_7)
- ESS Round 4 – [https://doi.org/10.21338/ess4e04\\_5](https://doi.org/10.21338/ess4e04_5)
- ESS Round 5 – [https://doi.org/10.21338/ess5e03\\_4](https://doi.org/10.21338/ess5e03_4)
- ESS Round 6 – [https://doi.org/10.18712/ess6e02\\_5](https://doi.org/10.18712/ess6e02_5)
- ESS Round 7 – [https://doi.org/10.21338/ess7e02\\_2](https://doi.org/10.21338/ess7e02_2)
- ESS Round 8 – [https://doi.org/10.21338/ess8e02\\_2](https://doi.org/10.21338/ess8e02_2)
- ESS Round 9 – [https://doi.org/10.21338/ess9e03\\_1](https://doi.org/10.21338/ess9e03_1)
- ESS Round 10 – [https://doi.org/10.21338/ess10e03\\_1](https://doi.org/10.21338/ess10e03_1)
- ESS Round 10 – [https://doi.org/10.21338/ess10sce03\\_0](https://doi.org/10.21338/ess10sce03_0) (self-completion)

Data files are imported into R with [readstata13](#)

Round	ESS_file	hash
1	ESS1e06_6.dta	c61f508eb0f5b60e038be2d5793a9f4d
2	ESS2e03_6.dta	1ddea926b393d16417856e1135b29d67
3	ESS3e03_7.dta	f3922c40bf5f37d0d5f1f1553a180898
4	ESS4e04_5.dta	f9455c929ace50fd3ab71a9ec9fd51a4
5	ESS5e03_4.dta	88c340e6a63d88bd7b1e42a2ded830de
6	ESS6e02_5.dta	eb508dfaec9f896851db7cc0de1cc1e9
7	ESS7e02_2.dta	0d413a5724618ff7ec373a48edbf5f0e
8	ESS8e02_2.dta	b1ab85d0a22aa17306e908095269e4dd
9	ESS9e03_1.dta	536f541f23064fd0b46ed7fd8b1e932a
10	ESS10.dta	533b89b4ebda6f58d5aef181b2c42c9b

Round	ESS_file	hash
10	ESS10SC.dta	975db0389d844e25aa669c3d2da4f7ac

*Note* — The ESS-10 is released with two data files, one for the standard face-to-face interviews and another file for countries with self-completion mode due to the COVID-19 restrictions.

## 1.2 ESS rounds

Summary of ESS rounds

- **n** – number of responses
- **n\_countries** – number of countries in ESS round
- **inw\_first** and **inw\_last** – first and last interview

essround	n	n_countries	inw_first	inw_last
1	42359	22	2002	2003
2	47537	25	2004	2006
3	43000	23	2006	2007
4	56752	29	2008	2010
5	52458	27	2010	2012
6	54673	29	2012	2013
7	40185	21	2014	2015
8	44387	23	2016	2017
9	49519	29	2018	2020
10	58810	30	2020	2022

## 1.3 Countries

essround	n	countries
1	22	AT, BE, CH, CZ, DE, DK, ES, FI, FR, GB, GR, HU, IE, IL, IT, LU, NL, NO, PL, PT, SE, SI
2	25	AT, BE, CH, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, LU, NL, NO, PL, PT, SE, SI, SK, TR, UA
3	23	AT, BE, BG, CH, CY, DE, DK, EE, ES, FI, FR, GB, HU, IE, NL, NO, PL, PT, RU, SE, SI, SK, UA
4	29	BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IL, LV, NL, NO, PL, PT, RO, RU, SE, SI, SK, TR, UA

---

essround	n	countries
5	27	BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IL, LT, NL, NO, PL, PT, RU, SE, SI, SK, UA
6	29	AL, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, HU, IE, IL, IS, IT, LT, NL, NO, PL, PT, RU, SE, SI, SK, UA, XK
7	21	AT, BE, CH, CZ, DE, DK, EE, ES, FI, FR, GB, HU, IE, IL, LT, NL, NO, PL, PT, SE, SI
8	23	AT, BE, CH, CZ, DE, EE, ES, FI, FR, GB, HU, IE, IL, IS, IT, LT, NL, NO, PL, PT, RU, SE, SI
9	29	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, HR, HU, IE, IS, IT, LT, LV, ME, NL, NO, PL, PT, RS, SE, SI, SK
10	30	AT, BE, BG, CH, CZ, DE, EE, ES, FI, FR, GB, GR, HR, HU, IE, IL, IS, IT, LT, LV, ME, MK, NL, NO, PL, PT, RS, SE, SI, SK

---

## 2 prt\* party variables

Information on ESS party IDs from “party-voted-for” (prtc\*) and “party-close-to” (prtc\*) questions – see also section “ESS party data structure” in manuscript.

### 2.1 prt\* variables

All ESS rounds include two types of survey questions with party information.

- **prtv\*** — “Party voted for in last national election, [country]?”
- **prtc\*** — “Which party feel closer to, [country]?”

essround	n	n_countries	n_prtv	n_prtc
1	42359	22	251	248
2	47537	25	281	274
3	43000	23	248	251
4	56752	29	309	296
5	52458	27	321	302
6	54673	29	331	331
7	40185	21	258	252
8	44387	23	283	271
9	49519	29	363	374
10	58810	30	380	390

### 2.2 ESS-9 example

We use the ESS-9 integrated file to describe the structure of the *prt\** variables in ESS data files.

Each ESS round uses country level variables for the **prt\*** variables (e.g. *prtvcat* — party-voted-for Austria ESS-9).

These **prt\*** variables include the following elements:

- starting with **prt**

- indicating the type of *pvt* variable
  - **v** — “party-voted-for”
  - **c** — “party-close-to”
- two character **country** code
- electoral tier number for Germany and Lithuania (*pvt\** only)

ESS-9 **pvt\*** variables by country

Examples for the first four countries in ESS-9

cntry	n	variables
AT	2	prtclcat, prtvtcat
BE	2	prtcldbe, prtvtdbe
BG	2	prtcldbg, prtvtdbg
CH	2	prtclgch, prtvtgch
CY	2	prtclbcy, prtvtbcy

Germany and Lithuania include multiple *pvt\** variables asking for voting decisions in each electoral tier. These variables include a number for the tier in the variable name.

We use the national tier (“*prtvede2*”, “*prtvblt1*”) as the primary “party-voted-for” variable.

cntry	variable
DE	prtvede1
DE	prtvede2
LT	prtvblt1
LT	prtvblt2
LT	prtvblt3

## 2.3 *pvt\** ID differences

ESS may use different IDs across ESS rounds

e.g. Netherlands *pvt\** rounds 1–10

essround	id_4	id_5	id_6
1	List Pim Fortuyn	Democrats '66	Green Left
2	List Pim Fortuyn	Democrats '66	Green Left
3	List Pim Fortuyn	Democrats '66	Green Left

essround	id_4	id_5	id_6
	4	List Pim Fortuyn	Democrats '66
	5	Christian Democratic Appeal	Green Left
	6	Christian Democratic Appeal	Democrats '66
	7	Socialist Party	Democrats '66
	8	Socialist Party	Christian Democratic Appeal
	9	Socialist Party	Christian Democratic Appeal
	10	Socialist Party	Christian Democratic Appeal

## 2.4 prt看\*/prt看\* ID differences

ESS party IDs may differ between the *prt看\** and *prt看\** variables.

Examples from six countries in ESS-9

cntry	essround	party_id	prt看_party	prt看_party
BG	9	2	Balgarska sotsialisticheska partiya (BSP)	Dvizhenie za prava i svobodi (DPS)
FI	9	10	Green League	Independence Party
LT	9	2	Homeland Union - Lithuanian Christian Democrats (TS-LKD)	Lithuanian Peasant and Greens Union (LVZS)
PL	9	3	Nowoczesna	Platforma Obywatelska
PT	9	17	Votou em branco/ nulo	CDS-PP
SK	9	5	LS Naše Slovensko	Christian Democratic Movement (KDH)



## 3 Party Facts harmonization

Information on Party Facts ESS party IDs harmonization – see also sections “Linking data sets with Party Facts” and “ESS party data structure” in manuscript.

### 3.1 ESS party IDs

Party Facts (PF) harmonizes ESS party IDs by creating a unique ESS party id (*“first\_ess\_id”*) for all ESS rounds. — see [PF GitHub](#) // *essprtv*

pvt_variable	n_ess_parties	n_harmonized
pvtv	3304	961
pvtc	2979	864

### 3.2 Parties per country

Number of ESS party IDs and harmonized IDs in ESS rounds by country (*pvtv* and *pvtc*)

cntry	n_essrounds	n_ess_parties	n_harmonized
AL	1	17	17
AT	7	114	26
BE	10	305	48
BG	6	149	74
CH	10	302	55
CY	5	77	21
CZ	9	169	44
DE	10	245	31
DK	8	167	26
EE	9	172	45
ES	10	307	77
FI	10	258	48
FR	10	303	61
GB	10	274	42

centry	n_essrounds	n_ess_parties	n_harmonized
GR	5	86	41
HR	4	101	52
HU	10	197	53
IE	10	185	37
IL	7	234	80
IS	5	97	36
IT	5	141	84
LT	6	412	151
LU	2	28	14
LV	3	74	43
ME	2	55	37
MK	1	26	26
NL	10	269	49
NO	10	202	24
PL	10	197	65
PT	10	208	51
RO	1	19	19
RS	2	80	60
RU	5	107	50
SE	10	189	23
SI	10	202	38
SK	7	106	34
TR	2	55	38
UA	5	128	79
XK	1	26	26

## 4 CHES left-right validation

ESS linking example – see also sections “Expert survey validation” and “Performance of Party Facts linking” in manuscript.

### 4.1 CHES information

[Chapel Hill Expert Survey](#) (CHES) series

year	countries	parties
1999	14	142
2002	23	171
2006	24	188
2010	24	203
2014	28	245
2019	28	247

### 4.2 CHES and ESS

Number of countries and parties that are included in ESS and CHES for an ESS round.

essround	year	countries_n	parties_n	ches_year	ches_parties_n
1	2002	18	196	2002	131
2	2004	18	190	2002	128
3	2006	18	191	2006	132
4	2008	21	215	2006	143
5	2010	20	241	2010	157
6	2012	20	239	2010	151
7	2014	18	216	2014	138
8	2016	18	216	2014	133
9	2018	24	299	2014	184
10	2020	23	284	2019	169

Overview country coverage ESS and CHES trend file

- **ess\_cntry** — number of countries in ESS round
- **ches\_cntry** — number of ESS round countries in CHES
- **ches\_missing** — names of ESS round countries not in CHES

essround	ess_cntry	ches_cntry	ches_missing
1	22	18	CH, IL, LU, NO
2	25	18	CH, EE, IS, LU, NO, TR, UA
3	23	18	CH, CY, NO, RU, UA
4	29	21	CH, CY, HR, IL, NO, RU, TR, UA
5	27	20	CH, CY, HR, IL, NO, RU, UA
6	29	20	AL, CH, CY, IL, IS, NO, RU, UA, XK
7	21	18	CH, IL, NO
8	23	18	CH, IL, IS, NO, RU
9	29	24	CH, IS, ME, NO, RS
10	30	23	CH, IL, IS, ME, MK, NO, RS

### 4.3 Country-year correlation

Country-year correlations for ESS and CHES left-right positions in each ESS round with at least 3 parties and 10 responses per party in a country.

ESS left-right party positions are calculated as mean values of **lrscale** variables for respondents that voted for the party (**prtv\***).

- **lrscale** — self-placement on left right scale // ESS rounds
  - **prtv\*** — “party-voted-for” in last national election // ESS rounds
  - **ches\_lr** — left-right party position // CHES trend file
- **lrgen** — “position of the party in YEAR in terms of its overall ideological stance.”  
// CHES trendfile

The table summarizes the country-year correlations by providing 0%, 10%, 25%, 50%, 75%, and 100% quantiles. The results are visualized in Figure 4.1.

ess_year	p0	p10	p25	p50	p75	p100
2002	0.82	0.87	0.94	0.95	0.99	1.00
2004	0.77	0.83	0.87	0.91	0.99	1.00
2006	0.63	0.86	0.89	0.93	0.98	1.00
2008	-0.35	0.79	0.90	0.94	0.98	1.00

ess_year	p0	p10	p25	p50	p75	p100
2010	0.45	0.78	0.91	0.96	0.97	0.99
2012	0.55	0.76	0.92	0.96	0.99	1.00
2014	0.73	0.83	0.88	0.91	0.95	0.98
2016	0.77	0.87	0.90	0.92	0.95	1.00
2018	0.26	0.81	0.90	0.93	0.98	1.00
2020	0.35	0.56	0.82	0.93	0.98	0.99

Lowest country-year correlation (-0.35) for ESS Romania 2008.

cntry	year	prtv	prtv_party	lr_n	lr_mean	ches_year	ches_lr
RO	2008	RO-4-1-v	PD-L	517	6.95	2006	NA
RO	2008	RO-4-12-v	Other: PIN	14	5.25	2006	NA
RO	2008	RO-4-2-v	Alianta PSD-PC	449	3.52	2006	NA
RO	2008	RO-4-3-v	PNL	165	7.06	2006	6.7
RO	2008	RO-4-4-v	PRM	31	4.54	2006	7.0
RO	2008	RO-4-5-v	UDMR	67	5.94	2006	6.0
RO	2008	RO-4-6-v	PNG-CD	15	6.75	2006	NA
RO	2008	RO-4-9-v	PNTCD	32	5.62	2006	NA

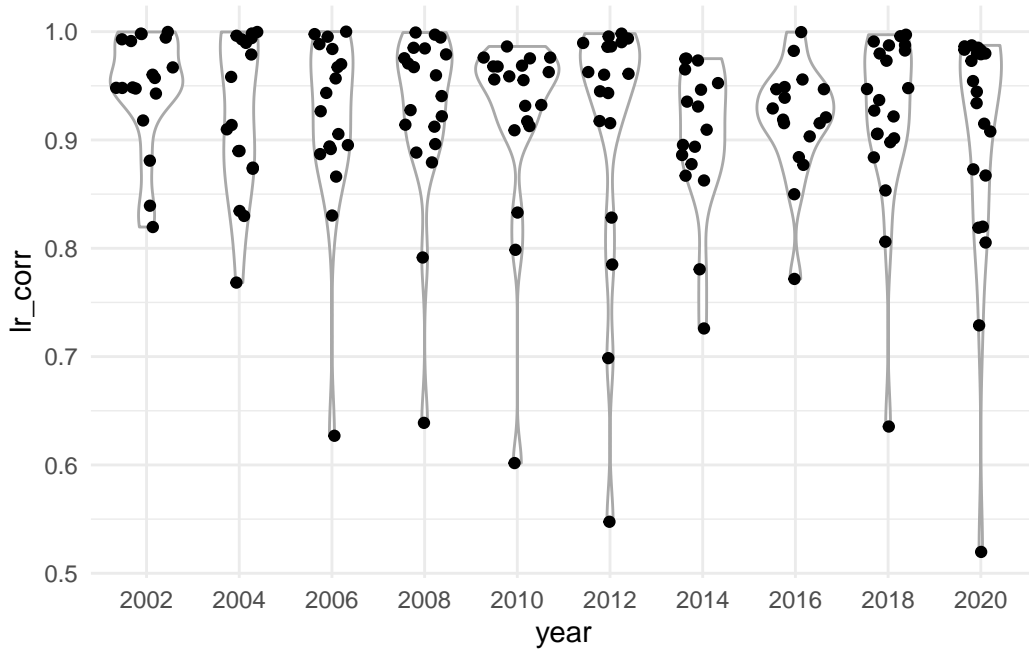


Figure 4.1: Violin plot for country wise correlations ( < 0.5 removed)

## 4.4 Share covered

We calculate the share of matches for the “party-voted-for” (*prtv*) question. Excluded from the calculation are instances of *other*, *independent*, and *technical* (see [Party Facts codebook](#)).

The table summarizes the share of party matches across all countries and ESS rounds.

quantile	share_match
0%	11.4
10%	54.6
25%	87.7
50%	98.4
75%	99.9
100%	100.0

The share of matched parties is weighted by the number of “party-voted-for” responses and is calculated for each country in every ESS round.

The next table summarizes the country level share of party matches for ESS rounds with data set matches.

cntry	min	median	max	ess_rounds
HR	11.4	28.8	46.1	2
HU	13.8	48.3	99.3	10
RO	20.4	20.4	20.4	1
BG	34.0	61.5	99.1	6
BE	44.0	92.7	97.7	10
PL	45.8	93.1	99.5	10
LV	50.6	53.9	93.1	3
DE	51.0	56.8	71.1	10
PT	57.9	98.4	99.9	10
FR	66.8	87.8	93.8	10
LT	71.9	93.2	97.0	6
EE	75.3	99.4	99.9	8
CZ	76.3	100.0	100.0	9
IT	76.7	94.1	95.8	5
ES	77.5	99.0	100.0	10
AT	90.8	96.6	100.0	7
SI	91.3	97.3	100.0	10
NL	92.1	99.7	100.0	10
GR	96.0	99.2	100.0	5
SK	97.2	100.0	100.0	7

centry	min	median	max	ess_rounds
GB	98.0	98.6	99.5	10
IE	98.3	99.8	100.0	10
FI	98.4	99.3	99.7	10
SE	100.0	100.0	100.0	10
DK	100.0	100.0	100.0	8
CY	100.0	100.0	100.0	1

## 5 ParlGov losers' consent

ESS linking example – see also sections “Party-voted-for in government” and “Performance of Party Facts linking” in manuscript.

### 5.1 Losers' consent models

Satisfaction with democracy by those that voted for parties in government vs. opposition. For a book length discussion and empirical assessment of European democracies see Anderson et.al. (2005) – esp. model page 104. A replication and extension to other regions is provided by Farrer and Zingher (2019, 525)

- Anderson, Christopher, ed. 2005. Losers' Consent: Elections and Democratic Legitimacy. Oxford; New York: Oxford University Press.
- Farrer, Benjamin, and Joshua N Zingher. 2019. “A Global Analysis of How Losing an Election Affects Voter Satisfaction with Democracy.” *International Political Science Review* 40(4): 518–34. — doi: [10.1093/poq/nfad003](https://doi.org/10.1093/poq/nfad003)

### 5.2 Variables

Variables used in **losers' consent** models and context information

- **stfdem** — How satisfied with the way democracy works in country?
  - 0 // Extremely dissatisfied — 10 // Extremely satisfied
- **cabinet** — “party-voted-for” (*prtv*) in government after election
  - ParlGov based calculation
  - excluding caretaker governments
- **lrscale** — Placement on left right scale
  - 0 // Left — 10 // Right
- **gndr** — Gender
- **agea** — Age of respondent, calculated



- **eduyrs** — Years of full-time education completed
- *ESS identifiers*
  - cntry — Country
  - essround — ESS round
  - pspwght — Post-stratification weight // see [ESS survey weights](#)
  - inw\_date — Date of interview // various ESS inw\* variables
- *Party information*
  - prtv — Party voted for in last national election // aggregated ESS IDs
  - prtv\_name — Party voted for in last national election // party name
  - first\_ess\_id — unique ESS party ID used in Party Facts

## 5.3 Summary statistics

Table 5.1: Data summary

Name	select(ess_lm, -idno)
Number of rows	433599
Number of columns	14
Column type frequency:	
character	3
Date	1
factor	4
numeric	6
Group variables	None

### Variable type: character

skim_variable	n_missing	complete_rate	min	max	empty	n_unique	whitespace
cntry	0	1.00	2	2	0	32	0
prtv	171780	0.60	8	14	0	2704	0
prtc	240202	0.45	8	10	0	2642	0

### Variable type: Date

skim_variable	n_missing	complete_rate	min	max	median	n_unique
inw_date	912	1.00	2002-01-14	2022-09-02	2011-06-03	4827

#### Variable type: factor

skim_variable	n_missing	complete_rate	ordered	n_unique	top_counts
gndr	331	1.00	FALSE	2	Fem: 231527, Mal: 201741, No : 0
prtv_party	171780	0.60	FALSE	888	Lab: 6580, Con: 6077, Chr: 5660, Soc: 4972
prtc_party	240202	0.45	FALSE	900	Lab: 4949, Con: 4578, Chr: 4290, Soc: 3484
cabinet	209306	0.52	FALSE	2	Yes: 121092, No: 103201

#### Variable type: numeric

skim_variable	n_missing	complete_rate	mean	sd	p0	p25	p50	p75	p100	hist
essround	0	1.00	5.39	2.80	1	3.0	5.00	8.00	10.00	
pspwght	0	1.00	1.01	0.52	0	0.7	0.93	1.18	6.85	
agea	2155	1.00	48.49	18.62	13	33.0	48.00	63.00	123.00	
eduyrs	5075	0.99	12.43	4.13	0	10.0	12.00	15.00	65.00	
lrscalc	55413	0.87	5.13	2.23	0	4.0	5.00	7.00	10.00	
stfdem	15516	0.96	5.28	2.51	0	4.0	5.00	7.00	10.00	

## 5.4 Multi-level models (ML)

Model variables preparation

- removing outliers *age* (99% quantile)
- selecting only variables used in models
- removing incomplete observations
- centering of continuous variables (*age*, *education*, *left-right*)

### 5.4.1 Three ML models

Multi-level models with quadric terms and interactions. Structure of models:

- Model 1 (ML-1) — ESS-Round/country and country
- Model 2 (ML-2) — ESS-Round and country

- Model 3 (ML-3) — country

Visualization of results in Figure 5.1 and Figure 5.2 – see variable information in Section 5.3

	ML-1	ML-2	ML-3
(Intercept)	5.782 (0.169)	5.790 (0.184)	5.775 (0.172)
gndrFemale	-0.182 (0.009)	-0.178 (0.010)	-0.179 (0.010)
cabinetNo	-0.637 (0.010)	-0.645 (0.010)	-0.640 (0.010)
eduyrs_c	0.048 (0.002)	0.045 (0.002)	0.048 (0.002)
poly(agea_c, 2)1	23.624 (3.151)	21.075 (3.192)	25.719 (3.189)
poly(agea_c, 2)2	30.470 (2.913)	30.403 (2.957)	31.438 (2.967)
poly(lrscale_c, 2)1	103.697 (3.333)	105.407 (3.204)	108.606 (3.208)
poly(lrscale_c, 2)2	35.905 (3.116)	39.358 (3.149)	40.284 (3.160)
cabinetNo × eduyrs_c	0.013 (0.003)	0.014 (0.003)	0.015 (0.003)
cabinetNo × poly(agea_c, 2)1	-4.329 (4.620)	-2.065 (4.675)	-3.641 (4.691)
cabinetNo × poly(agea_c, 2)2	13.465 (4.284)	14.204 (4.350)	13.904 (4.366)
cabinetNo × poly(lrscale_c, 2)1	-22.081 (4.862)	-23.826 (4.494)	-26.594 (4.496)
cabinetNo × poly(lrscale_c, 2)2	-108.724 (4.367)	-113.550 (4.397)	-113.758 (4.413)
SD (Intercept cntry)	0.931	0.965	0.970
SD (Observations)	2.106	2.142	2.150
SD (Intercept essround_cntrycntry)	0.500		
SD (Intercept essround)		0.219	
:—————:	—————:	—————:	—————:
Num.Obs.	205611	205611	205611
R2 Marg.	0.040	0.040	0.041
R2 Cond.	0.233	0.209	0.203
AIC	918254.1	924409.6	925869.4
BIC	918417.9	924573.3	926022.9
ICC	0.2	0.2	0.2

	ML-1	ML-2	ML-3
RMSE	2.13	2.16	2.17

Analysis of variance (ANOVA) models and refitting with Maximum Likelihood instead of Restricted Maximum Likelihood.

term	npar	AIC	BIC	logLik	deviance	statistic	df	p.value
ml1	16	918249.0	918412.7	-459108.5	918217.0	7617.436	1	0
ml2	16	924404.7	924568.4	-462186.3	924372.7	0.000	0	
ml3	15	925864.4	926017.9	-462917.2	925834.4			

## 5.4.2 Effects plot ML-1

Effects plot Multi-Level Model 1 (ML-1, see Section 5.4.1)

see Figure 5.1 and Figure 5.2

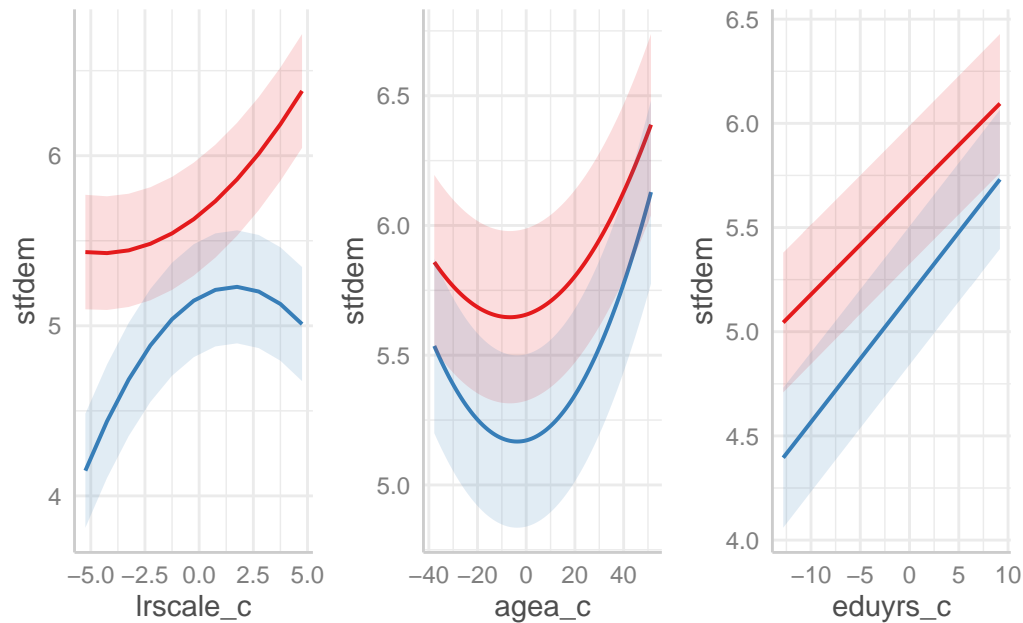


Figure 5.1: Effects plot (95% CIs) — Satisfaction with democracy

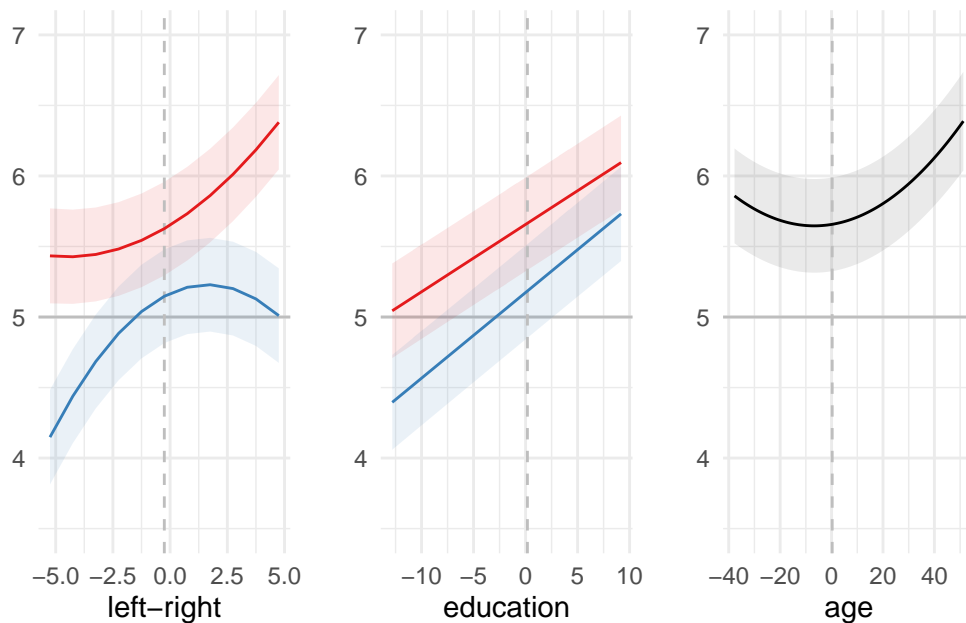


Figure 5.2: Effects plot (95% CIs) — Satisfaction with democracy // Article version

## 5.5 Linear effects (ML)

Multi-level model with linear terms and no interactions.

Visualization of results in Figure 5.3 (standardized coefficients) and Figure 5.4 (effects) – see variable information in Section 5.3

effect	group	term	estimate	std.error	statistic
fixed		(Intercept)	5.775	0.170	33.996
fixed		cabinetNo	-0.636	0.010	-64.341
fixed		gndrFemale	-0.178	0.009	-18.849
fixed		eduyrs_c	0.051	0.001	37.025
fixed		agea_c	0.002	0.000	6.679
fixed		lrscale_c	0.094	0.002	44.172
ran_pars	essround_centry:centry	sd__(Intercept)	0.503		
ran_pars	centry	sd__(Intercept)	0.934		
ran_pars	Residual	sd__Observation	2.112		

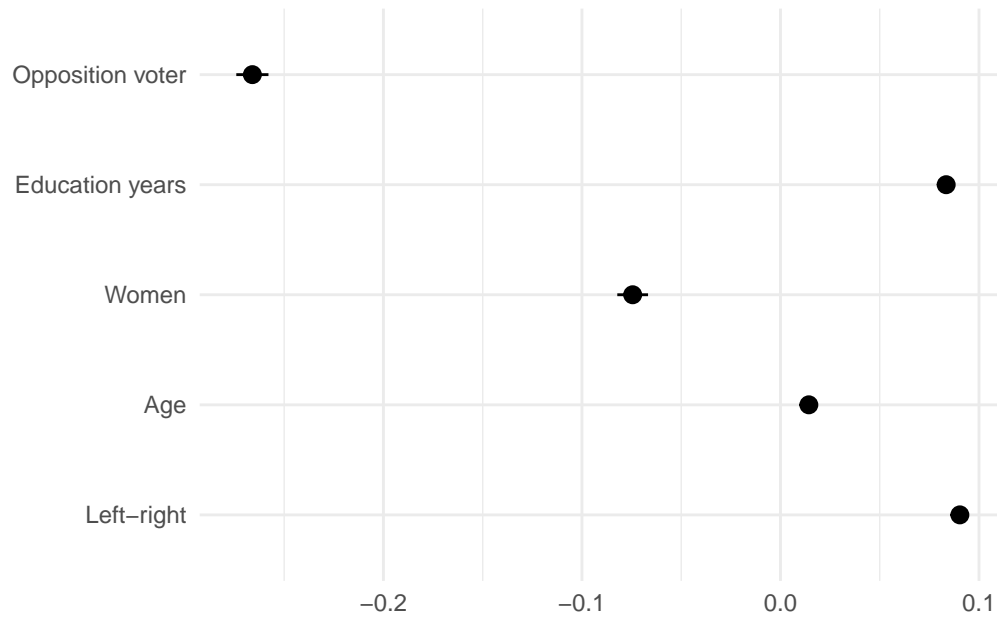


Figure 5.3: Standardized coefficients (95% CIs)– Linear effects model

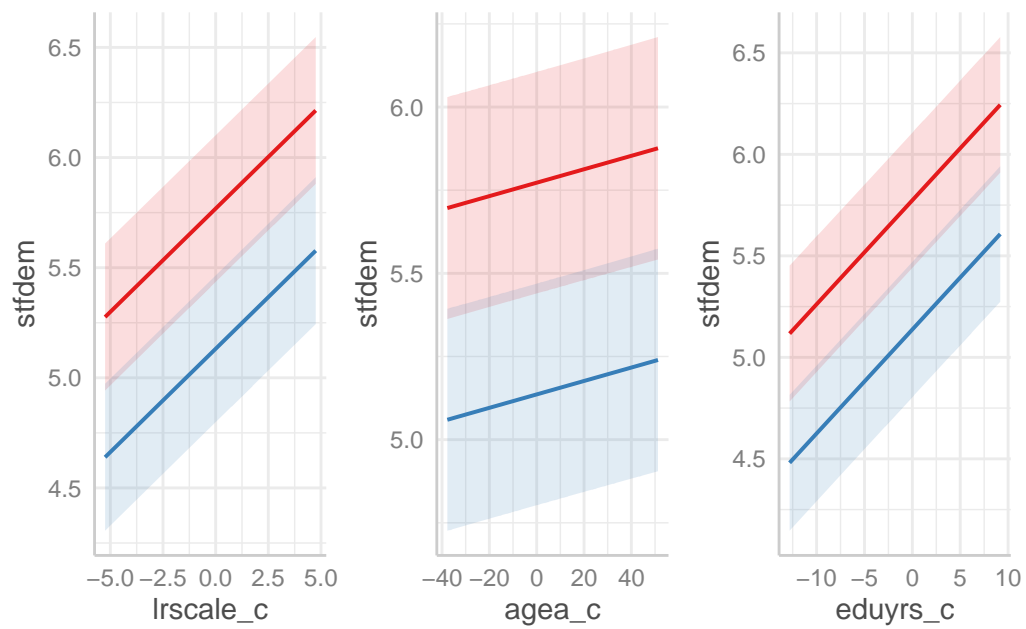


Figure 5.4: Linear effects plot (95% CIs) — Satisfaction with democracy

## 5.6 Fixed effects model

Fixed effects model with quadric terms and interactions.

Visualization of results in Figure 5.5 and variable information in Section 5.3

term	estimate	std.error	statistic	p.value	conf.low	conf.high
(Intercept)	6.407	0.037	173.718	0.000	6.335	6.479
gndrFemale	-0.178	0.011	-16.569	0.000	-0.199	-0.157
cabinetNo	-0.645	0.011	-58.835	0.000	-0.667	-0.624
eduyrs_c	0.045	0.002	21.591	0.000	0.041	0.050
agea_c	21.004	3.505	5.993	0.000	14.135	27.874
agea_c^2	30.381	3.306	9.190	0.000	23.901	36.860
lrscalc_c	105.418	3.903	27.011	0.000	97.769	113.068
lrscalc_c^2	39.400	4.134	9.531	0.000	31.297	47.502
cabinetNo:eduyrs_c	0.014	0.003	4.744	0.000	0.008	0.020
cabinetNo:agea_c	-2.033	5.236	-0.388	0.698	-12.295	8.229
cabinetNo:agea_c^2	14.216	4.958	2.867	0.004	4.499	23.933
cabinetNo:lrscalc_c	-23.832	5.585	-4.267	0.000	-34.779	-12.885
cabinetNo:lrscalc_c^2	-113.566	5.823	-19.502	0.000	-124.979	-102.153

Fixed effects for countries (“*cnty*”) and ESS rounds (“*essround*”) not shown.

r.squared	adj.r.squared	statistic	p.value	df.residual	nobs	se_type
0.18	0.18	756.54	0	205558	205611	HC2

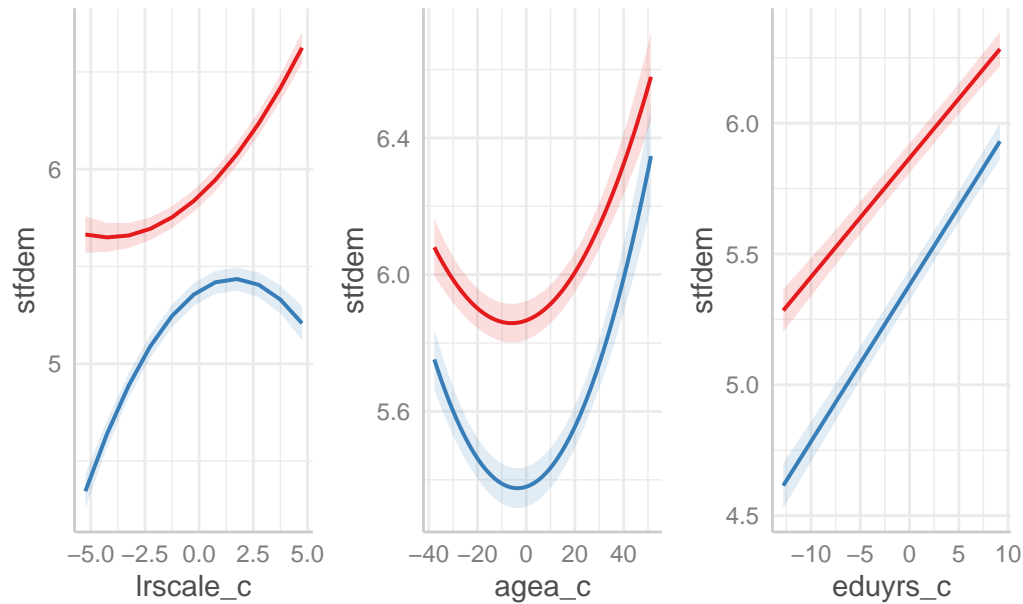


Figure 5.5: Fixed effects model (95% CIs) — Satisfaction with democracy

## 5.7 Share covered

We calculate the share of matches for the “party-voted-for” (*prtv*) question. Excluded from the calculation are instances of *other*, *independent*, and *technical* (see [Party Facts codebook](#)).

The table summarizes the share of party matches across all countries and ESS rounds.

quantile	share_match
0%	11.4
10%	65.4
25%	81.9
50%	95.8
75%	99.2
100%	100.0

The share of matched parties is weighted by the number of “party-voted-for” responses and is calculated for each country in every ESS round.

The next table summarizes the country level share of party matches for ESS rounds with data set matches.



cntry	min	median	max	ess_rounds
HR	11.4	73.0	100.0	4
HU	13.8	47.6	95.5	10
RO	18.0	18.0	18.0	1
BG	34.0	60.2	99.1	5
LV	37.1	68.6	100.0	2
PL	37.4	90.1	98.2	9
BE	46.8	80.1	92.0	10
PT	57.7	92.2	99.6	10
IL	58.7	71.8	78.7	6
FR	65.0	80.8	83.7	10
CH	74.3	91.0	99.9	10
CZ	74.3	100.0	100.0	9
TR	75.2	82.4	89.6	2
GB	76.5	81.9	90.8	10
IT	76.7	94.1	96.5	5
DE	77.5	89.2	92.4	9
EE	80.0	95.8	100.0	8
ES	80.1	98.3	99.7	9
LT	81.2	93.3	96.4	6
SI	85.9	95.8	100.0	10
AT	91.5	98.7	99.6	6
FI	91.8	93.0	94.5	10
NL	92.1	99.7	100.0	10
SK	94.7	100.0	100.0	7
GR	96.0	96.8	99.2	5
IS	96.0	98.7	100.0	5
NO	96.6	98.7	99.5	10
SE	96.7	99.8	100.0	9
IE	97.1	98.9	100.0	10
DK	97.6	98.8	99.4	8
CY	98.5	99.5	100.0	5
LU	99.1	99.6	100.0	2