



Gutenberg School of Management and Economics
& Research Unit “Interdisciplinary Public Policy”

Discussion Paper Series

***Electoral outcomes versus voters’
preferences: On the different tales
the data can tell***

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June 14, 2024

Discussion paper number 2412

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Highlights

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- The electoral success of a political party is not necessarily attributable to increased approval for that party.
- Similarly, a political party can lose elections despite gaining increased approval from the population.
- Such apparent paradoxes arise because the electoral method chosen can have a significant influence.
- A data analysis for political parties in Germany demonstrates the empirical relevance.

Electoral outcomes versus voters' preferences: On the different tales the data can tell

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Abstract

One of the primary goals of the social sciences is to understand the factors influencing fluctuations in support for political parties. However, the relationship between electoral outcomes and electorate preferences can be tenuous. The aggregation function's impact on translating voters' preferences into outcomes can vary significantly. Conversely, electoral outcomes may not accurately reflect how voters perceive winning or losing parties. Through an empirical case study, we examine short and long-term data. Our analysis reveals several key findings: Firstly, applying different electoral methods yields significantly divergent outcomes. Secondly, electoral trends do not necessarily align with voters' perceptions of the respective parties over time. Lastly, plurality-based methods can result in seat share gains for parties even in the face of declining support.

Keywords: Elections, Voting Schemes

JEL: D71

1. Introduction

Voting theory repeatedly emphasizes the significant influence that the selected electoral method can exert on electoral outcomes. It has been argued that electoral results may more faithfully reflect the design of a voting scheme than voters' preferences (Saari, 2000a, p. 3). We will henceforth refer to this phenomenon as the *arbitrariness result*. Recently, Brandt et al. (2022) demonstrated the ease with which manageable examples illustrating various voting anomalies can be generated. For instance, they provided an example of preferences over five alternatives involving only fourteen voters. Applying five different voting methods to the same preference profile reveals that each alternative is (s)elected once. The outcomes of elections are thus subject to arbitrariness, and ever since Arrow's groundbreaking impossibility theorem, it is generally known that this problem cannot be

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universally surmounted. Most recent empirical evidence for the variety of electoral outcomes that can emerge from different electoral methods is provided by [Lachat and Laslier \(2024\)](#).

While the *arbitrariness result* is widely acknowledged, a corollary of this finding seems to be less commonly recognized. Namely, if election outcomes are influenced by the amalgamation method, then one cannot infer preferences from an election outcome. Even if a party gains increasing support among the electorate, it can still lose the elections. Conversely, it is also true that a party can be successful in elections even as it experiences a significant loss of public backing.

However, in a significant portion of electoral research and public discourse, we observe that an electoral defeat is equated with a loss of trust and support from the voters. The corollary we have described seems to receive little consideration in many respects. The reader may think of the huge research that fathom the factors that contribute to the fall of social democratic parties across the globe (see, e.g. [Benedetto et al., 2020](#)). In a similar vein, scholars explain the reasons that lead to increased support for radical right parties which in turn is indicated by their electoral success.

One might argue that there is no empirical evidence for the corollary; that is, no evidence to suggest that a party's performance in elections becomes detached from voter preferences for that party. This research gap must be acknowledged. Nevertheless, our aim with this study is to address this gap and to provide empirical evidence that electoral outcomes and public support do not necessarily align. We also present evidence that a party's electoral successes occurred precisely when the public increasingly and predominantly distances itself from that party. Our empirical findings are based on the two just mentioned phenomena that are widely discussed in the literature: the decline of social democracy and the rise of populist extreme right-wing parties in elections.

While our contribution does not introduce novel theoretical insights per se, it elucidates an implication arising from the arbitrariness result in voting theory. The novelty of our contribution lies in providing empirical evidence for this corollary. We structure our empirical findings into three parts: Firstly, we illustrate how plurality-based and rank-order-based voting methods yield significantly divergent electoral results, drawing on data from the 2021 election year. Secondly, from a long-term perspective, we juxtapose electoral outcomes with a measure of public support, finding evidence of both variables drifting. Thirdly, we assess the degree to which parties gain or lose parliamentary seats despite stable or opposing public backing compared to their electoral successes or losses.

We contend that the contribution at hand holds relevance for a wide array of empirical research endeavours. Our findings underscore the necessity of accounting for the idiosyncrasies of the electoral method employed in each case when drawing inferences from election outcomes to voters' opinions.

We have structured our paper as follows: We begin by deriving our corollary in [Chapter 2](#). Our empirical investigation focuses on preference and election data from Germany, with a brief overview of institutional background provided in [Chapter 3](#). [Chapter 4](#) introduces the data used in our analysis and presents our initial empirical findings. Long-term assessments are detailed in [Chapter 5](#), with specific emphasis on the social democrats ([Chapter 5.2](#)) and a radical right party in [Chapter 5.3](#). Regression results supporting our corollary are

presented in Chapter 5.4. Finally, we conclude with Chapter 6.

2. Theoretical Background

Consider two elections within a proportional-representation system akin to Denmark’s, featuring a single nationwide district. The specific electoral system (mixed-member, single-district, or multiple districts) is inconsequential at this stage. It suffices to assume that voters are limited to selecting their top choice (plurality system, commonly used in proportional representation systems). The first election takes place at t_0 , followed by the second several years later at t_1 . Suppose a party, denoted as d , fails to secure a legislative seat in the t_0 election. Subsequently, in the t_1 election, the same party garners the highest number of seats in parliament, establishing itself as the dominant party. One might anticipate a significant increase in voter support for the party between the two elections.

Now, consider a scenario where the party that emerged with the most seats in the t_0 election withdraws from parliament following the subsequent election. One might infer that this party has experienced a substantial decline in public support. However, both conclusions could be misleading.

Election at t_0			Election at t_1		
Group 1	Group 2	Group 3	Group 1	Group 2	Group 3
34%	33.5%	32.5%	34%	33.5%	32.5%
a	b	c	d	b	c
d	d	d	a	c	b
c	c	b	c	a	a
b	a	a	b	d	d

Table 1: Voters’ preferences and electoral outcomes

Table 1 depicts the subject at hand. The electorate comprises three distinct voter groupings (all voters within a group have the same strict preferences). At t_0 , party d receives no parliamentary representation since no voter ranks d first. This outcome exemplifies the “More-preferred-less-seats paradox” (van Deemen, 1993). Party d is *more preferred* than, for instance, a because two-thirds of all voters consider d to be (strictly) superior to a , whereas only 34% (group 1) hold the opposite view. Notably, party d emerges victorious not only against party a but also against parties b and c in head-to-head match-ups. Party d is a Condorcet-winner party without parliamentary representation. The preceding case also illustrates “The Condorcet-winner-becomes-loser” conundrum (van Deemen, 1993).¹

¹ Scholars have coined a variety of terms to describe ‘voting anomalies’ or ‘voting paradoxes’ (van Deemen, 1993; Kurrild-Klitgaard, 2008, 2013, 2018; Kaminski, 2018; Brandt et al., 2022). Most of them are paraphrasing violations of Arrow’s seminal condition of the independence of irrelevant alternatives (IIA) (Arrow, 1963), or are subsets of IIA. Empirical evidence for such voting anomalies is provided by e.g. Dasgupta and Maskin (2004, 2008, 2020); Potthoff and Munger (2021); Keskin et al. (2022); Barbaro and Steiner (2023).

Let us narrate the evolution of party d with a somber yet regrettably realistic account: Following the disastrous election outcomes in t_0 , party d undergoes a strategic shift towards populist right-wing ideologies, capitalizing on misogynistic and xenophobic sentiments. This populism resonates with group-1 voters, often characterized as disgruntled older males, leading to a surge in their preferences for the party. However, the party's aggressive ideological pivot alienates the vast majority of voters from other groups. Consequently, while party d gains traction among group-1 voters, it experiences a substantial decline in rankings among all other voters. Once hailed as a Condorcet victor, party d now finds itself relegated to the status of a Condorcet loser. Despite this dramatic reversal in public support, the seat distribution fails to reflect the true sentiment. Contrary to expectations, the party emerges victorious as the largest parliamentary group.

To illustrate that this incongruous outcome is a product of the plurality-based proportional representation system, consider an alternative scenario where society adopts the Condorcet method, an electoral system frequently endorsed by scientists (Dasgupta and Maskin, 2004, 2020; Maskin and Sen, 2016, 2017a,b). In this scenario, party d would have secured the most seats in the t_0 election but would have dwindled to the party with the fewest seats in the subsequent electoral term after the t_1 election.² The same holds by applying Borda's count.

The second case, where the strongest party in parliament is left without any parliamentary representation following an election, is exemplified by Party a . Despite entering the election campaign prior to t_1 as the leading faction, it loses its parliamentary presence thereafter. A comparison of preferences between t_0 and t_1 for this party indicates a decrease in support among Group-1 voters, while it gains favour with two-thirds of the electorate overall. Therefore, the catastrophic electoral outcome cannot be solely attributed to a shift in voter allegiance away from this party.

This example underscores the substantive divergence in the interpretation of candidate or party support between scholars of social choice theory and scholars of voting behaviour and elections. While social choice theorists typically consider voters' entire preferences, scholars of voting behaviour often limit their focus to voters' top preferences (Monroe, 1995). However, this approach assumes that voters are indifferent between all candidates or parties they did not cast a ballot for, which is highly improbable. Given the propensity of plurality-based PR systems to produce results akin to those outlined in our example above, it becomes challenging to interpret election results as reliable indicators of party support. Below, we will provide an empirical application demonstrating the varying narratives that the data may convey.

The extent to which this is an actual problem for interpreting election results can only be assessed when empirical preference profiles are examined. This will be done in the remainder

²It is well known that the Condorcet method selects the Condorcet winner (if present) by pairwise comparison. Its ordinal nature is a drawback for the seat allocation problem. The order of the seats can be reliably determined ('party a receives more than party b '). However, we cannot specify how many additional seats party a is entitled to. Hence, we will confront the PR system with rank-order voting (Borda count), which is also frequently endorsed in normative research (Saari, 2006; Maskin, 2020).

of this paper. In the interests of heightened clarity, we will summarize the insights we gained from the example above by the following two observations (remarks):

Remark 1. Under 'proportional representation', the seat distribution can be proportional, anti-proportional, or even uncorrelated with voters' party preferences.

- Remark 2.**
1. A party can win the election because of its dwindling support.
 2. A party can drop from parliament because it experienced a significant increase of popular backing.
 3. A party can lift up or down without significant correspondence in public support.

Both remarks reflect the inevitable arbitrariness of voting, a result repeatedly proved by Saari (1992, 2000a,b, 2010) and others. For the ongoing, it is helpful to state the following corollary, whose empirical relevance we are going to assess below. It is a corollary because it is implied by the general arbitrariness results.

Corollary 1. The electoral victory or defeat of a party is not indicative of the party's support among the electorate.

We will use the case of Germany to demonstrate the empirical relevance of our corollary.

3. The empirical case: Germany's electoral system

3.1. Germany's electoral system and federal electoral results

German federal elections have utilised a mixed-member proportional (MMP) system since 1953. Two ballots are available to voters: a candidate vote for one of the candidates in their constituency, and a party list vote. The second-vote shares ultimately determine the allocation of seats in the Bundestag. The voting method for both ballots is plurality voting.

Here, a remark to avoid possible confusion seems appropriate. Political scientists have coined the term "plurality system" to describe many-district systems without proportional representation. These plurality systems differ in some way from proportional systems. Yet, they all have in common (with the exemption of the single-transferable voting) that political representation is based solely or primarily on voters' first preferences. In this sense, Germany employs the plurality voting system twice.

3.2. Party fragmentation and the fall of social democracy

Like many other Western democracies, the German party system has experienced increased fragmentation over the past several decades. Prior to 1980, there were only three parties in the Bundestag; however, as of 2017, there are six. This growing fragmentation renders the voting system more susceptible to independence of irrelevant alternatives (IIA) violations (Barbaro and Steiner, 2023).

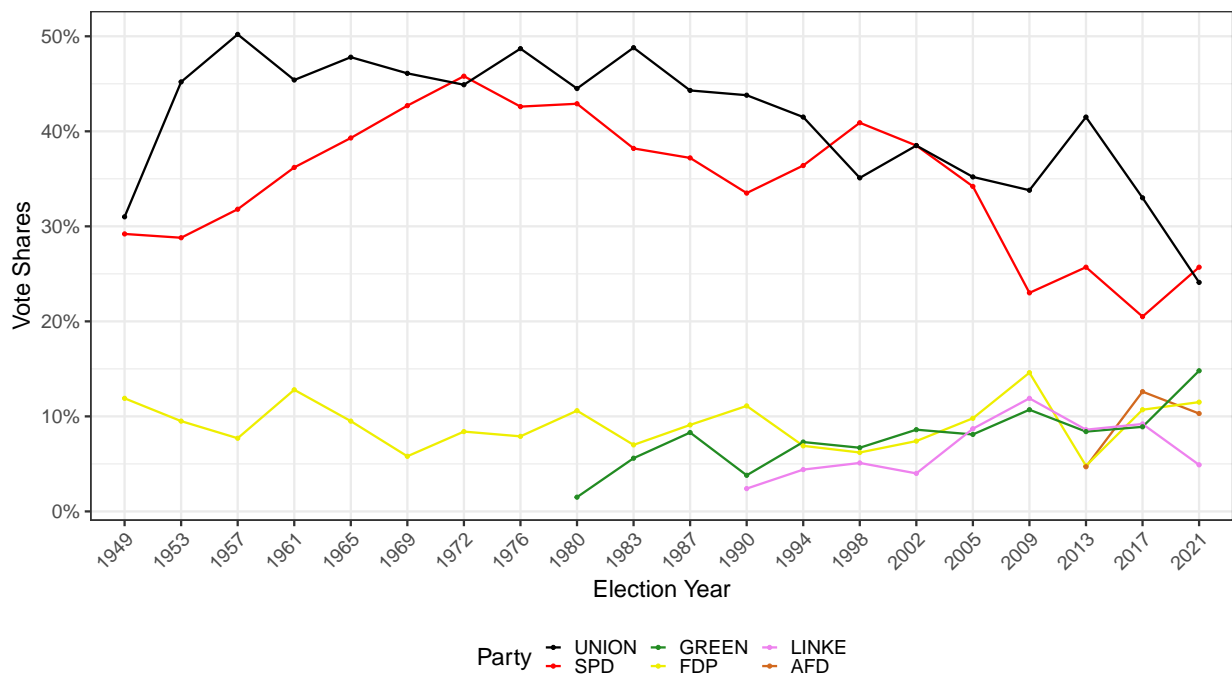


Figure 1: Electoral results in German federal elections

A prevalent trend observed in West European party systems, which has attracted considerable research interest, is the declining support for social democratic parties. This phenomenon also extends to Germany, where the Social Democratic Party (SPD) has played a significant role in shaping the country’s political landscape over an extended period. The party’s electoral support has halved over the past 20 years. In 2017, the SPD secured 20.5% of the vote, a significant decrease from the 40.9% it garnered in 1998. Figure 1 illustrates all election results from 1950 onwards for the six parties currently represented in the Bundestag.

Bandau (2022b) recently conducted a survey of the abundance of studies on the SPD crisis. He classified the reasons highlighted in research into four categories:

1. **Sociological:** the crisis as a result of a changing social structure (Industry employment has decreased by over 20% during the past decade (Benedetto et al., 2020)).
2. **Materialist:** the crisis as a result of changing economic conditions (globalisation).
3. **Ideational:** the crisis as the result of ideological failure (labour-market reforms, (Horn, 2021; Carrillo-Tudela et al., 2021)).
4. **Institutional:** the crisis as a result of organizational deficits.

The party was held responsible for diluting its distinguishing profile. The alienation of traditional voters appeared to have adverse effects, maybe “signalling the start of a terminal decline” (Berman and Snegovaya, 2019).

This example from Germany stands in a series of developments in many countries (Banda, 2022a). Nevertheless, a similar picture pertains to conservative parties. In their heydays in the early 1980s, the conservatives' vote share scratched at 50%. Since then, it has dropped to just over 20% in the 2021 elections. The decline in vote shares for the SPD and the union of conservative parties (CDU/CSU, henceforth UNION) coincided with the rise of new parties, particularly the GREENs, the LINKE, and the self-proclaimed "Alternative for Germany" (AFD).

3.3. The rise of Germany's populist radical right party

Similar to the purported crisis of social democracy, there are a plethora of studies on the rise of populist radical right parties (PRRPs), albeit under entirely different pretexts (Guriev and Papaioannou, 2022; Oshri et al., 2022). In Germany, the electoral success of the AfD, founded in 2013, have attracted considerable scholarly attention (Ziblatt et al., 2023; König, 2022; Kübler and Schäfer, 2022; Steiner, 2023). A central question revolves around elucidating the factors contributing to the growing support for this party. The rising electoral credibility is frequently attributed to economic distress Dehdari (2021), alienation to immigration policy (Hangartner et al., 2018), and a growing number of voters questioning the merits of globalisation.

The AfD earned Bundestag representation in 2017 with a 12.6% vote share. The 2021 elections (10.3%) confirmed this success. The AfD finished as the second-strongest party in three Eastern state elections in 2019. In the 2017 federal elections, AfD candidates secured plurality victories in three districts. The number of directly elected extreme-right legislators increased to 16 in 2021. The party has consistently out-pollled other parties in most Eastern states in recent years.

Arzheimer and Berning (2019) identified two major elements that may explain the widespread support for the radical right. Initially, the party was far more moderate than it has become in recent years. The party's rise was primarily attributable to discontent with the bail-out programme during the Euro crisis, which was linked to prevalent attitudes among conservative voters. Second, the shift to the right coincides with the 2015 suspension of the Dublin regulation. In this particular environment, the electorate transitioned from an initially bourgeois-conservative milieu towards the prototype of the voters of populist radical right parties in Western Europe.

4. Empirical Part One: The different representation of voters' preferences by voting schemes

Our first empirical part is intended to demonstrate how various voting schemes applied on the same voters' preferences yield diverging results. In particular, we distil the effect of different voting rules on the representation of voters' preferences by leveraging the German case in 2021.

4.1. Data set and data processing

We utilized data from the polling organization [Forschungsgruppe Wahlen \(2022\)](#), comprising 33,264 observations covering the entirety of 2021. Our analysis focuses on the period from the beginning of the year to the 2021 federal elections on September 26, 2021. The poll data were collected longitudinally through regular cross-sectional surveys conducted throughout the year. Consequently, the collected data were segmented into distinct waves corresponding to the weeks during which the surveys were conducted. Appendix [Appendix A](#), Table [A.3](#), provides detailed information on the waves, calendar weeks, and the respective survey periods.

In each wave, respondents were asked to rank parties in order of preference, from first to third. We utilized this information to construct individual rankings for positions one through three. For ranking positions four through six, we utilized data from a separate variable. Participants were asked to rate each party on a scale ranging from -5 to $+5$, with -5 indicating the lowest rating and $+5$ indicating the highest. This thermometer-type variable, commonly referred to as the "Skalometer", is frequently employed in empirical assessments ([Mader and Schoen, 2018](#); [Pappi et al., 2021](#), Ch. 4) and has been demonstrated to be a reliable proxy for voters' preferences ([Troitzsch, 2019](#)).³ We adopted the same statistical method as [Barbaro and Specht \(2022\)](#) to determine the 2017 rankings of individuals. In the end, we obtained personalised rankings, allowing us to apply the rankings to a variety of voting methods. In an alternative approach, we constructed participant rankings based solely on their Skalometer party rating. Both approaches generate remarkably comparable preference rankings, such that our findings hold whether we use one or the other method.⁴

For example, the participant with ID number 01 indicated that she favours the UNION the most. She ranked the Liberal party (henceforth: FDP) as second and the GREEN party (GREEN) as third. Accordingly, she gave the UNION a $+5$ grade, the FDP a $+3$ grade, and the GREEN a $+1$ grade. The SPD received a zero, the leftist party (LINKE) a minus two, and the AFD a minus five. Therefore, this participant's preference ordering is

$$\text{UNION} \succ_{01} \text{FDP} \succ_{01} \text{GREEN} \succ_{01} \text{SPD} \succ_{01} \text{LINKE} \succ_{01} \text{AFD}.$$

We repeated this procedure for each survey participants. We applied the data to PR system and the Borda count. For the latter, we project a seat distribution for the Bundestag for each survey wave, and compare it to projections derived from the PR system.

To map the Borda total to a distribution of parliamentary seats, we first calculate the respective Borda score. Applying the notations from [Elkind et al. \(2017\)](#), let the pair

³This information is summarised by the standard vote intention survey item which is famously known in Germany as the *Sunday question*: 'Assuming the elections are next Sunday which party would you vote for?' In our data, the simulated rankings correspond closely with the participants' stated voting intentions.

⁴The following two figures illustrate the similarities between the two approaches. Firstly, 93.4% of the participants share at least one common party in both choice sets (i.e., the set of most-preferred parties, which may include more than one party because the most-preferred parties received the same Skalometer score). Secondly, to assess the concordance of everyone's orderings generated by both approaches, Kendall's τ is utilized, where τ ranges from -1 to 1 ([Kendall and Smith, 1939](#)). On average, the distribution of the resemblance measure yields 0.83 for all participants (1st Quartile: 0.8, 3rd Quartile: 0.93).

$\mathcal{E} = (\mathcal{B}, N)$ represent an election, where $\mathcal{B} = \{c_1, \dots, c_m\}$ signifies the alternative set (ballot) and $N = \{v_1, \dots, v_n\}$ denotes the set of voters, both sets with cardinality $\aleph > 2$.

Consider v to be a vote cast in election \mathcal{E} . The Borda score β that candidate $c \in \mathcal{B}$ receives from v is $\beta_c(v) = |C| - \text{pos}_v(c)$, where $|C|$ denotes the number of parties under consideration (we restrict our analysis to the parties being currently represented in the Bundestag, thus $|C| = 6$). The Borda score of c in election \mathcal{E} is the sum of c 's Borda scores from all voters. Hence, we transformed all participants' orderings by the function $\beta_c(v)$. Let respondent k , for example, rank the UNION second. k 's Borda score for the UNION is $6 - 2 = 4$. Each wave's Borda score is the sum of the Borda scores received by the UNION from all participants in that wave.

An example demonstrates the calculations. Assume there are one hundred voters and six options. Every voter ranks party x second. Party y is ranked first by 50 voters and fourth by the other fifty voters. The Borda score for party x is $100 \times 4 = 400$, while the score for party y is $50 \times 4 + 50 \times 3 = 350$. In parliament, x receives more seats than y , with the Borda scores specifying the relative strength. Note that applying the plurality rule yields the opposite result: x receives 50% of the seats and y receives no seats, thus yPx . Note also that this way to translate Borda scores to parliamentary seats ensures that a party a being above party b in the Borda score (viz., a performs better than b in the Borda count) receives more seats than b (monotonicity). This important feature is not fulfilled in [Monroe's 'Fully Proportional Representation Scheme'](#) (see [Monroe, 1995](#), p. 928f), which is a often-considered approach to map Borda scores into committees.

4.2. On the different tales the data may tell

Figure 2 illustrates the striking differences that result from applying the plurality rule versus the Borda count. The diagram on the left depicts the expected seat distribution following the plurality rule. This image is widely recognised by the German public and has been the subject of recent research ([Faas and Klingelhöfer, 2022](#)). It indicates the substantial rise of the SPD in pre-election surveys, after social democrats' values had been shallow for a long time. On the other hand, it illustrates the AFD's stable support, which appears to be comparable to that of democratic parties like FDP and LINKE.

At the beginning of 2021, polls and scientific forecasts ([Quinlan et al., 2021](#)) projected that the social democrats would receive around 16% of the vote. In early summer 2021, the media openly questioned whether the nomination of an SPD chancellor candidate should be taken seriously in light of the party's dismal poll numbers ([Krewel, 2023](#)). Against this backdrop, the SPD's entry into the Bundestag in 2021 as the strongest party with a result of 25.7% appeared all the more astounding, even 'strange' ([Süß, 2022](#)). Such a vast movement between the parties raises the question of its compatibility with all the major concerns of social democrats. The globalisation did not instantly reverse, no new working class emerged, and there is no indication that the party abruptly overcame its reported incapacity to draw "future-imagining" ([Byrne, 2020](#)). Thus, we will evaluate whether the party's success was more a result of the plurality system's quirks than the electorate's euphoria.

The UNION trailed behind with a lower vote percentage of 24.1%. This outcome was unlikely to occur for quite some time. Less than three months before the federal elections,

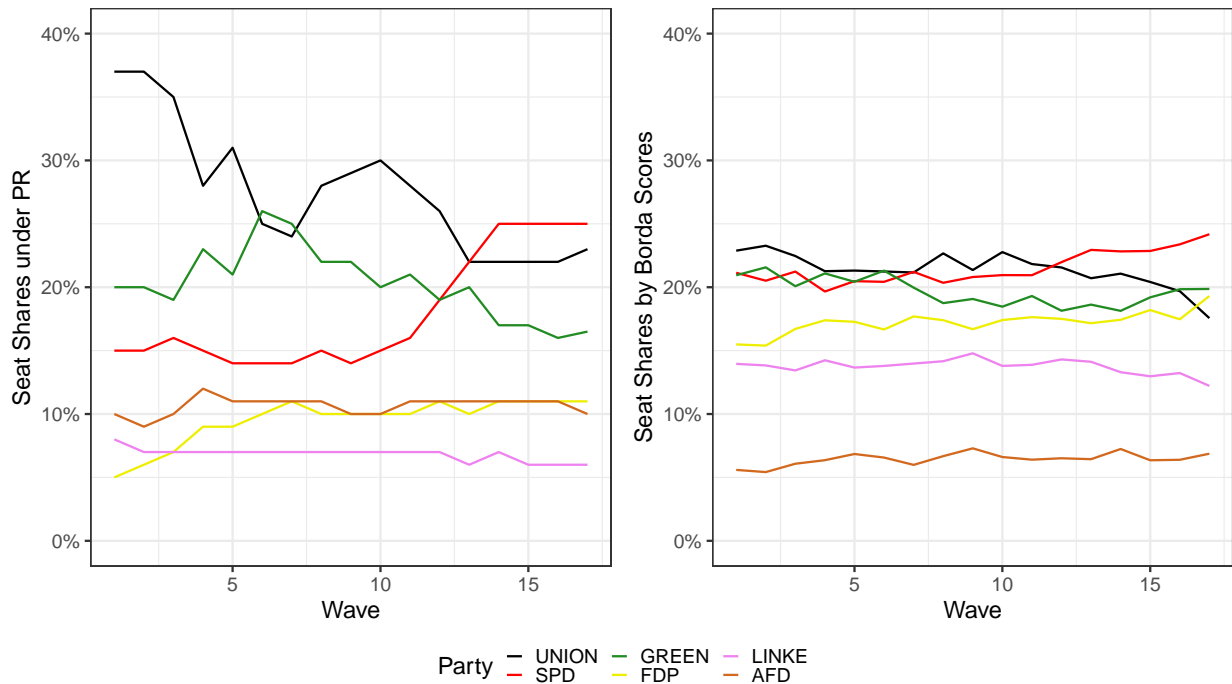


Figure 2: Prospected Seat Shares under Proportional Representation versus Borda’s count

the UNION was thrilled to see the polls lingering around 40 per cent. Also, the GREEN party had ample opportunity to head the government, but it placed third.

By examining the right side of Figure 2, a radically different narrative reveals. Although the SPD values increased in the weeks preceding the election (at the expense of UNION and GREEN), the changes are less pronounced than depicted on the left panel. An unanticipated increase in SPD support must not be mentioned throughout the election year. Instead, the projected seat distribution remains relatively stable. Throughout the year, three parties (UNION, SPD, and GREEN) experience the most public support, all hovering in a comparable order of magnitude.

In addition, the images contrast and compare different vantage points on the AFD. There are no indications of a triumphant right-wing march on the right-hand-side picture. In contrast, the party is a distant competitor. Neither does their public support exceed that of other parties, nor can they continue to compete with them.

The comparison of the two graphs in Figure 2 sheds light on the impact of the aggregation rule on the electoral outcome. Both graphs are based on the exact same data on respondents’ party support prior to the 2021 federal election, but we can frame quite different stories around them. The two most notable discrepancies between both stories are that the one based on plurality rule suggests dramatic shifts in public opinion and attests to ample support for the radical right AFD. On the other hand, the Borda count also captures a swing in favour of the SPD but paints a picture of rather stable support for the established parties. It also takes into account the overwhelming rejection of the AFD in large parts of

the electorate and therefore assigns it a smaller share of seats than the plurality rule.

5. Empirical Part Two: Parties' electoral performance vs voters' perceptions

5.1. Data and Empirical Strategy

The second part of our empirical analysis is directly linked to our Corollary 1 that asserts that party performances are not necessarily accompanied by a corresponding up and down of voters' preferences over the parties. Even if this result is grounded on a solid theoretical basis, it is another question of whether it is relevant in actual elections. To illustrate the empirical relevance of the Corollary, we investigate how the seat shares of German parties develop in reaction to changes in party support throughout the German federal elections since 1980.

For this analysis, we draw on cumulated survey data from 1977 to 2023 from the Politbarometer covering twelve Bundestag elections between 1980 and 2021 ([Forschungsgruppe Wahlen, Mannheim, 2022](#)). Our objective is to contrast the vote share developments, as depicted in Figure 1 with a measure of voters' party perceptions. For the latter, we again use a thermometer-type variable ('Skalometer'). Basis for this evaluation are Tukey's five-number summaries, which we display by box plots in Figure 3.

5.2. Electoral results vs. voters' party perceptions

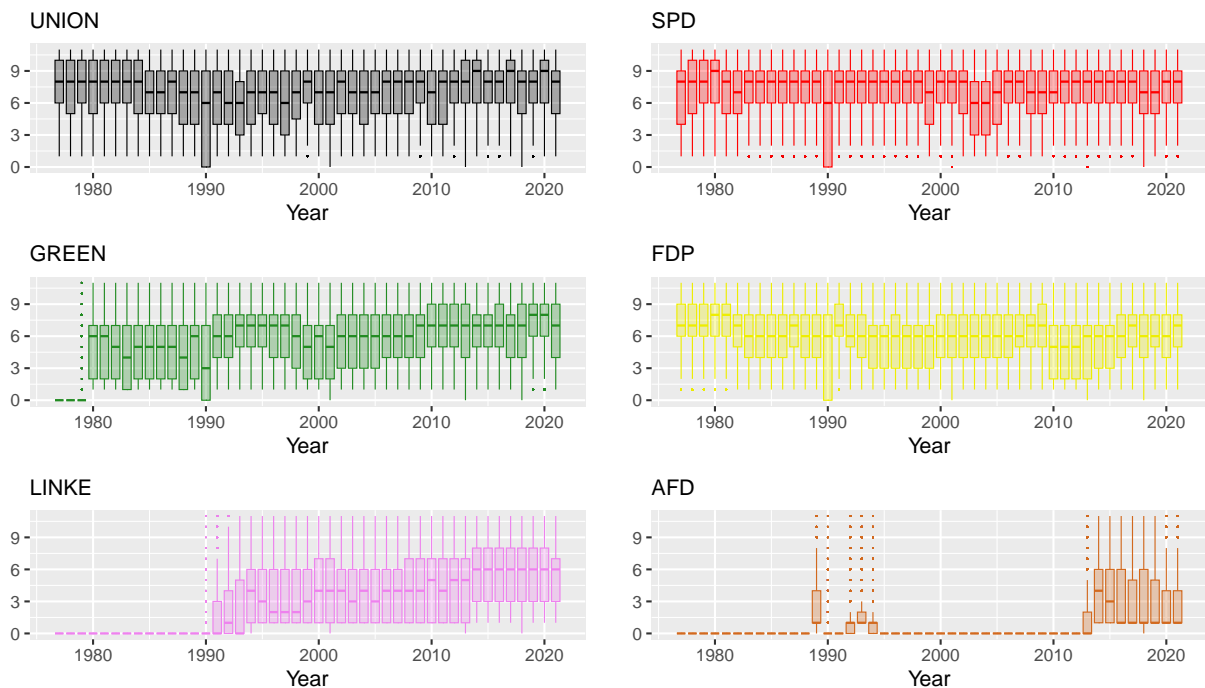


Figure 3: Skalometer data per party by year, 1977 - 2023. Data: [Forschungsgruppe Wahlen, Mannheim \(2022\)](#)

Despite the 'rise and fall of social democracy' (Benedetto et al., 2020) that we observe in the election results depicted in Figure 1 above, it shows that voters' assessment of the social democrats remained relatively stable over time. Between 2003 and 2006, significant drops can be ascertained when the SPD was in charge of the government and imposed controversial labour market reforms (Launov and Wälde, 2016). These reforms, called 'Hartz-Reforms', have been identified in the literature as the primary cause for the party's continued decline (Turner, 2018; Bandau, 2022a,b; Weisskircher et al., 2022). However, the finding that the reforms have 'demoralized the SPD electorate' (Dostal, 2016) can hardly be seen reflected in the long-term data. Rather, the descriptive results suggest that the relation between the SPD's election results and their popular support may be weak. The decline in the party's vote shares is not reflected in a decline in average support. With some modifications, the observations made for the SPD can also be applied to conservative parties. The graph presented in the top-left quadrant summarizes the trend of voter approval for the CDU and its Bavarian sister party, the CSU, collectively referred to as the UNION. Similarly, the Union parties experienced a more or less continuous decline in their share of votes. Indeed, particularly towards the end of the 1980s and throughout the 1990s, there is evidence of a decrease in voter support.

However, we also observe positive associations between electoral outcomes on one hand, and voter evaluations on the other. The generally increasing electoral results for the Green Party and the Left Party are associated with analogous rises in voter favourability.

A particularity arises with the far-right AfD. We will address it separately in the subsequent subsection. However, it is noteworthy that the values in the lower-right graph for the 1990s pertain to the party "Die Republikaner" which was active at the time. Therefore, they can be disregarded in this context.

5.3. The rise of the radical right AfD: does the party garner increasing support in the public?

The rise of the AfD, founded in 2013, particularly occurred in the year 2015. [Arzheimer and Berning \(2019\)](#) vividly described how the party shifted to the right during the refugee crisis (see Chapter 3.3). The left panel in Figure 4 displays the polling figures for the party from 2014 to 2016. Our objective is to assess whether the party similarly increased in public perception.

A comparison between survey results on one hand and the perception of the electorate on the other can be regarded as an empirical depiction of our Corollary: The shift to the right has led to the overwhelming majority vehemently rejecting the party and its program. However, as polarization also encompasses a minority feeling appealed to questionable attitudes, the proportion of voters who viewed the AfD as their most-preferred party has increased. Fig. 4 depicts the bleeding support during the party's radicalization. Poll data to prospect vote shares and overall popular backing go opposite directions. Thus, it is erroneous to presume that rising poll results or even favourable election outcomes indicate rising overall approval. During the period when the party experienced a meteoric rise in opinion polls, the average public perception of the party significantly declined. On a scale ranging from -5 to +5, the AfD registered a rating of -1.6 in 2014, coinciding with an average polling result

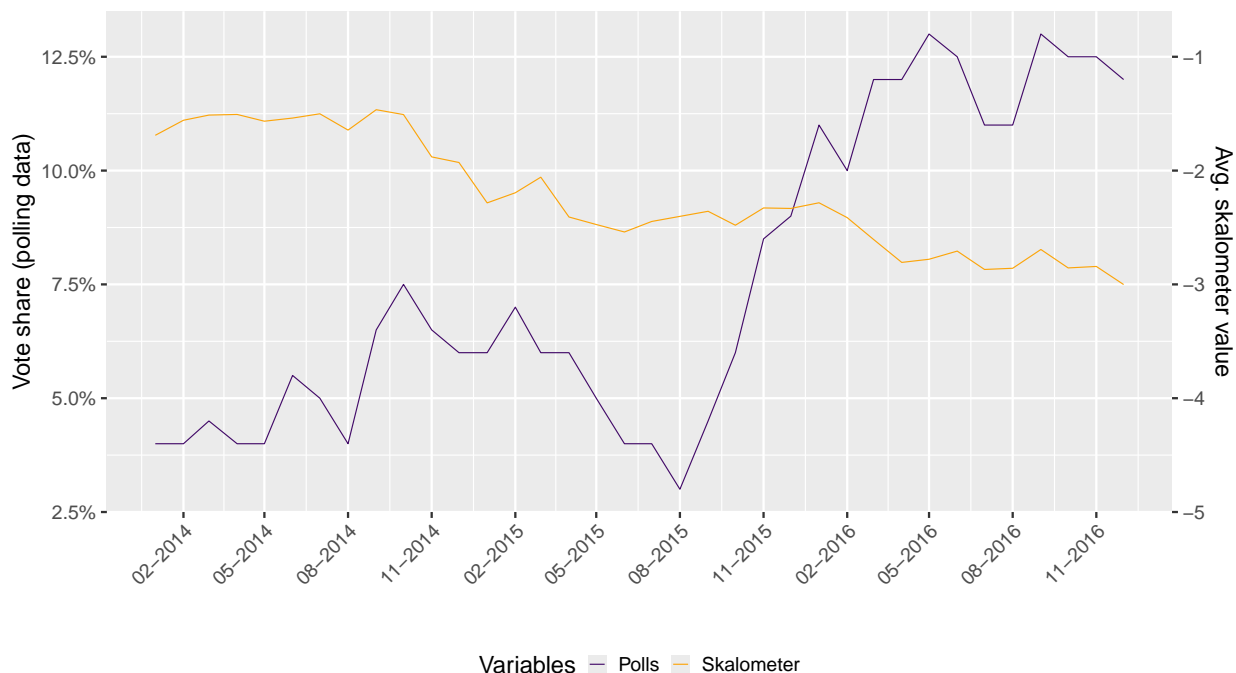


Figure 4: Success in polling results vs drop in voters’ perceptions for the AFD

of 5.3% in the same year. By 2016, when the party reached around 12% in opinion polls, the average perception had dropped to -2.7 .

What then explains the rise of the Afd in elections? We can assert that it is not an increased appreciation for this party among the population. Rather, the data indicate that the party benefits from a growing polarization, which is rewarded in plurality-based electoral systems⁵.

It should be emphasized that our findings do not contradict the well-founded results regarding the transformed electorate, as presented by [Arzheimer and Berning \(2019\)](#). Rather, we broaden the focus to encompass the entirety of the electorate and observe that alongside a radicalizing minority, there has also emerged a rejecting majority vehemently opposed to the party’s shift to the right.

5.4. On the relation between swings in electoral outcomes and party support

In the subsequent analysis, our aim is to conduct a statistical examination of the relationship between parties’ electoral performance and their overall support. To capture a momentary depiction of party support during election periods and to accommodate fluctuations in support levels throughout the electoral cycle, we confine our analyses to survey waves conducted in the month preceding a federal election and the month of the election

⁵See our example in Chapter 2, where party a in t_0 is a polarizing party, because a minority ranks the party top, the rest bottom

itself. This approach encompasses data from 51,666 respondents surveyed across twelve federal elections. We compute both the plurality-based seat share and the seat share based on the Borda score, as previously outlined.

To elucidate the empirical implications of Corollary 1, we undertake an examination to assess the degree to which aggregation rules accurately reflect shifts in party support. To this end, we ground our analysis on variations in seat shares and disparities in party ratings from one election cycle to the subsequent one. Specifically, we investigate whether and how frequently the plurality aggregation rule yields positive swings from one Bundestag election to the next, notwithstanding a decrease in party support, and vice versa. Additionally, we aim to explore whether the Borda count exhibits lower susceptibility to such voting anomalies and induces fewer distortions when translating the empirical preference profiles of German voters into seat shares.

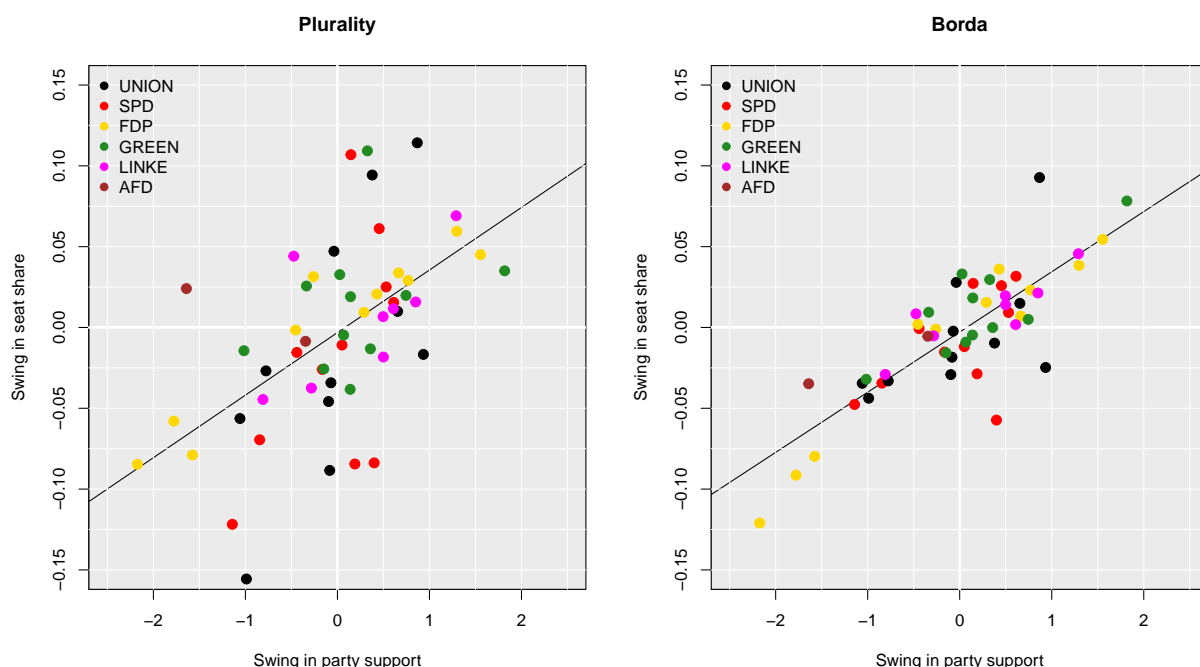


Figure 5: Skalometer data per party 1980 - 2021. Data: [Forschungsgruppe Wahlen, Mannheim \(2022\)](#)

Figure 5 illustrates the fluctuations in seat shares derived from the plurality count (left panel) and the Borda count (right panel) plotted against the variations in party support estimated by the average Skalometer rating. Both plots indicate a notably positive correlation between swings in party support and swings in seats. This observation is reinforced by the fitted regression line, which exhibits a similar slope in both cases. The findings of the corresponding linear regression models are detailed in Table 2. These results unveil that the strength of the relationship between swings in party support and swings in seats remains consistent across both aggregation rules: a positive swing of one point on the Skalometer scale corresponds to a seat bonus of 3.9 percentage points for the plurality count and 3.7

percentage points for the Borda count.

Nevertheless, we observe voting anomalies for both aggregation rules, characterized by instances where a party gains seats despite a decline in support, or loses seats despite an increase in support. These anomalies manifest in the upper left and lower right quadrants of the graphs. Remarkably, more than 22% of observations fall within these quadrants for both aggregation rules, underscoring the prevalence of such irregularities within the preference profiles of the German electorate. Additionally, the graph illustrates that these monotonicity⁶ failures occur for all kind of parties, but that the major parties UNION and SPD are more often affected by decreasing vote shares despite gains in support than vice versa.

Despite the comparable frequency of voting anomalies under both the plurality and Borda count, meaningful disparities between the two graphs persist. Particularly noteworthy is the observation that all data points are much closer to the fitted regression line for the Borda count (right graph) compared to the plurality rule. As evidenced by the R^2 values presented in Table 2, the model fit is substantially superior for the Borda count ($R^2 = 0.65$) in contrast to the plurality rule ($R^2 = 0.32$).

Why is that relevant? A closer look at the observations that lie close to the zero point on the x -axis provides an answer. These data points describe cases in which there is hardly any change in party support. However, looking at these observations in the left graph, we see that the plurality rule leads to a large variation in seat shares for observations close to the vertical zero line. For example, there are three observations for which the party's support hardly changes, but the seat share based on the plurality count declines significantly by about 8 percentage points. This is, for example, the SPD in 1990 and 2009, both times losing more than 8 percentage points of their plurality-based seat share despite slightly increasing their party support by 0.2 and 0.4 Skalometer points. The huge decline in seats can thus not be interpreted as a significant decline in party support. Another neighbouring observation describes the UNION in 2017, where it lost 8.8 percentage points of seats based on plurality count while losing only 0.04 points in party support.

Indeed, the plurality count also yields significant seat gains in certain instances despite minor changes in party support. The electoral triumph of the SPD in 1998 exemplifies such a scenario, where the plurality rule predicts a seat gain exceeding ten percentage points, despite the party's support experiencing a mere change of 0.15 Skalometer points. Considering the minimal disparities in party support, these substantial shifts in seat shares are noteworthy, and the direction of these swings appears entirely arbitrary.

The swings in seat share projected by the Borda count exhibit less volatility, particularly in proximity to the zero point on the x -axis. When there is minimal change in party support from one election to the next, the Borda count generates more modest shifts in seat shares compared to the plurality count. Revisiting the extreme cases of the SPD in 1990 and

⁶Monotonicity conveys the notion that electoral outcomes should reflect changes in individuals' preferences at least non-negatively. Responsiveness and 'nonperversity' are synonyms for monotonicity. The latter refers to the characterisation by Riker (1982, p. 45) who stated that 'It would be perverse in the extreme if increased votes for an alternative contributed to its defeat'.

2009, the Borda count also forecasts a decline in seat share despite an increase in party support. However, the decline is smaller at -5.7 and -2.9 percentage points, respectively, in comparison to the -8.4 percentage points derived from the plurality count. Overall, we encounter fewer errors when interpreting Borda count results as indicators of party support than when interpreting plurality-based electoral outcomes in a similar manner.

Table 2: OLS regression of swing in party seat share on swing in party support

	Plurality seat share	Borda count seat share
Swing in party support	0.039*** (0.008)	0.037*** (0.004)
Constant	-0.003 (0.006)	-0.003 (0.003)
Observations	54	54
R ²	0.323	0.659
Adjusted R ²	0.310	0.653
F Statistic (df = 1; 52)	24.812***	100.602***

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; standard errors in parentheses.

Still, given the empirical preference profiles that we encounter in Germany both aggregation rules lead to voting anomalies in about 22% (Borda) and 24% (plurality) of cases. Yet, the total sum of error is significantly lower for the Borda count than for the plurality rule, as indicated by the larger R^2 of the regression models.

6. Concluding remarks

Electoral outcomes can be “chaotic” (Saari, 2001), and different voting methods can produce vastly different outcomes, even with unchanged voter preferences. The extent of a party’s victory in an election may not necessarily correlate with its widespread public support. Conversely, the party experiencing the largest loss of parliamentary seats might actually be gaining substantial support. It is not uncommon for parties falling short of a majority to secure the majority of seats, while those identified as Condorcet and/or Borda winners may find themselves trailing far behind and potentially facing withdrawal from legislative bodies. Such outcomes may be startling for political scientists seeking to dissect the apparent causes of fluctuations in political parties’ fortunes.

Our argument hinges on the notion that election outcomes are shaped by two discernible factors: voter preferences and the aggregation function selected to amalgamate them. The latter factor, we posit, may exert a predominant influence. When assessing election outcomes, it is imperative to acknowledge and differentiate the distinct impacts of these two factors. We observe a gap in certain research where the theoretical aspects we emphasize are not adequately considered.

To illustrate the significance of our argument, we conducted a case study using German federal elections. We compared evaluations based on the plurality-based PR rule with those derived from applying Borda’s count, using skalometer data to estimate voter preferences. Our analysis of the 2021 election year reveals the divergent narratives that data can tell. We find that public perception of support for respective parties can be biased. Furthermore, our long-term analysis demonstrates that for certain parties, such as the social democrats, trends in electoral results diverge from voters’ perceptions of the party.

We contend that our assessments hold significance for various research strands. For instance, research exploring the ongoing decline of social democratic parties in numerous countries often assumes, implicitly or explicitly, that a decrease in vote shares must correlate with a decline in popular support. While such research provides explanations for the purported decline rooted in socio-economic factors and other trends, we emphasize the pivotal role of the voting system.

Our third empirical analysis evaluates the disparity between changes in seat shares and shifts in public support. Our findings reveal the frequency of voting anomalies within the German plurality-based proportional representation system, affecting approximately one-third of party results across major and minor parties. We observe that volatility in German parties’ election outcomes often does not correspond with a similar fluctuation in public approval. Specifically, our results indicate that the electoral rule can lead to swings in seat shares of up to 7 percentage points, despite minimal or opposing changes in popular approval.

The proportional representation system is capable of producing both proportional and disproportional seat allocations. Even after a comprehensive review of related research, we believe this is the first empirical demonstration of the pattern. Considering the theoretical context, our results are not implausible. In a critique of proportional representation, [Monroe \(1995\)](#) poses the query “proportional to what and representative of what?” This objection appears to be pertinent in light of our findings.

Appendix A. Gesis Data Set 2021: Participant and Week Summary

Table A.3: Descriptive statistics for the data set

Wave	Cal. Week	Survey Period	# Respondents	♀	♂	East	West
1	2	Jan, 12 to Jan, 14	1,535	662	873	506	1,029
2	4	Jan, 25 to Jan, 27	1,610	745	865	492	1,118
3	8	Feb, 23 to Feb, 25	1,448	673	775	468	980
4	12	Mar, 23 to Mar, 25	1,263	558	705	423	840
5	15	Apr, 13 to Apr, 15	1,548	730	818	494	1,054
6	18	May, 04 to May, 06	1,515	741	774	478	1,037
7	20	May, 18 to May, 20	1,515	714	801	478	1,037
8	23	Jun, 07 to Jun, 09	1,461	667	794	459	1,002
9	25	Jun, 22 to Jun, 24	1,444	661	783	439	1,005
10	28	Jul, 13 to Jul, 15	1,500	702	798	463	1,037
11	30	Jul, 27 to Jul, 29	1,435	642	793	437	998
12	32	Aug, 10 to Aug, 12	1,484	724	760	450	1,034
13	34	Aug, 24 to Aug, 26	1,502	703	799	481	1,021
14	35	Aug, 31 to Sep, 02	1,562	716	846	502	1,060
15	36	Sep, 07 to Sep, 09	1,554	703	851	493	1,061
16	37	Sep, 14 to Sep, 16	1,562	722	840	517	1,045
17	38	Sep, 20 to Sep, 22	1,684	750	934	537	1,147

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