

# Campaigning in the Age of Platforms:

## A Longitudinal Analysis of German Parties & Politicians

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Social media platforms now play a central role in election campaigns for parties and politicians. Yet, comparatively little research has compared how these political actors use these platforms during and outside of campaign periods, with much focus on single elections. Given narratives about the prevalence of a permanent campaign, we examine how German national and state actors used Twitter and Facebook between 2010 and 2021—a period that included forty-three state, national, or European elections. We demonstrate a surge and decline in the volume of party posts, contrasting with continued increases among politicians. These actors' communication was distinct during campaign periods, with more positive rhetoric and increased use of platform affordances. User engagement was also contingent on platform affordances; though posts received more 'likes' during the campaign period, followers were less inclined to 'share' political content. We demonstrate how platform campaigning evolved over a thirteen-year period, potentially exacerbating the personalization of politics, and show how platforms' features and affordances structure both the supply of and demand for political communication at election time.

**Keywords:** campaign communication, parties, longitudinal, social media, platforms, German politics

Online communication now plays a central role in political campaigning in most democracies, with social media platforms serving as vital campaign tools for parties and politicians (Dimitrova and Matthes 2018; McGregor 2020). Platforms may also have fundamentally changed the nature of political campaigning and political conduct more broadly, potentially contributing to the phenomena of “permanent campaigning” (Blumenthal 1982; Elmer, Langlois, and Mckelvey 2018), the personalization of politics (Garzia 2011; Hamřík and Kaniok 2022; Karvonen 2010) and negative campaigning (Auter and Fine 2016; Ceron and d’Adda 2016). Analyses of political communication on social media have largely focused on campaigning at election time, often restricted to a single election or platform, and rarely comparing communication during and outside of election periods. Meanwhile, the demise of Twitter (now X) and growing concerns about the societal role and power of Facebook have prompted discussion about whether the “age of the platform” (Simon 2011) may now have ended (Bogost 2022). Rather than communication being siloed through several central platforms, we appear to have entered an era of increasingly fractured and fragmented platform environments (Crul 2022; Wickerson 2021). This development suggests that the time is ripe for a longitudinal analysis of this first era of platform campaigning to better understand how elections structure political communication on these platforms over time.

From an international comparative perspective, campaigning on platforms has been comparatively understudied in the German case, with disproportionate scholarly focus on U.S. campaigns, especially for the presidency (see e.g., Kreiss 2012, 2016). Our focus on the German case is also normatively motivated given that it is frequently said to trail comparative countries on metrics of ‘digitalization’, illustrated by sometimes-comical statistics like the fact that more than eighty percent of German companies still use fax machines (Berry 2023). As a result, the issue of digitalization and the country’s lack of technological progress with communication had itself become a political issue during the 2021 national election at the end of our period of analysis (Noyan 2021; Rooks 2021).

We therefore analyze the extent of political communication on two of the most important social media sites of the platform era: Facebook and Twitter. Facebook was the platform with the highest number of users in Germany throughout this period, whereas Twitter was extensively used by political actors and the most politically engaged sections of the German public (Kemp 2023). Our twelve-year timespan covers forty-one in-country elections—thirty-eight *Bundesland* (state) elections and three national elections—plus two European elections. We analyze posts by the six largest parties at both the federal and state levels, *Bundestagsfraktionen*, and *Bundestag* members over twelve years (2010 to 2021) including 2,828,249 tweets gathered through the Twitter academic API and 1,265,188 Facebook posts collected using CrowdTangle. These data allow us to sequence and analyze the communication of political actors and their audiences’ responses in a coherent and systematic way by using a combination of descriptive statistics and cross-sectional time-series analyses.

On the supply side, we find a steady increase in the volume of social media posting by parties between 2010 and early 2019, followed by a downward (Twitter) or flat (Facebook) trend, potentially indicating that parties became more targeted in their use of social media, more conscious of the limitations of these ‘traditional’ platforms, or increasingly concerned about saturation or contamination of messages. Individual politicians continued to increase their volume of posts. We also identify that elections continue to shape platform campaigning, offering evidence against the idea of a permanent campaign. National election periods were clearly visible in our temporal trends, and we identify several other changes in communication during the campaign period, including a shift to more visual content, greater use of platform affordances, and more positive rhetoric. In short, campaign periods still matter.

On the demand side, we show that political actors receive more ‘likes’ on their social media posts in the two months prior to election day, suggesting that an important (though likely small) sub-section of German voters are expressing their support for political content when they perceive it is their time to ‘do politics’. Campaign periods therefore present parties with the opportunity to increase their ongoing interactions beyond the election. Yet, we also find that posts receive fewer ‘shares’ during the campaign period, suggesting that even politically engaged users are less willing to repost political content to their networks at times when politics is contested and highly salient. The divergent responses in terms of likes and shares illustrates the importance of understanding the distinct dynamics and affordances of digital platforms for political actors, political scientists, and communication scholars.

We proceed by positioning our research agenda in the literature, leading to our empirical expectations about supply-side temporal trends, use of affordances and rhetoric, plus the demand-side responses in terms of engagement. Having set out our expectations, we introduce our original dataset of Facebook and Twitter posts and outline our approach. Next, we present our empirical results, again moving from the supply to the demand side. We then discuss potential explanations and implications of these findings before concluding by outlining future directions for further study.

## Platform Campaigning

A longitudinal perspective can complement existing studies on digital campaigning in several ways that are impossible to observe when studying campaigns and elite communication as they are happening, i.e., one campaign after another. Across the past two decades, social media platforms have decisively shaped political communication. These platforms have become main news sources among German citizens under forty-five (Hölig, Behre, and Schulz 2022), transforming how political parties and politicians run election campaigns (Chadwick and Stromer-Galley 2016; Davis and Taras 2022), and structuring how political actors communicate with citizens and each other (Barberà et al.

2021; Jungherr 2023). The scale of change in political communication in these past years is difficult to overstate, as digital societies have moved from information scarcity to abundance in increasingly high-choice media environments (Van Aelst et al. 2017). Digital media have fundamentally “re-tooled politics” (Jungherr 2016), yet these changes have rarely been studied over extended periods, or compared across election and non-election periods as inadequate data access has previously made temporal studies beyond one or two election cycles difficult, if not impossible, as researchers had to use changing data sources for their studies (Bruns 2019; Freelon 2018).

As these developments have been taking place, political actors have been learning and adapting. Strategies on social media have often revolved around trial and error, with each new election revealing surprises for researchers (see e.g., Klinger and Russmann 2017). As social media platforms have evolved, so have the experiences of political actors, their ability to strategize, to make sense of, and to “guesstimate” the logic behind algorithms, where political actor’s assessment of previous cycles influence their communication in future campaigns (see e.g., Cowburn 2022). Yet, without longitudinal analyses, these feedback loops between electoral cycles remain largely hidden. The disproportionate focus on election campaigning may also create epistemic challenges, with our ability to generalize from the specific to the general period hindered by the distinct communication of political actors during elections (Wells et al. 2019).

Platforms have fundamentally changed the nature of political campaigning. Though we argue that this transformation has been broad, we focus on three distinct aspects of this change. First, the trend of “permanent campaigning” (Blumenthal 1982)—where legislators spend almost their entire time focused on re-election at the expense of other tasks—has been exacerbated by the development of platforms (Elmer, Langlois, and McKelvey 2012; Elmer, Langlois, and McKelvey 2018). Our understanding of this trend has, to date, been limited by the comparatively little research comparing the communication of political actors during and outside of campaign periods. Second, the direct link between politicians and the public has been shown to contribute to an increasing personalization of politics (Garzia 2011; Hamřík and Kaniok 2022; Karvonen 2010), and the “presidentialization” of parliamentary politics with disproportionate focus on the personal characteristics of party leaders (Lefevre, Van Aelst, and Peeters 2020; Poguntke and Webb 2015). Third, the structure and logic of platforms are said to have incentivized negative campaigning, with negative content fostering greater engagement with parties and politicians (Auter and Fine 2016; Ceron and d’Adda 2016). When Facebook replaced the simple “like” button with five different kinds of interaction or popularity cues in 2016, user behavior also changed (Porten-Cheé et al. 2018). These distinct types of interactions are not equally weighted algorithmically, with the “anger” reaction weighing five times as much as a simple “like”, amplifying and pushing messages that evoke angry reactions. In 2019, several European parties filed a complaint that Facebook was structurally incentivizing them to communicate in an increasingly negative way (Klinger, Koc-Michalska, and Russmann 2023).

Our understanding of the role of platforms in exacerbating trends of permanent campaigning, personalization of politics, and negative campaigning is further limited by the disproportionate focus on political actors in the United States. U.S. elections are in many ways an outlier compared to elections in comparable countries with a two-party system defined by “weak parties and strong partisanship” (Azari 2016), multi-year campaign periods, disproportionate influence and levels of financial resources, and a distorted relationship between votes and representation due to a combination of the Electoral College, Senate apportionment, and gerrymandering in the House of Representatives. With comparatively strong parties competing in a multi-party system usually producing government coalitions, lower levels of partisan identification by voters, a mixed electoral system,<sup>1</sup> short campaign period, and lower levels of spending than in U.S. elections, Germany is a more representative case for a variety of countries in Europe and beyond. Germany is also broadly representative of these other countries in terms of digital adoption. Though lagging behind other advanced democracies in aspects of digitalization such as fiberglass connectivity and digital public administration, Germany has high levels of digital literacy and internet adoption among its citizenry (Kemp 2023), making it appropriate for studying digital communication. To date, we also lack an in-depth understanding of German parties and politicians’ use of digital campaigning over the period in which social media platforms have come to dominate political communication, with previous studies largely preceding these platforms (Schweitzer 2008, 2011, 2012).

## Expectations

We group our expectations in terms of four changes across the period in which social media platforms have emerged as an important political force. We are initially interested in the descriptive trend of the volume of posts being made by these actors across the entire period as an indicator of their growing use and centrality to the communication strategies of formal political actors. Second, we seek to understand the adoption of the platform affordances, especially visual affordances. Third, we are interested in the rhetoric used in posts on these platforms. And fourth, we examine the responses to these posts. In all cases, we are interested not only in the long-term temporal trends but also in the differences between the campaign period immediately before an election and at other times. We include further analyses at the party level in our supplementary analysis given the likelihood that political actors in different parties develop their use of these platforms in distinct ways.

## Volume

Social media have become key elements of campaigning since their emergence almost two decades ago, with Twitter and Facebook becoming the most important and popular platforms (Kemp 2023).

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<sup>1</sup> Proportional representation combined with first past the post single-member districts.

Though other platforms have emerged, Twitter and Facebook have become household names and, to date,<sup>2</sup> have remained the most relevant platforms in political communication. By the 2013 German national election, all major German parties had developed campaigns on platforms (Stier et al. 2018). We therefore expect the volume of posts by political actors to increase over time (*H1a*).

Using the volume of posts, we can also test the permanent campaign theory (Elmer, Langlois, and McKelvey 2012) versus the election effect (Larsson 2016). Our interest here is to understand if political actors are indeed “always on” in terms of posting on social media (Joathan and Lilleker 2023), or if their behavior changes immediately before an election. We expect that parties and politicians will increase the volume of posts in the campaign period before an election (*H1b*).

*H1a:* Political actors will post more over time.

*H1b:* Political actors will post more during campaign periods.

## Affordances

Digital platforms appear to have altered campaigning so profoundly towards data-centered practices that we have entered a new era of campaigning (Magin et al. 2017; Roemmele and Gibson 2020), beyond the original “three ages” postulated by Blumler and Kavanaugh (1999). Parties and politicians have been quick to adopt social media platforms as another broadcasting channel, with a perceived trend towards hypermedia campaigning (Klinger and Russmann 2017; Lilleker, Tenscher, and Štětka 2015).<sup>3</sup> Most obviously, the visual turn in political communication and the emergence of newer platforms with primarily visual affordances (Russmann, Svensson, and Larsson 2019) have incentivized political actors to communicate more visually on social media platforms (Marchal et al. 2021; Steffan 2020). We therefore expect that political actors’ adoption of the affordances will increase linearly over time (*H2a*)—both in terms of using newer functions such as retweets, mentions and quote tweeting; and in terms of the visual content posted. Given our expectations about campaign periods in *H1b*, we further expect that political actors will make particular use of these affordances in the campaign periods immediately before elections (*H2b*).

Political actors’ use of these affordances are likely a more active attempt at political campaigning than posting purely text-based content. We expect that these actors will use more positive rhetoric when campaigning in this way, with more positive rhetoric in posts that make use of these affordances (*H2c*).

*H2a:* Political actors will increase their use of platform affordances over time.

*H2b:* Political actors will increase their use of platform affordances at election time.

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<sup>2</sup> As we were writing the first version of this paper, Twitter CEO Elon Musk made the decision to rebrand the platform to “X”.

<sup>3</sup> Despite their comparatively limited use for interacting with citizens.

*H2c:* Political actors' posts that use these affordances will be more positive.

## Rhetoric

To better understand the relationship between platforms and negative campaigning, we use a measure of political actors' sentiment in their social media posts. Numerous studies have shown in the past years that negative campaigning is increasing, and parties benefit from going negative online, receiving more engagement and media coverage (Klinger, Koc-Michalska, and Russmann 2023; Maier and Nai 2020). We therefore expect to find that political actors will use more negative rhetoric over time (*H3a*).

In addition, parties and politicians are generally more positive immediately before an election campaign (see e.g., Silva, Schürmann, and Proksch 2023) meaning we expect that political actors will use more positive rhetoric during election campaigns. Some studies find that this pattern is at least somewhat conditioned by polling figures (Silva, Schürmann, and Proksch 2023), ideological position (Valli and Nai 2022), or coalition partner status (Haselmayer and Jenny 2018).

*H3a:* Political actors' posts will become more negative over time.

*H3b:* Political actors' posts will be more positive during election campaigns.

## Engagement

We expect engagement to increase over time given the huge rise in the number of people using Twitter and Facebook both in general and as a source of political information. For example, only eighteen percent of Germans used social media as a news source in 2012, a figure which rose to twenty-nine percent by 2023 (Newman 2012; Newman et al. 2023). We also know that when political actors make greater use of the affordances of platforms they receive more user engagement (Koc-Michalska et al. 2021). Given the greater number of users and our expectations about political actors' changing use of these platforms (see *H2a*), we expect that posts will receive more engagement over time (*H4a*).

The subset of the German electorate who are interested enough in politics to follow these political actors on Twitter and Facebook will be particularly attentive to politics more generally, and certainly be aware of forthcoming elections. In this, we expect that these audiences will be sufficiently attentive to notice when it is their turn to 'do politics' and will increase their engagement immediately before an election (*H4b*).

We note that other studies find that negative content increases engagement (Bene et al. 2022; Heiss, Schmuck, and Matthes 2019; Klinger, Koc-Michalska, and Russmann 2023). We therefore expect to find a similar relationship between post rhetoric and engagement in our data (*H4c*).

- H4a:* Political actors' posts will receive more engagement over time.
- H4b:* Political actors' posts will receive more engagement during campaign periods.
- H4c:* Political actors' posts will receive more engagement when they are more negative.

## Data & Method

To better understand how politicians and parties use Twitter and Facebook, we scraped the feeds of German Bundestag members and state and national parties. Data were collected using the Twitter academic API in late 2022, prior to any substantive changes being made to the platform before its discontinuation in 2023. To collect Facebook posts, we used Meta's CrowdTangle platform.<sup>4</sup>

At the national level we collect data from the party accounts and the *Bundestagsfraktion* accounts for the six parties in the Bundestag at any point during our period of analysis: *Alternative für Deutschland* (AfD), *Christlich Demokratische Union/Christlich-Soziale Union* (CDU/CSU),<sup>5</sup> *Freie Demokratische Partei* (FDP), *die Grünen*, *die Linke*, *Sozialdemokratische Partei Deutschlands* (SPD).<sup>6</sup> We similarly collect data from both the state party and *Landtag* (state parliament) *Fraktion* accounts for each of the sixteen *Bundesländer* (states). Finally, we are also interested in the behavior of politicians, meaning we also collect the feeds of members of the *Bundestag* (national parliament).

For the national party and *Fraktion* accounts, we were able to collect data on both platforms going back to 2010, meaning we include all posts between 1st January 2010 and 31st December 2021 at the national level. For state parties and politicians, the historic data is incomplete, meaning we restrict our analyses to the period between 1st January 2015 and 31st December 2021. This approach gives us a total of 4,093,437 posts (2,828,249 tweets and 1,265,188 Facebook posts) from 1,594 accounts (Twitter 743, Facebook 851) to analyze.

## Key Dependent & Independent Variables

Our expectations above include several important variables that we define here. For our arguments about general trends in our data, we present descriptive findings about the number of posts over time. These are simple counts of the number of posts aggregated monthly for each group across the entire period.

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<sup>4</sup> The national SPD account geoblocks access to their posts. Because CrowdTangle is hosted on U.S. servers the service is unable to access these data. For the SPD, we therefore manually scraped the posts from the national party accounts.

<sup>5</sup> Given that the CDU does not compete in Bavaria, and the CSU only competes in Bavaria, we consider these as a single 'Union' party in our analyses. Within this, we categorize the CSU as the Bavarian state party in our data structure to ensure all parties in our analysis have national accounts and accounts for each state. We acknowledge here that organizational and policy differences between the CDU and CSU exist, but note that many parties are also organizationally and positionally heterogeneous at the state level.

<sup>6</sup> Our data also include several independent politicians who are not a member of any party, these are coded as *Fraktionslos* in our data.



Given the numerous differences between Facebook and Twitter, we operationalize the affordances of these platforms separately. Given that Twitter was primarily a text-based platform (McCoy 2023), we consider the different ways that users can post, following the convention established by Larsson and Moe (2012, 2014). Most obviously, they can just post a plain text message to their feed that will then appear on their followers' feeds, we categorize these posts as "original". Twitter users can also write an original message but tag another user in the content of that message using the @ symbol, we categorize these posts as "mention". Twitter users may also choose to amplify content by other posters without adding their own text through the "retweet" function on the platform, these retweets are then broadcast to their followers giving posts the opportunity to go 'viral' and appear to users outside of their follower network. Similarly, users can "quote" other users to spread posts. Whereas the "retweet" function merely broadcasts the original post to a wider audience, the "quote" function adds additional text above the shared posts, research indicates that the quote feature is often used to criticize the original post (Bastian 2022; Garimella, Weber, and De Choudhury 2016; McNear 2018). Finally, users can "reply" to the tweets of other users directly. Replies are not broadcast to a user's followers and instead appear below the original post, often used to start a direct dialogue both with the original poster and other users (Bliss et al. 2012; Nishi et al. 2016). We therefore have five categories of Twitter affordances: original, mention, retweet, quote, and reply. In our analyses below, we take original tweets as our reference category and consider the use of other affordances over time. These categories follow the framework for analyzing Twitter affordances established in previous communications scholarship (Larsson and Moe 2012).

For Facebook, we note that the platform is less text-based and instead encourages the use of a variety of media, especially visual media. We therefore trace the adoption of these affordances in our data. As with Twitter, Facebook users may choose to post a text-only message to their 'friends' on the platform; we again categorize these posts as "original" or "text" posts. Facebook users may also choose to include a link to another website in their posts, categorized here as a "link". Facebook posts may also include visual media, the adoption of which we identify using the categories of "photo" for photographic content, including a single photo or the uploading of a photo album; and "video" for the inclusion of video media. We contend that these operationalizations of affordances reflect the distinct ways in which the political actors campaigned on these platforms throughout our period of analysis, where designs of digital environments structure how political actors use them for campaigning purposes (Bossetta 2018). Put simply, we are interested in different aspects of these platforms because the platforms themselves are distinct, our goal is not to directly compare behavior on Twitter and Facebook but to understand how those behaviors changed both over time and during election campaigns.<sup>7</sup>

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<sup>7</sup> Were we to extend this analysis to Instagram or TikTok, further affordance categories would likely be necessary.

To measure engagement with posts, we use two distinct measures: shares and likes. On both Twitter and Facebook, users have the opportunity to either share or retweet a post to their followers or friends, or to indicate that they like the content of the post. Research indicates that sharing and liking function quite differently for audiences (Guo and Sun 2020; Kim and Yang 2017) and so we include both measures in our analyses. Given that Twitter does not have the range of other ways to ‘interact’ with a post that Facebook has, such as responding with a sad or angry reaction, we do not examine these responses in our data. Our interest in focusing on shares and likes is whether posts are being responded to positively and are being broadcast further.

We operationalize the rhetoric used in posts by applying a sentiment analysis dictionary of terms to the text. Dictionaries-based approaches have long been used to label concepts such as sentiment in text corpora (Grimmer, Roberts, and Stewart 2022) and are widely used in academic studies of social media and elections (see e.g., Tumasjan et al. 2010). SentimentWortschatz (Remus, Quasthoff, and Heyer 2010) contains 16,406 positive and 16,328 negative German word forms and includes adjectives and adverbs explicitly expressing a sentiment, and nouns and verbs implicitly containing one. We sum scores for each post in our dataset, with each post receiving a score that represents the total value of the words in the dictionary. Posts that do not contain any words featured in the dictionary receive a score of zero. Though we interpret these posts as not containing any obviously positive or negative sentiment, we demonstrate that our findings about post sentiment are robust to the exclusion of these posts in the supplementary material.

We expect our trends to be impacted by the imminent presence of an election and an identifiable pattern of campaign activity. As in other European parliamentary democracies (see e.g., Krogstad, Aardal, and Narud 2004), the “short campaign” refers to the intensive final month before an election. Strict laws only permit parties to put up billboards (which remain an important messaging tool) in these final few weeks before the election, and radio and TV ads are limited to the month prior to election day. As stated by the federal returning officer, the ‘heated’ phase of a state or federal election lasts for the final four to six weeks before election day (Die Bundeswahlleiterin 2023). Given these restrictions, we consider the final month as the period we expect to see the most intensive campaign activity. Our campaign period variable therefore takes the value 1 for posts in the thirty days prior to an election and 0 otherwise. For state elections, the variable only takes the value 1 for the state party and politicians in the associated state. For example, we would not expect a party or politician in Hamburg to campaign for an election in Bavaria. For national and European elections, we expect all parties and politicians to actively campaign, meaning that this variable does not change spatially.

We also account for secular change over time, operationalized as a continuous date/time variable. To identify whether a post is by a national party, state party, or politician we include a

factor variable to indicate this, in our analyses we use the national party as the reference category. Finally, we include a dummy variable to indicate whether the post was made on Facebook or Twitter.

## Control Variables

For our empirical models, we are interested in variation other than secular temporal change, meaning we include a time trend to account for this. Given the continued differences across a range of political indicators between the former states of the German Democratic Republic (GDR) and the Federal Republic of Germany (FRG) (Connolly 2020; Gramlich 2020; Kalter and Foroutan 2021; Welsch 2022), we include a dummy variable for parties and politicians from East Germany.<sup>8</sup> We note here that this control was rarely significant in our models and add that all of our empirical results are robust to the inclusion of state fixed effects. More broadly, we observe relatively little in the way of geographic variation at the state level in the digital campaigning of parties or politicians. Given that the obvious ideological differences between the parties likely structure their communication on these platforms, all models control for party, with party-level results reported in the supplementary material.

## Method

We use a combination of descriptive statistics, multinomial logistic regression, and fixed effects models to test our hypotheses. We initially present the descriptive trends in our data for each of the different groups, and the temporal changes in the use of the different affordances. These longitudinal trends provide the foundation for our understanding of the changing behavior of political actors on social media platforms across the period.

Having established the longitudinal trends in our data, we then empirically test how accounts change their behavior during election campaigns using a series of regression models with accounts serving as the panel identifiers in our data. Here we are interested in the within-account change to identify changing patterns of each account. We examine the use of different affordances with a multinomial logistic regression and examine engagement and rhetoric by using fixed effects models clustered at the author level. These models enable us to identify change within the engagement and sentiment of different political accounts.

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<sup>8</sup> Berlin's state parties and politicians are not coded as East Germany given the impossibility of dividing a *Bundesland* in our data, meaning the five *Bundesländer* categorized as East Germany are: Brandenburg, Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt, and Thüringen.

# Analysis

Given our expectations set out previously, we present our results in terms of temporal trends in our data, affordances, rhetoric, and engagement. We first present the descriptive trends to better understand patterns in our data and then run a series of empirical models. These models are explained in turn below.

## Volume

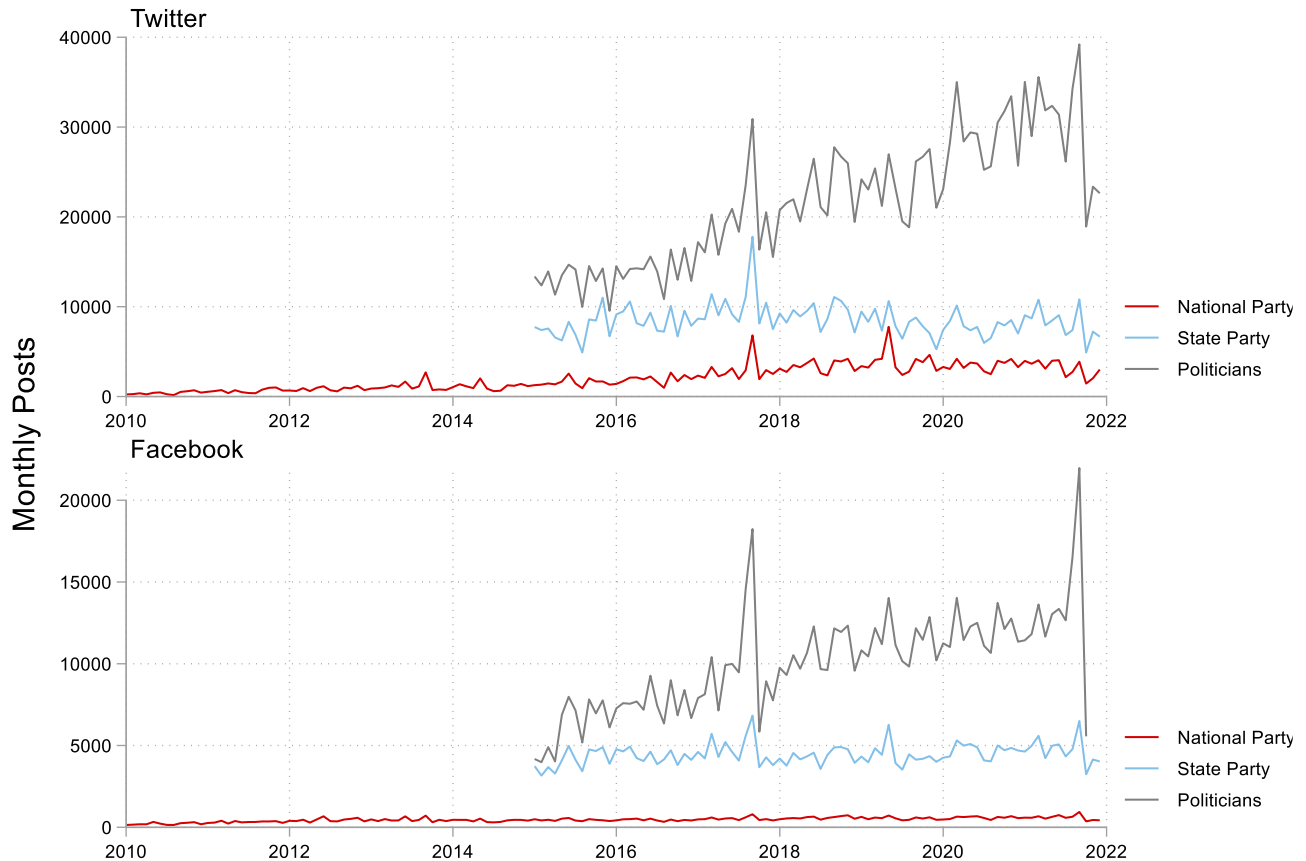
We first present the descriptive trends about the volume of posts, segmented by hierarchy and by type. Figure 1 shows the number of aggregated monthly posts for national parties, state parties, and politicians (*H1a*). On Twitter, national parties peaked in their volume of tweets between 2017 and 2019, with a gradual decline from 2020 onwards. State parties also posted fewer tweets than they had done in the 2016 to 2019 period, with the most tweets in the September 2017 general election. In contrast, the average number of monthly tweets by politicians increased consistently between 2017 and the end of our analysis. On Facebook, we see no equivalent decline in the number of posts from national and state parties, with an almost entirely flat trend from 2012 onwards. In short, the temporal change expected in *H1a* is conditioned by actor type, with support for the hypothesis among politicians on both platforms but far more nuanced in terms of national and state parties.

On both platforms, we see increasing use by individual politicians across this period. The diverging trends in terms of the quantity of content between parties and politicians may reflect the increasing personalization of the German political system in the digital era (Bukow and Angenendt 2019; Zittel and Gschwend 2008), with politicians increasingly communicating through digital platforms (Angenendt et al. 2022). This may contribute to a greater individualization of politics on social media platforms, where users are less attentive to the activities of the formal party structures (at the national or state level) and see more content from their preferred politicians. This development asks serious questions about the form and model of representation being enacted online (Disch 2012; Mansbridge 2003).

That we do not see such a large spike in the volume of content from parties in the 2021 election as in the 2017 election—especially on Twitter—comes as an additional surprise given that the 2021 election was conducted when COVID-19 restrictions were still in place, potentially serving as an incentive to move more campaigning to the digital sphere (Poguntke, Scarrow, and Webb 2021). The declining volume of posts on Twitter from national and state parties could also be a signal that these actors no longer think the platform is as useful, and have instead pivoted to newer platforms such as TikTok. Alternatively, they may perceive algorithmic benefits of posting less frequently to the site, for example getting more eyes on each post by following this strategy. This

might be the result of a more sophisticated digital campaign infrastructure, as observed elsewhere (Kreiss 2012, 2016). Conversely, we don't see this drop off in Facebook posts, though party-level analyses in the supplementary material indicate that the continued levels of posting on Facebook have largely been sustained by increased volumes from parties on the right of the political spectrum, especially the AfD.

**Figure 1: Monthly Posts by Hierarchy**



We also clearly see an uptick in the volume of posts at election time among all political actors (*H1b*). Among parties and politicians, the periods of national election campaigning in the month of September in 2013, 2017, and 2021 are clearly visible in these data, suggesting that political actors do increase their campaign activity immediately before election time rather than engaging in a “permanent campaign” at all times. On both Twitter and Facebook, these descriptive data support our expectation that political actors will post more content at election time (*H1b*).

## Affordances

We next present the descriptive trends by post type in Figure 2 to enable us to understand the changing use of platform affordances by these political actors over time (*H2a*). Given that we are unable to collect the state party and politician data before 2015 (see Figure 1), we present these groups separately from national parties. In the first two panels, we present the trends of different types of posts on Twitter first for national parties between 2010 and 2021 and then for state parties

and politicians between 2015 and 2021. In the third and fourth panels, we present the Facebook data in the same way.

At the start of the national party Twitter trend (Figure 2, panel 1), original posts were the dominant type of post from the start of our analysis until the September 2013 national election. Following the 2013 election, retweets became the most common type of post and remain so for the rest of our analysis. From 2016 onwards, mentions also overtake original posts as national parties become more versed in the affordances of Twitter and leverage the perceived benefits of including other users in their posts. We see a particular spike in retweets, mentions, and replies in the September 2017 national election, and in the May 2019 European election (especially for replies). These spikes are notably absent during the September 2021 national election, suggesting that national parties had moved away from increasing the volume of posts by this time, and throughout 2021 the average number of retweets declined, despite the presence of a national election.

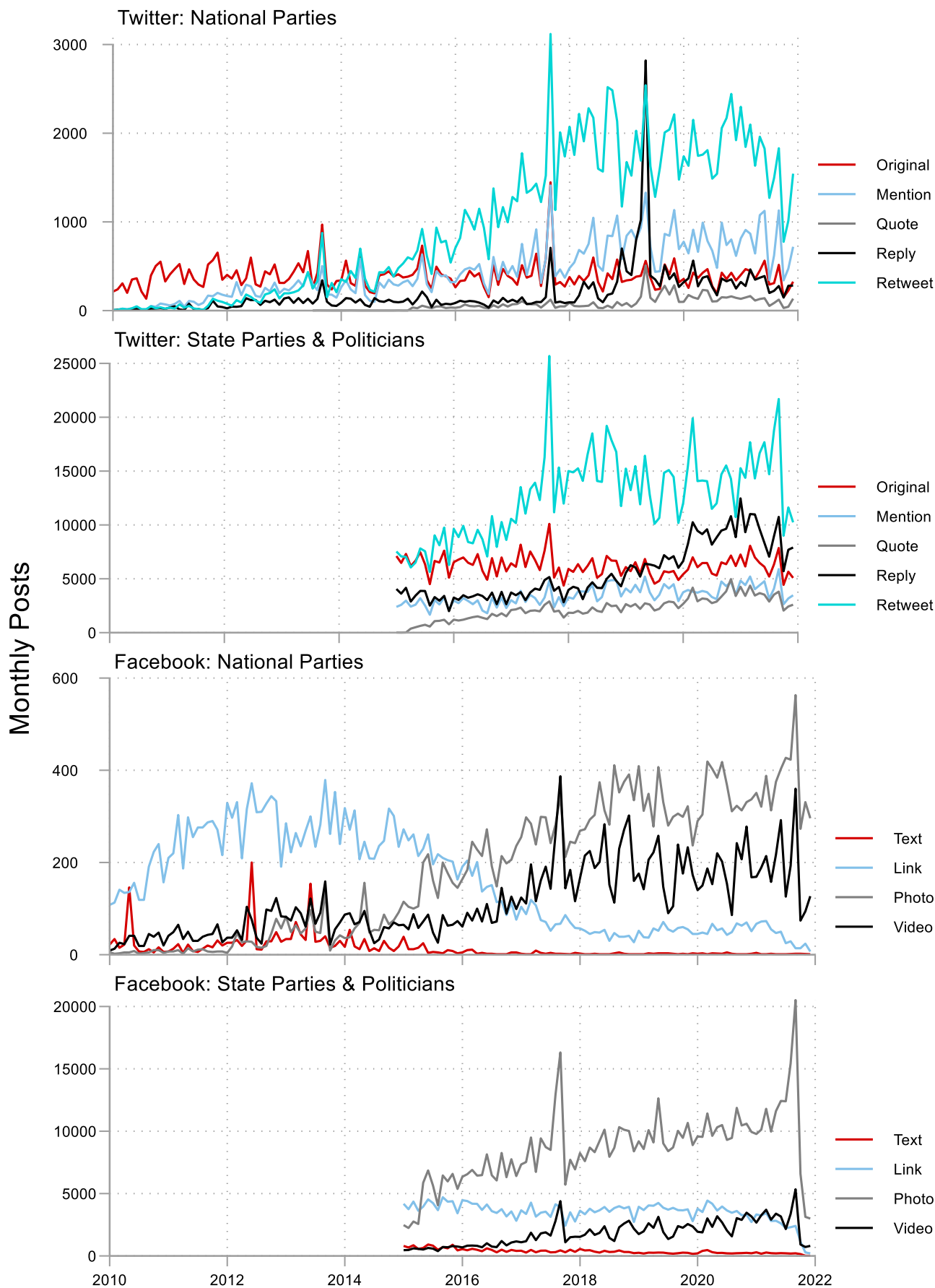
By 2015, retweets and original posts by state parties and politicians were roughly equal (Figure 2, panel 2). In line with the national party trend, the number of retweets then increased up to the September 2017 national election before flattening for the final four years of observations. In contrast, volumes of original tweets declined gradually across this period. By 2019, replies had become the second most popular type of tweet for this group and remained so until the end of our analysis whereas mentions never overtook original tweets. This pattern suggests greater sophistication of usage among national parties than was observed among state parties or politicians, likely given these organizations' additional resources and social media capabilities.

The shifting use of affordances is even more clearly visible in the Facebook trends. At the national level (Figure 2, panel 3), posts with links are the most common type until the start of 2016. From 2016 onwards, photos overtake links to be the plurality type, with videos also overtaking original content by the start of 2017. Not only did the posts containing these types of media increase but posts without photo or video content also declined dramatically, to the extent that parties barely ever posted links by the end of our period of analysis. From 2016 onwards, national parties rarely ever posted text-only content, on Facebook. Text, once the dominant medium for national parties on Facebook, became less relevant during this period and was replaced by visual forms of media content.

At the start of 2015, state parties and politicians were posting more links than any other type of Facebook (Figure 2, panel 4). Just four months later, photos had become the most common type of content posted, with volumes of photos being posted increasing throughout our period of analysis, especially during national elections in 2017 and 2021. Videos also grew for these political actors, though more slowly than among national parties, and again saw higher rates during national election periods. Unlike for national parties, the number of links only declined slightly by the start of 2020. The number of text-only posts also declined from a low starting point across this period. These trends

demonstrate the extent to which Facebook became a visual medium for these actors across this period.

**Figure 2: Monthly Posts by Type**



To better understand when these political actors were more likely to use different affordances of these social media platforms beyond the descriptive timeline, we perform multinomial logistic regressions to predict the probability of each outcome with an additional control based on the type of political actor.<sup>9</sup> Given the obvious differences between the platforms, we conduct these analyses separately by platform. In both cases, we consider variation against the baseline category of posts containing only text. We present our results in Table 1.

As in the descriptive trends presented in Figure 2, Table 1 shows a clear and statistically significant temporal trend in the adoption of all affordances on both Twitter and Facebook, indicating a move away from text-only original content on these platforms. As expected, political actors made greater use of the affordances of these platforms over time (*H2a*).

We see distinct patterns in terms of political actors changing use of these platforms in the campaign period (*H2b*). On Twitter, we observe little in the way of change, with exception being that these actors were quote-tweeting less often, in other regards, however, their behavior on Twitter remained largely the same. In contrast, these actors fundamentally shifted their behavior toward more ‘campaign-oriented’ content on Facebook, including links, photos, and videos. We see a greater shift towards more engaging and visual communication on the platform in this period. Our finding for *H2b* is therefore highly dependent on the platform analyzed, and is likely connected to our distinct operationalizations of affordances and their connection to the concept of campaigning.

**Table 1: Affordances**

|                                     | Twitter              |                      |                     |                     | Facebook             |                      |                      |
|-------------------------------------|----------------------|----------------------|---------------------|---------------------|----------------------|----------------------|----------------------|
|                                     | Mention              | Quote                | Reply               | Retweet             | Link                 | Photo                | Video                |
| <b>Date (<i>H2a</i>)</b>            | 0.000***<br>(0.000)  | 0.001***<br>(0.000)  | 0.001***<br>(0.000) | 0.000***<br>(0.000) | 0.000***<br>(0.000)  | 0.001***<br>(0.000)  | 0.001***<br>(0.000)  |
| <b>Campaign Period (<i>H2b</i>)</b> | -0.003<br>(0.036)    | -0.140***<br>(0.048) | -0.161*<br>(0.091)  | 0.049<br>(0.037)    | 0.213***<br>(0.057)  | 0.548***<br>(0.060)  | 0.781***<br>(0.068)  |
| <b>Sentiment (<i>H2c</i>)</b>       | 0.028***<br>(0.004)  | 0.022***<br>(0.003)  | 0.001<br>(0.004)    | 0.011***<br>(0.004) | 0.022***<br>(0.004)  | 0.030***<br>(0.004)  | 0.038***<br>(0.003)  |
| <b>Politician</b>                   | -1.118***<br>(0.141) | 0.805***<br>(0.308)  | 0.510**<br>(0.254)  | -0.363*<br>(0.197)  | -0.881***<br>(0.291) | -0.899***<br>(0.259) | -2.106***<br>(0.305) |
| <b>State Party</b>                  | -0.351**<br>(0.146)  | 0.276<br>(0.322)     | -0.030<br>(0.259)   | -0.216<br>(0.205)   | -0.124<br>(0.323)    | 0.102<br>(0.289)     | -0.719**<br>(0.340)  |
| <b>Observations</b>                 | 2,828,249            | 2,828,249            | 2,828,249           | 2,828,249           | 1,265,188            | 1,265,188            | 1,265,188            |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Baseline = Original Text; Reference Category = National Party

Controls for party and East Germany, and the constant term, not shown

We also expected that the use of affordances would be accompanied by more positive text content (*H2c*). This expectation is largely borne out by our empirical results, with more positive

<sup>9</sup> National party, state party, or politician.



sentiment in all categories except Twitter replies compared to the baseline category of original text-only posts. On Facebook, we see a similar pattern as in H2b, with the most positive sentiment in the text accompanying visual content. On Twitter, we see that the most positive sentiment accompanied posts that mentioned other users and quote tweets, suggesting that political actors were using these affordances to boost the outreach of co-partisans or in support of groups and causes with whom they aligned.

We also note that politicians were more likely to post quotes and replies on Twitter, but less likely to mention other accounts. On Facebook, politicians were much less likely than national parties (reference category) to post links, photos, or videos. State parties largely posted similar content to national parties, though with fewer mentions on Twitter and less video content on Facebook, perhaps the result of lower campaign budgets.

## Rhetoric

We are also interested in the changing sentiment of political actors' posts. To measure variation in a given account's rhetoric, we run fixed effects ordinary least squares (OLS) regressions, grouped at the account level. This means that coefficients presented in Table 2 are the intra-account variation in sentiment given the independent variables shown in the first column. Fixed effects models therefore control for inter-account variation such as the number of followers, party affiliation, or traditional forms of media attention which might otherwise contribute to variation in language used.<sup>10</sup>

**Table 2:** Rhetoric

|                                     | Twitter              | Facebook             |
|-------------------------------------|----------------------|----------------------|
| <b>Date (<i>H3a</i>)</b>            | -0.000***<br>(0.000) | -0.000***<br>(0.000) |
| <b>Campaign Period (<i>H3b</i>)</b> | 0.083***<br>(0.014)  | 0.142***<br>(0.026)  |
| <b>Constant</b>                     | 0.310*<br>(0.174)    | 3.086***<br>(0.787)  |
| <b>Observations</b>                 | 2,828,249            | 1,265,188            |
| <b>R<sup>2</sup></b>                | 0.001                | 0.002                |
| <b>Number of accounts</b>           | 743                  | 851                  |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Control for Post Type not shown

As with our previous analyses, we are initially interested in the temporal change in language used, with the expectation that sentiment will become more negative over time (*H3a*). Table 2 shows

<sup>10</sup> We also present a random effects model in the supplementary material using all posts. This indicates that content on Twitter was significantly more negative than on Facebook and that politicians were more positive than parties.

that, indeed, the sentiment of posts by political actors on both Twitter and Facebook became more negative over the period of our analysis. For clarity, the comparison here is purely temporal, meaning that individual accounts' sentiment was more negative than they themselves had been at earlier periods in time. This finding aligns with trends in other countries (Brady et al. 2019) and analyses of negative campaigning more broadly (Klinger, Koc-Michalska, and Russmann 2023).

Next, following the pattern established in our previous analyses, we are interested in whether these actors adopt different language at election time, with the expectation that they will be more positive during the campaign period (*H3b*). Again, Table 2 indicates support for this hypothesis, with political actors adopting more positive rhetoric on both Twitter and Facebook in the month before election day. This finding aligns with empirical results from the United States (Vasko and Trilling 2019).

We also see significant variation based on the type of post, with mentions, and quotes much more positive than original content on Twitter. On Facebook, the sentiment of posts aligns with the degree of media content, with text-only posts the most negative, then links, photos, and videos steadily more positive in their accompanying text content.

## Engagement

Having examined the changing communication of these political actors, we now turn to audience reception to these messages. Whereas the previous analyses considered the supply-side production, our focus here is on the demand-side response. As with the analysis of political rhetoric, we are interested in how engagement at the account level changes given certain conditions, meaning we again use fixed effects models. As discussed above, we operationalize engagement both in terms of the average number of shares and likes that a post receives, noting that these are two distinct ways that users may engage with a political actors' post.

As in our previous analyses, we again start by understanding temporal change in our data, expecting that posts will receive relatively more engagement over time (*H4a*). As shown in Table 3, we see a clear positive trend in three of our four cases, with only the average number of retweets (shares) on Twitter not showing a statistically significant increase over the period of our analysis. The average number of Facebook shares and likes increased over the period, as did the average number of likes on Twitter.

We next consider differences during and outside of the campaign period, expecting an increase in all types of engagement immediately before an election (*H4b*). Here, our results indicate that accounts receive *fewer* shares on both platforms during the campaign period, but more likes (though only significantly more on Twitter). The divergent patterns between liking and sharing posts in the month before an election could have two potential explanations. This finding could be driven by

voters being wary of reposting explicitly political content at a time when political tensions are running high, and therefore opting instead to merely ‘like’ posts so that they do not appear on their feeds. Alternatively, the decline in sharing during the campaign period could be the result of audience saturation, with political actors posting more during election periods (see temporal trends) and so voters sharing fewer of these posts. To test which of these mechanisms is driving our findings for election campaigns, we re-run these models with the inclusion of an additional control for the number of posts from the political actor, with the results presented in the supplementary material. Our main finding of significantly fewer shares but more likes is robust to the inclusion of a control for the total number of posts in the last month and in the last week (and actually increases in both size and significance). This extension suggests that this finding is not the result of audience saturation and is instead connected to audience (voter) perceptions about sharing overtly political material at election time.<sup>11</sup>

**Table 3: Engagement**

|                                     | Shares                 |                          | Likes                    |                            |
|-------------------------------------|------------------------|--------------------------|--------------------------|----------------------------|
|                                     | Twitter                | Facebook                 | Twitter                  | Facebook                   |
| <b>Date (<i>H4a</i>)</b>            | 0.005<br>(0.007)       | 0.021***<br>(0.006)      | 0.031***<br>(0.005)      | 0.068***<br>(0.017)        |
| <b>Campaign Period (<i>H4b</i>)</b> | -54.849***<br>(11.690) | -7.545***<br>(2.279)     | 5.052***<br>(1.864)      | 4.921<br>(5.287)           |
| <b>Sentiment (<i>H4c</i>)</b>       | -2.252***<br>(0.339)   | -1.218***<br>(0.403)     | -1.595***<br>(0.267)     | -1.062**<br>(0.422)        |
| Type: Mention (Twitter)             | 25.485**<br>(10.027)   |                          | -18.359***<br>(4.100)    |                            |
| Type: Quote (Twitter)               | -28.694***<br>(8.496)  |                          | -23.133**<br>(8.998)     |                            |
| Type: Reply (Twitter)               | -54.532***<br>(12.467) |                          | -65.965***<br>(7.549)    |                            |
| Type: Retweet (Twitter)             | 285.892***<br>(32.905) |                          | -67.690***<br>(7.058)    |                            |
| Type: Link (Facebook)               |                        | 9.672<br>(13.311)        |                          | -53.408***<br>(18.553)     |
| Type: Photo (Facebook)              |                        | 32.878**<br>(15.607)     |                          | 10.101<br>(18.143)         |
| Type: Video (Facebook)              |                        | 48.666***<br>(14.948)    |                          | -18.405<br>(16.493)        |
| <b>Constant</b>                     | -100.043<br>(146.895)  | -422.008***<br>(139.903) | -595.201***<br>(112.585) | -1,314.247***<br>(365.284) |
| <b>Observations</b>                 | 2,828,249              | 1,265,188                | 2,828,249                | 1,265,188                  |
| <b>R<sup>2</sup></b>                | 0.001                  | 0.001                    | 0.018                    | 0.008                      |
| <b>Number of accounts</b>           | 743                    | 851                      | 743                      | 851                        |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

<sup>11</sup> In the supplementary material, we test whether our main relationships for campaign periods change over time using an interaction effect. For affordances and rhetoric, we observe no change; for engagement these relationships become more pronounced over time.

We next expected that posts with more negative sentiment would receive more engagement ( $H_4c$ ). Across both platforms, content with more negative sentiment attracted more engagement both in terms of likes and shares. This finding aligns with other literature that finds that negative content by political elites elicits wider engagement on social media (Macdonald, Russell, and Hua 2023; Rathje, Van Bavel, and van der Linden 2021). Given that politicians and parties likely want to maximize their online reach, we might expect them to use more negative rhetoric so that their messages are seen by more people.

Platform affordances also conditioned the level of engagement, with posts that make greater use of these affordances receiving more attention online. Post type was highly informative of the level of engagement, with original posts on Twitter getting more likes than all other types and more shares than all other types except retweets. Given the viral nature of retweeted posts on Twitter, the finding that retweeted posts attract more retweets is unsurprising: followers were likely motivated by the virality of the original content to further spread these posts. On Facebook, we see that links get significantly fewer likes, and photos and videos get significantly more shares than text-only posts. We see a direct clear relationship between the level of media content and the propensity for sharing. Beyond the descriptive trends shown in Figure 2, this pattern further suggests that visual media has now assumed a dominant role in the sphere of political communication on Facebook.

## Discussion

Taken together, our results present a compelling overview of the fundamental changes in the way that German political actors communicated on and were engaged with on the two leading social media platforms across this period. As the volume of content shifted from parties to politicians, posts became increasingly visual in nature, making use of the distinct affordances provided by Twitter and Facebook. The shifts were particularly prominent during campaign periods immediately before state, national, and European elections and likely continued to influence the way these actors communicated after the election concluded. Though these posts became more negative over time, election periods were notable for their more positive rhetoric, and posts that made use of platform affordances also contained more positive sentiment. On the demand side, we present evidence that though posts received more likes during the campaign period, users were less likely to share content from political actors at times when politics was more salient. Users were also more likely to like and share more negative posts.

Our results suggest that the campaign period continues to matter in a number of important ways. Political actors not only posted higher volumes of content during the campaign period (see

Figure 1) but used distinct affordances on Facebook as well as more positive rhetoric on both Twitter and Facebook during the campaign period, presented visually in Figure 3. Engaged users also responded to this political content in distinct ways at election time, being more inclined to like posts but sharing them far less often. Our data do not indicate that a “permanent campaign” by German political actors is taking place on digital platforms, a finding which aligns with results from the United States (Vasko and Trilling 2019).



We see closer alignment between different types of affordances on Facebook than on Twitter. This finding could be connected to the platform structures, with networks on Facebook originally constructed around a series of bidirectional ‘friend’ relationships, whereas Twitter has always maintained a unidirectional ‘follower’ relationship.<sup>12</sup> Alternatively, it could be that our distinct operationalizations of type on Facebook are more aligned with campaigning behavior than the types we identify on Twitter. In other words, videos and photos are better indicators of ‘campaigning’ than retweets or mentions are.

Engagement during the campaign period is highly dependent on affordance. We demonstrate that users are more prone to liking content in the month before elections but less amenable to sharing on either platform. Through our extensions of this analysis, we argue that this is a user-side phenomenon of not wanting to appear political at a time when politics is in the spotlight. This is particularly noteworthy given that these users who are choosing to follow parties and politicians on social media are likely some of the most political in Germany, and are not representative of the

<sup>12</sup> Facebook introduced a unidirectional ‘subscribe’ feature similar in September 2011 (Parr 2011).

German electorate at large (Caers et al. 2013; Quercia, Capra, and Crowcroft 2012). Given that digital adoption of the German population is broadly representative of other advanced democracies (Kemp 2023), we would likely expect to see a similar pattern in elsewhere, though variation may be expected in countries with different party systems or partisan engagement; most obviously, the United States.

Concerningly, we find that negative content received more attention in the form of likes and shares. The incentive for political actors is therefore to be negative, yet, they are more positive in the campaign period. This relationship suggests that political actors on Facebook follow traditional campaigning practices and are not simply following the incentives and logic afforded to them by platforms (but see Steffan and Venema 2020).

Previous research into the uses of digital media by political actors initially suggested lofty (Chadwick 2019; Yang and Kim 2017), sometimes Habermasian (Gripsrud et al. 2010; Matassi and Boczkowski 2023), visions of actors congregating in online public spheres. Later insights have problematized this position, pointing instead to the growth of harassment and hostility as a result of the affordances of social media platforms (Esser and Pfetsch 2020; Koiranen et al. 2022). These results suggest some different developments. Whereas previous research largely found quote tweets to be critical of the original post, our findings suggest that quote tweets are no less positive than original tweets. One potential explanation of this is the disproportionate focus on political actors in the United States, suggesting the need for further research into a greater diversity of national contexts, ideally using comparative research designs (Matassi and Boczkowski 2023).

## Conclusion

This longitudinal analysis sheds light on the evolving landscape of political communication in the age of platforms in the German context. Our research has challenged the notion of a permanent campaign, indicating that campaign periods still exert a discernible impact on the communication patterns of political actors. The temporal dynamics of social media posts suggest a shifting strategic awareness among parties, possibly driven by growing sophistication of digital campaigning techniques or concerns about message saturation. Moreover, this study highlights the transformation of the platform landscape itself, from the dominance of centralized platforms to a more fragmented environment by the end of our analysis. The decline of once-dominant platforms, like Twitter's rebranding as X, and the ongoing concerns about Facebook suggest a more complex and dynamic ecosystem of digital communication channels by the end of our period of analysis, potentially connected to the rise of other platforms such as TikTok and Instagram.

Distinct communication strategies are present during campaign periods, characterized by more positive rhetoric and an increased use of platform affordances, suggesting a conscious

adaptation. The juxtaposition of elevated 'likes' and reduced 'shares' during campaign times reflects the nuanced nature of user engagement; though individuals are more inclined to signal support through likes, the act of sharing political content might be hindered by the contentious nature of election discourse.

By focusing on the German case, this research contributes to bridging the gap in the literature concerning platform campaigning in democracies other than the United States. As the political and technological landscapes continue to evolve, future research could extend this research to election campaigning in other national contexts. We contend that the German case is more representative than the U.S. and we would largely expect our findings to travel to other democracies. Future research could also investigate the interplay between platform affordances, political rhetoric, and user engagement, where an analysis of the reasons behind the variations in user responses during campaign periods could shed light on the intricate motivations and behaviors of politically-engaged users. One obvious extension of this work would be to include analysis of visual platforms such as Instagram and TikTok. Though these analyses would necessarily be more limited in temporally, we would expect a similar change in communication at election time.

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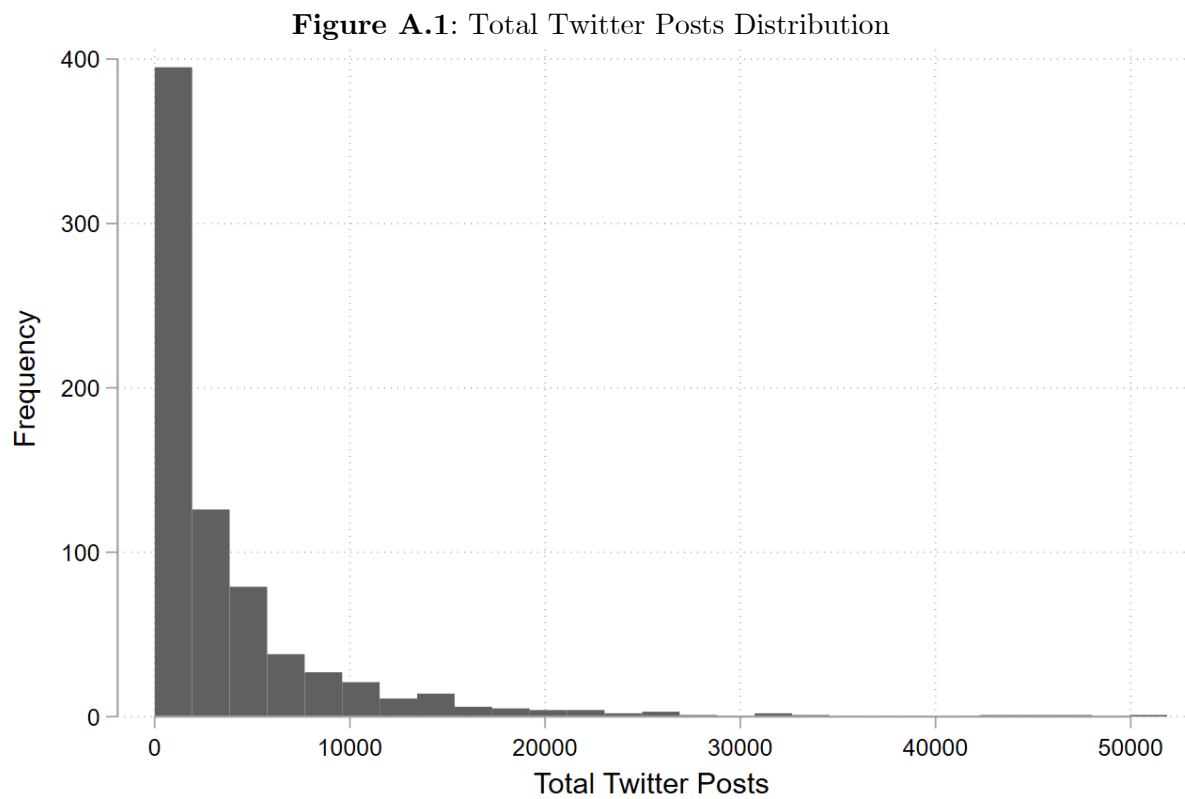
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# Supplementary Material

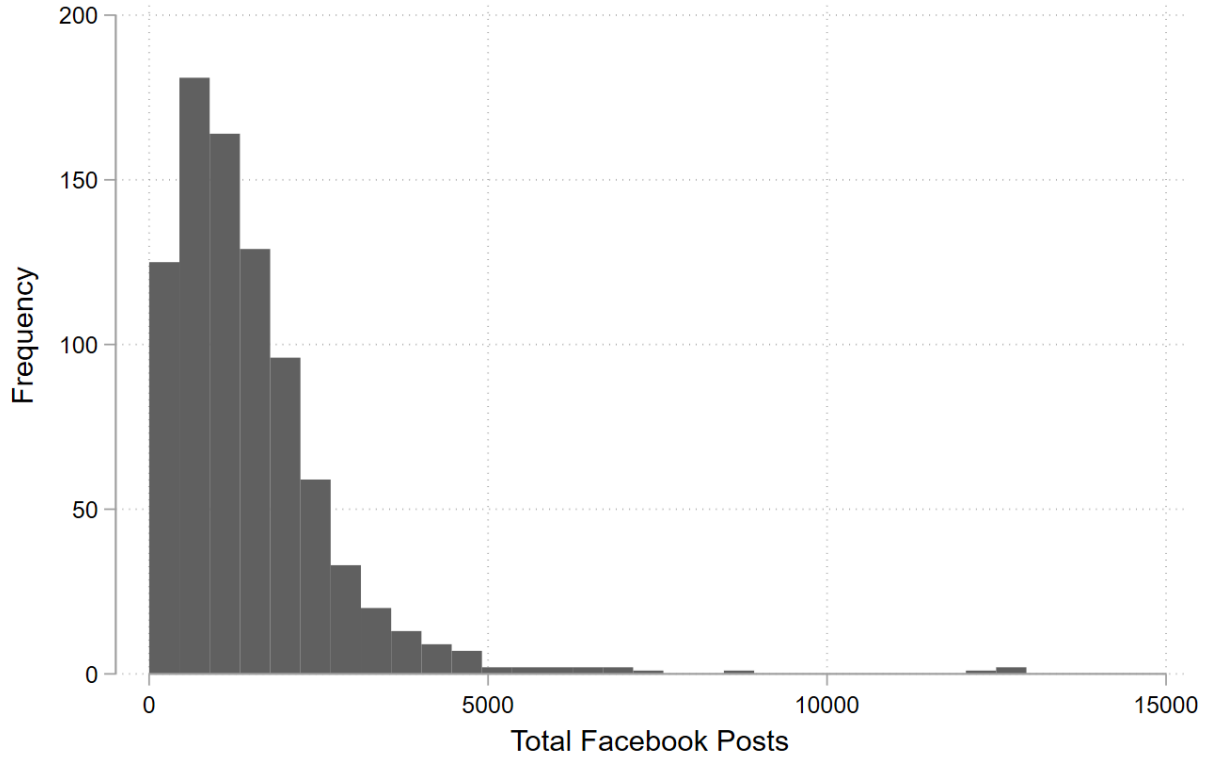
Below we present several extensions to our main analyses, including breaking down the main results at the party level.

## Volume

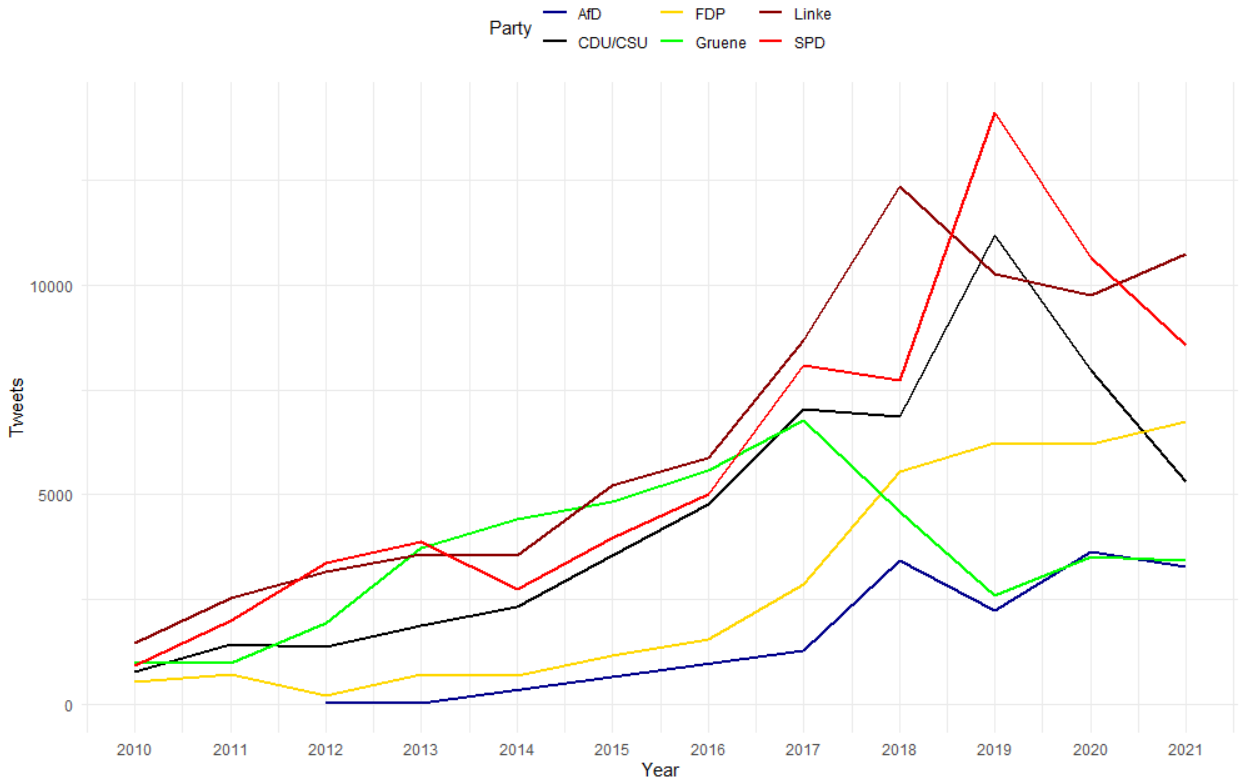
Figure A.1 shows the distribution of the total number of Twitter posts by each actor featured in our dataset. Similarly Figure A.2 shows the total number of Facebook posts. Figure A.3 and Figure A.4 show the temporal trends by party for Twitter and Facebook respectively.



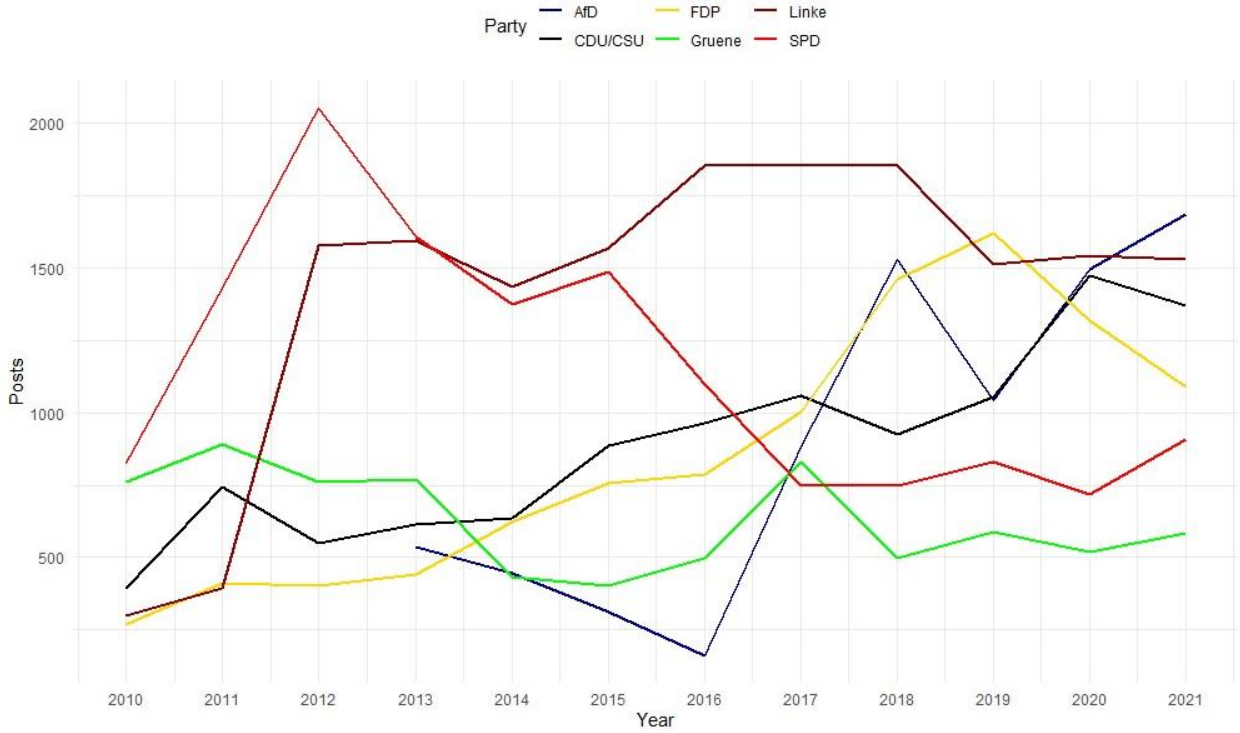
**Figure A.2: Total Facebook Posts Distribution**



**Figure A.3: Twitter by Year, Party**



**Figure A.4: Facebook by Year, Party**



## Affordances

Table A.1 shows affordances broken down by party. We see that the AfD were more likely to post original content on Twitter than the CDU/CSU (the reference category), with negative coefficients for all the other types of posts. On Facebook, they were more likely to include links in their posts but less likely to include photos. The FDP behaved similarly to the CDU/CSU on Twitter, though it had more links and fewer photos and videos on Facebook. *Die Grünen* were markedly different from the CDU/CSU on Twitter with more mentions and fewer quotes, replies, or retweets, and fewer photos on Facebook. Both *die Linke* and the SPD used Twitter in a similar way to the CDU/CSU, though posted fewer videos—and in the case of *die Linke*, fewer photos—on Facebook.

**Table A.1: Affordances with All Variables**

|                        | Twitter              |                      |                      |                    | Facebook             |                      |                      |
|------------------------|----------------------|----------------------|----------------------|--------------------|----------------------|----------------------|----------------------|
|                        | Mention              | Quote                | Reply                | Retweet            | Link                 | Photo                | Video                |
| <b>Campaign Period</b> | -0.003<br>(0.036)    | -0.140***<br>(0.048) | -0.161*<br>(0.091)   | 0.049<br>(0.037)   | 0.213***<br>(0.057)  | 0.548***<br>(0.060)  | 0.781***<br>(0.068)  |
| <b>Politician</b>      | -1.118***<br>(0.141) | 0.805***<br>(0.308)  | 0.510**<br>(0.254)   | -0.363*<br>(0.197) | -0.881***<br>(0.291) | -0.899***<br>(0.259) | -2.106***<br>(0.305) |
| <b>State Party</b>     | -0.351**<br>(0.146)  | 0.276<br>(0.322)     | -0.030<br>(0.259)    | -0.216<br>(0.205)  | -0.124<br>(0.323)    | 0.102<br>(0.289)     | -0.719**<br>(0.340)  |
| <b>AfD</b>             | -1.160***<br>(0.223) | -0.441**<br>(0.213)  | -0.980***<br>(0.260) | -0.479*<br>(0.263) | 0.383**<br>(0.188)   | -0.645***<br>(0.179) | -0.135<br>(0.196)    |
| <b>FDP</b>             | 0.012<br>(0.140)     | -0.087<br>(0.175)    | 0.447*<br>(0.237)    | -0.261<br>(0.185)  | 0.438***<br>(0.158)  | -0.556***<br>(0.160) | -0.347**<br>(0.163)  |
| <b>Gruene</b>          | 1.355***<br>(0.112)  | -0.323**<br>(0.147)  | 0.241<br>(0.186)     | -0.299*<br>(0.174) | 0.046<br>(0.197)     | -0.988***<br>(0.193) | -0.368*<br>(0.209)   |
| <b>Linke</b>           | 0.206*<br>(0.112)    | 0.295*<br>(0.147)    | 0.311<br>(0.186)     | 0.177<br>(0.174)   | -0.296<br>(0.197)    | -1.130***<br>(0.193) | -0.590***<br>(0.209) |

|                     |           |            |            |           |           |            |            |
|---------------------|-----------|------------|------------|-----------|-----------|------------|------------|
|                     | (0.113)   | (0.155)    | (0.200)    | (0.171)   | (0.209)   | (0.192)    | (0.199)    |
| <b>SPD</b>          | -0.174    | 0.038      | 0.040      | -0.013    | -0.034    | -0.182     | -0.330**   |
|                     | (0.130)   | (0.193)    | (0.291)    | (0.199)   | (0.142)   | (0.128)    | (0.132)    |
| <b>Fraktionslos</b> | -0.291*   | -0.027     | 0.023      | -0.187    | -0.288    | -1.351**   | -0.818***  |
|                     | (0.164)   | (0.176)    | (0.269)    | (0.197)   | (0.199)   | (0.557)    | (0.308)    |
| <b>East Germany</b> | 0.044     | 0.057      | 0.056      | -0.039    | -0.157    | 0.082      | 0.003      |
|                     | (0.117)   | (0.124)    | (0.191)    | (0.148)   | (0.155)   | (0.148)    | (0.157)    |
| <b>Date</b>         | 0.000***  | 0.001***   | 0.001***   | 0.000***  | 0.000***  | 0.001***   | 0.001***   |
|                     | (0.000)   | (0.000)    | (0.000)    | (0.000)   | (0.000)   | (0.000)    | (0.000)    |
| <b>Sentiment</b>    | 0.028***  | 0.022***   | 0.001      | 0.011***  | 0.022***  | 0.030***   | 0.038***   |
|                     | (0.004)   | (0.003)    | (0.004)    | (0.004)   | (0.004)   | (0.004)    | (0.003)    |
| <b>Constant</b>     | -8.748*** | -17.461*** | -14.672*** | -8.678*** | -5.735*** | -19.336*** | -24.434*** |
|                     | (0.924)   | (1.269)    | (1.353)    | (1.289)   | (1.285)   | (1.280)    | (1.170)    |
| <b>Observations</b> | 2,828,249 | 2,828,249  | 2,828,249  | 2,828,249 | 1,265,188 | 1,265,188  | 1,265,188  |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Baseline = Original Text

Reference Categories: Hierarchy = National Party, Party = CDU/CSU

## Rhetoric

We are also interested in the comparative rhetoric between different accounts online, shown in the random effects model presented in Table A.2. Here, we see that politicians were significantly more positive than national parties (reference category), though state parties were not significantly different in their communication than national parties. Most obviously, we see a substantively large and statistically significant negative association between Twitter and sentiment, where Twitter posts were much more negative than those on Facebook. As in the previous analysis, the negative time trend remains.

**Table A.2:** Between-Account Rhetoric

|                           | Sentiment |
|---------------------------|-----------|
| <b>Politician</b>         | 0.943***  |
|                           | (0.187)   |
| <b>State Party</b>        | 0.173     |
|                           | (0.199)   |
| <b>Twitter</b>            | -0.723*** |
|                           | (0.083)   |
| <b>Date</b>               | -0.000*** |
|                           | (0.000)   |
| <b>Observations</b>       | 4,093,437 |
| <b>Number of accounts</b> | 1,594     |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Reference Category for Hierarchy = National Party

Controls for party and geography, and constant term not shown

Given that many posts do not contain even a single word identified in the sentiment dictionary, we repeat our rhetoric analysis on the subset of posts that contain at least one word and therefore receive a non-zero score. Though we believe that the zero scores are a meaningful indicator



of neutrality (i.e., the post is not obviously positive or negative), we also show that our results are robust to only include scaled rhetoric in Table A.3

**Table A.3:** Sentiment, Non-Zero Posts Only

|                                | Twitter Sentiment<br>(Non-Zero) | Facebook Sentiment<br>(Non-Zero) |
|--------------------------------|---------------------------------|----------------------------------|
| <b>Campaign Period</b>         | 0.142***<br>(0.025)             | 0.247***<br>(0.037)              |
| <b>Date</b>                    | -0.000<br>(0.000)               | -0.000***<br>(0.000)             |
| <b>Type: Mention (Twitter)</b> | 0.313***<br>(0.035)             |                                  |
| <b>Type: Quote (Twitter)</b>   | 0.245***<br>(0.034)             |                                  |
| <b>Type: Reply (Twitter)</b>   | -0.105***<br>(0.036)            |                                  |
| <b>Type: Retweet (Twitter)</b> | -0.007<br>(0.034)               |                                  |
| <b>Type: Link (Facebook)</b>   |                                 | 0.835***<br>(0.128)              |
| <b>Type: Photo (Facebook)</b>  |                                 | 1.236***<br>(0.128)              |
| <b>Type: Video (Facebook)</b>  |                                 | 1.504***<br>(0.140)              |
| <b>Date</b>                    | -0.000<br>(0.000)               | -0.000***<br>(0.000)             |
| <b>Constant</b>                | 0.067<br>(0.311)                | 4.176***<br>(1.027)              |
| <b>Observations</b>            | 1,464,942                       | 853,392                          |
| <b>R-squared</b>               | 0.001                           | 0.002                            |
| <b>Number of accounts</b>      | 741                             | 851                              |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

We can also identify heterogeneity in campaign rhetoric between the parties. As shown in Table A.4, the AfD, FDP, Gruene, and SPD become far more positive on Twitter in the month before an election. Conversely, the CDU/CSU become significantly more positive on Facebook. To clarify, given that these are again fixed effects models, the coefficients represent change by each party in the campaign period, in other words, this is the change versus their sentiment at other times rather than any measure of absolute sentiment.

**Table A.4:** Party Heterogeneity

|                                  | Twitter             | Facebook            |
|----------------------------------|---------------------|---------------------|
| <b>Campaign Period x AfD</b>     | 0.205***<br>(0.048) | 0.122<br>(0.111)    |
| <b>Campaign Period x CDU/CSU</b> | 0.021<br>(0.023)    | 0.110***<br>(0.041) |
| <b>Campaign Period x FDP</b>     | 0.148***<br>(0.035) | 0.116*<br>(0.061)   |

|                                       |           |           |
|---------------------------------------|-----------|-----------|
| <b>Campaign Period x Gruene</b>       | 0.084***  | -0.037    |
|                                       | (0.023)   | (0.077)   |
| <b>Campaign Period x Linke</b>        | 0.041     | -0.103    |
|                                       | (0.029)   | (0.104)   |
| <b>Campaign Period x SPD</b>          | 0.077**   | 0.077     |
|                                       | (0.034)   | (0.052)   |
| <b>Campaign Period x Fraktionslos</b> | 0.011     | 0.184     |
|                                       | (0.034)   | (0.202)   |
| <b>Observations</b>                   | 2,828,249 | 1,265,188 |
| <b>R<sup>2</sup></b>                  | 0.001     | 0.002     |
| <b>Number of accounts</b>             | 743       | 851       |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Reference Type = Original (Twitter), Text (Facebook)

Table A.5 shows that politicians are much more positive than national party accounts, but state parties are statistically indistinguishable from national parties. At the partisan level, the AfD and *die Linke* are considerably more negative than the CDU/CSU (baseline category). As above, we observe a negative time trend, with accounts becoming more negative over time, and East German accounts are, on average, more positive in their rhetoric.

**Table A.5:** Between-Account Rhetoric with Partisanship

|                           | Sentiment |
|---------------------------|-----------|
| <b>Politician</b>         | 0.943***  |
|                           | (0.187)   |
| <b>State Party</b>        | 0.173     |
|                           | (0.199)   |
| <b>AfD</b>                | -0.657*** |
|                           | (0.106)   |
| <b>FDP</b>                | -0.102**  |
|                           | (0.048)   |
| <b>Gruene</b>             | -0.043    |
|                           | (0.166)   |
| <b>Linke</b>              | -0.522*** |
|                           | (0.076)   |
| <b>SPD</b>                | -0.241*   |
|                           | (0.127)   |
| <b>Fraktionslos</b>       | 0.186     |
|                           | (0.216)   |
| <b>East Germany</b>       | 0.113**   |
|                           | (0.057)   |
| <b>Date</b>               | -0.000*** |
|                           | (0.000)   |
| <b>Twitter</b>            | -0.723*** |
|                           | (0.083)   |
| <b>Constant</b>           | 0.941***  |
|                           | (0.266)   |
| <b>Observations</b>       | 4,093,437 |
| <b>Number of accounts</b> | 1,594     |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Reference Categories: Hierarchy = National Party, Party = CDU/CSU

# Engagement

As referenced in the main text, we also run our engagement models with additional controls based on the number of posts in the past month (Table A.6) and past week (Table A.7). In both cases, our main finding about the campaign period retains substantive size and significance, indicating that this finding is not the result of audience saturation given the additional posts by political actors during the campaign period.

**Table A.6:** Within-Account Engagement with Control for Number of Posts (Month)

|                                 | Shares                 |                          | Likes                    |                            |
|---------------------------------|------------------------|--------------------------|--------------------------|----------------------------|
|                                 | Twitter                | Facebook                 | Twitter                  | Facebook                   |
| <b>Campaign Period</b>          | -54.839***<br>(12.044) | -7.327**<br>(3.224)      | 5.322***<br>(1.647)      | 8.808<br>(7.179)           |
| <b>Type: Mention (Twitter)</b>  | 25.485**<br>(9.983)    |                          | -18.338***<br>(4.086)    |                            |
| <b>Type: Quote (Twitter)</b>    | -28.691***<br>(8.333)  |                          | -23.073***<br>(8.910)    |                            |
| <b>Type: Reply (Twitter)</b>    | -54.526***<br>(11.967) |                          | -65.821***<br>(7.542)    |                            |
| <b>Type: Retweet (Twitter)</b>  | 285.895***<br>(32.874) |                          | -67.619***<br>(7.033)    |                            |
| <b>Type: Link (Facebook)</b>    |                        | 9.659<br>(13.303)        |                          | -53.652***<br>(18.498)     |
| <b>Type: Photo (Facebook)</b>   |                        | 32.845**<br>(15.597)     |                          | 9.506<br>(17.891)          |
| <b>Type: Video (Facebook)</b>   |                        | 48.645***<br>(14.899)    |                          | -18.779<br>(16.346)        |
| <b>Sentiment</b>                | -2.252***<br>(0.339)   | -1.218***<br>(0.403)     | -1.595***<br>(0.267)     | -1.062**<br>(0.423)        |
| <b>Date</b>                     | 0.005<br>(0.007)       | 0.021***<br>(0.006)      | 0.031***<br>(0.005)      | 0.068***<br>(0.017)        |
| <b># Previous Posts (Month)</b> | -0.000<br>(0.024)      | -0.013<br>(0.134)        | -0.003<br>(0.007)        | -0.237<br>(0.417)          |
| <b>Constant</b>                 | -100.091<br>(145.370)  | -421.168***<br>(144.979) | -596.449***<br>(110.879) | -1,299.262***<br>(379.179) |
| <b>Observations</b>             | 2,828,249              | 1,265,188                | 2,828,249                | 1,265,188                  |
| <b>R<sup>2</sup></b>            | 0.001                  | 0.001                    | 0.018                    | 0.008                      |
| <b>Number of accounts</b>       | 743                    | 851                      | 743                      | 851                        |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Reference Type = Original (Twitter), Text (Facebook)

**Table A.7:** Within-Account Engagement with Control for Number of Posts (Week)

|                                | Shares                 |                          | Likes                    |                            |
|--------------------------------|------------------------|--------------------------|--------------------------|----------------------------|
|                                | Twitter                | Facebook                 | Twitter                  | Facebook                   |
| <b>Campaign Period</b>         | -56.035***<br>(11.809) | -6.460**<br>(3.111)      | 5.611***<br>(1.711)      | 12.176*<br>(6.869)         |
| <b>Type: Mention (Twitter)</b> | 25.390**<br>(9.976)    |                          | -18.315***<br>(4.086)    |                            |
| <b>Type: Quote (Twitter)</b>   | -28.859***<br>(8.353)  |                          | -23.055**<br>(8.955)     |                            |
| <b>Type: Reply (Twitter)</b>   | -55.095***<br>(11.959) |                          | -65.700***<br>(7.524)    |                            |
| <b>Type: Retweet (Twitter)</b> | 285.760***<br>(32.882) |                          | -67.628***<br>(7.046)    |                            |
| <b>Type: Link (Facebook)</b>   | -2.251***<br>(0.339)   | 9.287<br>(13.319)        | -1.595***<br>(0.267)     | -55.984***<br>(18.280)     |
| <b>Type: Photo (Facebook)</b>  | 0.005<br>(0.007)       | 32.447**<br>(15.612)     | 0.031***<br>(0.005)      | 7.220<br>(17.137)          |
| <b>Type: Video (Facebook)</b>  |                        | 48.352***<br>(14.825)    |                          | -20.501<br>(15.866)        |
| <b>Sentiment</b>               |                        | -1.216***<br>(0.404)     |                          | -1.050**<br>(0.417)        |
| <b>Date</b>                    |                        | 0.020***<br>(0.006)      |                          | 0.067***<br>(0.017)        |
| <b># Previous Posts (Week)</b> | 0.030<br>(0.049)       | -0.178<br>(0.314)        | -0.014<br>(0.011)        | -1.189<br>(1.044)          |
| <b>Constant</b>                | -98.235<br>(147.405)   | -416.728***<br>(145.264) | -596.054***<br>(112.100) | -1,278.934***<br>(379.051) |
| <b>Observations</b>            | 2,828,249              | 1,265,188                | 2,828,249                | 1,265,188                  |
| <b>R<sup>2</sup></b>           | 0.001                  | 0.001                    | 0.018                    | 0.009                      |
| <b>Number of accounts</b>      | 743                    | 851                      | 743                      | 851                        |

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Reference Type = Original (Twitter), Text (Facebook)

We are also interested in the variation in engagement between accounts. To better understand this, we run a random effects model on the entire dataset. Here, we include platform as an independent variable rather than sub-setting the data by platform to understand the comparative engagement across the entire dataset. We present our results in Table A.8. Here, we find that politicians' posts were shared slightly more but liked less often than posts by national parties. State parties receive similarly fewer likes than national parties. At the partisan level, we see that engagement with posts from the FDP, Gruene, and SPD are statistically indistinguishable from those by the CDU/CSU (base category), whereas posts by the AfD receive on average seventy-five (75.612) additional shares and 155 (154.834) additional likes. Posts from *die Linke* outperform the CDU/CSU to a lesser degree, with roughly sixty-seven more shares and sixty-four more likes. We again note that posts with negative sentiment are shared and liked more, with an underlying time trend towards more engagement, and a slightly lower rate of liking East German accounts. In terms of platform-level differences, posts on Twitter were shared far more, but Facebook posts received, on average, 100 more likes.

**Table A.8: Between-Account Engagement**

|                           | Shares      | Likes       |
|---------------------------|-------------|-------------|
| <b>Politician</b>         | 58.692*     | -323.757**  |
|                           | (30.875)    | (133.842)   |
| <b>State Party</b>        | -27.793     | -345.533*** |
|                           | (30.368)    | (133.039)   |
| <b>AfD</b>                | 75.612***   | 154.834***  |
|                           | (21.399)    | (35.701)    |
| <b>FDP</b>                | 7.477       | 17.392      |
|                           | (14.059)    | (12.050)    |
| <b>Gruene</b>             | 4.504       | -15.651     |
|                           | (12.798)    | (14.327)    |
| <b>Linke</b>              | 76.205***   | 65.793**    |
|                           | (15.553)    | (33.520)    |
| <b>SPD</b>                | 11.346      | 18.297*     |
|                           | (15.676)    | (10.318)    |
| <b>Fraktionslos</b>       | 117.789***  | 42.863***   |
|                           | (35.082)    | (9.086)     |
| <b>East Germany</b>       | -1.069      | -27.644**   |
|                           | (17.615)    | (10.999)    |
| <b>Date</b>               | 0.013***    | 0.040***    |
|                           | (0.005)     | (0.007)     |
| <b>Sentiment</b>          | -2.701***   | -1.214***   |
|                           | (0.576)     | (0.278)     |
| <b>Twitter</b>            | 40.598***   | -100.191*** |
|                           | (13.152)    | (15.955)    |
| <b>Constant</b>           | -293.287*** | -468.976*** |
|                           | (95.296)    | (138.619)   |
| <b>Observations</b>       | 4,093,437   | 4,093,437   |
| <b>Number of accounts</b> | 1,594       | 1,594       |

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Reference Categories: Hierarchy = National Party, Party = CDU/CSU

**Table A.9:** Campaign & Date Interaction

|                      | Twitter              | Facebook            |
|----------------------|----------------------|---------------------|
| Affordances: Mention | 0.000*<br>(0.000)    |                     |
| Affordances: Quote   | 0.000<br>(0.000)     |                     |
| Affordances: Reply   | 0.000<br>(0.000)     |                     |
| Affordances: Retweet | 0.000<br>(0.000)     |                     |
| Affordances: Link    |                      | -0.000<br>(0.000)   |
| Affordances: Photo   |                      | 0.000<br>(0.000)    |
| Affordances: Video   |                      | -0.000<br>(0.000)   |
| Rhetoric             | 0.000<br>(0.000)     | 0.000<br>(0.000)    |
| Engagement: Shares   | -0.034***<br>(0.009) | 0.004<br>(0.004)    |
| Engagement: Likes    | 0.010***<br>(0.004)  | 0.034***<br>(0.011) |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Coefficients shown are the interaction of 'Campaign Period' x 'Date'*

We also test to see if the observed relationships between campaign periods and affordances, rhetoric, and engagement change over time. To do so, we interact our dichotomous campaign period variable with our continuous date variable. In Table 9, we present the coefficients for that interaction effect for all models. Other than for engagement we observe no relationship in this interaction term, meaning that the campaign effects neither increase nor decrease over time. For engagement, we see a positive interaction effect for likes on both platforms, indicating that the relationship between likes and campaign periods increases over time. Similarly, the relationship between campaign periods and shares on Twitter gets more negative over time, though there is no equivalent relationship on Facebook.