The Rise of Germany's AfD: A Social Media Analysis

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ABSTRACT

In 2017, a far-right party entered the German parliament for the first time in over half a century. The Alternative für Deutschland (AfD) became the third largest party in the government. Its campaign focused on Euroscepticism and a nativist stance against immigration. The AfD used all available social media channels to spread this message. This paper seeks to understand the AfD's social media strategy over the last years on the full gamut of social media platforms and to verify the effectiveness of the party's online messaging strategy. For this purpose, we collected data related to Germany's main political parties from Facebook, Twitter, YouTube, and Instagram. This data was subjected to a unified multi-platform analysis, which relies on four measures: party engagement, user engagement, message spread, and acceptance. This analysis proves the AfD's superior online popularity relative to the rest of Germany's political parties. The evidence also indicates that automated accounts contributed to this online superiority. Finally, we demonstrate that as part of its social media strategy, the AfD avoided discussion of its economic proposals and instead focused on pushing its anti-immigration agenda to gain popularity.

CCS CONCEPTS

• **Networks** → **Social media networks**; • **Human-centered computing** → **Social network analysis**;

KEYWORDS

political campaigns, social media, AfD, multi-platform, Twitter, Facebook, Instagram, YouTube

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1 INTRODUCTION

The rise of the Alternative für Deutschland (AfD) represented a schism in German politics. The AfD originally emerged as an anti-Euro party and then gradually adopted the language of right-wing populism [54]. The AfD has advocated for anti-Euro, anti-immigration and anti-refugee policies, and has been outspoken about other previously taboo topics in German politics. Its anti-establishment rhetoric parallels that of other EU right-wing populist parties, such as the National Front in France, the Party for Freedom in Netherlands and the Lega Nord in Italy. The recent surge in far-right voting in Europe calls for careful study of the roots of this new political trend.

The AfD was founded as a eurosceptic party by a group of university professors and former politicians in February 2013. Their proposals were centered on economic liberalism, ordoliberalism and free market ideas. Though the AfD was originally a single-issue party, it soon found support from right-wing groups and started shifting toward an anti-immigration ideology. Before the AfD, right-wing populist parties had achieved only limited electoral success in Germany. The AfD overcame this burden by distancing itself from previous right-wing ideologies and presenting itself as a party with economic expertise and scientific authority [22]. Moreover, it formed a stable nation-wide organization [4]. In the 2013 federal elections, the AfD missed the 5% threshold for entering parliament by only 0.3%. Nevertheless, by the next year, the party won seven seats in the European Parliament and later entered three state parliaments.

This rapid increase in electoral success would not have been possible without the AfD's wide base of supporters. At its beginnings, the AfD's constituents were mostly well educated, high-income citizens [5]. Following 2014, the party enjoyed a great surge of support from low-income citizens [42]. According to the latest study of the issue, the 2017 election report from the Infratest dimap Institute [10], the largest demographic group that voted for the AfD was East German men. Kim [30] investigated why lower socio-economic groups like blue-collar workers and the unemployed would support a party that advocates radical market-oriented policies, which would not benefit them. Kim argues that the AfD strategically avoided discussion of the party's economic proposals to prevent divisions among its supporters.

The AfD's base of support tripled in recent years, from 5% in 2015 to 15% in 2018. This inflection in the opinion polls started in September 2015, at the beginning of the *refugee crisis*. The AfD's popularity

in polling grew over one year, and then the polls remained stable until several months before the 2017 federal elections. The party's support increased further after the elections, indicating approval of the party's work in parliament.

The rise of the AfD cannot be understood fully without taking its online presence into consideration. This study aims to describe the AfD's social media strategy and compare its effectiveness with that of other German parties by examining various platforms over multiple years. First, we give an overview of political parties' activity on social media and then we focus on the AfD's user engagement strategy. We propose a unified multi-platform analysis for the evaluation of all the different social media channels. This analysis covers the four social media platforms that are used regularly by German political parties to examine how political messages spread across them. To further understand the AfD's strategy, we compare its social media discourse with their campaign proposals. Moreover, we show that the spread of the AfD's messages was boosted by automated accounts on at least one of the platforms.

2 THEORETICAL BACKGROUND

2.1 Political Parties' Activity on Social Media

The use of social media by political parties has transformed political communication. Since the World Wide Web provides a plurality of possibilities for communicating with the electorate [43], political parties have developed new methods and tools for externalizing party attitudes and evaluating the reactions of potential voters [59]. In social media, candidates and parties have official pages and accounts, through which they make political statements and declare their positions on salient issues. These messages are diffused further on the platforms by journalists and other users [64]. Voters can then respond to political actors, providing them with rapid and granular feedback; the directness of this political dialog was not possible when only traditional media was available [44]. This form of political interactivity has been proven to benefit political actors, making them more favorable to the electorate [63]. Additionally, in accord with existing trends in data collection [34], political parties are using social media to collect, monitor, and analyze voter reactions to political messaging [56]. These analyses help the parties to design, correct, and strategically adapt campaign activities. Finally, political parties use social media as spaces for political microtargeting [45], sending personalized messages to users to encourage support. Social media has become so critical to political campaigning that social media has become 'environmental' [58]: parties and candidates cannot avoid or neglect its use, as social media platforms are now a cornerstone of political communication.

Given the constant flow of information on social media, political parties and candidates no longer present a static or complete overview of their views and positions to the users. They tend to comment and respond on topics that were made prominent by exogenous events, like economic crises or natural catastrophes, or they adapt rapidly to the topics in the agenda set by mass-mediated public debates and news-media platforms [25]. In addition, they choose to address topics about which they hold strong and influential positions and that are of concern to voters [68], while avoiding other topics that might decrease their popularity. Finally, the parties

concentrate on issues and strategies that are tailored to the audience on each social media platform [62]. This behavior means that the image of the political parties that is presented to the electorate often deviates from the official party positions that are expressed in political manifestos [25].

Although the above behaviors and strategies are characteristic of all parties, the opportunities available on social media are of greater importance for outsider parties. As they have limited access to traditional mass media, they use these new communication channels to overcome disadvantages in communication and to contact potential voters [31]. Therefore, outsider parties emphasize their online presence and intensify their interactions with users to achieve effective communications [27]. Due to their limited resources, they are even more selective about the topics that they express opinions about and they deploy strategies that promote only their strongest arguments [68]. For example, left-wing populist parties tend to concentrate on economic issues on social media, while right-wing populist parties tend to focus on issues that resonate with xenophobic voters [14].

2.2 The AfD's Social Media Strategy

As an outsider party, social media has been an important communication channel for the AfD since its foundation, because social media platforms provided a space to influence public opinion outside of the traditional media. In recent years, the AfD has been effective on social media as reported on media channels and in previous research: Arzheimer [1] analyzed Facebook posts from 2013 and 2014 and found that the AfD used more populist rhetoric on Facebook than it did on other communication channels; Schelter et al. [52] evaluated the Facebook posts of six political parties in Germany in 2014 and 2015 and reported that social media was a major factor in the success of the AfD; and both Hegelich [23] and Medina Serrano et al. [36] studied social media campaigns in the months leading up to the 2017 German federal election.

From the literature, we deduce three main factors that help explain the AfD's effectiveness on social media:

- **Alternative media:** The AfD relies on social media platforms to spread its message. The party leaders have blamed traditional media for presenting them in a negative light and obscuring their intentions. Using social media as an alternative ecosystem, the AfD reached a part of the German population that felt disenchanting with conventional communication channels. Indeed, a study from the Otto-Brenner-Stiftung [9] confirmed that followers of the AfD place less trust in the German media. Hence, they prefer to obtain information from social media platforms. Furthermore, a 2018 Pew Research Center report [46] ascertained that people with populist preferences in Germany tend to have less trust in the media. The right-wing political party has taken advantage of this fact by employing a strong social media campaign.
- **High online activity:** The AfD's strategy is to make use of social media as much as possible and get its content to go viral. To achieve this, the AfD regularly asks its supporters to share content. Furthermore, it uses a provocative tone, which together with its critical position on political correctness [40], encourages users to engage and reply with positive

or negative comments. Another factor that stimulates the high user response is the negative and aggressive tone in the AfD's anti-establishment and anti-immigrant stances, following the work of Fan et al. [15] that showed that hate spreads faster on social media.

- **Online Manipulation:** The right-wing party was not alone in spreading its message, as pro-AfD social bots were active on Facebook [3] and Twitter [41]. Social bots [16] are automated fake accounts that are fashioned to look like real users and whose purpose is to viralize topics and manipulate trends. Even though Neudert et al. [41] found low levels of automation in the time leading up to the 2017 German federal election, they did find that social bots in their sample were working in favor of the AfD. Although it is not possible to track the origin of these bots, two online communities—Infokrieg and Reconquista Germania—had the explicit goal of trolling social media in support of the AfD [12]. While the effects of online manipulation attempts on public opinion are difficult to quantify, these automated accounts likely amplified the online reach of the AfD's message.

These three points are in line with the social media activity of other populist parties in Europe [11, 35, 53]. Social media has given populist political actors greater freedom to articulate their ideology and spread their message [14]. Social media acts as a sort of people's voice in populist movements [19] facilitating the reinforcement of the anti-establishment ideology that is common to populist parties [37]. Furthermore, social media has no gatekeepers to fact-check the information, which gives populists a fertile space to spread their rhetoric [29].

2.3 Multi-Platform Schema

In order to understand and evaluate the AfD's strategies on social media, a long-term multi-platform analysis is needed. Even though research on digital campaigns over the last two decades has been extensive, few studies have focused on how candidates and parties use multiple social media channels [50, 57]. The social media environment itself has become more complex, and the fast pace of technology and digitalization calls for researchers to adapt their methods to cross-platform research. Indeed, researching media platforms separately ignores the reality of today's contemporary media experience [7]. Already in 1968, when the term media ecology was first coined, researchers realized that media should not be considered in isolation [48]. However, researchers tend to conveniently study the types of social media that can be accessed, without taking into consideration the political relevance of specific aspects of diverse media platforms [28].

Rains and Brunner [49] found that between 1997 and 2013 more than two-thirds of studies on social media were limited to a single platform, most often Facebook. However, research on Twitter has become more predominant in the last few years [26], given the easy availability of the data in comparison to other platforms. Moreover, Facebook decided to restrict the access to its API, which is likely to impede future research on this platform.

On the other hand, there exist only a handful of studies about political campaigns that focus on data from YouTube [33, 66] or Instagram [17, 39]. However, according to a 2018 Pew Research

Center report [47], these two platforms have become the most popular among younger citizens, which may make them more relevant to politics in the near future. Additionally, politicians are not bound to use only the thoroughly-researched platforms. Germany's chancellor, Angela Merkel, for instance, has an Instagram account but not one on Twitter.

Bossetta [8] presents a framework for comparing different platforms and how their idiosyncratic features affect political campaign strategies on social media. He exhibits differences between platforms in terms of their network structures, functionalities, and algorithms. Our multi-platform analysis does not focus on the platforms' structure but instead deals with online interactions between political parties and users. We hope that this focus will prove helpful in advancing understanding of the overall social media strategy of political parties.

3 DATA AND METHODS

We propose a multi-platform approach that unifies the different features of each social media channel. The analysis is based on the following four categories:

- **Party engagement:** Quantifies the activity of a political party on a social media channel. It constitutes the main source of interaction with the users.
- **User engagement:** Represents the amount of users' online interaction with the political party. Interactions may be in the form of a direct response to the social media content or a message sent to the party's account. User engagement does not imply direct support for a party, given that it may have a positive or a negative tone.
- **User support:** Determines the level of users' acceptance of and alignment with the party's social media content.
- **Message dissemination:** Quantifies the success of the party in spreading its message across a social media channel, which is one of the main purposes of an online political campaign.

These measures give a general overview of the fields in which a political party is performing better than others. The specific measures used on each platform and their association with one of the four categories are listed in Table 6. Each of these is explained thoroughly in the next section.

In order to apply this multi-platform approach, we collected data from Facebook, Twitter, YouTube, and Instagram using the application programming interfaces (APIs) of each platform. We also collected the AfD's 2017 manifesto as a reference for the party's official ideology and proposals. From the social media channels, we collected data for the AfD and for the other six main political parties in Germany: CDU, Germany's main conservative party; CSU, the sister party of the CDU in Bavaria; Bündnis90/Die Grünen, the green party in Germany; FDP, a neo-liberal party; SPD, Germany's social-democratic party; and Die Linke, the radical left party. This allowed us to compare and measure the AfD's effectiveness on social media against the effectiveness of the other parties' online activity.

For Facebook, we retrieved posts made by the political parties in the period from January 2015 to May 2018. These posts amounted to a total of 12,912 posts. The data included all comments and reactions to the posts and their respective comments. The number of posts

is smaller in comparison to those collected by Arzheimer [1] or Schelter et al. [52]. This is due to changes in the Facebook API. Previously, the API allowed access to drafts, status changes, and post modifications. Our data only includes the final posts written by each party, which is helpful, since we are not interested in considering every modification made by the page administrators.

For Twitter, we collected the tweets from political parties' Twitter accounts over the one-year period, starting in July 2017. We also included tweets from users that mentioned or retweeted the political parties. This dataset includes 1,961,318 tweets. We also collected tweets that included the name of one or more of the political parties. Overall, we gathered 30,437,991 tweets.

We obtained the tweets from the parties using Twitter's Search API, which allows access to the last 3,200 tweets from an account. We gathered the rest of the tweets with an automated procedure that continuously accesses data from Twitter's Streaming API. In contrast to the Search API, the Streaming API allows the retrieval of tweets in near real-time based on certain criteria like hashtags, keywords or geolocations. The limitation of this API is that it only provides a sample of the complete tweets. The enterprise version of the API, called Firehose, makes it possible to query the entire Twitter history, but its cost is prohibitive. Morstatter et al. [38] analyzed the differences between Firehose and the Streaming API and showed that samples gathered from the public API are biased.

For YouTube, we used its Data API to collect metadata from videos published between October 2016 and May 2018. We focused on the videos published on the YouTube channels belonging to the political parties. The AfD has two channels, namely *AfD Kompakt* and *AfD-Fraktion Bundestag*, while each of the other parties only has one. The former was created in October 2016 and the latter in December 2017, two months after this party entered the parliament. From their two channels, we also extracted the videos' subtitles using the Linux package YouTube-dl. Some of the videos do not include dialogue, but only have a written message. We manually transcribed these videos for further analysis.

For Instagram, we collected 4,155 Instagram posts from the political parties' accounts before the capabilities of Instagram's public API were diminished. The period of time matches the period we used for collecting Facebook data. For Twitter, the period of time is shorter, given that historical data cannot be collected with Twitter's public API. For YouTube, we only collected data beginning with the creation of AfD's first YouTube channel.

In order to find insights in the collected data, we applied the following methods:

Exploratory Data Analysis. We first performed simple qualitative and quantitative analyses on the data. We gathered and summarized the interactions for each platform. For Facebook and Twitter, we also included a time series of how the parties interacted over time. For the four different measures in the multi-platform schema, we performed Kolmogorov-Smirnov tests to determine the goodness of fit to the log-normal distribution and used Vuong tests [67] to compare with similar distributions. The results provide a better intuition about how the different social media measures behave.

Bot Detection. A growing body of literature deals with social bots and their influence on politics [60]. Most of these studies analyze the percentage of bot activity in a given narrative. For example,

Neudert et al. [41] analyzed the users who tweeted hashtags related to German political parties a month before the 2017 elections. They found that tweets with AfD-related hashtags showed the highest percentage of users that behaved as if they were automated. However, even though hashtags are helpful to characterize the Twitter conversation, their use does not directly indicate support for the party since they can be attached to both positive and negative messages. In contrast, we concentrate on users who spread the political parties' messages directly and look for bot behavior. We can perform such an analysis only on Twitter, since information about who is sharing which political content on the other platforms is not available.

We categorized the users who had retweeted the parties' original contents with the help of Botometer¹, which is a public bot detection framework created by the University of Indiana. The framework implements a machine learning algorithm that has been trained on tens of thousands of labeled examples [65]. For a given user, it returns a score from 0 to 1, which determines the probability that the user is a bot. We selected 0.5 as the threshold to classify bots. Additionally, we only used Botometer's language independent features for the classification, given that the other features can only give accurate predictions when the content is written in English.

Topic Modeling. Topic modeling algorithms are based on statistical models that discover topics from a text corpus. We selected Latent Dirichlet Allocation (LDA) given its extensive use in the literature [6]. LDA takes a group of documents and treats each document as a combination of topics. Each topic is then defined from a collection of words. After creating a list of topics, the trained model assigns the probability of belonging to each topic to a document. Within each document, the probabilities sum up to one. The probabilities and topic distributions are helpful in comparing different large text corpora. Hence, we used this method to contrast the AfD's online content against the proposals included in their party manifesto.

For LDA to work, the number of topics (K) must be predefined. We decided to train the model on twenty topics. The algorithms for calculating the optimal number of topics did not converge, so we chose the most appropriate K after experimenting with different parameters. Moreover, the model requires two hyperparameters: α , the prior of the topic distribution; and β , the prior of the word distribution. We set $\alpha = K/20$ and $\beta = 0.01$, as suggested by Griffiths and Steyvers [21]. For the implementation, we relied on *nltk* and *tmtoolkit*, two Python toolkits used for natural language processing.

In the next section, we discuss the data analysis and the results of these methods. First, we consider each social media platform separately and then we analyze them together with the proposed multi-platform approach.

4 FINDINGS

4.1 Facebook

For years, German political parties have used Facebook as their main form of online communication. They interact with users by

¹<https://botometer.iuni.iu.edu/#/>

creating posts that state their views and ideology on group pages. Of the seven parties, the AfD has the page with the most fans, with two times as many fans as the pages of CDU and SPD, which are the current ruling parties. After initially losing support in early 2015, the AfD's number of fans increased sharply when the *refugee crisis* arose [11]. The AfD's fan count almost doubled in a single year, from around 140,000 to 260,000 followers. This parallels the increase in support of the AfD shown in opinion polls. Both online and offline, the AfD grew to be an important political force in Germany.

Table 1 presents the results of our analysis of Facebook data. The most active party was the AfD, with 2,363 posts. At the same time, its post received the most comments. Each post had an average of 420 comments. In comparison, the CDU page had an average of 160 comments per post. Comments can have a positive or negative connotation. Hence, a high number of comments does not directly translate into party support. Negative comments were both in favor and against the posts' messages. Sentiment analysis of the comment corpus would not suffice to determine party support since the methods can only classify text into positive and negative categories. The context is necessary for understanding the nature of the comments.

Table 1: Facebook statistics for the German political parties in the period from January 2015 to May 2018.

	posts	comments	likes	shares
AfD	2,363	994,191	4,168,022	2,891,377
CDU	1,690	272,155	483,924	153,131
CSU	2,162	406,804	1,897,622	634,153
Die Grünen	1,127	142,473	625,689	411,073
Die Linke	1,367	140,489	903,629	437,920
FDP	2,211	118,277	755,000	192,974
SPD	1,992	247,095	892,198	421,025

The number of shares is more representative of the party's reach. When a user shares a post, it appears on the timelines of the user's Facebook friends. Posts with more shares have reached more users on the platform. The number of shares of the AfD's posts is larger than the sum of the shares of all posts from the rest of the parties. This is a clear signal of the wide reach of the AfD on Facebook and of its online popularity.

The CSU comes in second in terms of the numbers of comments and shares. The CSU is a conservative party that operates only in the state of Bavaria, while its close counterpart the CDU operates in the rest of Germany. The CSU is more conservative than the CDU on social issues and is closer to the political spectrum of the AfD [18]. These results suggest that users with right-wing ideologies are more politically active on Facebook. Although the CSU performed well in terms of Facebook activity, it has lost voter support over time. Since 2015, the CSU's approval rating has gone down ten points in the opinion polls.

Figure 1 shows the number of posts per month made by the pages of the German parties. The pattern is similar for all the parties.

The large peak in the plot corresponds to the month of the 2017 parliamentary elections. In the months following the election, the AfD continued to post content on Facebook, whereas activity from the rest of the parties declined.

Figure 1: German political parties' Facebook activity: Number of posts per month between January 2015 to May 2018.

We further analyzed the AfD's posts. The format of these posts consists of a message and an image that combines a short text with a picture. The tone of these messages tends to be provocative and sometimes is even sensationalist. The topics discussed are controversial, which encourages users to engage with the posts and express personal opinions.

To perform a quantitative analysis of the posts, we preprocessed the text by removing stop words and punctuation marks. The most frequent nouns are AfD, Germany, politics, EU, Merkel, Euro, German people, SPD, and citizen. Indeed, the general message is that the AfD is on the side of Germany and its citizens, and it is against the Euro and the establishment parties, which are represented by *Merkel* and *SPD*. Another word appearing on several posts is the verb *teilen* (to share). This suggestion was the fifth-most used verb in the posts, indicating that part of the AfD's strategy is to viralize its content by explicitly asking fans to share it.

4.2 Twitter

All of the German political parties have a Twitter account that interacts with politicians, journalists, and other users. In contrast to Facebook, the AfD has the fewest followers on Twitter [55]. Nevertheless, this lack of followers does not imply that they are less successful on this platform. For example, more than 50% of the political conversation on Twitter on the day of the 2017 federal election was related to the AfD [23].

As in our analysis of Facebook data, we selected four corresponding measures on Twitter: number of tweets, likes, mentions and retweets (Table 2). We divided the number of tweets into two categories: all tweets and original tweets, the latter of which are those with content from only the party account, not including retweets from other users. The format of the AfD's original tweets resembles that of the Facebook posts, as a brief message together with a picture. Most of the tweets include a link to the corresponding Facebook post. However, given the character limit, the message is shorter on Twitter. The tweets also include hashtags. The top-used

hashtags by the AfD Twitter account are AfD, TrauDichDeutschland, BTW17, Bundestag, Merkel, SPD, Gauland, CDU, FDP, and GroKo. TrauDichDeutschland is AfD's campaign slogan, BTW17 refers to the 2017 election, Gauland is one of the leaders of the AfD, and GroKo is the grand coalition between CDU, CSU, and SPD.

Table 2: Twitter statistics in the period from July 2017 to July 2018.

	tweets	original tweets	mentions	likes	retweets
<i>AfD</i>	9,193	2,092	368,005	638,886	269,445
<i>CDU</i>	4,911	3,097	345,192	117,437	39,726
<i>CSU</i>	2,886	1,622	233,012	70,474	14,812
<i>Die Grünen</i>	2,492	1,295	157,213	124,371	42,183
<i>Die Linke</i>	6,809	1,776	208,047	136,440	45,856
<i>FDP</i>	3,149	1,730	189,687	121,220	31,487
<i>SPD</i>	7,480	1,782	260,056	119,507	41,803

On Twitter, the AfD was also the most active party with the largest number of tweets. 77 percent of these tweets were retweets and most of them were from other regional AfD Twitter accounts or AfD politicians. SPD and Die Linke followed a similar pattern. CDU published more original tweets than the other parties, with 66 percent of the tweets being original content. Figure 2 shows the tweet activity over the one-year period. The AfD was more active than the other parties most of the time. The activity of all the parties went up during the election month and went down afterward. In contrast to the post activity on Facebook, the AfD did not continue to tweet at the same pace as during the months before the election.

Figure 2: German political parties' Twitter activity: Number of tweets per month during a one-year period.

Like Facebook comments, mentions allow users to reply to a tweet or send a message directly to the party account by using the @ symbol and the screen name of the account. We excluded

retweets that included a mention of a political party from this analysis. Additionally, if a tweet mentioned more than one party, each mention was counted separately. The results show that the AfD received the most mentions and CDU came in the close second place. Even though Die Grünen has the most followers, it had the fewest mentions. Note that the mentions in our data come from the sample that the Streaming API provides, which is only a selection of all mentions published to the platform over the period of interest.

While mentions can contain positive or negative messages about the party, likes and retweets serve as measures of support [24]. For both these measures, there is a large difference between the AfD values and those of the other parties. Like shares on Facebook, the AfD's tweets were retweeted more than the tweets of all other parties combined. Retweets and likes can only originate from the account's original tweets. On average, each of the AfD's original tweets was retweeted 129 times and had 305 likes. For comparison, each CDU tweet was, on average, retweeted 13 times and had 38 likes. This corresponds to a difference of one whole order of magnitude.

Not only the total number of retweets is of relevance, but also the information on which users retweeted the party accounts. With this data, we could investigate how many of the party retweets were published by social bot accounts. We obtained the Botometer score from all the users who had retweeted a political party during the month of September 2017. This subset of data included 111,919 retweets from 22,396 unique users. We assigned accounts that were closed by Twitter directly to the bot category. After classifying the users, we calculated the percentage of retweets from the bot accounts. Table 3 shows the results for each party. With almost 33 percent, the AfD is the party with the maximum number of bots retweeting each party's content. The CDU, CSU, and FDP follow with bot retweets between 20 and 25 percent. The parties with the lowest percentage of bot retweets are SPD, Die Grünen and Die Linke.

Table 3: The number of retweets in September 2017 and the percentage of those that belong to accounts classified as bots.

	retweets	bots(%)
<i>AfD</i>	43,633	32.92%
<i>CDU</i>	14,603	21.15%
<i>CSU</i>	3,738	24.02%
<i>Die Grünen</i>	15,440	15.68%
<i>Die Linke</i>	12,888	12.97%
<i>FDP</i>	7,905	23.45%
<i>SPD</i>	13,712	12.99%

Note that these results do not provide an exact quantity of bot activity since the bot detection methods are not always accurate. Even the term *bot* is defined loosely across the literature [20]. Nevertheless, the comparison between parties is of relevance since the percentages vary considerably. Interestingly, center, center-right,

and right-wing political parties have a higher proportion of bot retweets. Hence, we conclude that automated accounts on Twitter were more likely to spread messages from the center and right side of the German political spectrum.

4.3 YouTube

YouTube is different from the other platforms in its focuses on videos instead of text and images. YouTube allows political parties to publish video content that can then be shared on other social networks. In the first years after its conception, the AfD did not use a YouTube channel to spread its message. The channel AfD Kompakt was first created in October 2016 and is closely related to the AfD's member magazine of the same name. It claims in its description to be the AfD's official YouTube channel. Three months after the 2017 elections, the AfD faction in parliament created a new channel called AfD-Fraktion Bundestag. We considered both channels in our analysis since both seek to spread official AfD content. The other parties have only one YouTube channel with official videos.

Table 4 shows the party activity and user response to the parties on YouTube. The party activity varies, with Die Grünen having published the most videos in the period of interest. The difference between parties is greater when taking into account the number of comments on the videos. The difference is not entirely due to user interaction, but is affected by the fact that the comment sections of some videos were disabled. For CSU, FDP and Die Grünen, several videos have comments deactivated, and the AfD Kompakt channel does not allow any comments on its videos. The 8,080 comments on the AfD's videos are therefore all from its second channel. Even though this channel has been active only since December 2017, the AfD-Fraktion Bundestag's videos have more comments and likes than any of the other parties' channels.

Table 4: Youtube statistics for the German political parties in the period from October 30 2016 to May 2018.

	videos	comments	likes	dislikes	views
<i>AfD</i>	454	8,080	60,375	2,458	2,049,008
<i>CDU</i>	264	4,988	5,574	9,926	385,262
<i>CSU</i>	166	44	2,410	1,728	482,586
<i>Die Grünen</i>	479	665	27,480	26,199	5,283,833
<i>Die Linke</i>	204	5,791	20,043	6,912	814,219
<i>FDP</i>	63	910	341	90	853,673
<i>SPD</i>	236	3,573	22,469	22,348	2,418,132

A unique YouTube feature is the option to dislike a video. A dislike depends on the context of the video and does not always translate into opposition to the party. The AfD channels have the lowest ratio of dislikes to likes. Both Die Grünen and SPD have nearly equal numbers of likes and dislikes, whereas the CDU has considerably more dislikes than likes.

Video popularity is measured by the number of views. As with the publishing activity, Die Grünen's videos have the most views. The SPD has the channel with most views after Die Grünen even though they posted less than half the number of the videos. The AfD comes in third place for this measure. From all the parties, the most-seen videos are the campaign commercials. Most of the videos are of press conferences, campaign talks, and appearances in the German parliament by politicians of the party. These videos receive less attention than the others.

4.4 Instagram

Little research has been published about Instagram's potential in political campaigns [51]. Thomson and Greenwood [61] found that users in the US are less likely to engage with political images on Instagram. In contrast, a survey in Germany by Eckerl and Hahn [13] showed that the platform holds great potential for political communication. In the collected data, we observe active political campaigns from the German political parties. Each has an active Instagram account.

Table 5 shows that the AfD takes second place in terms of activity after the CSU. Even so, user interaction with the AfD's posts is greater than interaction with the CSU's posts. Die Linke has a similar number of posts and likes as the AfD, but their posts attract significantly fewer comments. Indeed, the number of comments on the AfD's posts is larger than the sum of the comments on the posts of all the other parties.

The AfD's strategy on Instagram is like its strategy on Facebook. Most of the party's Instagram posts are a subset of the Facebook posts. They include an image that embeds a short text and have a longer text in the image description. Since Instagram is more image oriented, the highlight of the information is embedded in the image. The top nouns used in the descriptions are the same as those used in the Facebook posts but are ranked in a different order. The subset of messages in these Instagram posts is representative of AfD's messages on Facebook.

Table 5: Instagram statistics for all the German political parties in the period from January 2015 to May 2018

	posts	comments	likes
<i>AfD</i>	870	68,399	469,380
<i>CDU</i>	229	4,702	122,353
<i>CSU</i>	958	4,880	154,291
<i>Die Grünen</i>	514	16,689	317,048
<i>Die Linke</i>	825	13,313	418,208
<i>FDP</i>	584	8,397	325,941
<i>SPD</i>	175	4,098	105,067

4.5 Social Media Comparison

In order to compare and summarize the results of the previous subsections, we applied the aforementioned multi-platform schema. Table 6 lists which features of each of the social media platforms

Table 6: Features on each social media channel divided into the four categories from the multi-platform analysis. The collected data from the features in bold letters are more likely to follow a log-normal distribution and give better fits than the exponential, Poisson and power-law distribution according to the KS and Vuong tests. This is also the case for the features in italics, with the only difference that the log-normal distribution did not give a better fit than the exponential distribution.

	Facebook	Twitter	YouTube	Instagram
<i>party engagement</i>	posts	tweets	videos	posts
<i>user engagement</i>	comments	mentions	comments	comments
<i>user acceptance</i>	likes	<i>likes</i>	<i>likes</i>	<i>likes</i>
<i>message dissemination</i>	shares	retweets	<i>views</i>	—

falls into each one of the four categories. The only missing entry on the table is the message dissemination measure for Instagram. This would correspond to the number of times the pictures from a party account have been observed. This information is private and is only accessible to the owner of a business account, and is even then restricted to the account's own posts.

With the aid of the four measures introduced in this table, we proceed to compare the level of effectiveness of the AfD's activity on social media. Unfortunately, a quantitative cross-platform comparison is not possible, since the period of data collection differs between the social media platforms. Across the social media channels, the AfD has a high party engagement, taking either the first or second place in this category. This is part of their aforementioned social media strategy. In terms of user engagement, the AfD surpasses the rest of the parties by a considerable margin. As mentioned before, the tone of the party's message, together with the controversial topics they tend to discuss, such as immigration and the economic crisis, encourage users to engage more with the posts. The same superiority is shown in user support. In this category, the difference between the AfD and the rest of the parties is even larger than the difference in user engagement. This suggests that the user base that supports the party is also regularly active on social media. Regarding the last category, the AfD spread its message on Facebook and Twitter more effectively than the other German political parties by an order of magnitude. The same dominance is not observed on YouTube. Nevertheless, the fact that the AfD decided to open a channel after entering the parliament suggests that they now consider YouTube as part of the party's social media strategy. In the next few years, the AfD may prove to be as successful in spreading their message on YouTube as it has been on the other two platforms.

For the measures of user engagement, user acceptance and message dissemination categories, we provided aggregated results that were independent of the party activity. We deliberately did not focus on efficiency measures like the average number of Facebook likes per post or the average number of views per YouTube video in this analysis since the social media features are far from following a normal distribution. The great majority of social media posts attract little user engagement, in contrast to the very few posts that draw large amounts of attention. Indeed, research has shown that most complex social media interactions follow a log-normal distribution [2, 32, 69]. We assessed this statement by testing the distributions of

the features per unit of social media activity. This analysis considered the four social media channels and all seven German political parties². We used bootstrapped Kolmogorov-Smirnov tests with 50 samples and a p-value of 0.05. In all cases, the tests failed to reject the null hypothesis that the data is generated from a log-normal distribution. We further compared the log-normal distribution with the exponential, power-law and Poisson distribution by implementing Vuong tests with a p-value of 0.05. In all cases, the log-normal distribution was a better fit than the Poisson or the power-law distributions. However, in some cases, the Vuong test failed to show that the log-normal distribution gave a better fit than the exponential distribution. The features with at least one case of a failing Vuong test are shown in Table 6 in italic letters. On the other hand, the features in bold letters fit better to the log-normal distribution than to the other three distributions for the data from all of the political parties.

4.6 Discourse Comparisons

The last step in our analysis consisted of exploring the difference between how the AfD presents its goals to followers online and the content of party's explicitly stated political intentions and motives. For this analysis, we only considered the Facebook posts, YouTube videos and Instagram posts created during the same one-year period over which we collected the Twitter data, so that the period of interest for all four channels was the same. With the help of topic modeling, we compared the topics between the different communication channels with the topics included in the party's manifesto.

For this analysis, we treated each post, tweet and video as a document. We divided the text of the manifesto into paragraphs and defined each of these paragraphs as a document. The resulting corpora include 1,113 Facebook posts, 9,213 tweets, 436 YouTube video captions, 866 Instagram posts, and 395 paragraphs from the manifesto. Preprocessing was applied to eliminate stop words, punctuation marks, and applying the Snowball stemming algorithm to the remaining words. We additionally removed the string "RT" from the retweets.

Since the topics are created algorithmically, the interpretation of each topic relies on human curation. To compare the five corpora, we selected the topics that were directly connected to the economy

²We did not evaluate the YouTube comments since many videos have them blocked, and the Twitter mentions since they do not always represent a response to a tweet.

or immigration. We then calculated the percentage of documents that included these topics. For this calculation, we summed up the probabilities of each document from the selected topics and then divided by the number of topics. Table 7 shows that economy and immigration are treated equally in the manifesto, whereas in the AfD's Facebook, Twitter and Instagram content, immigration topics are discussed significantly more than economic topics.

In the case of YouTube, only 18% of the total discourse is related to immigration or economic topics, and these are discussed in a similar proportion. This exception can be attributed to the fact that in contrast to the other social media platforms, there is a lack of platform-specific generated content. Most of the videos on the AfD's channels are political speeches, which represent the oral discourse of the right-wing party which is not necessarily related to its social media message. Further research into discourse comparisons could focus on the differences between the speeches given at campaign events and those given during parliament sessions.

By comparison, immigration topics are discussed more frequently on Twitter and Instagram than on Facebook. Retweets were included in the Twitter data, perhaps explaining the 6% difference between the Twitter and Facebook corpora. For Instagram, the AfD's content is mostly a subsample of the Facebook posts, which indicates that the AfD deliberately favored immigration-related content on this platform. With this discourse analysis, we prove quantitatively that the AfD-generated content on social media downplayed the party's economic proposals and focused on immigration topics, which validates the analysis published by Kim [30].

Table 7: Percentage of documents related to topics discussing economy or immigration on different platforms.

	economy	immigration
Manifesto	21%	19.2%
Facebook	4.5%	16.1%
Twitter	4.7%	21.8%
Youtube	9.9%	8.2%
Instagram	7.6%	28%

5 CONCLUSION

Since its foundation, the AfD has used social media as its primary communication tool. In this paper, we proved that the AfD's online activity prompted the most user interactions of any German political party. Our analysis covers four social platforms over a longer period of time than has been considered in previous research. We mapped the AfD's social media strategy and illustrated some of the differences between the party's online discourse and its manifesto. We also confirmed that the spread of the AfD's message was boosted by automated accounts to some extent.

Although we cannot prove a direct connection between poll gains and social media dominance, we conclude that the AfD succeeded in spreading its message on social media. This message has also entered the limelight in traditional media and has permeated Germany's public agenda. The success of the AfD's social media

campaign together with traditional media coverage was essential in spreading and stimulating anti-establishment sentiment, which partially explains the rise of a far-right party in Germany.

The AfD's effective social media campaign raises the question of what strategies the other political parties will take to improve their online activity. There is no simple solution that can attend to this question. Digital campaigns have to evolve and take into consideration the new trends. In particular, they have to be creative to attract the younger citizens and at the same time reach those citizens that are disappointed with current politics.

Overall, the results suggest that there exists a shift in Germany's online political communication induced by AfD's social media dominance. Future research should explore the causes and effects of this shift. For example, it is plausible that the shift has led to an increase in online polarization or to user discussions becoming more aggressive. These phenomena have to be analyzed taking into consideration the potential biased reality caused by automated accounts.

The main contribution in this paper is the unified multi-platform analysis that classifies social media features into four categories. We hope that this cross-platform analysis can help scholars in the study of political parties and their campaigns around the globe. We emphasize the necessity for continuous and rigorous research in this field for two reasons: to cope with recent changes in digital media that directly affect online political interaction, and to understand the emergence and rise to dominance of right-wing populist parties around the world.

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