

# Digital Despots and Tweeting Democrats: The Influence of Regime Type on Leaders' Social Media Communication

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## Abstract

How do the strategic political incentives of different regime types influence the structure and sentiment of social media communication by heads of government? Political leaders increasingly view social media as an essential way to connect with their citizens. However, differences in accountability structures and media freedom, which vary with the level of democracy, systematically influence the form this connection takes. We analyze both the structure and sentiment of over 30,000 French and English language tweets made by 24 political leaders in Sub-Saharan Africa between 2018 and 2021. We find evidence that leaders of more democratic countries tweet more frequently, are less likely to engage directly with specific users, and are more measured in their communication style.

**Keywords:** social media, authoritarianism, democracy, public communication

## 1. Introduction

Social media is an increasingly common channel of communication between political leaders and their citizens. By 2020, leaders from at least 163 countries had a personal presence on Twitter, with many leveraging the platform for pivotal announcements about global events such as the COVID-19 pandemic (Burson 2020; Haman 2020). Unlike traditional forms of communication, such as press releases and televised speeches, social media is relatively insulated from the biases associated with media coverage and commentary. Political leaders can determine exactly what, when, and how frequently they want to post on social media platforms without worrying about the agendas of traditional media outlets. This creates a direct link between leaders and their citizens.

While the rising importance of social media communication is global, we should not expect all political leaders to use it the same way. Leaders face very different incentives depending on which

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societal groups they are accountable to and how much control they have over information flows within their countries. These attributes vary systematically with the level of democracy. In more democratic regimes, political leaders answer to larger groups of voters who have greater access to alternative information sources. Under these conditions, social media is primarily used to disseminate information to regular citizens. In less democratic regimes, where elite actors tend to dominate politics and information is more easily manipulated by the regime (Tufekci 2014), political leaders focus more on pro-regime messaging and engaging directly with elite actors.

To identify differences in social media communication across regime types, we analyze over 30,000 tweets by African political leaders from their certified Twitter handles from 2018 to 2021. We find that leaders of more democratic countries tweet more frequently than their non-democratic counterparts and are less likely to engage directly with specific users, although both of these effects are contingent on a high enough percentage of the population using Twitter. More democratic leaders are also noticeably more measured in the way they tweet: (1) more democratic leaders exhibit lower positivity, on average, (2) the onset of the COVID-19 pandemic was only associated with declining positivity in more democratic countries, and (3) pre-election jumps in positivity are less extreme for leaders of more democratic countries.

The current study contributes to our understanding of modern political communication across regime types. Much research on social media focuses on usage by the general population (e.g. Chunly 2020; Ruijgrok 2021). Of studies that analyze social media communication by political elites, the majority examine candidates (e.g. Gross and Johnson 2016) and/or lower levels of government (e.g. Graham et al. 2013). With the notable exception of Bulovsky (2019), the relatively few studies that look at social media communication by heads of government, as we do, are almost exclusively single-case (see Norris 2009) or comparative among democracies (e.g. Rivas-de-Roca and Pérez-Curiel 2023).

Our study also improves methodologically on existing research about the social media use of political elites. We apply recent advances in natural language processing (NLP) to assess the sentiment of tweets rather than relying on more common dictionary-based sentiment measures. The multilingual, transformer-based XLM-roBERTa-base model developed by Barbieri, Anke, and Camacho-Collados (2022) represents a significant step forward in this regard. This technique also allows us to study the sentiment of tweets in different languages (French and English) in a comparative

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context, which remains relatively rare in political science research (e.g. Davidson et al. 2019; Dai and Radford 2018).

Finally, our research has real-world significance. Public communication by leaders affects the thoughts and actions of their audiences, hence shaping dynamics in different political systems. In some cases, social media communication can sway individuals to support the agenda presented by leaders on social media; in others, a particularly euphemistic presentation of harsh realities might cause them to reflect on their willingness to seek change (e.g. Weidmann and Rød 2019). Understanding systematic differences in how political leaders communicate over social media is a necessary first step toward a deeper understanding of these dynamics.

## **2. Accountability, information control, and social media communication style**

Contemporary heads of government must navigate the complexities of a hybrid media environment, in which both traditional and non-traditional gatekeepers influence how their messaging is received and amplified (Chadwick 2013). However, they also have an unprecedented opportunity for low-cost, continual, and direct communication with citizens through social media. They can create content and craft messages directly for users on their own schedule without the mediating role of traditional news outlets.

The ways in which political leaders do this, however, reflect their broader strategic environment. In particular, we identify two aspects of political systems that shape the incentives faced by leaders in social media communication: accountability structures and information control.

First, political leaders are accountable to those societal groups that have the ability to remove them from office. Political leaders naturally prioritize communications with the most important of these groups. Generally speaking, more democratic leaders are accountable to larger subsets of the population than less democratic leaders (Bueno de Mesquita et al. 2001). There is, of course, variation in the *identity* of these groups, especially within non-democracies where core constituencies can be based on parties, militaries, familial ties, or other formal or informal institutions (Geddes, Wright, and Frantz 2014). However, *size* tends to correlate positively with the level of democracy, meaning that - on average - more democratic leaders aim to reach and engage with a broader audience than their less democratic counterparts. Second, political leaders differ with respect to how completely they can control the information and narratives available to citizens within their borders. Messaging

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is most effective when targets cannot easily access alternative viewpoints (Enikolopov, Petrova, and Zhuravskaya 2011). Under such conditions, political leaders face fewer constraints on the content they can include in their social media communication.

In other words, as countries become more democratic, accountability typically shifts from elites to the public, and state control over information declines. Patterns of social media communication across regimes should reflect these differences.

The most basic characteristic of social media communication is its frequency; that is, how often leaders use social media to communicate with their citizens. In line with existing research by Bulovsky (2019), we anticipate that leaders of more democratic countries, on average, post on social media more frequently than others. In a study of social media use by (democratic) political leaders, Aharony (2012) describes Twitter as one of many channels political leaders use to influence citizen perceptions. Yu (2016) adds that the engagement citizens seek with political content is consistent across different social media platforms. In this view, social media is useful because it allows leaders to reach audiences that do not consume traditional media. The more accountable leaders are to ordinary citizens, the more they will try to connect directly with their public, and the more valuable social media is for reaching such audiences. In contrast, less democratic leaders are primarily accountable to a smaller group of people. Utilizing communication channels that reach broad segments of the regular population is simply a less efficient use of their time. As Bulovsky (2019) notes, “with diminished electoral benefits, authoritarian leaders’ accounts should exhibit more sclerotic characteristics (p. 24).” This leads to our first hypothesis.

**Hypothesis 1.** *Leaders of more democratic countries post more frequently on social media than leaders of less democratic countries.*

Frequency is not, however, the only characteristic of social media communication we expect to differ across regime types. If leaders tailor their communication to match their specific political incentives, there will also be differences in style.

First, we anticipate leaders of less democratic countries, who are less accountable to their citizenry writ large, engage in more elite-level exchanges on social media than leaders of more democratic countries. Leaders of less democratic countries are often served by directly addressing powerful individuals and institutions, domestically and abroad. Engaging with international actors can provide

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an appearance of legitimacy, which is itself more important when elections are themselves less legitimate (e.g. Cooper and Wang 2020; Dukalskis 2021). Engaging with domestic elites, who are a particularly important constituency in less democratic contexts, can also be a way to curry favor and/or provide additional legitimacy. The calculation differs for leaders of more democratic countries. Elitist exchanges may result in disaffection by regular citizens. Along these lines, Gurevitch, Coleman, and Blumler 2009 note that “[a]s political discourse takes a more vernacular, quotidian form, politicians are under pressure to present themselves as personalities with whom citizens would want to interact (p. 173).” This imperative is more pronounced where more democratic accountability structures encourage leaders to engage with a broader and often more diverse audience. In short, the benefits of elite-level exchanges are higher and the cost lower for leaders of less democratic countries. This leads to our next hypothesis.

**Hypothesis 2.** *Leaders of more democratic countries have fewer elite-level exchanges on social media than leaders of less democratic countries.*

Next, we posit that leaders’ ability to control information influences the relative positivity of their social media posts. Leaders of less democratic countries have both the desire and the ability to “spin” their messaging in a positive, pro-regime direction. Guriev and Treisman (2022) argue that “rather than terrorizing or indoctrinating the population, [contemporary authoritarian] rulers survive by leading citizens to believe – rationally but incorrectly – that they are competent and public-spirited (p. 101).” Accordingly, in a comparative analysis of speeches, they find that these modern “informational autocrats” emphasize economic performance and service provision rather than violence or other forms of threats. We anticipate the tendency toward positive spin also extends to social media communication.

While more democratic leaders might also wish to self-promote through positive messaging (see Grimmer, Messing, and Westwood 2012), they are constrained by the greater degree of media freedom in their countries. A free and flourishing media landscape is one of the hallmarks of democracy. As a result, more democratic leaders compose social media posts with the understanding that any information they provide will face scrutiny from traditional and other media. When adverse events occur, their less democratic counterparts can utilize censorship to avoid discussing unpleasant topics or narratives (King, Pan, and Roberts 2013), essentially deploying social media as part of

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a broader, cohesive information campaign. This becomes more difficult as information control weakens.

Accordingly, we anticipate that democratic leaders – on average – are less positive in their social media communications. We also expect that, faced with an objectively adverse event, the decline in positivity is greater for democratic leaders, as they necessarily face up to the reality of their situation.

**Hypothesis 3a.** *Leaders of more democratic countries have a less positive style of social media communication, on average, than leaders of less democratic countries.*

**Hypothesis 3b.** *Leaders of more democratic countries respond to negative events with a greater decline in positivity than leaders of less democratic countries.*

Finally, we anticipate that country leaders alter their social media communication in electoral periods when the stakes of political communication are especially high. This is true in most non-democracies, as well as in democratic countries. Of course, in the most extreme authoritarian regimes, leaders are not affected by electoral cycles; elections – if they are held – come and go without any perceivable impact on their behavior. However, such regimes are relatively rare in today’s world. More common are competitive authoritarian regimes, for whom elections serve as real, if heavily biased, arenas for contestation (Levitsky and Way 2002). In competitive authoritarian regimes, as in democracies, leaders exert significant effort to mobilize supporters in the lead-up to elections.

First, we expect elections to increase the frequency of tweets. Voters in all regimes have short memories and are most influenced by changes to their welfare that occur nearer to election day (Fair 1978). Social media is a tool for making voters – and powerful elites who might influence blocks of voters – view the incumbency more positively. Leaders will utilize this tool with greater frequency as elections grow closer. Case studies in different countries and at different levels of government support this view. For instance, Stier et al. (2018) find that, during the 2013 campaign for the German Bundestag, candidates tweeted more frequently immediately prior to election day. In Cameroon, Ngange (2020) finds that the frequency of tweets by candidates for the 2018 elections was greatest one month prior to the elections. Likewise, Gray and Gutierrez-Mannix (2021) show that Twitter use by elected US Attorney Generals is greater during election periods for both their personal and official accounts.

Second, we expect the sentiment of tweets to be more positive during pre-electoral periods than

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at other times. Campaigns are complicated moments for political communication, with incentives to speak both positively about oneself and negatively about one's opponents. However, the literature finds that incumbents – who are the focus of our study – tend to rely mostly on more positive messaging. For example, in a comparative study of eight European countries, Crabtree et al. (2020) demonstrate that the party manifestos of the incumbent party are more positive than others, especially when it is also the prime minister's party. Examining tweets from the 2016 US Primary, Gross and Johnson (2016) find that candidates are more negative with respect to candidates who are ahead of them in the polls, suggesting that those on top are comparatively positive. Finally, Evans, Cordova, and Sipole (2014) find that candidates for the US House use mobilizing messages more frequently than attacking ones and that this is especially true for incumbents.

Although we expect leaders of all regimes to adjust their communication in electoral periods, we anticipate swings to be greater in competitive authoritarian regimes than in their democratic counterparts. Not only do they have greater control over narratives, but competitive authoritarian leaders are particularly likely to rely on short-term mobilization strategies. This includes widespread vote-buying, in which individuals are granted material rewards in exchange for their support. In line with this, Ham and Lindberg (2015) find that the degree of vote buying is most significant at intermediate levels of democracy when more overt forms of manipulation are discouraged, but long-term partisan affiliations are not yet established. Blaydes (2011) demonstrates that poverty rates in Mubarak's Egypt were lower in election years due to election-related handouts. Election-based changes in communication style should reflect the shorter-term mobilization strategies of competitive authoritarian leaders.

**Hypothesis 4a.** *Social media communication is (1) more frequent and (2) more positive immediately before and after an election.*

**Hypothesis 4b.** *The change in communication style during electoral periods is greater for leaders of less democratic countries than leaders of more democratic countries.*

### **3. Methodology**

We evaluate our hypotheses using an original dataset of tweets by political leaders in Sub-Saharan Africa between January 2018 and December 2021. This region has a wide range of political regimes, ensuring variation on our main independent variable (regime type). While we would ideally have

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observations for all of these countries, our final sample is necessarily limited by several considerations (see details in Appendix 1).

First, not all political leaders use Twitter. We focus on leaders who (1) were active on Twitter between 2018 and 2021 and (2) utilized a verified personal government media account.<sup>1</sup> The four-year time window balances competing practical considerations. On the one hand, we need temporal variation in electoral incentives to evaluate *Hypotheses 4a* and *Hb*. The 2018–2021 window includes elections in most countries. On the other hand, there are likely to be long-term trends in how Twitter is used that would be difficult for us to parse. A shorter time period increases the comparability of tweets throughout the sample.

Second, not all political leaders tweet in the same language. Of the 30 leaders we identified as being active on Twitter during our time period with a verified personal account, 12 used only English, 9 used only French, 1 used only a different language (João Lourenço of Angola, Portuguese), and 8 used multiple languages. We focus on leaders who tweet primarily in English, French, or a combination of the two, resulting in a final sample of 24 leaders. We do this for several reasons. First, even the most inclusive multilingual models are unfortunately not yet able to process all local languages – such as Kirundi. In order to avoid cherry-picking which local languages to include, we purposefully decide to limit the study’s current scope to the two high-resource languages, English and French. Second and more importantly, past studies have highlighted that multilingual models are predominantly trained on high-resource languages like English, wherefore the expected performance on low-resource languages is significantly lower (e.g. Bender et al. 2021).

Most leaders in our final sample (see Table 1) only tweet in one language. Of the three exceptions, Ali Bongo Ondimba (Gabon) tweeted only in English and French. Ismail Guelleh (Djibouti) tweeted in English, French, Arabic, and Somali, of which 90% are in English or French. Évariste Ndayishimiye (Burundi) tweeted in English, French, and Kirundi, of which 68% was in English or French. Since the decision to tweet in a language other than French or English reflects the intended audience and may change the content of the tweet, we perform all of our analyses without these latter two leaders and show that our results are the same (see Appendix 5).

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1. Twitter requires users to verify an email address with an official government domain, which assures us that the accounts in our study are legitimate.



**Table 1.** Overview of cases

Name	Country	Avg. Democracy Score	Twitter Users (% Pop)	Age	Education	Language
Macky Sall	Senegal	0.72	1.27	Mid	3	French
Cyril Ramaphosa	South Africa	0.72	5.99	Mid	2	English
Nana Akufo-Addo	Ghana	0.71	3.06	Old	2	English
Roch Kaboré	Burkina Faso	0.70	0.24	Mid	3	French
Mokgweetsi Masisi	Botswana	0.64	4.72	Mid	3	English
George Weah	Liberia	0.62	0.35	Young	3	English
Juliu Maada Bio	Sierra Leone	0.55	0.44	Mid	3	English
Mahamadou Issoufou	Niger	0.53	0.13	Mid	3	French
Muhammadu Buhari	Nigeria	0.53	1.65	Old	1	English
Mohamed Bazoum	Niger	0.52	0.12	Mid	2	French
Alassane Ouattara	Cote d'Ivoire	0.51	1.00	Old	3	French
Adama Barrow	The Gambia	0.51	1.26	Young	1	English
Andry Rajoelina	Madagascar	0.49	0.11	Young	1	French
Patrice Talon	Benin	0.42	0.48	Mid	2	French
Faure Gnassingbé	Togo	0.40	0.61	Young	3	French
Ali Bongo Ondimba	Gabon	0.39	1.37	Mid	3	French, English
Hakainde Hichilema	Zambia	0.38	1.00	Mid	3	English
Edgar Lungu	Zambia	0.35	1.05	Mid	2	English
Yoweri Museveni	Uganda	0.30	0.65	Old	2	English
Paul Biya	Cameroon	0.30	0.73	Old	2	French
Emmerson Mnangagwa	Zimbabwe	0.29	2.24	Old	2	English
Ismail Guelleh	Djibouti	0.25	1.50	Old	0	Fr, Ar, Somali
Paul Kagame	Rwanda	0.24	1.10	Mid	2	English
Évariste Ndayishimiye	Burundi	0.18	0.25	Young	2	En, Fr, Kirundi

Notes: Leaders active on Twitter are manually identified through the official government account labels. Electoral Democracy Score and Twitter Users (% Pop) are averaged over the observations for the users. Age is based on the average age in the data, split as follows: young - under 55, mid - 55 to 69, old - 70 and older. Education is classified on a scale from 0 to 3 (0 = Primary, 1 = Secondary, 2 = University, and 3 = Graduate). Languages are extracted from tweets' language tags.

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Reflecting on our ability and limitations to make inferences from our findings, Table 1 highlights that the composition of our final sample of leaders is diverse and does not appear to be structurally driven by degree of democratization, geography, or economic development. In Appendix 1, we provide a comparison of the leaders/countries included and excluded from the sample to further address concerns of sample bias.

### **3.1 Dependent variables**

The Twitter data consists of account information and tweets. The first pillar contains the account creation date, the profile bio, follower counts, following counts, and tweet counts. We extract this information through the `tweepy` python package. The second pillar consists of all tweets between January 1st, 2018, and December 31st, 2021. Since accessing the Twitter API through `tweepy` only allows for the extraction of a maximum of 3,200 tweets per user, we resort to a social networking services (SNS) scraper, `snsrape` (JustAnotherArchivist 2022). From the 41,292 tweets initially scraped, we restrict the sample to include only those the leaders posted while in office (32,792 tweets). After further restricting the sample to those in English or French, we were left with 31,121 tweets with metadata of the 24 political leaders. After extraction of the tweets, all irrelevant information is removed, and all relevant features are formatted for ease of use.

As outlined earlier, we argue that social media use by leaders reflects the political system within which they operate and the political incentives they face. We acknowledge that some leaders in our sample may not always manage their own accounts. However, media teams acting on behalf of leaders must respond to the same political incentives. This means we can expect the same systematic differences regardless of whether media teams are involved or not.

To measure the frequency of social media communication, we calculated the daily number of tweets posted by each leader.

To measure the occurrence of elite-level exchanges, we created a binary variable that takes a value of 1 if another user is directly mentioned in the tweet using the “@” symbol and 0 otherwise. While scholars frequently note the potential of social media - particularly Twitter - for fostering interaction and dialogue between leaders and their constituents (e.g. Graham et al. 2013; Tromble 2018), many existing studies question whether real-world politicians use Twitter this way (see Jungherr 2016). For example, examining dynamics in Scotland during the 2010 UK general election campaign, Baxter

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and Varfis (2011) show that only 3 of 20 parties and 1 of 12 independent candidates included an online discussion forum on their website.

At the presidential level, we take this argument one step further.<sup>2</sup> Direct exchanges between users represent an interaction between two individuals that necessarily excludes others from the conversation. This perception is even greater when the users interacting with one another are political elites, as is most often the case for heads of government. For example, in 2020, Ugandan President Museveni tweeted:

“Congratulations to @BemanyaT upon his election as the next Director General of the African Intellectual Property Organization (ARIPO). He is the second Ugandan to occupy this position. I thank the Foreign Affairs Ministry that oversaw the lobbying. <https://t.co/z7rd5KWl48>.”

Posts of this sort do not represent the type of inclusive, interactive dialogue between politicians and constituents of the sort found by Graham et al. (2013) in a study of UK parliamentary candidates. At least when it comes to social media communication at the highest level of government, mentioning users directly is almost always targeted at elite actors rather than regular citizens.

To capture the sentiment of tweets - how positive or negative the language is - we use a multilingual XLM-roBERTa-base model pre-trained on almost 200 million tweets (Barbieri, Anke, and Camacho-Collados 2022) to generate a positivity scores for each tweet (0 to 2 scale with 2 most positive score). The model was fine-tuned for evaluating the emotional tone of texts (Barbieri, Anke, and Camacho-Collados 2022) and is specialized to work with Twitter data. It is based on RoBERTa, a more robust version of Google’s BERT model (Liu et al. 2019). As the original BERT model, our employed XLM-roBERTa-base model utilizes transformers. Transformers allow the model to consider long-range dependencies in sequential data, such as individual words in a sentence (Devlin et al. 2019). For instance, if a country’s leader states in a tweet that “it was horrific,” the model will be able to determine what “it” refers to even though it might be clarified much earlier or later in the sentence. Since BERT-based models, like the one we use, take a bidirectional approach - that is, they consider the dependencies of a word with all other words prior and after itself - the model is relatively robust to different sentence structures (Devlin et al. 2019).

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2. See Katz, Barris, and Jain (2013) for a discussion of the mismatch between the promise and reality of US President Obama’s social media engagement.

This methodology improves on studies that utilize dictionary-based approaches. Such techniques are not well-suited to the unstructured nature of social media data and/or struggle to incorporate contextual information (Hutto and Gilbert 2014). For example, Figure 1 depicts two posts from our data that the VADER algorithm incorrectly labeled as neutral. Barbieri, Anke, and Camacho-Collados (2022)’s model outperforms other common approaches across multiple benchmarks of sentiment analysis, giving us confidence in the results of this state-of-the-art model.

As the leaders’ tweets are relatively clean and roBERTa can incorporate contextual information like punctuation, we do not perform further data preparation steps. Tweets from official governmental accounts are likely to be comparatively less noisy. The potentially idiosyncratic style of social media is also captured by the model (Barbosa and Feng 2010; Derczynski et al. 2013). Finally, by utilizing a multilingual model, we reduce the potential bias associated with employing individual models specializing in English and French separately. We outline our model choice in detail and compare its performance to the VADER algorithm in Appendix 2.



Figure 1. Positive tweets incorrectly labeled as neutral by VADER model

### 3.2 Independent variables

Our primary independent variable is regime type. We use V-DEM’s electoral democracy score, which is available for the entire time and allows us to study variation in the degree of democracy.



(a) Positive tweet. Sentiment score = 1.9133



(b) Negative tweet. Sentiment score = 0.0894

**Figure 2.** Examples of tweets' compound sentiment score (XLM-roBERTa-base model, 0 to 2 range)

This is appropriate because our proposed mechanisms are not discrete. For instance, as leaders depend more on citizens than elites for their authority, they will care more about keeping their tweets inclusive. Likewise, as their control over information diminishes, we expect leaders to adopt increasingly measured approaches to social media communication.

We include a variable to measure the relative importance of Twitter at the country level. In a comparative study of 32 European countries, Haman and Školník (2021) finds that overall Twitter use in the country significantly influences whether or not members of parliament adopt Twitter. Our measure captures the percentage of the population using Twitter. As Table 1 shows, Twitter use varies substantially in our sample, but at least some countries have levels comparable to more significant economies in the Global South, like India (1.7%) and Brazil (8.0%).

Our sample consists of tweets before and during the COVID-19 pandemic. We include a variable that indicates whether the first case of COVID-19 has been confirmed in the country to account for potentially alternating political climates in times of distress. We also use this variable to directly examine how sentiment changes in countries when news becomes objectively more negative.

For our analysis of electoral cycle effects, we incorporate two indicator variables: one for the 3 months preceding an election and one for the 3 months following it. We take this approach, rather than using continuous variables, since we expect the effect of elections on communication to occur in a relatively narrow time frame; for example, we do not expect that electoral considerations would be driving differences in social media communication between a day 2 years prior to an election and a day 18 months prior to an election. We include a post-election variable for two reasons. First, some elections are contested, and the time immediately after an election can involve as much campaigning as the time immediately before. Second, even when elections occur smoothly, there is likely to be a period of congratulation and expression of gratitude that likely increases the frequency and positivity

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of tweets beyond what is “normal”.

In addition, we control for several characteristics of the leaders. As shown in Table 1, we code leaders’ age to account for potential biases introduced by their technical affinity. We also consider the leaders’ level of education, which was identified as relevant for the study of political leaders by Krcmaric, Nelson, and Roberts (2020) and Baturu (2016). Following Ellis, Horowitz, and Stam (2015), we classify the level of education on a scale from 0 to 3 (0 = Primary, 1 = Secondary, 2 = University, and 3 = Graduate). Finally, we control for the language to account for potential linguistic effects.

#### **4. Results and discussion**

We begin our analysis with *Hypothesis 1*, which predicts that democratic leaders tweet more frequently than non-democratic leaders. Our dependent variable is the number of tweets by a given user on a given day. We use a negative binomial model to account for the large number of zeros in our data. Consistent with *Hypothesis 1*, there is a positive relationship between the electoral democracy score and the daily number of tweets. However, the relationship is not statistically significant in the baseline model (Model 1 in Table 2). We, therefore, interact the electoral democracy score with the measure of country-level Twitter use (Model 2). The positive and significant coefficient on the interaction term suggests that Twitter use is more frequent in more democratic countries but that this relationship only exists in countries with higher levels of Twitter penetration. We illustrate this conditionality in Panel (A) of Figure 3, which depicts the average marginal effect (AME) of electoral democracy score for different levels of Twitter usage. When Twitter use is low, the predicted effect of electoral democracy on tweet frequency is indistinguishable from zero. However, when Twitter use is roughly greater than the midpoint in our data, electoral democracy has the predicted positive relationship with tweet frequency. The findings fit into our theoretical framework that leaders of more democratic countries seek to address the broad citizenry and are thus more incentivized to tweet when Twitter use is higher.

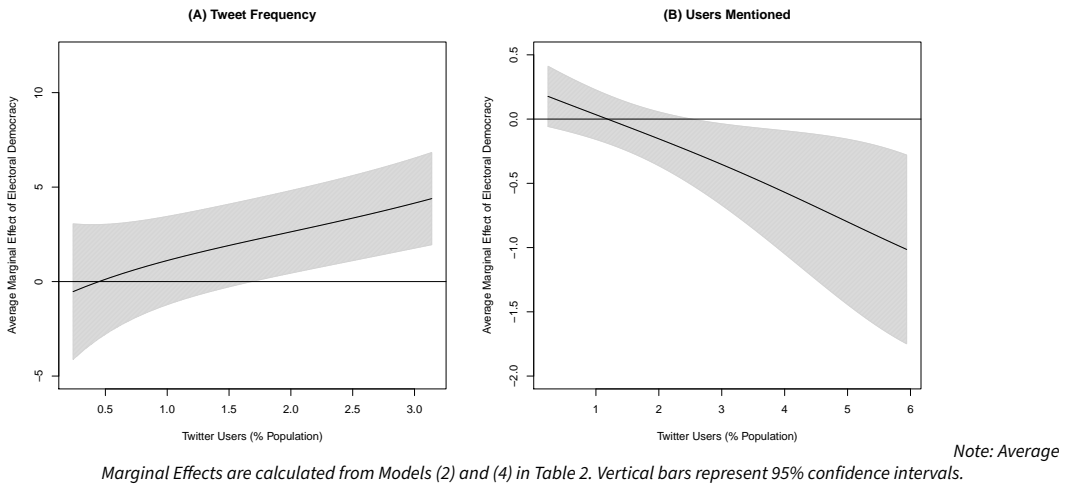
**Table 2.** Relationship between Democracy and Tweet Frequency/User Mentions

	<i>DV: Frequency</i>		<i>DV: Mentioned Users</i>	
	(1)	(2)	(3)	(4)
Electoral Dem. Score	1.509 (1.201)	-1.025 (1.750)	0.239 (0.977)	1.949* (1.004)
Twitter Users (% Pop)	0.130 (0.083)	-1.388** (0.266)	-0.202**	0.901***
Elec. Dem. × Twitter Users (% Pop)		2.290*** (0.812)		-1.646*** (0.424)
Age	0.036** (0.018)	0.040** (0.016)	-0.042*** (0.010)	-0.043*** (0.008)
Education	0.003 (0.240)	0.055 (0.206)	0.461*** (0.126)	0.362*** (0.114)
COVID-19 Active	0.146 (0.254)	0.103 (0.202)	-0.332* (0.184)	-0.324* (0.190)
Constant	-3.455** (1.573)	-2.223 (1.532)	0.060 (0.894)	-0.696 (0.886)
Unit of analysis	User-Day	User-Day	Tweet	Tweet
Observations	28,961	28,961	31,121	31,121

Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Models (1) and (2) are negative binomial models, Models (3) and (4) are logit models.

All models have robust standard errors, clustered at the user.



**Figure 3.** Level of Democracy and Tweet Frequency/Inclusivity



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Next, we examine *Hypothesis 2*. This hypothesis predicts that elite-level exchanges are less likely in countries with a higher level of democracy. Accordingly, we anticipate a negative relationship between electoral democracy and our indicator for user mentions. In Model 3 of Table 2, we regress our indicator variable for mentioned users on electoral democracy score using a logit model. As with *Hypothesis 1*, we find no effect in the baseline specification. However, the interaction model (Model 4) uncovers a similar pattern: in countries with low Twitter use, electoral democracy is positively correlated with mentioning more users. In contrast, in countries with higher levels of Twitter use, we find the predicted negative correlation between mentioning other users and electoral democracy. This is illustrated in Panel (B) of Figure 3.

Why might this contingency exist? Twitter is less valuable for reaching mass audiences in countries where it is not widely used. This changes the incentives faced by more democratic leaders, who may tweet less frequently and use the platform more as a way to target international audiences through direct elite-level exchanges – such as highlighting them meeting a foreign head of government. The incentives faced by different leaders diverge as Twitter use increases.

The control variables in Table 2 also reveal some interesting patterns. Age has a positive relationship with tweets' frequency and inclusivity. While education has no significant relationship with frequency, it is positively correlated with mentioning other users directly. This paints a picture of younger, more educated leaders from all regime types engaging more with the powerful few, perhaps to portray “political hipness.”

Next, we examine the relationship between electoral democracy and tweet sentiment. Our dependent variable is the tweet-level positivity score. *Hypothesis 3a* predicts that the sentiment of social media posts by non-democratic leaders is more positive than those by democratic leaders. For this hypothesis, we regress (OLS) our sentiment variable on the electoral democracy score. According to *Hypothesis 3b*, we also expect a more significant decline in positivity after the advent of COVID-19 – an adverse event – in more democratic countries. We use an indicator variable for whether the tweet was sent after the advent of COVID-19 to explore this expectation.

As was the case for *Hypotheses 1* and *2*, Model (1) of Table 3 shows there is not a significant correlation between electoral democracy and tweet positivity. However, we include the interaction with our measure of Twitter users in Model (2). The negative and significant coefficient on the interaction term again suggests that the expected negative correlation exists in countries with higher

**Table 3.** Relationship between Democracy and Tweet Sentiment

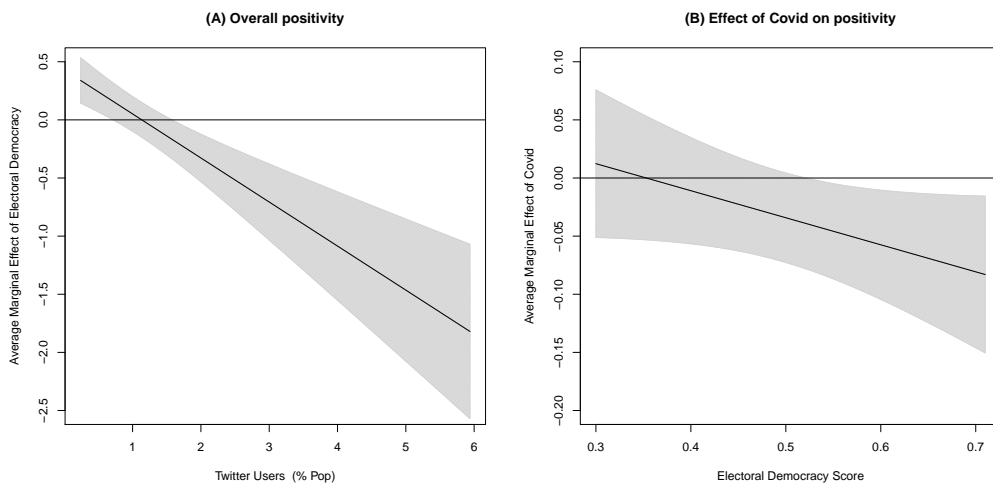
	<i>DV: Positivity</i>		
	(1)	(2)	(3)
Electoral Dem. Score	0.051 (0.116)	0.430*** (0.112)	0.156 (0.124)
COVID-19 Active	-0.037* (0.021)	-0.039* (0.022)	0.082 (0.068)
Twitter Users (% Pop)	-0.014 (0.010)	0.249*** (0.056)	-0.011 (0.010)
Age	-0.007*** (0.001)	-0.007*** (0.001)	-0.007*** (0.001)
Education	0.048** (0.020)	0.032*** (0.011)	0.047*** (0.018)
French	0.165*** (0.048)	0.183*** (0.029)	0.166*** (0.047)
Elec. Dem. × Twitter Users (% Pop)		-0.379*** (0.077)	
Elec. Dem. × COVID-19 Active			-0.233* (0.132)
Constant	1.654*** (0.111)	1.434*** (0.089)	1.579*** (0.106)
Unit of Analysis	Tweet	Tweet	Tweet
Observations	31,121	31,121	31,121
R <sup>2</sup>	0.089	0.099	0.090
Adjusted R <sup>2</sup>	0.088	0.099	0.090

*Note:*

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

levels of Twitter use. This is illustrated in panel (A) of Figure 4: conditional on a significant Twitter audience, the predicted AME of electoral democracy is negative.

Model (3) in Table 3 examines the effect of the objectively negative news that COVID-19 had reached the country in question. This model reveals that tweets after the advent of COVID-19 had a similar sentiment to those before it in non-democracies, but - as indicated by the negative



Note: Average Marginal Effects are calculated from Models (2) and (3) in Table 3. Vertical bars represent 95% confidence intervals.

**Figure 4.** Level of Democracy and Tweet Sentiment

and significant interaction coefficient - there was a decline in positivity among more democratic countries. Panel (B) of Figure 4 illustrates that this relationship exists even without restricting attention to countries with significant Twitter penetration. Regardless of the target audience, less democratic regimes can spin events in a more positive light than more democratic regimes. However, in Appendix 5, we demonstrate that the correlation is somewhat greater for countries with larger Twitter audiences. In Appendix Appendix 3 we also dive into a more detailed analysis of a specific negative event during the COVID-19 pandemic - the first day of confirmed cases in each country.

Turning to our control variables, the models in Table 3 also suggest that younger leaders tweet more positively on average than their older counterparts. Likewise, higher levels of education appear to correlate with more positive sentiment. Tweets in French are also more positive than those in English.

This latter finding is particularly striking. Our sentiment model was pre-trained on a multilingual corpus and employed the same infrastructure irrespective of the language. Therefore, we are hesitant to attribute this effect to biases in the model. Instead, we offer two possible interpretations. First, French might be a more volatile, emotional language with a more expressive vocabulary than that of English. Since tweets are, on average, quite positive in our data, this would push tweet positivity scores upward on balance. Second, French-speaking individuals might be more expressive - or

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more positive - due to cultural influences (Perlovsky 2009). Our results diverge from those of Crabtree et al. (2020), who observed a slightly more positive sentiment in English than French in a cross-language study of European party manifestos. To validate our findings and help distinguish between these two mechanisms, we examined Canadian President Justin Trudeau's tweets - the only international political leader who posts almost all of his content identically in both English and French. Consistent with the first potential explanation, Trudeau's French tweets conveyed more positivity than their English counterparts, supporting our speculation that this effect is associated with the French language, rather than cultural factors (see Appendix 4).

Finally, we examine how election dynamics influence tweet frequency and sentiment. *Hypothesis 4a* predicts that leaders of all countries tweet more frequently and more positively immediately before and after elections. Additionally, according to *Hypothesis 4b*, we expect this effect to be greater for less democratic leaders.

To evaluate the effect of elections on frequency, we regress the number of tweets each day on variables capturing whether it is a pre- or post-election period (Model (1) in Table 4), again using a negative binomial model to account for a large number of zero-tweet days. We find a positive, significant relationship between being in a pre-election period and tweet frequency. However, in Model 2, we interact these variables with electoral democracy and find no significant relationship. The results are illustrated in the top panel of Figure 5. Leaders of all regime types increase the frequency of their tweets during pre-election periods. However, this increase is not greater in less democratic regimes but appears to occur regardless of regime type.

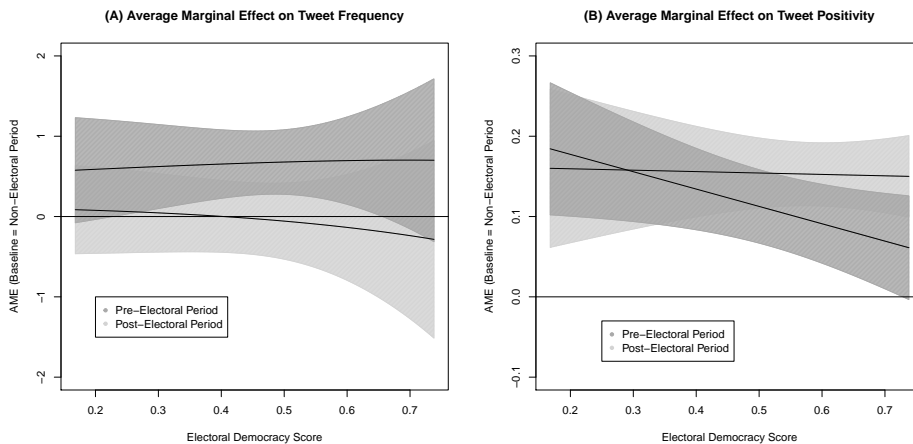
We turn next to tweet sentiment. In line with *Hypothesis 4a*, all leaders show a marked increase in positivity during pre- and post-election periods across regime types. Furthermore, as predicted by *Hypothesis 4b*, the correlation in the pre-election period is smaller in the more democratic countries in our sample. As shown in Figure 5, the pre-election increase in positivity is larger when the electoral democracy score is low. This is consistent with electoral effects being greater for the less democratic countries in our sample.

**Table 4.** Relationship Between Elections and Twitter Usage

	<i>DV: Frequency</i>		<i>DV: Positivity</i>	
Pre-Electoral	0.646*** (0.231)	1.014 (1.666)	0.108*** (0.027)	0.221*** (0.057)
Post-Electoral	-0.046 (0.232)	0.240 (0.719)	0.153*** (0.022)	0.163** (0.067)
Electoral Dem. Score	1.478 (1.210)	1.541 (1.261)	0.044 (0.106)	0.067 (0.108)
Twitter Users (% Pop)	0.133 (0.124)	0.133 (0.125)	-0.011 (0.009)	-0.012 (0.009)
COVID-19 Active	0.120 (0.273)	0.113 (0.268)	-0.044*** (0.015)	-0.047*** (0.015)
Age	0.036* (0.019)	0.036* (0.019)	-0.007*** (0.001)	-0.007*** (0.001)
Education	0.004 (0.248)	0.008 (0.249)	0.045*** (0.017)	0.047*** (0.016)
French			0.168*** (0.043)	0.166*** (0.042)
Elec. Dem. X Pre-Electoral		-0.739 (1.278)		-0.216** (0.102)
Elec. Dem. X Post-Electoral		-0.593 (1.387)		-0.018 (0.110)
Constant	-3.419** (1.618)	-3.449** (1.631)	1.653*** (0.091)	1.639*** (0.089)
Unit of Analysis	User-Day	User-Day	Tweet	Tweet
Observations	28,961	28,961	31,121	31,121
R <sup>2</sup>			0.096	0.096
Adjusted R <sup>2</sup>			0.096	0.096

Note:

\* p<0.1; \*\* p<0.05; \*\*\* p<0.01



Note: Predicted effects are calculated from the models in Table 4. Confidence intervals in the second and third panels do not reflect cluster robust standard errors.

Figure 5. Electoral Cycles and Social Media Communication

## 5. Conclusion

Political leaders across regime types rely on social media platforms to communicate directly with their citizens. However, the form of communication varies systematically with the level of democratization. As political institutions become more democratic, they incentivize leaders to engage with broad citizen audiences about policies and events. Where they are less democratic, the less pressing need to engage with regular citizens combined with more comprehensive control of the narrative results in less frequent, propaganda-based, aimed primarily at elite audiences.

In this article, we use the official Twitter output from the leaders of 24 African countries to illustrate these differences. We demonstrate the existence of systematic differences in communication structure and style. The level of democracy was positively correlated with frequency and negatively correlated with mentioning users and content positivity. Notably, however, these correlations were stronger when the level of Twitter use in the country was high. The value of social media in democracies is its ability to reach an audience the regime cares about. When it cannot reach this target audience, there is not the same incentives to engage in honest, citizen-driven, frequent dialogue, and the incentives of more and less democratic countries converge.

We also looked at the effect of elections on Twitter communication patterns. Social media is an increasingly important part of campaigns. In line with this, we saw an increase in the frequency of social media communication in the lead-up to elections for all countries in our sample. However,

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while the post-election congratulatory period was common across regime types, we saw a greater increase in pre-election positivity in less democratic countries. This is consistent with greater reliance on propaganda and “spin” in these less democratic elections (Guriev and Treisman 2022). Taken together, these findings help us understand how political leaders in Africa are using Twitter.

Our research has broad implications for the study of comparative political communication. The findings suggest that social media communication in less democratic regimes is integrated into authoritarian systems of information and narrative control. In contexts where access to alternative sources of information may be limited, the version of events portrayed on social media may have an outsized impact on the beliefs of citizens. Understanding these communications can be critical to unpacking the political dynamics in more closed societies.

We also illustrated a state-of-the-art technique for analyzing tweet sentiment. The model developed by Barbieri, Anke, and Camacho-Collados 2022 represents an improvement over dictionary-based methods for attributing sentiment, especially for the multilingual tweets in our data set. As shown in our study, this is a valuable tool for future research on tweet sentiment in political science.

Finally, while we affirm Twitter’s substantial role in modern political communication, the social media space consists of various platforms. Nonetheless, we are confident that our findings have overarching applicability as past studies reveal that engagement patterns with political content are consistent across social media sites (e.g. Yu 2016). Alternative platforms, with more or less restrictive terms of use, may also emerge in the coming years. These changes may alter the nature of political discourse online, affecting the strategic incentives faced by political leaders of different regimes. Future research should consider such shifts when studying the interplay of language, sentiment, and politics on social media platforms.

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