

# Tweeting to the European people: analyzing dynamic changes in online communication strategies and their relation to citizen engagement

**NLP; topic modeling; social media; predictive modeling; European politics**

## Extended Abstract

Social media are an important means of communication for political agencies, as they make it possible to engage with large sectors of the public simultaneously and at low cost. For institutions with only indirect electoral accountability – such as the European Commission – social media can be strategic to increasing self-legitimation, promote citizen engagement, and shape public perception. This is especially important in times of increasing politicization (De Wilde, 2011; Özdemir & Rauh, 2022; Rauh, 2019), where European policy and integration have increasingly become a matter of public debate and polarization. Yet, a comprehensive analysis of whether and how political bodies within the European Union have exploited the strategic potential offered by social media to increase their legitimation and support is currently lacking.

To address this, we analyzed how Twitter communication from the main European executive body, the European Commission (EC) Twitter communication, has evolved over the past years, and whether changes in its communication can be interpreted as strategic adaptations aimed at increasing engagement and support from the European public. Specifically, our study addressed the following questions:

- To what extent has the European Commission exploited Twitter as a communication channel, compared to other supranational and national agencies?
- What are the main focus areas of EC's Twitter communication? How have they evolved over time? Do these changes reflect strategic attempts to generate higher engagement?
- How has the style of EC's Twitter communication evolved over time? Is there evidence of it evolving towards more accessible and engaging messaging, a prerequisite for successful communication and increased self-legitimation?
- More generally, which topics and features of style relate positively to engagement from EC's Twitter audience? Is there evidence that the observed changes in EC communication being beneficial to citizen engagement?

To address these questions, we used state-of-the-art NLP and predictive modeling techniques to analyze all English tweets produced by the EC's official account (**@EU\_Commission**) between June 2010 and July 2022, excluding retweets and mentions (30k tweets). We also analyzed the full volume of tweets from a range of additional national and international agencies for a range of comparative analyses. Other agencies include: two national executives (UK government, **@10DowningStreet**; Scottish government, **@scotgov** – selected because English-speaking), other legislative and executive EU bodies (European Parliament, **@Europarl\_EN**;

Council of the European Union, @**EUCouncil**), transnational economic and monetary institutions (European Central Bank, @**ecb**; International Monetary Fund, @**IMFNews**), and the United Nations (@**UN**).

First, we found that the EC has made conspicuous use of Twitter as a communication channel, with the average number of tweets per day (6.75) being the second highest among the agencies considered (see Figure 1).

Secondly, we used contextualized topic modeling (Bianchi et al., 2020) combined with a model selection pipeline based on out-of-sample NPMI to extract prominent topics in EC's Twitter communication. We found that the focus of EC communication shifted from economy-, finance- and governance-related topics, towards areas of policy concerning health, digitalization, the environment, and European culture and identity, which generate higher engagement (see Figure 2). Computing dynamic rank-based similarity between per-topic volume and engagement distributions, we found evidence that the EC has indeed shifted its focus in favor of increased alignment with interests of the general public (see Figure 3), and that it has progressively differentiated its profile from that of more technocratic institutions (see Figure 6).

Thirdly, we analyzed the style of EC's tweets, focusing on both holistic and fine-grained style descriptors (see Benoit et al., 2019; Hansen and Enevoldsen, 2023; Rauh, 2022), and found that EC communication has become increasingly less complex and less emotionally neutral, features which are associated with more accessible and engaging messaging (see Figure 4), required for effective communication with the wide citizenry. Yet, under a subset of the metrics considered, the EC's current style is still more complex than that of the national governments included in the sample (see Figure 5). Importantly, for both topic and style changes, 2017 seems to mark a key transition point, potentially reflecting a reaction to the shock represented by the Brexit referendum.

Even on the relatively short time scale offered by Twitter data, we were able to observe trends that highlight dynamic relations between communication strategies, citizen engagement, and politicization. Alongside delivering novel insights on these relations, our work represents a foundational step towards future hypothesis-driven research, and a demonstration of how a combination of NLP tools and predictive modeling techniques can be used to enhance our understanding of complex social and political dynamics at a transnational scale.

## References

- Benoit, K., Munger, K., & Spirling, A. (2019). Measuring and explaining political sophistication through textual complexity. *American Journal of Political Science*, 63(2), 491–508.
- Bianchi, F., Terragni, S., Hovy, D., Nozza, D., & Fersini, E. (2020). Cross-lingual contextualized topic models with zero-shot learning. *arXiv preprint arXiv:2004.07737*.
- De Wilde, P. (2011). No polity for old politics? a framework for analyzing the politicization of european integration. *Journal of European integration*, 33(5), 559–575.
- Hansen, L., & Enevoldsen, K. (2023). Textdescriptives: A python package for calculating a large variety of statistics from text. *arXiv preprint arXiv:2301.02057*.
- Özdemir, S. F., & Rauh, C. (2022). A bird's eye view: Supranational eu actors on twitter.
- Rauh, C. (2019). Eu politicization and policy initiatives of the european commission: The case of consumer policy. *Journal of European Public Policy*, 26(3), 344–365.
- Rauh, C. (2022). Clear messages to the european public? the language of european commission press releases 1985–2020. *Journal of European Integration*, 1–19.

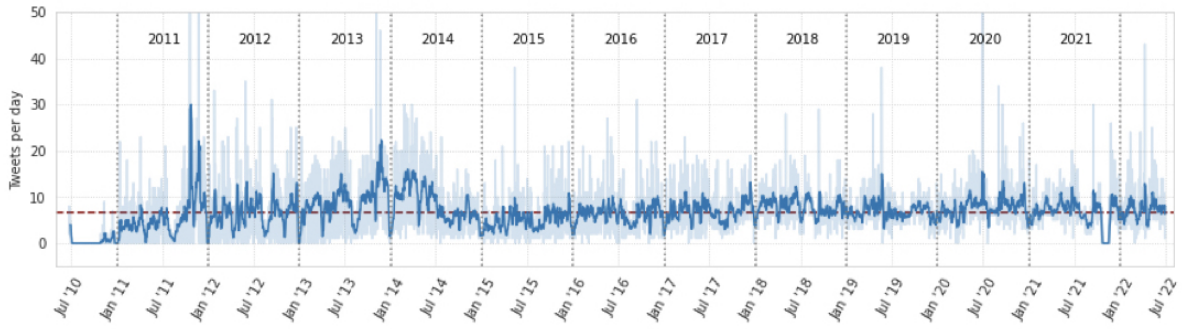


Figure 1: Number of tweets per day produced by the EC's Twitter accounts between July 2010 and July 2022. The light blue line represents the raw count of tweets for a given day, the darker line represents temporally smoothed estimates. The red horizontal line marks the overall average.

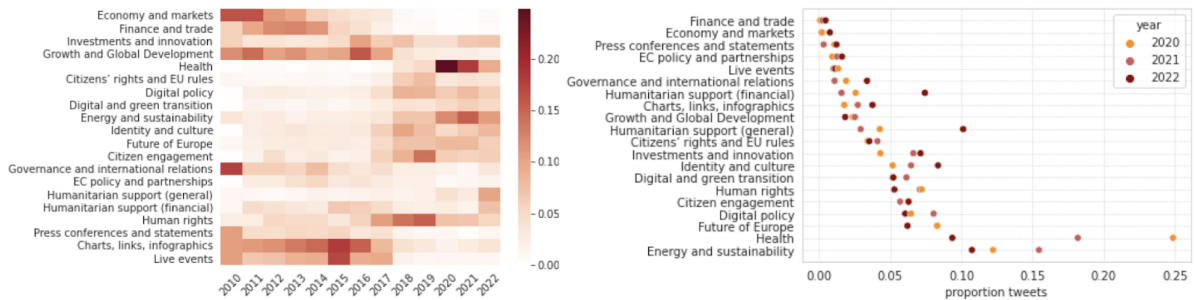


Figure 2: **Left:** Topic volume for each of the 20 topics identified by our topic model over time. Colors represent the proportion of tweets per year that score highest on the target topic. **Right:** proportion of tweets per topic between 2020 and 2022

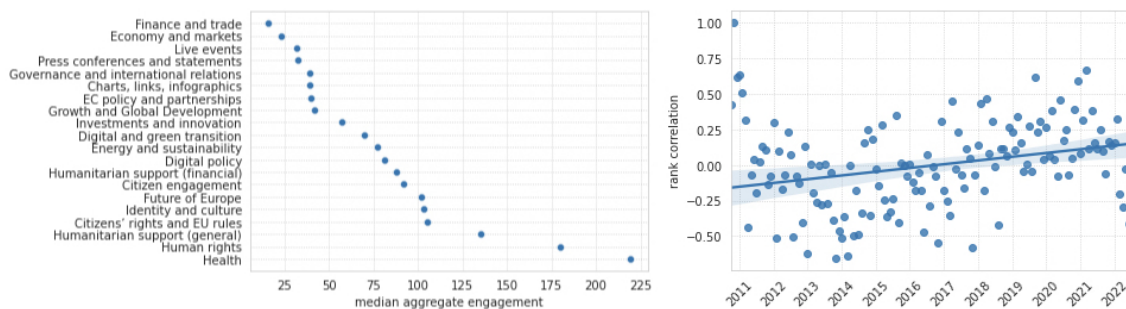


Figure 3: Median engagements per topic (left) and rank correlation between engagement and topic volume distributions over time (right). Increasing correlation values indicate increasing tuning of the EC's Twitter activity towards topics that generate higher engagement.

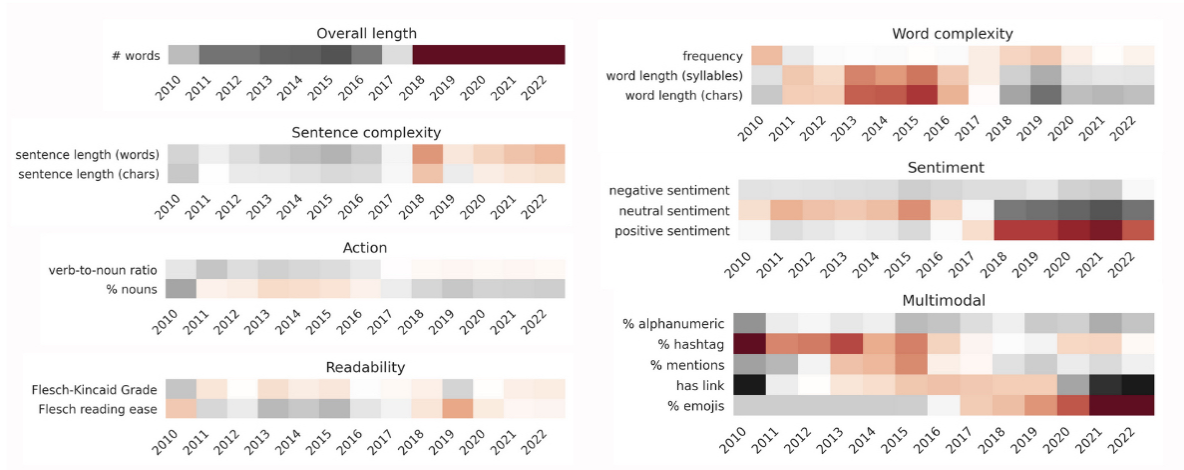


Figure 4: Evolution of style metrics over time. Colors indicate average score for each metric over the year. Scores are standardized to zero mean and unit variance.

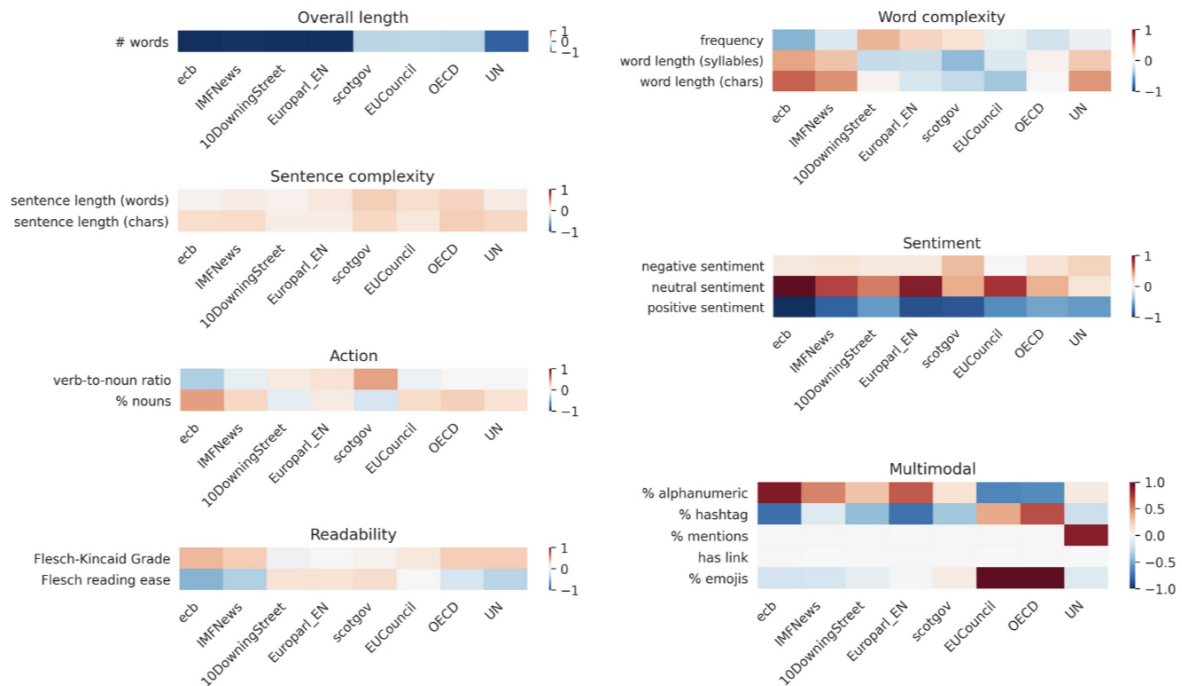


Figure 5: Robust regression coefficients showing group difference between each reference agency (x-axes) and the European Commission for all style descriptives. Positive coefficients (marked in red) indicate that the target agency scores on average higher than the EC on that descriptive. Negative coefficients (blue) indicate the opposite patterns. Non-significant coefficients are set to zero for the purpose of this visualization.

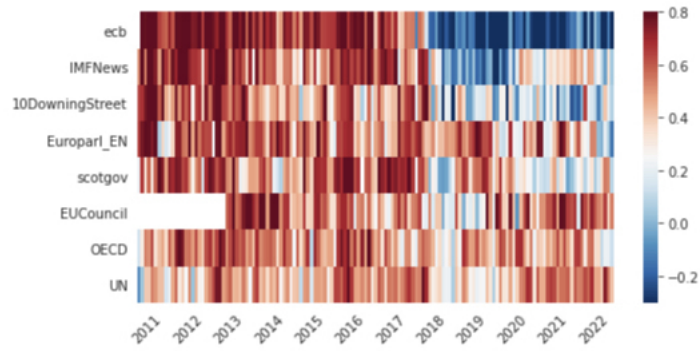


Figure 6: Per-month similarity (rank correlation) between distribution of topic volumes from the EC account vs other agencies.