

POLARISATION AND DISINFORMATION CONTENT FROM SPANISH POLITICAL ACTORS ON TWITTER/X

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ABSTRACT:

This study analyses the role of the main Spanish political groups in the polarisation of public opinion and the promotion of the culture of disinformation through *Twitter* (now *Platform X*). The study carries out an analysis of issues associated with tweets and retweets in Spanish of the total published (n = 33,506 messages out of a total of 49,288 messages), which are contrasted with 2,730 disinformation publications identified by the two most relevant fact-checking projects in Spain (*Maldita.es* and *Neutral.es*). Based on the applied methodology, a political-communicative context is observed on *Platform X* characterised by a high level of self-promotion and polarisation, facilitated by the communication strategy of specific topics, applied by the actors analysed. The results show how these political actors can play an active and differentiated role in the promotion of disinformation content identified by the *Maldita.es* and *Neutral.es* data verification projects. This may contribute to the polarisation of Spanish public opinion on *Platform X* by delegitimising the opinions of their opponents on issues of interest to the public.

KEY WORDS:

digital behaviour, digital communication, disinformation, *Platform X*, political conflict, Spanish politicians, *Twitter*

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1 Introduction

During electoral processes and social contexts marked by significant political and social conflicts, polarisation is used to delegitimise information published in the media or to influence a debate on topics that are not necessarily among the main problems identified by citizens.¹ Despite these difficulties, studies that accurately define disinformation find a 'disinformation culture' in which the intentional sharing of or

¹ ALLCOTT, H., GENTZKOW, M.: Social Media and Fake News in the 2016 Election. In, *Journal of Economic Perspectives*, 2017, Vol. 31, No. 2, p. 211-236.



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unlawful intention to share erroneous information is perhaps the main element used to differentiate concepts.² Based on Said-Hung, Merino-Arribas and Martínez-Torres,³ some content should be considered the malicious dissemination of messages that contain confusing, false, or deceptive information. This content differs from related terms, such as fake news – which primarily entails the malicious dissemination of false or manipulated stories that are usually focused on the medium in which they are disseminated or usually broadcast – or disinformation – which involves the dissemination of content based on rumours, e.g., inaccurate, unverified or false information, which are usually included when sharing information on a specific topic.

The ‘disinformation culture’ alluded to by authors such as Wardle and Derakshan,⁴ and increasingly promoted on current digital platforms, e.g., *Twitter* (now *Platform X*), makes the disinformation content that structures it increasingly the protagonist in disseminating populist communication. It focuses on promoting clickbait or disinformation content to increase the leader’s popularity or cause related to the transmitted content.⁵

Platform X has become a consolidated medium in political communication, as it is a channel for direct conversation with citizens.⁶ For this reason, academic researchers such as Enli and Naper⁷ have analysed the use of this social media platform by politicians, parties, governments, and international organisations, among others, as an effective communication tool for maintaining their presence and engagement among citizens. In most cases, this presence is based on an adaptation of the rhetoric applied to the topics covered throughout the different messages published by the actors or political groups in this digital communication scenario. It is carried out through the concise exposition of their ideas, which are transmitted without delving into this context’s interactive and communicative capacities,⁸ in eminently unidirectional communication with their followers.

It is essential to associate the topics or issues addressed in messages published by political actors⁹ with content (in our case, disinformation content) that favours the affective polarisation of the political debate in public opinion from the role assumed and the discursive tactics (thematic, in our case) applied to mobilise potential voters.¹⁰ This is done to better position ideas within public opinion on *Platform X*,¹¹ where highly partisan community structures contribute to greater affective polarisation of the socio-communicative scenario. This is especially evident in bipartisan political systems with pluralistic electoral rules¹² because of the promotion of prejudices and antidemocratic movements interested in excluding other political forces.¹³ In the Spanish case, authors such as Orriols¹⁴ highlighted a political scenario characterised by a relatively moderate, or even reduced, sentimental polarisation and exhibits the same values presented in European

countries such as Germany, Austria or Switzerland. However, since 2015, this situation has intensified in Spain owing to the rise of new parties and the crisis of the bipartisan system of political alternation of the PSOE and PP. This seems to favour a direct and positive relationship between ideological polarisation and the affective polarisation of voters in Spain.¹⁵

We should recognise *Platform X* as an essential communication scenario within the current political debate from the point of view of both public representatives and political parties, including specific stakeholders and political groups.¹⁶ This scenario is based on hybrid language favouring the consolidation of power and is used as a social weapon or element of community cohesion by pretending to say much more than it does.¹⁷ In addition, authors such as Ceia, Mota and Lewis,¹⁸ Darius,¹⁹ Morselli, Passini and McGarty,²⁰ and Haq et al.²¹ have paid attention to how using signifiers (creative words or emoticons) facilitates effective communication and promotes polarisation in public opinion on platforms such as *Platform X*. These authors have analysed the discourse and sentiment related to the hashtags or terms applied by users (general), political groups and partisans around specific topics (e.g., COVID-19), electoral processes or social protests that have taken place.

Projects such as *Maldita.es* and *Newtrales* have arisen in Spain, throughout Europe, and in other regions (e.g., *FactCheck.org*, *Snopes*, *Politifact*, and *First Draft* in the United States; *ColombiaCheck* in Colombia; *Chequeando* in Argentina; or *Verificado* in Mexico; among others). These projects focus on promoting journalistic and citizen verification mechanisms for information transmitted via different communication channels, especially digital platforms such as *Platform X*, which foster a more significant impact of disinformation content on public opinion.²² Such projects can help change people’s attitudes as tools for constructing democracy by elaborating on the false nature (partial or total) of messages associated with this type of content.²³ Above all, given that this type of content generates higher levels of viralisation through the fear, indignation, or surprise it engenders,²³ it conditions public opinion.

Spain has had a traditionally bipartisan government since 1977 (dominated by the PSOE and the Unión de Centro Democrático until 1983, the PSOE and Alianza Popular until 1989, and then the PSOE and Partido Popular to the present). Authors like Sánchez have called this situation an “imperfect bipartisanship”.²⁴ That is, two dominant political groups fail to fix their exclusive representative ideological space (left and right) while coexisting with other emerging parties from the territorial dividing lines of the country (national parties and nationalist parties). In Spain, as a result of the legislative elections of 2015 and 2016, the government has been reconfigured amid the rise of new political parties that favour “fragmented multipartyism”,²⁵ a result of Spain’s electoral system. Thus, political factors have allowed new emerging political actors to enter the Spanish political arena (Unidas Podemos, Vox, and Ciudadanos, among others).²⁵ This system has generated greater complexity in gathering enough voters to provide parliamentary representation for current political groups and, thus, a greater interest among them in finding and applying communication strategies for retaining voters and attracting new ones via ‘traditional’ media and social media (e.g., *Platform X* or *Facebook*).

2 WARDLE, C., DERAKSHAN, H.: *Information Disorder: Toward an Interdisciplinary Framework for Research and Policy Making*. [online]. [2023-05-28]. Available at: <<https://rm.coe.int/information-disorder-toward-an-interdisciplinary-framework-for-research/168076277c>>.

3 SAID-HUNG, E. M., MERINO-ARRIBAS, M. A., MARTÍNEZ-TORRES, J.: Evolución del debate académico en la Web of Science y Scopus sobre unfaking news (2014 – 2019). In *Estudios sobre el Mensaje Periodístico*, 2021, Vol. 27, No. 3, p. 961-971.

4 WARDLE, C., DERAKSHAN, H.: *Information Disorder: Toward an Interdisciplinary Framework for Research and Policy Making*. [online]. [2023-05-28]. Available at: <<https://rm.coe.int/information-disorder-toward-an-interdisciplinary-framework-for-research/168076277c>>.

5 See: MAZZOLENI, G., BRACCIALE, R.: Socially Mediated Populism: The Communicative Strategies of Political Leaders on Facebook. In *Palgrave Communications*, 2018, Vol. 4, No. 1, p. 1-10.

6 ZAZO, L.: Implantación de Twitter en los entornos políticos españoles. In *International Visual Culture Review*, 2022, Vol. 9, p. 1-11.

7 ENLI, G., NAPER, A. A.: Social Media Incumbent Advantage: Barack Obama’s and Mitt Romney’s Tweets in the 2012 U.S. Presidential Election Campaign. In BRUNS, A., SKOGERBO, E. (eds.): *The Routledge Companion to Social Media and Politics*. New York : Routledge, 2015, p. 560.

8 COLEMAN, S., BLUMLER, J. C.: *The Internet and Democratic Citizenship*. Cambridge : Cambridge University Press, 2009, p. 232.

9 CRABTREE, CH. et al.: It’s Not Only What You Say, It’s Also How You Say It: The Strategic Use of Campaign Sentiment. In *The Journal of Politics*, 2018, Vol. 82, No. 3, p. 1044-1060.

10 GARCÍA-OROSA, B., LÓPEZ-GARCÍA, X.: Language in Social Networks as a Communication Strategy: Public Administration, Political Parties and Civil Society. In *Communication & Society*, 2019, Vol. 32, No. 1, p. 107-125.

11 See: GUARINO, S. et al.: Characterizing Networks of Propaganda on Twitter: A Case Study. In *Applied Network Science*, 2020, Vol. 5, No. 1, p. 1-22.

12 URMAN, A. Context Matters: Political Polarization on Twitter from a Comparative Perspective. In *Media, Culture & Society*, 2019, Vol. 42, No. 6, p. 857-879.

13 OSMUNDSEN, M. et al.: Partisan Polarization Is the Primary Psychological Motivation behind Political Fake News Sharing on Twitter. In *American Political Science Review*, 2021, Vol. 115, No. 3, p. 999-1015.

14 ORRIOLS, L.: *La polarización afectiva tras el fin del bipartidismo (2015-2020): De la trinchera partidista a la trinchera ideológica*. Released on 25th March 2021. [online]. [2023-04-15]. Available at: <<https://dobetter.esade.edu/es/polarizacion-afectiva>>.

15 TORCAL, M. et al.: Political and Affective Polarisation in a Democracy in Crisis: The E-Dem Panel Survey Dataset (Spain, 2018-2019). In *Data in Brief*, 2020, Vol. 32, Article No. 06059.

16 See: CAMPOS-DOMÍNGUEZ, E.: Twitter y la comunicación política. In *El Profesional de la Información*, 2017, Vol. 26, No. 5, p. 785-789; LARSSON, A. O.: The EU Parliament on Twitter – Assessing the Permanent Online Practices of Parliamentarians. In *Journal of Information Technology & Politics*, 2015, Vol. 12, No. 2, p. 149-166.

17 ALVAREZ-NOREÑA, E.: La Creatividad del Lenguaje Como Arma Social. In *Diversité et Identité Culturelle en Europe*, 2013, Vol. 3, p. 83-94.

18 CEIA, V., MOTA, T., LEWIS, R.: Creatividad del Lenguaje Como Politics on Twitter. In *Digital Studies/Le Champ Numérique*, 2022, Vol. 12, No. 1, p. 1-36.

19 DARIUS, P.: Who Polarizes Twitter? Ideological Polarization, Partisan Groups and Strategic Networked Campaigning on Twitter During the 2017 and 2021 German Federal Elections «Bundestagswahlen». In *Social Network Analysis and Mining*, 2022, Vol. 12, No. 1, p. 7-19.

20 MORSELLI, D., PASSINI, S., MCGARTY, C.: Sos Venezuela: An Analysis of the Anti-Maduro Protest Movements Using Twitter. In *Social Movement Studies*, 2021, Vol. 20, No. 5, p. 509-530.

21 HAQ, E. U. et al.: Enemy at the Gate: Evolution of Twitter User’s Polarization During National Crisis. In *IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining*. Hague : Institute of Electrical and Electronics Engineers, 2020, p. 212-216.

22 VOSOUGHI, S., ROY, D., ARAL, S.: The Spread of True and False News Online. In *Science*, 2018, Vol. 359, No. 6380, p. 1146-1151.

23 AMAZEEN, M. A.: Journalistic Interventions: The Structural Factors Affecting the Global Emergence of Fact-Checking. In *Journalism: Theory, Practice & Criticism*, 2020, Vol. 21, No. 1, p. 95-111.

24 FERNANDEZ ESQUER, C.: *Desproporcionalidad y gobernabilidad*. Released on 29th March 2016. [online]. [2023-05-22]. Available at: <<http://agendapublica.es/desproporcionalidad-y-gobernabilidad/>>.

25 PENADES, A., PAVÍA, J.: *La Reforma Electoral Perfecta*. Madrid : Los Libros de la Catarata, 2016, p. 136.

2 Methodology

This work seeks to analyse the role of the leading Spanish political groups in the sociopolitical polarisation and promotion of the culture of disinformation through *Platform X*. It verifies the following hypothesis, which is based on approaches from related research carried out by authors such as Mazzoleni and Bracciale²⁶ and Cinelli et al.:²⁷

H1: Spanish political groups play an active and differentiated role in promoting the culture of disinformation on *Platform X*.

To test this hypothesis, the work aims to achieve the following specific objectives based on the analysis of data collected from a project based on a qualitative-quantitative design:

- Identify the traits that characterise the communicative activity of the salient political groups on *Platform X* during the study period.
- Determine the main topics addressed by the salient political groups on *Platform X*.
- Establish the main issues regarding the level of disinformation content identified through fact-checking projects in Spain.
- Estimate the level of agreement between the topics addressed by political groups on *Platform X* concerning the disinformation content identified by the selected fact-checking projects.

The work is based on the analysis of topics through the evaluation of words based on the co-occurrence of terms used by political groups to treat topics in messages published by them on *Platform X* and the level of association with disinformation content detected by the main fact-checking projects in Spain (*Maldita.es* and *Newtral.es*). It also identifies the features that characterise the communicative activity and the main topics and problems addressed on *Platform X* by the political actors studied in this work.

We selected *Platform X* as our case social networking site because it is a social medium that is part of the current digital language, multichannel, polysynthetic, and integrative²⁸ of the micronarratives transmitted since its creation.²⁹ Political actors use it as one of the leading social media to contact citizens, especially during electoral processes.¹⁶ In addition, it has growing potential to disseminate content generated by the digital media themselves or for them to carry out their journalistic work through immediate contact (whether with the facts or with other users).

Compared to other social media (e.g., *Facebook*), *Platform X* users are more active, especially in Spain.³⁰ Moreover, we accounted for the contrasts of the main topics addressed by the salient political actors on *Platform X* by assessing news related to verifying disinformation content published on *Maldita.es* or *Newtral.es*, two of Spain's leading journalistic fact-checking projects. These sites have been considered by authors such as García-Vivero and López,³¹ Bernal-Triviño and Clares-Cavilán³² in their analyses of, for example, the data verification procedures used by these types of initiatives in Europe and Spain. We selected these disinformation content verification projects by considering the differences we observed in their assessments of journalistic approaches when they identified disinformation content.

26 See: MAZZOLENI, G., BRACCIALE, R.: Socially Mediated Populism: The Communicative Strategies of Political Leaders on Facebook. In *Palgrave Communications*, 2018, Vol. 4, No. 1, p. 1-10.

27 See: CINELLI, M. et al.: The Echo Chamber Effect on Social Media. In *Proceedings of the National Academy of Sciences*, 2021, Vol. 118, No. 9, p. 1-8.

28 SALAVERRÍA, R., GARCÍA-AVILÉS, J., MASIP, P.: Concepto de Convergencia Periodística. In LÓPEZ, X., PEREIRA, X. (eds.): *Convergencia Digital. Reconfiguración de los Medios de Comunicación en España*. Santiago de Compostela: Servicio Editorial de la Universidad de Santiago de Compostela, 2010, p. 320.

29 GUERRERO-PICO, M., SCOLARI, C. A.: Narrativas transmedia y contenidos generados por los usuarios: El caso de los crossovers. In *Cuadernos.info*, 2016, Vol. 38, p. 183-200.

30 MAYO-CUBERO, M.: Use of Social Media in News Media Coverage of the Crisis, Disaster, and Emergencies in Spain. In *Revista Española de Comunicación en Salud*, 2019, Vol. 43, p. 43-54.

31 GARCÍA-VIVERO, G., LÓPEZ, X.: La Verificación de Datos en Europa. Análisis de 5 Iniciativas Europeas: Maldita.es, Newtral, Pagella Política, Les Décodeurs y BBC Reality Check. In *adComunica*, 2020, Vol. 21, p. 235-264.

32 BERNAL-TRIVIÑO, A., CLARES-CAVILÁN, J.: Uso del móvil y las redes sociales como canales de verificación de fake news. El caso de Maldita.es. In *El Profesional de la Información*, 2019, Vol. 28, No. 3, p. 1-8.

Maldita.es actively selects disinformation (according to the level of viralisation and potential danger), which it classifies as 'half-truth', 'misleading', or 'false'. What is investigated determines the evidence and associated sources.³³ The editors in charge of the project validate this work. In the case of *Newtral.es*, its team of verifiers collects the daily statements of key social agents (e.g., politicians and public administrators) and selects statements of interest or journalistic relevance (to assess the implications of these statements).³⁴ It verifies the general public and official data through sources and experts. Based on this information, peer verification is then carried out by the coordinator in charge of a team of verifiers and the project's editor-in-chief to verify content (content that passes this triple verification is published) or to classify information as a hoax (totally or partially false disinformation). Finally, content lacking sufficient evidence for consideration within the first group is considered inaccurate, e.g., a half-truth or a misleading statement.

Our selection of the two fact-checking projects (*Maldita.es* and *Newtral.es*) – despite the high level of discretion applied to determine what is or is not disinformation – results from their conditioning of the different social and linguistic contexts inherent to journalistic work.³⁵ However, their main impact is as a counterweight (independent or not) to political power, following Uscinski.³⁶ This impact extends beyond the mechanisms of control and methodologies applied in each selected project and stems from identifying disinformation content. Accordingly, our general objective proposed in this study does not detract from the legitimacy of the projects. Specifically, we compare the main issues addressed by the salient Spanish political groups on *Platform X* during the study period to the main issues of the viralised disinformation content concerning public opinion in Spain, which were identified by these journalistic verification projects.

Our study thus focuses on the following data from the messages (tweets and retweets) published in Spanish (n = 33,506 messages – to detect the predominant language of each tweet, the polyglot library, developed by Al-Rfou)³⁷ among the total posts (N = 49,288 messages) of users associated with the main political groups in Spain (parties, leaders and political actors who, at some point, were spokespersons during the study period) (Table 1) who had the following common characteristics:

- To obtain 10% or more of the votes during either of the general election held in 2019 (April and November), which allowed them to have more significant political representation (10 or more deputies) than the rest of the political groups with a presence in the Congress of Deputies in Spain;
- To have a scope of national political action (in the entire Spanish territory) rather than focusing only on one of the autonomous communities into which the country is territorially divided;
- To have a parliamentary group in the Spanish Congress of Deputies (Table 1). These features allowed them to have a prominent role in the debates held in the Congress of Deputies (given the number of seats, which allowed them a more significant number of interventions in the different debates held in this scenario). In addition, they had greater visibility in Spanish public communication on social media,³⁸ favouring a progressive fragmentation and polarisation of the public sphere. This process occurs not only from homophilic relationships (based on solid affective ties between users) but also from increasingly heterophilic interactions based on attracting users with weak ties or affective relationships who are not nourished by social ties such as friendship or sustained collaboration over time.³⁹ Social media (e.g., *Platform X*) provide an ideal setting for free advertising, limiting argumentative responses and promoting emotional content through the algorithm used in the network.⁴⁰

33 *Metodología de Maldito Bulo*. Released on 19th May 2020. [online]. [2023-05-22]. Available at: <<https://maldita.es/metodologia-de-maldito-bulo>>.

34 *Metodología y Transparencia*. Actualized on 15th September 2023. [online]. [2023-05-22]. Available at: <<https://www.newtral.es/metodologia-transparencia/>>.

35 GRAVES, L.: Anatomy of a Fact Check: Objective Practice and the Contested Epistemology of Fact Checking. In *Communication, Culture & Critique*, 2016, Vol. 10, No. 3, p. 518-537.

36 USCINSKI, J. E.: The Epistemology of Fact Checking (Is Still Naive): Rejoinder to Amazeen. In *Critical Review*, 2015, Vol. 27, No. 2, p. 243-252.

37 *Polyglot 16.7.4*. Released on 3rd July 2016. [online]. [2023-10-15]. Available at: <<https://pypi.org/project/polyglot/>>.

38 BRUNDIDGE, J.: Encountering "Difference" in the Contemporary Public Sphere: The Contribution of the Internet to the Heterogeneity of Political Discussion Networks. In *Journal of Communication*, 2010, Vol. 60, No. 4, p. 680-700.

39 NAHON, K.: Where There Is Social Media There Is Politics. In BRUNS, A. (ed.): *The Routledge Companion to Social Media and Politics*. New York: Routledge, 2015, p. 560.

Table 1: Political groups' activity on Platform X between September 2019 and February 2020

Political Group	Scope of Political Action	Own Parliamentary Group	Political Actor	Type of Actor	Number of Tweets Collected
Partido Socialista Obrero Español (PSOE)	National	Socialist Parliamentary Group – 120 deputies	PSOE	Political party	6,990
			Pedro Sanchez	Leader	
			Adriana Lastra	Spokesperson	
Partido Popular (PP)		Popular Parliamentary Group: 87 deputies	Partido Popular	Political party	5,135
			Pablo Casado	Leader	
Ciudadanos*		Citizens Parliamentary Group: 10 deputies	Ciudadanos	Political party	13,344
			Albert Rivera	Leader	
			Inés Arrimadas	Spokesperson	
			Jose Manuel Villegas	Spokesperson	
Unidas Podemos (UP)		Confederal Parliamentary Group of Unidas Podemos: 33 deputies	Unidas Podemos	Political party	6,296
	Pablo Iglesias		Leader		
	Irene Montero		Spokesperson		
Vox	Vox Parliamentary Group: 52 deputies	Vox	Political party	8,731	
		Santiago Abascal	Leader		
		Iván Espinosa de los Monteros	Spokesperson		
Total					33,506

Note. *During the data collection period, the role of spokesperson was played by several politicians in the Ciudadanos political party.

Source: Own processing

The dataset of disinformation content was identified in *Maldita.es* and *Newtral.es* (n = 2,730 tweets with disinformation content) between 16th August 2019, and 15th March 2020. This period extends fifteen days before and fifteen days after the salient tweets of political actors to provide the most significant amount of relevant disinformation content that these fact-checking projects identified that the aforementioned actors' tweets could have impacted. This data helped us achieve our general objective concerning the topics in disinformation (such as hoaxes, half-truths, and misleading or false statements) identified by the previous journalistic projects.

For the daily collection of the analysed tweets, the R package RTweet⁴⁰ was applied from 1st September 2019, to 29th February 2020 (6 continuous calendar months). This period was marked by the 'function' of the government of Spain, led by Pedro Sánchez, who failed to obtain the necessary number of votes in the Congress of Deputies for another term in office after the elections of April 2019. This led to a new call for general elections in the country on 10th November of the same year, when the current government was constituted.

40 KEARNEY, M. W. et al.: *Package: 'Rtweet'*. [online]. [2023-10-05]. Available at: <https://cran.r-project.org/web/packages/rtweet/rtweet.pdf>.

Regarding the content extracted from *Maldita.es* and *Newtral.es*, R Selenium⁴¹ and Rvest⁴² were used to collect data regarding their fact-checking projects directly from these websites.

The posts on *Platform X* and disinformation content collected from *Maldita.es* were pre-processed following the steps performed by Welbers, Van Atteveldt and Benoit⁴³ and Qaiser and Ali.⁴⁴

- Normalisation of the words contained in the analysed messages via regular expressions (REGEX);
- Elimination of posts in languages other than Spanish;
- Segmentation of the words of the analysed messages (e.g., progressive Spain);
- Elimination of stopwords through the use of the ISO Stopwords directory,⁴⁵ the R packages dplyr,⁴⁶ Stringi Tidyverse,⁴⁷ and Tidytext,⁴⁸ punctuation marks; symbols and separators; and pseudo lemmatisation,^{49 50} present in the messages.

The tweets that comprised our sample were analysed in groups of politically related users (in those cases where some actors did not have *Platform X* handles, the topics were analysed without including them) at the level of salient political actors (e.g., PSOE – party, Sanchezcastejon – leader, and Adriana Lastra – spokesperson). Our work is based on the assumption that a communicative strategy carried out by politically relevant *Platform X* users is articulated and oriented to consolidate a position in the Spanish political agenda from the position of representation that these users have in the Spanish Congress of Deputies. Thus, a strategy in which messages in Spanish have greater relevance than posts in other languages (e.g., Catalan, Basque or Galician) is directed towards a more autonomous political agenda.

Our analysis followed the methodology proposed by Debnath and Bardhan.⁵¹ Therefore, Topic Modelling (TM) was performed to identify the topics that best described the messages presented in the totality of tweets and disinformation content. TM was performed by applying machine learning techniques through the assignment algorithm of latent Dirichlet allocation (LDA), which allowed us to automatically analyse the content of the messages and determine the groups or clusters of words around the topics addressed in the collected tweets. This work is based on the principle that each document (in our case, each tweet published by the studied users) can be understood as a space where all topics addressed by the respective authors are distributed.⁵² According to LDA, the language of 'text collection' is composed of entities associated with the following:

- Words are discrete data, defined as vocabulary elements indexed by {1, ..., V}. Words represented by unit-based vectors of a single component are equal to one, and the rest are equal to zero.
- Documents understood as a sequence of N words are represented by $W = (W_1, W_2, \dots, W_n)$, where W_n is the number of words that comprise the complete sequence that makes up each sequence of this type of entity.
- A corpus comprises a collection of M documents, represented by $D = \{W, W, \dots, W\}$.

41 HARRISON, J., YEONG, J.: *R Selenium: R Bindings for 'Selenium WebDriver'*. [online]. [2023-10-15]. Available at: <https://cran.r-project.org/web/packages/R Selenium/index.html>.

42 WICKHAM, H.: *Rvest*. [online]. [2023-10-15]. Available at: <https://rvest.tidyverse.org/>.

43 WELBERS, K., VAN ATTEVELDT, W., BENOIT, K.: Text Analysis in R. In *Communication Methods and Measures*, 2017, Vol. 11, No. 4, p. 245-265.

44 QAISER, S., ALI, R.: Text Mining: Use of TF-IDF to Examine the Relevance of Words to Documents. In *International Journal of Computer Applications*, 2018, Vol. 181, No. 1, p. 25-29.

45 DIAZ, C.: *Stopwords ISO*. [online]. [2023-10-15]. Available at: <https://github.com/stopwords-iso>.

46 SÁNCHEZ, R.: *El paquete dplyr*. [online]. [2023-10-15]. Available at: <https://rsanchez.gitbooks.io/rprogramming/content/chapter9/dplyr.html>.

47 WICKHAM, H., ÇETINKAYA-RUNDEL, M., GROLEMUND, G.: *R for Data Science*. [online]. [2023-10-15]. Available at: <https://www.tidyverse.org/>.

48 SILGE, J., ROBINSON, D.: *Text Mining with R*. [online]. [2023-10-15]. Available at: <https://www.tidytextmining.com/>.

49 MORENO, A., GUIRAO, J.: *Grampal*. [online]. [2023-10-15]. Available at: <http://cartago.llf.uam.es/grampal/grampal.cgi?m=etiquetario>.

50 TVANGESTE: *Dsl2mobi*. [online]. [2023-10-15]. Available at: <https://github.com/Tvangeste/dsl2mobi/commits?author=Tvangeste>.

51 DEBNATH, R., BARDHAN, R.: India Nudges to Contain COVID-19 Pandemic: A Reactive Public Policy Analysis Using Machine-learning Based Topic Modelling. In *PLOS ONE*, 2020, Vol. 15, No. 9, Article No. e0238972.

52 BLEI, D. M., NG, A., JORDAN, M.: Latent Dirichlet Allocation. In *Journal of Machine Learning Research*, 2003, Vol. 3, p. 993-1022.

The purpose of TM is to extract latent semantic themes by detecting the main topics from the set of selected messages through a probabilistic method. TM thus seeks to model a corpus that assigns topics to each tweet and generates distributions of words linked to a collection of texts (in our case, the messages contained in each of the analysed tweets). This technique has been used to study political narrative contexts,⁵³ electoral processes on *Platform X*,⁵⁴ and applied public policies.⁵⁵

The inner box represents the repeated choice of topics (Z) and words (W) in N documents (messages of tweets) for replicas of topics. represents the distribution of topics presented in the document, while and are hyperparameters of the distribution made through the LDA. In other words, TM applied in this study works based on parameters initially estimated for its correct functioning (the initial assignment of specified themes in the corpus of messages) in favour of the recognition of words associated with the different topics addressed and identified at the level of the different messages analysed individually through LDA.

As the LDA model fails to estimate the optimal number of topics addressed in the analysed messages,⁵⁶ we use the metrics proposed by Griffiths and Steyvers,⁵⁷ Cao et al.,⁵⁸ Arun et al.,⁵⁹ Mimno et al.,⁶⁰ and Deveaud, Sanjuan, and Bellot.⁶¹ These authors identify several topics that maximise or minimise these issues both at the level of activity on *Platform X* of the five most prominent political groups and at the level of relevant disinformation content published on *Maldita.es* and *Neutral.es*.

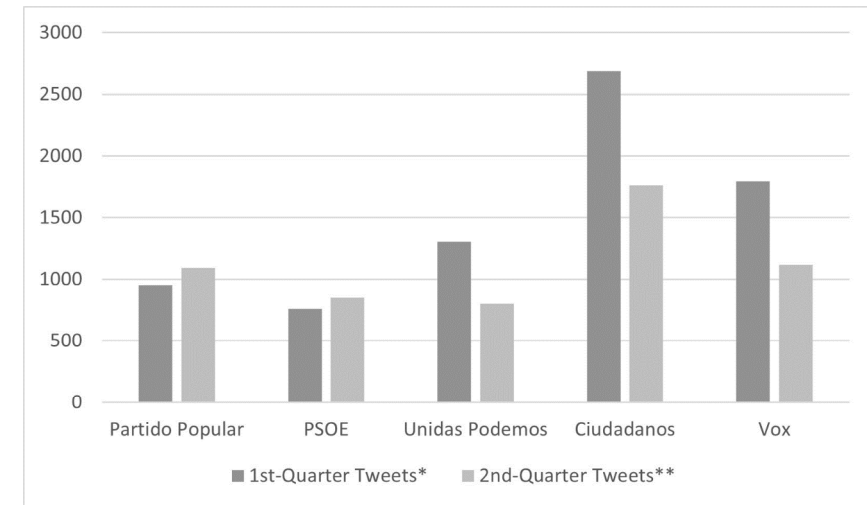
In each metric used to estimate the topics addressed by each political group analysed in this work, 20 topic groupings were taken as input parameters for applying the LDA model. For example, this total number of topics was used to identify the optimal number of topics addressed by political groups on *Platform X* according to the (growth) trend, the values test and the range of variation observed in the four metrics considered.

Regarding the *Platform X* posts of the salient political groups, our proposed analysis of each topic (made using the Topicmodels package of R)⁶² followed Mehrotra et al.,⁵⁷ e.g., we grouped the tweets to generate ‘macro-documents’ to train our LDA model. This grouping was performed because each tweet is concise (maximum 280 characters). For the purposes outlined in this work, this grouping would not help us identify the co-occurrence of terms if we limited our analysis to the individual level (in contrast, we analysed the disinformation data extracted from *maldita.es* at the individual level because the relevant articles had a greater length and different structure than the tweets). Therefore, the technique and assumption used by Mehrotra et al.,⁵⁷ e.g., the aggregation of tweets via semantic or temporal similarity criteria, helped enrich the revealed content of a specific document or user and helped the LDA model to better detect and group salient topics. We used the Ggplot2⁶³ package to visualise the detection metrics of the optimal topics detected during each relevant electoral process.

53 GRIMMER, J., STEWART, B. M.: Text as Data: The Promise and Pitfalls of Automatic Content Analysis Methods for Political Texts. In *Political Analysis*, 2013, Vol. 21, No. 3, p. 267-297.
 54 SONG, M., KIM, M. C., JEONG, Y. K.: Analyzing the Political Landscape of 2012 Korean Presidential Election in Twitter. In *IEEE Intelligent Systems*, 2014, Vol. 29, No. 2, p. 18-26.
 55 WALKER, R. M. et al.: Topic Modeling the Research Practice Gap in Public Administration. In *Public Administration Review*, 2019, Vol. 79, No. 6, p. 931-937.
 56 MEHROTRA, R. et al.: Improving LDA Topic Models for Microblogs via Tweet Pooling and Automatic Labeling. In *Proceedings of the 36th International ACM SIGIR Conference on Research and Development in Information Retrieval*. United States: Association for Computing Machinery, 2013, p. 889-892.
 57 GRIFFITHS, T. L., STEYVERS, M.: Finding Scientific Topics. In *Proceedings of the National Academy of Sciences*, 2004, Vol. 101, No. 1, p. 5228-5235.
 58 CAO, J. et al.: A Density-Based Method for Adaptive LDA Model Selection. In *Neurocomputing*, 2009, Vol. 72, No. 7-9, p. 1775-1781.
 59 ARUN, R. et al.: On Finding the Natural Number of Topics with Latent Dirichlet Allocation: Some Observations. In KARLAPALEM, K. (ed.): *Advances in Knowledge Discovery and Data Mining*. United States: Springer, 2010, p. 230.
 60 MIMNO, D. et al.: Optimizing Semantic Coherence in Topic Models. In *Proceedings of the 2011 Conference on Empirical Methods in Natural Language Processing*. Edinburgh: Association for Computational Linguistics, 2011, p. 262-272. [online]. [2023-01-15]. Available at: <http://dirichlet.net/pdf/mimno11optimizing.pdf>.
 61 DEVEAUD, R., SANJUAN, E., BELLOT, P.: Accurate and Effective Latent Concept Modeling for Ad Hoc Information Retrieval. In *Document numérique*, 2014, Vol. 17, No. 1, p. 61-84.
 62 GRÜN, B. et al.: *Topicmodels: Topic Models*. [online]. [2023-10-15]. Available at: <https://cran.r-project.org/web/packages/topicmodels/index.html>.
 63 WICKHAM, H. et al.: *Ggplot2*. [online]. [2023-10-15]. Available at: <https://ggplot2.tidyverse.org/>.

3 Results

Figure 1 illustrates the users’ posting activity (objective 1), which was more relevant between September and November 2019 than in the following months. The first quarter, marked by the electoral debate, was derived from the head of the Spanish government in the April 2019 election and the subsequent opening of a new electoral period (developed during the first three months of analysis) that preceded the new general elections for the presidency on 10th November 2019. This context shows how these actors’ communicative effort is concentrated in electoral events such as the one framed during the period studied.



Note. * 1st quarter consists of messages published in September, October and November 2019. ** 2nd quarter consists of messages published in December 2019, January, and February 2020.

Figure 1: Average number of tweets published between September 2019 and February 2020

Source: Own processing

Table 2 shows how the general political discourse promoted on *Platform X* fostered the polarisation of the Spanish political sector (objective 2). Political groups actively promoted issues intended to directly confront the group(s) they deemed their primary political opponent(s). This process was more relevant during the study period, given that the first months were marked by an inconclusive election (April 2019) and the new electoral period (November 2019). This confrontation was marked by the different political groups’ positioning, in an apparent political communication strategy deployed on *Platform X*, with each group focusing the confrontation on specific thematic niches:

- PP and Cs centred their political–communicative interests on their exposure of and critical allusion to the government’s dominant political group and its leader (the PSOE/ Pedro Sánchez).
- The Vox framed issues within a context of ‘total’ confrontation characterised by the permanent use of nationalist expressions and criticism of the political formation and the president of the government of Spain (PSOE/Pedro Sánchez) and presented itself as an alternative for the PP voters and as a defender of Spaniards’ rights.
- PSOE and UP followed a strategy of confrontation with the rest of the political groups, the defence of social rights, equality, and gender policies promoted by the current government, and the relevance of building dialogues favouring the constitution of a politically sympathetic government.

Communication strategies allow locating a polarised communication framework oriented towards positioning around specific issues by the politicians studied. This strategy uses micronarratives based on original messages, messages published by retweeted third parties, or content published in traditional media to attract voters/citizens around the communication agenda primarily associated with their interests.

Table 2: Topics extracted by LDF according to political groups with a higher probability of co-occurrence (≥ 0.005)

Topic	Political Groups Analysed				
	Cs	PSOE	PP	UP	Vox
Topic_1	Spain, Spainmarch, families, cs, education, 10n, equality, country, future, Cs.	sanchezcastejon, government, psoc, president, hours, act, functions, secretary, now yes, socialist.	pablocasado, interview, for everything that unites us, networks, direct, you can, president, popular, you can.	women, years, country, rights, equality, Spain, people, democracy, violence, day.	government, sanchez, spain, state, psoc, vox, santiabascal, Torra, Pedro, Catalonia.
Topic_2	cs, days, summary, live, media, tomorrow, news, newscs, interview, communication.	government, spain, pensions, commitment, sanchezcastejon, measures, equality, people, transition, country.	spain, sanchez, party, spaniards, government, for everything that unites us, pp, popular, psoc, employment.	government, we can, pabloiglesias, psoc, people, sanchez, united, pedro, pp, coalition.	vox, thread, spain, spanish, violence, ivanedlm, women, interventions, ortegasmith, gender.
Topic_3	thanks, day, freedom, spain, congratulations, Cs, years, equality, world, work	women, democracy, years, day, Spain, freedom, memory, victims, equality, violence	sánchez, government, psoc, ábalos, case, pedro, spain, president, mature, state	government, pensions, rights, Spain, people, country, life, work, change, measures	vox, Congress, pp, government, congresses, deputies, spain, ivanedlm, table, law
Topic_4	Sanchez, Spain, government, PSOE, Spanish, cs, country, state, nationalists, pp.	government, psoc, spain, sanchezcastejon, country, pp, 10n, right, now Spain, lock.	catalonia, spain, security, law, freedom, state, Spaniards, support, national, democracy,	pabloiglesias, people, campaign, we can, interview, act, irenemontero, ungobiernocontigo, direct, meeting.	vox, left, sons, pp, country, years, voxes, psoc, party, parents.
Topic_5	Barcelona, support, safety, violence, victims, colau, Cs, neighbours, law, years.		days, agenda, government, taxes, education, pp, sector, employment, freedom, Sánchez		vox, Spainalways, Spainviva, people, act, Spanish, Spain, Santiago, voxes, ivanedlm
Topic_6	torra, catalonia, sánchez, catalans, state, government, democracy, freedom, coexistence, justice		sánchez, government, psoc, spain, torra, pp, state, pedro, president, table.		Spain, Spainalways, vox, spanish, unit, Spainviva, madrid, barcelona, freedom, defence.
Topic_7	government, Madrid, Andalusia, psoc, corruption, community, taxes, Vamosmadrid, millions, money.		years, Spain, victims, day, freedom, eta, family, party, hug, life.		

Note. Prepared by the authors using 49,288 posts in Spanish by users associated with the salient political groups on *Platform X*

Source: Own processing

Table 2 illustrates a political debate marked by a discursive context in which most political groups focused on a specific number of topics (4 to 7). This number varied according to the role assumed by each political group: the political groups (PP, Cs, and Vox) that opposed the national executive had the highest numbers (7 and 6 topics). Reversely, the political groups associated with the central government (PSOE and UP) had the lowest number of issues (4).

By analysing the salient topics, we can obtain more detail on how the different strategies for political communication were deployed and oriented towards confrontation, facilitating the political groups' polarisation analysis. Table 2 demonstrates the debates' electoral emphasis as promoted by each of the salient political groups during the study period as follows:

- Cs focused on labour rights, political corruption in Spain, education reform, and its anti-independence position, explicitly opposing the October 2019 independence protests in Barcelona and the PSOE and its leading position regarding these issues.
- The PP focused on addressing employment, taxes, and education reforms; on the political crisis generated by the attempt of Venezuela's vice president, Nicolás Maduro, to enter European territory; and on its fight against independence in Catalonia and its defence of Spanish democracy.
- Vox focused on re-establishing its position opposing the Catalan independence movement and the PSOE and its leader regarding this issue (like the opposition of Cs to the PP). It also described their partners' attacks on women in Spain as sexist violence and promoted the 'Parental Pin' (the right of parents to choose the education their children receive).
- PSOE focused on promoting measures concerning retiree pensions, the vindication of historical memory and gender equality, and on the interest in a political blockade by the PP.
- UP focused on gender equality and the fight against sexist violence in Spain. It also called for a coalition with PSOE to constitute a national government and emphasised related proposals for labour reform.

Table 2 shows the different polarisation strategies applied by the political groups studied, which vary according to their ideological orientation and role within the Spanish political scene (opponents and government). The political groups (opponents) located ideologically on the right of the political spectrum in Spain (PP, Cs and Vox) focused mainly on a more fragmented approach to topics aimed at mobilising their voters and positioning Spanish public opinion around the defence of the country's unity, gender violence and the educational rights of parents. In contrast, the parties on the left of the ideological spectrum (PSOE and UP) in charge of the government preferred not to atomise their voters but to mobilise them around a smaller number of topics, focusing mainly on valuing the alliances for the formation of a new government and the fight for rights and issues of social interest (e.g., defence of historical memory, rights of pensioners, and gender equality). The polarised communication scenario allows us to see each political group's thematic *niche*. However, there are also points of affinity between the studied political groups, as there seems to be a certain level of coordination among them that allows them to position their voters around thematic features or specific topics while focusing the conflict on traditional opposition toward the political actors who are the preferred targets of their attacks on *Platform X*. In the case of Cs, PP, and PSOE, these topics are more associated with the main problems expressed by the Spanish people during the study period⁶⁴ (e.g., employment, pensions, corruption, and economic problems).

In contrast, UP and Vox were the furthest from addressing issues of social interest (e.g., sexist violence). Therefore, in this communicative scenario, the traditional political groups or those with more longevity in the Spanish political scene could have focused on attending to citizen interests. Simultaneously, the younger parties aimed to position themselves around issues further removed from the social debate, which they tried to position within Spanish public opinion.

64 *Tres problemas principales que existen actualmente en España (Multirresposta %)*. [online]. [2023-06-04]. Available at: <https://www.cis.es/cis/export/sites/default/-Archivos/Indicadores/documentos_html/TresProblemas.html>.

Regarding objective 3, the main topics addressed in the disinformation content identified by the fact-checking projects of *Maldita.es* and *Newtral.es* (Table 3) allow identifying the main topics of this type of content as follows:

- Police actions that occurred during the October 2019 independence protests in Barcelona.
- Electoral content associated with possible political agreements between PSOE and UP.
- Phishing and economic fraud.
- Content published on *Platform X* and the Internet.
- Immigrant aid in general, specifically for unaccompanied immigrant minors in Madrid and Spain.
- Measures promoted by the Spanish government against gender violence.
- The 'Parental Pin' in education.
- Risks associated with food consumption.

Table 3: Disinformation topics extracted by LDF ($\beta \geq 0.006$)

Topic	<i>Maldita.es</i> and <i>Newtral.es</i>
Topic_1	police, video, Barcelona, sentence, Catalonia, hoax, audio, national, networks, Mossos.
Topic_2	elections, sánchez, party, pablo, we can, pedro, pp, hoax, iglesias, psoc.
Topic_3	data, message, phishing, WhatsApp, web, page, company, mail, sms, mails.
Topic_4	bitcoin, scam, program, people, money, faces, investment, case, Jordi, article.
Topic_5	content, web, tweet, post, account, screenshot, hoax, text, headline, evidence.
Topic_6	data, year, government, Spain, years, Madrid, men, number, community, affirmation.
Topic_7	coronavirus, article, outbreak, China, virus, video, covid19, who, health, countries.
Topic_8	video, hoax, images, image, photo, networks, <i>Facebook</i> , men, Spain.
Topic_9	euros, Spain, aid, years, immigrants, people, help, Mena, Madrid, social.
Topic_10	video, education, Spain, hoax, school, years, children, students, city council, parents.

Note. Prepared by the authors from the 2,730 instances of disinformation content collected from *Maldita.es* and *Newtral.es*
Source: Own processing

The main themes associated with disinformation content reveal a communicative context in which this type of content focuses on apparently unconnected topics and general issues not considered within the Spanish political scene (e.g., food consumption and content published on the Internet), as well as issues directly related to topics addressed by the political groups studied. Despite our inability to estimate the intensity or direction of this potential relationship in this article, it shows a communicative scenario in which the polarisation promoted by the political groups studied favours their assumption of a prominent role in disseminating this type of content to influence Spanish public opinion (objective 4). They do so by serving as a political base/platform to increase the interest of the citizens who encounter them before related issues are approached by those who represent them politically and ideologically in Spain. This role varies according to the role (opposition or government or potential ally) and these actors' ideological profile within the Spanish political scene, at least during the period studied. Vox, PP and Cs were potential promoters (voluntarily or involuntarily) of a favourable communication scenario for the viralisation of this type of content. At the same time, PSOE and UP were recipients (voluntarily or involuntarily) of these messages.

4 Discussion and Conclusions

The polarisation of public opinion and the promotion of disinformation content have become increasingly relevant at both the social and academic levels. Thus, we specifically focused on digital platforms and the role of political actors in this process.

In our case (the main political actors in Spain), our data allow us to observe the active roles of the PSOE, Popular, Ciudadanos, and Vox parties in the increase in socio-communicative conditions on *Platform X*, fostering polarisation and conflict among users associated with these parties, their leaders, and their spokespersons. Beyond the influence of electoral processes during the period studied, *Platform X* allowed them to develop certain micronarratives in the digital communicative contexts that we studied around specific topics intended to facilitate cohesion with their constituents. In most cases, these electoral topics were addressed via a cyber pragmatic approach⁶⁵ that established relationships with constituents via the self-promotion of their political projects and delegitimization of and confrontation with their primary opponents.

Each of the salient political actors focused promptly on a limited number of issues that were not necessarily linked to the main problems identified by Spanish citizens⁶⁶ and increased the polarisation of public opinion in Spain to promote their interests among the users associated with them on *Platform X*.

Our data also allows us to see how, via the framework of confrontation and self-promotion exercised by the analysed political actors, such actors actively participated (not necessarily as direct promoters) in forming a disinformation context for Spanish public opinion. Moreover, this seemingly took place through different roles assumed within the viralisation of this type of content on digital platforms, e.g., *Platform X*. On the one hand, some political actors engendered the disinformation identified by *Maldita.es* and *Newtral.es* when approaching issues directly associated with this type of content (e.g., Partido Popular, Ciudadanos and Vox). In contrast, others seemingly contributed this type of content primarily as the recipients or actors directly alluded to (e.g., PSOE and Unidas Podemos). Therefore, the data partially confirms hypothesis (H1) since the active and differentiated role of the actors in promoting the culture of disinformation in Spanish public opinion on *Platform X* is observable only for some political groups and not in all cases studied. Political actors do not necessarily act as active promoters in viralising disinformation content. On the other hand, regarding the treatment of related issues, political actors play different types of roles that facilitate the viralisation of such content on social media, such as *Platform X*, or act as recipients of disinformation.

The results shown and discussed in this work allow us to approximate how political groups in Spain have been advancing towards possible polarisation scenarios from digital scenarios such as *Platform X*. This favours a context like the one proposed by the authors and taken into account for the elaboration of this article, where the Spanish political actors studied beyond implementing communication strategies that can favour polarisation within public opinion. The messages they published on *Platform X* would favour the conditions for virtualising disinformation content from this scenario. An action that this work does not allow (given its scope) to determine if it is done from an active role or interested in such purposes would warrant the development of new studies with a different scope than the one shown here.

It is necessary to highlight the limitations of our study, which is based on a probabilistic model of topic analysis to evaluate the main issues we exposed, both at the level of the political actors analysed and at the level of the disinformation content identified by the selected fact-checking projects. This approach should be complemented with new lines of research on the topic addressed here that will explore other aspects, such as the level of intensity and centrality of the role of the political groups studied around particular subjects. Future research should also delve more deeply into the roles these groups assume and their relationships at an ideological level and according to their political position within the Spanish political landscape (opposition or government). Studies should be considered, longitudinally and in specific periods, to detect patterns that help

65 GARCÍA-OROSA, B., LÓPEZ-GARCÍA, X.: Language in Social Networks as a Communication Strategy: Public Administration, Political Parties and Civil Society. In *Communication & Society*, 2019, Vol. 32, No. 1, p. 107-125.

66 *Tres problemas principales que existen actualmente en España (Multirrespuesta %)*. [online]. [2023-06-04]. Available at: <https://www.cis.es/cis/export/sites/default/-Archivos/Indicadores/documentos_html/TresProblemas.html>.

the media and data verification projects better monitor and identify disinformation content that has gone viral in Spanish public opinion from social media such as *Platform X*. The possible dissemination strategies of this type of content by the political groups analysed, or those related to them should not be neglected.

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