



Exploring User Engagement with Portuguese Political Party Pages on Facebook: Data Sprint as Workflow

Explorando el *engagement* de los usuarios con las páginas de los partidos políticos portugueses en Facebook: El *data sprint* como flujo de trabajo

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ABSTRACT In the broader context of a research project about political participation on Facebook during the Portuguese electoral year of 2019 - for the European Parliament in May, and for the National Parliament in October -, a dataset of more than 9,000 posts and corresponding reactions and comments had been previously retrieved using Facepager. Participating in a data sprint came up as an opportunity to explore some specific questions in an intensive and time-bound context, using a subset of the data tailored to the purpose of discovering: 1) how differently official parties tried to engage with Facebook users before, during, and after the campaigns for the major elections periods (“supply side”), and 2) what type of content received the most attention and engagement (“demand side”). Our results show that regardless of the party’s age and position in the political spectrum, the persistent main categories are “National Politics”, “Fundamental Rights”, and “Self-Promotion” for both elections. Also, we found that posts with images attract more attention, and apparently this may be leveraged if the textual content of the post is in topics of “National Politics”. However, this finding requires further investigation. Along with details about the research during the data sprint and the main findings, this paper is also a testimony about the singularities and learnings of a process built upon the constraints of taking data sprints situation as a workflow.

KEYWORDS Facebook, political engagement, elections, political parties, data science

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RESUMEN En un contexto amplio de un proyecto de investigación sobre participación política en Facebook durante el año electoral portugués de 2019 - para el Parlamento Europeo en mayo, y para el parlamento Nacional en octubre -, un *dataset* de más de 9.000 posts y sus correspondientes reacciones y comentarios fue previamente recolectado usando Facepager. A través de la participación en un *data sprint*, se tuvo la oportunidad de explorar cuestiones específicas en un contexto intensivo de tiempo limitado. Mediante el uso de un *subset* de los datos mencionados, se plantearon las siguientes preguntas de investigación: 1) ¿Cómo fueron las estrategias de los partidos políticos para interactuar e involucrar a los usuarios antes, durante y después de las campañas? (“oferta”); y 2) ¿Qué tipo de contenidos recibieron más *engagement*? (“demanda”). Nuestros resultados muestran que, independientemente de la antigüedad de los partidos y sus posturas en el espectro político, las categorías más populares respecto a la temática de las publicaciones son “National Politics”, “Fundamental Rights”, and “Self-Promotion” para ambas elecciones. Además, se aprecia en un análisis preliminar que las publicaciones con imágenes atraen más la atención, y aparentemente, esto puede ser aprovechado al máximo si el contenido en texto de la publicación es, sobre todo, acerca de temas de la categoría “National Politics”. Este primer contacto con el conjunto de datos, junto con otros detalles acerca de la investigación durante el *data sprint* y sus principales hallazgos presentan un testimonio sobre las singularidades y aprendizajes de un proceso construido sobre la base de utilizar el *data sprint* como flujo de trabajo.

PALABRAS CLAVE

Facebook, *engagement* político, elecciones, partidos políticos, data sprint, data science



Exploring User Engagement with Portuguese Political Party Pages on Facebook: Data Sprint as Workflow

1. Introduction

With the continuous rise in the use of online communication by the general public, political parties became increasingly present on social media platforms (Macnamara, 2011; Enli and Skogerbø, 2013; Nahon, 2015; Kalsnes, 2016; Vogels *et al.*, 2021). The online conversations and interactions on social media provide an exhaustive source of data on political engagement, opinion dynamics, and online community structures compared to the traditional sources, such as interviews and surveys, allowing new research approaches fueled by tools and methods native to the digital universe (for a comprehensive and still relevant systematic review, cf. Kapoor *et al.*, 2018). In the field of political communication, a very significant part of the existing literature is focused on how political actors such as parties and candidates use social media to reach out to the electorate (Effing *et al.*, 2011; Bennett, 2012; Larsson and Kalsnes, 2014; Lilleker *et al.*, 2015). Campaign periods tend to be considered particularly relevant time frames for analysis (Enli and Skogerbø, 2013; Magin *et al.*, 2017; Klinger and Russman, 2017), though more longitudinal studies also have their place in the literature (Larsson, 2016; Heiss *et al.*, 2019; Serra-Silva *et al.*, 2018).

A common dispute underlining some studies is related to the normalization vs. equalization hypotheses. The first (Klinger, 2013; Ramos-Serrano *et al.*, 2018) states that

major parties already rely on a stronger presence through mainstream media. This allows them to be more conservative in the usage of social media without compromising their primacy. The conflicting “equalization hypothesis” argues that smaller or newer parties can (and do) take advantage of these platforms to counterbalance and eventually overcome an otherwise unfavorable position (Gibson and McAllister, 2014; Samuel-Azran, 2015; Bene, 2021). Another research trend, keeping up with the perceived ascension of populist and “alt-right” movements (Engesser *et al.*, 2017; Alonso-Muñoz and Casero-Ripollés, 2020), tries to make sense of the phenomenon by identifying features in the communicative style that may potentiate this rise.

The rationale for our research was that the communicative interchange that takes place in social media, however asymmetrical it may be, needs to consider both the posts and their content (“supply-side”) and the engagement affordances allowed to the users (“demand-side”). Our main objective was thus to investigate how this communicative exchange took place on Facebook, to have a more accurate description of what happened both on the supply and the demand sides before, during, and after the European and Legislative Elections in Portugal in 2019. The activity on the supply side can be measured by the number of posts from the page owners, while from the demand side it can be measured by the number of comments, shares, and reactions (at the time, *Like, Love, Haha, Wow, Sad* or *Angry*) from users. These interactions, commonly explained and analyzed as user engagement (Effing *et al.*, 2011, Stetka *et al.*, 2019; Sobacı and Hatipoğlu, 2020), are the major metrics used in the literature.

While these allow for a quantitative assessment of how common users interact with the posts, they may fail in providing a more in-depth explanation of those behaviors, which calls for some additional strategical and methodological approaches. Another objective was thus to investigate what this interchange *actually* means, targeting the content of posts and comments through diverse methodological strategies.

In this study, we evaluate how official parties tried to engage with Facebook users during the two major 2019 elections in Portugal, and which type of content received the most attention, two complementary sides of the communicational exchange which are commonly referred to in the literature respectively as “supply-side” and “demand-side” (Norris, 2003; Gibson, 2012; Theocaris *et al.*, 2016; Xenos *et al.*, 2017). At the same time, it will serve as a testimony about the singularities and learnings of a research process built upon the constraints of a data sprint.

The main research questions that this paper seeks to answer are the following:

RQ1: How differently do official parties try to engage with Facebook users in the two major 2019 elections periods in Portugal?

RQ2: What type of content receives the most attention and engagement from the users?

2. Methodology

2.1. Data context

In the broader context of a research project (PINBook PT: Political Interest Networks in Facebook Portugal) about political participation on Facebook during the Portuguese electoral year of 2019 – for the European Parliament in May, and for the National Parliament in October – a total of more than 9,000 posts and corresponding reactions and comments had been previously retrieved using Facepager. This dataset, spanning a period of 18 months (from July 2018 until the end of 2019), contains the posts from the official pages of the Portuguese parties with parliamentary representation during the legislature that was sworn in after the latter electoral act.

Such an amount of data was indispensable for the project's main objectives – the analysis of political participation through Facebook, from official and non-official actors –, but also inspired more specific research questions. Participating in a data sprint came up as an opportunity to explore some of those questions in an intensive and time-bound context, while at the same time connecting with people outside the project and from different backgrounds, constituting an *ad-hoc* group gathering disparate researchers and skills towards a common goal.

2.2. Corpus

To attain both objectives, while at the same time keeping in mind the tenets of current research (which are far from exhausting the field), we have opted to analyze the two electoral periods of 2019 (European and Legislative campaigns) and select two samples of posts for each period: those with the highest level of interactions, and those with the highest level of “other reactions” (i.e., reactions other than *Like* or *Love*). This latter approach takes advantage of Facebook's current availability of multiple reactions beyond the *Like* button, which, to a certain extent, attenuate the inherent ambiguity of the original reaction and allow a more nuanced expression of meanings and emotions. Though the connection between emotions and reactions is present in the literature (Hughes and van Kessel, 2018; Eberl *et al.*, 2020), this procedure was, as far as the authors have examined, never attempted in previous studies.



Figure 1. Mapping of political parties (political spectrum and foundation time).

For the comparative analyses, the political parties were mapped (Figure 1) according to their foundation time (“older” if founded before 2000 vs. “newer” if founded after that date), and political position (left vs. right). As the sprint developed, other specific data – namely the images embedded in the posts and the emojis within posts and comments – were gathered.

2.3. Query Design and Visual Protocol

For this study, posts from the Portuguese political parties' public pages were collected using Facepager, a tool for fetching publicly available data from various social media platforms (Jünger and Keyling, 2019).

The complete dataset, spanning 18 months of posts from the pages of the Portuguese parties represented in the parliament elected in 2019 (cf. Appendix I: List of political parties) and corresponding comment trees, consists of more than 9,000 posts and more than 100,000 comments, along with their engagement metrics. From that main dataset, the subsets of 100 posts each were retrieved for the periods of the two major

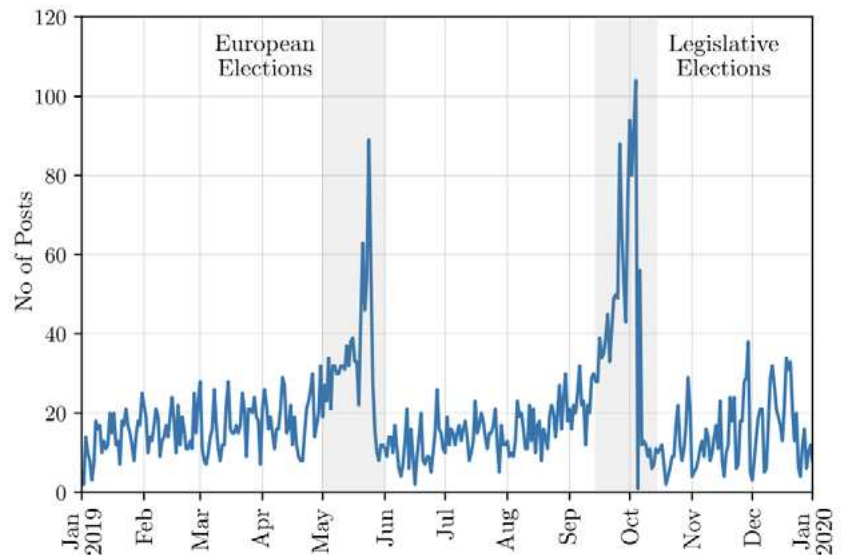


Figure 2. Daily post activity over time (all pages/parties).

elections and related electoral campaigns. Two periods (April to June and September to November 2019) were chosen, to cover two months before each election, which include both the official campaign time and the “pre-campaign” time, and the month after. These periods also correspond to those with higher activity from the supply side, i.e., the higher values of published posts per day by the political parties on their Facebook official pages, as shown in Figure 2.

Within these periods, we then selected the top 100 posts for each with 2 filters, as summarized in Table 1. A similar approach was taken for the top 100 comments.

	European Elections (2 months before, including 15 days of campaign + 1 month after)	Legislative Elections (2 months before, including 15 days of campaign + 1 month after)
Posts ranked by “other reactions” (<i>Haha, Wow, Sad, Angry</i>) [Used for all analysis]	Top 100 posts + Top 100 comments within those posts	Top 100 posts + Top 100 comments within those posts
Posts ranked by total interactions (reactions + comments + shares) [Used only for visual and sentiment analysis]	Top 100 posts + Top 100 comments within those posts	Top 100 posts + Top 100 comments within those posts

Table 1. Datasets.

Figure 3 gives a graphical representation of the visual protocol used for the data sprint.

Study Design – Visual Protocol


Platform	Dataset/Sub-datasets	Extraction	Analysis	Visualization
Facebook 	Posts and comments	Facepager	<ul style="list-style-type: none"> • Text Analysis Manual Coding • Text Sentiment analysis NLTK Vader 	RAWGraphs
	Images within the posts	Python urllib library	<ul style="list-style-type: none"> • Python • Memespector GUI • Image Content analysis 	<ul style="list-style-type: none"> • Imagesorter • Gephi
	Emojis within posts and comments	SpaCy		RAWGraphs

Figure 3. Visual Protocol.

The data sprint lasted a total of five days, leaving approximately two and a half days for actual research, plus the latter half of the last day for the presentation of results. The team was at the outset split into two groups according to their skills and previous background: the first dealing with the task of codifying the posts' content, following a previously established set of categories (cf. Appendix II); the second dealing with quantitative dimensions such as engagement metrics and automated sentiment analysis. About halfway through the process, both groups regathered to crosscheck and discuss the respective findings, aiming at a global analysis and interpretation of the data. For the third and last phase of the project, the team prepared a set of visualizations that synthesized the main results.

2.4. Implementation of the Methodology

To answer RQ1 (How parties try to engage with Facebook users?), we looked at the posts' content: text, images and emojis.

The 100 posts with more "other reactions" of each subset (i.e., European and Legislative elections), were considered for manual coding of categories, which were then analyzed and ran through several visualization techniques. "Other reactions", i.e., all reactions besides *Like* and *Love*, were considered instead of common engagement metrics (total reactions, total interactions, number of shares, etc.) not because these could be considered more representative, but rather because these more diverse responses from the "demand side" could be helpful in showing a wider spectrum of engagement strategies from the "supply side". As a complement, word frequencies were also considered, both for these posts and for the similar corpora of the 100 posts with more interactions from each period. Images and emojis on posts were also subjected to analysis, as described in more detail below. Finally, posts and comments, after being translated to English, were subjected to sentiment analysis with NLTK.VADER¹.

To answer RQ2 (What type of content receives more attention and engagement?), we

additionally analyzed comments to the posts, and particularly emojis within those comments, using SpaCy² for retrieval and RawGraphs³ for visualization. Given that the subsets of data were already selected due to being the top-rated regarding interactions or “other reactions”, the techniques used to answer RQ1 were also applicable for RQ2.

2.4.1. Data processing

Text

1. Posts and comments were translated from Portuguese to English with Google Translator⁴.
2. Text sentiment analysis was processed with NLTK.VADER (Hutto and Gilbert, 2014), a model used for text sentiment analysis that is sensitive to both polarity (positive/negative) and intensity (strength) of emotion.
3. Emoji extraction, through text description, was carried out with SpaCy and the addon Spacymoji⁵.

Images

After being retrieved with the Python urllib library⁶, the images belonging to the corpora were processed with:

1. Google Vision API⁷, with a particular focus on the Safe features detection, and visualized with the help of heatmaps.
2. Image Sorter⁸, which allows the grouping of images according to several criteria, e.g. by color resemblance.

3. Results

3.1. Basic descriptive statistics

Tables from 2 to 5 give a basic overview of the sampled data, from which it can already be observed that none of the subcorpora includes all the initial 11 official party pages (cf. Appendix I). Although every page appears in at least one of the samples, only seven are present in all of them. From left to right in the political spectrum, these are: PCP (Communist Party), L (Free; left-wing), PAN (People Animals Nature, an ecologically and animal rights oriented party), PPD/PSD (Social Democrat Party, center-right), IL (Liberal

2. An open source software library for advanced natural language processing (<https://spacy.io/>).

3. <https://www.rawgraphs.io/>

4. <https://pypi.org/project/googletrans/>

5. A community maintained addon (<https://pypi.org/project/spacymoji/>)

6. <https://docs.python.org/3/library/urllib.html>

7. <https://cloud.google.com/vision>

8. <https://imagesorter.software.informer.com/>

Initiative, neoliberal/libertarian), CDS-PP (Popular Party, conservative), CH (Enough, extreme right populist).

This disproportionality is amplified if we look at the number of posts of each page in the dataset, with PAN and IL always overrepresented, and CH also overrepresented, except in one of the samples. The averages of “other reactions” (Tables 2 and 3) and of total interactions (Tables 4 and 5) allow to compensate for this overrepresentation, showing less intense fluctuations between higher and lower averaged parties.

Page	Number of posts in dataset	Total of “other reactions”	Average of “other reactions” per post
PCP	8	535	66.88
CDU (PCP+PEV)	1	25	25.00
PEV	1	45	45.00
BE	13	765	58.85
L	5	161	32.20
PS	5	518	103.60
PAN	24	2,229	92.88
PPD/PSD	2	59	29.50
IL	23	1,974	85.83
CDS-PP	4	218	54.50
CH	14	728	52.00
<i>TOTAL</i>	<i>100</i>	<i>7,257</i>	<i>72.57</i>

Table 2. Dataset with Top 100 “Other Reactions” for European Elections.

Page	Number of posts in dataset	Total of “other reactions”	Average of “other reactions” per post
PCP	1	128	128.00
CDU (PCP+PEV)	1	79	79.00
BE	6	985	164.17
L	9	2,882	320.22
PAN	17	4,679	275.24
PPD/PSD	3	266	88.67
IL	24	5,230	217.92
CDS-PP	4	691	172.75
CH	35	13,653	390.09
<i>TOTAL</i>	<i>100</i>	<i>28,593</i>	<i>285.93</i>

Table 3. Dataset with Top 100 “Other Reactions” for Legislative Elections.

Page	Number of posts in dataset	Total of interactions	Average of interactions per post
PCP	5	3,750	750.00
CDU (PCP+PEV)	5	3,865	773.00
BE	3	2,086	695.33
L	1	937	937.00
PS	11	13,901	1,263.73
PAN	37	58,814	1,589.57
PPD/PSD	3	3673	1,224.33
IL	31	36,014	1,161.74
CDS-PP	1	1,088	1,088.00
CH	3	3,124	1,041.33
TOTAL	100	127,252	1,272.52

Table 4. Dataset with Top 100 Interactions for European Elections.

Page	Number of posts in dataset	Total of interactions	Average of interactions per post
PCP	2	7,572	3,786.00
L	8	36,991	4,623.88
PS	10	24,645	2,464.50
PAN	13	33,986	2,614.31
PPD/PSD	4	10,233	2,558.25
IL	33	81,261	2,462.45
CDS-PP	1	1,805	1,805.00
CH	29	111,734	3,852.90
TOTAL	100	308,227	3,082.27

Table 5. Dataset with Top 100 Interactions for Legislative Elections.

3.2. Text

3.2.1. Categorization

The two sets of 100 posts with the highest rate of “other reactions” were analyzed and classified manually, using a list of categories and subcategories from a preexisting codebook conceived by the team.

The classification was done by four coders, which independently classified 50 posts each. For this project, and although some posts may have benefited from a multiple categorization approach, the team agreed to have only one code per post to facilitate the statistical treatment and to keep the task more manageable within the time limits of the data sprint. Intercoder reliability was assessed by the categorization and comparison of a small sample, done by all 4 coders, until consensus was reached. The total of 200 posts was subject to a further round of mutual verification, to strengthen the reliability.

Both in the first and second rounds, some limitations in the original codebook were detected, prompting the members involved in this task to rectify the coding scheme, readjusting some of the initial categories and also creating new ones, in order to fit the data more thoroughly.

The data for each period, with added categories and subcategories, were sorted and analyzed according to several criteria, of which 1) the frequency of each *category* and *subcategory*, and 2) the frequency and ratios of categories for each *party* yielded the most relevant interpretations.

The category distributions for European and Legislative Elections were visualized using the RAWGraphs tool and are shown in Figures 4 and 5.

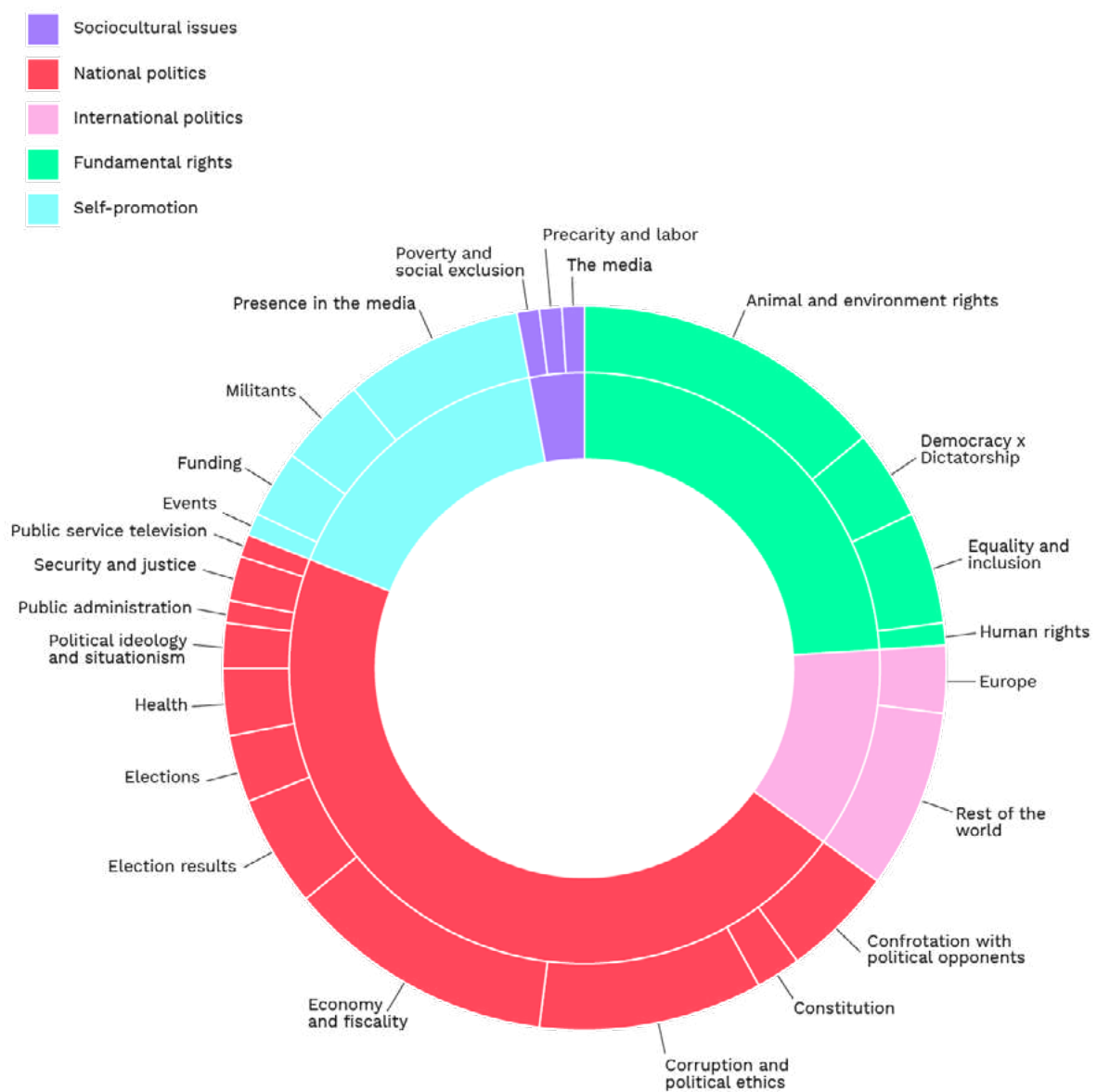


Figure 4. European Elections categories (all parties).

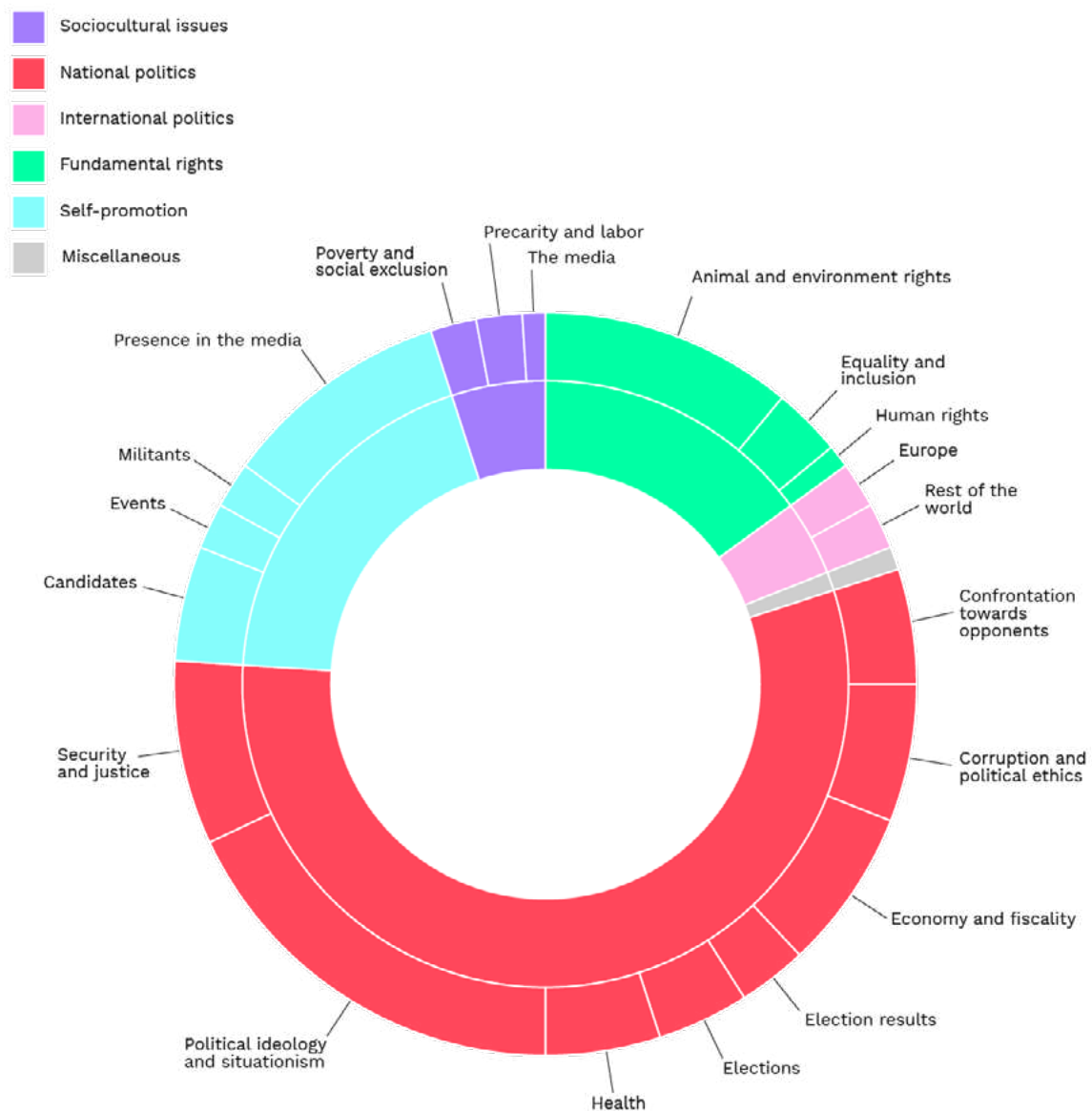


Figure 5. Legislative Elections categories (all parties).

The top 100 European Elections posts with more “other reactions” (Figure 4) highlighted the following results:

- The most frequent category is “National Politics”, with “Economy and Fiscality” and “Corruption and Political Ethics” as its most frequent subcategories;
- “Fundamental Rights” is the second most frequent main category, although this result may be biased by the predominance of the “Animal and Environmental Rights” subcategory in the posts by PAN;
- Surprisingly, “International Politics” is not only the second less-frequent category during European Elections, but “Rest of the World” surpasses “Europe” as a subcategory.

The top 100 Legislative Elections posts with more “other reactions” (Figure 5) highlighted the following results:

- The weight of “National Politics” is overwhelming, with the subcategories “Security and Justice” and “Political Ideology” being more frequent than in the European Elections;
- “Self-promotion” is also more frequent than in the European Elections, with “Presence in the Media” and “Candidates” as the most frequent subcategories;
- The “Security and Justice” subcategory grows in importance.



Figure 6. European Elections category cloud (all parties).

The clouds for most frequent categories (Figures 6 and 7) confirm the previous analysis, showing how some subcategories shift in importance from the European to the Legislative Elections. Such is the case of “Economy and Fiscality” and “Animal and Environmental Rights” decreasing, and “Political Ideology and Situationism” increasing.

A similar analysis was applied at the party level (Figure 8), this time considering the 200 posts (i.e., both European and Legislative Elections), in order to assess individual party strategies.



Figure 7. Legislative Elections category cloud (all parties).

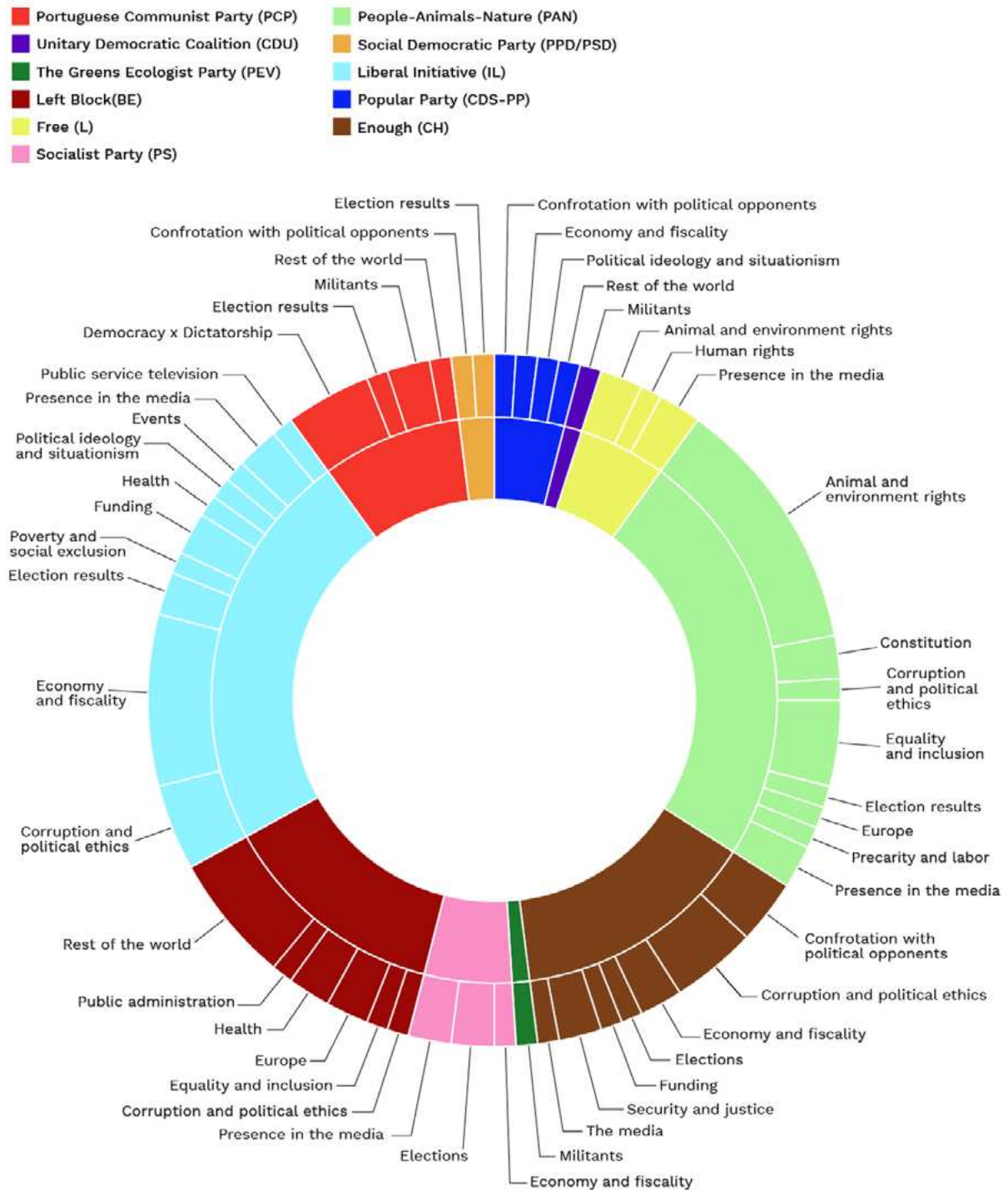


Figure 8. Most frequent categories by political party.

Although the corpus only considers posts that achieved higher levels of “other reactions”, which may disallow a generalization, some evidence can be highlighted:

- The three right-wing parties (CDS-PP, IL and CH) have “Confrontation with Political Opponents” as a more frequent subcategory than other (left, center-left and center-right) parties;
- Left-wing parties BE (Left Block) and CDU (Unitary Democratic Coalition between the Communist and the “Greens”) relate more to “International Politics”;
- Some subcategories are almost monopolized by one single party, as is the case of IL for “Economy and Fiscality” and PAN for “Animal and Environmental Rights”.

3.2.2. Word frequency

Word clouds were also generated for the most frequent words across the corpus, again separately between the European (Figure 9) and the Legislative Elections (Figure 10). Due to time constraints, there was no attempt at a correlation between words and categories.



Figures 9 and 10. European elections and Legislative Elections most frequent words (all parties).

Given that “liberal” and “initiative” are almost exclusively used by the new political party that uses those words in its name (IL), we may extrapolate that they had a dominant role in reaching the attention of the public during the European Elections, even if they then failed to elect an MP.

In the Legislative Elections, the word “freedom” stands out, which is consistent with the weight of both “Fundamental Rights” as one of the most common categories and “Political Ideology and Situationism” as one of the dominant subcategories.

3.2.3. Usage of emojis

Emoji frequencies in the posts and comments were also analyzed, and visual depictions were created with RAWGraphs. The next two visualizations show, for all four subcorpora, the distribution of emoji frequencies in posts, (Figure 11) and in comments (Figure 12), in both cases grouped by parties.

The analysis revealed that political parties hardly used emojis in their posts. However, a more substantial amount of emojis appeared in the comments, as discussed just below. The most significant discovery was that PAN is by far the party that more regularly uses these special characters.

Considering that emojis were more frequent in comments, the following two visualizations show those that were more frequent in those posts with more “other reactions”, first in the European Elections (Figure 13), and then in the Legislative Elections (Figure 14).



Figure 11. Emojis on posts (divided by parties).



Figure 12. Emojis on comments (divided by parties).

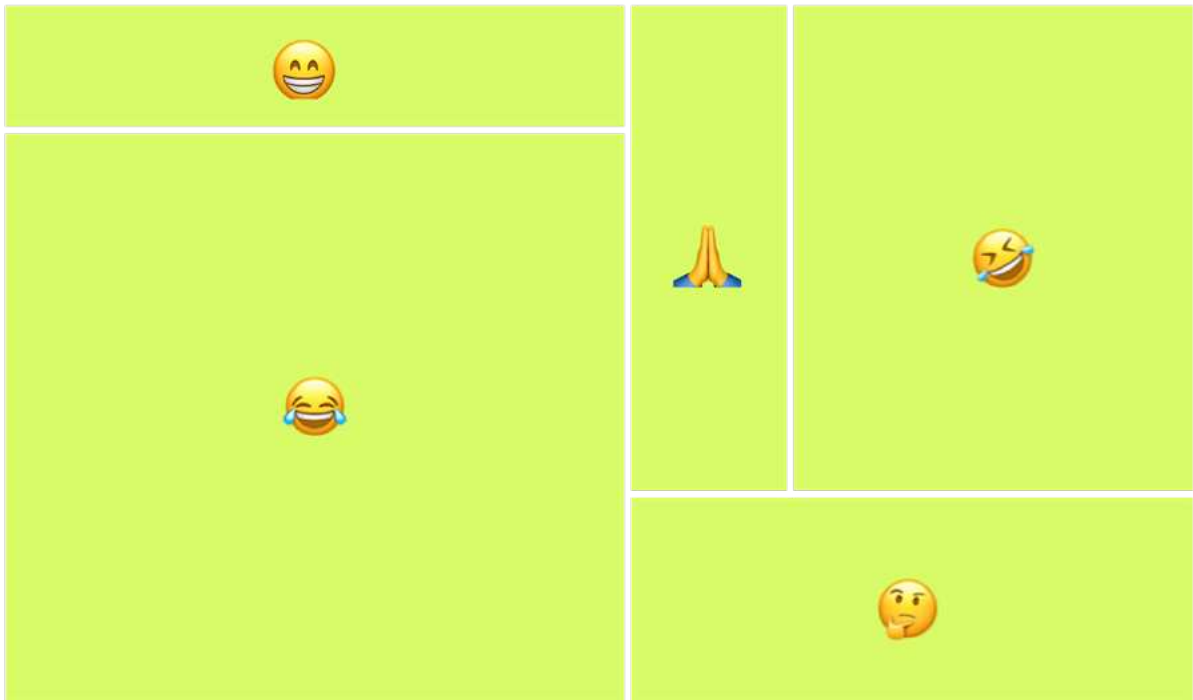


Figure 13. Most frequent emojis in the comments for European Elections “other reactions”.

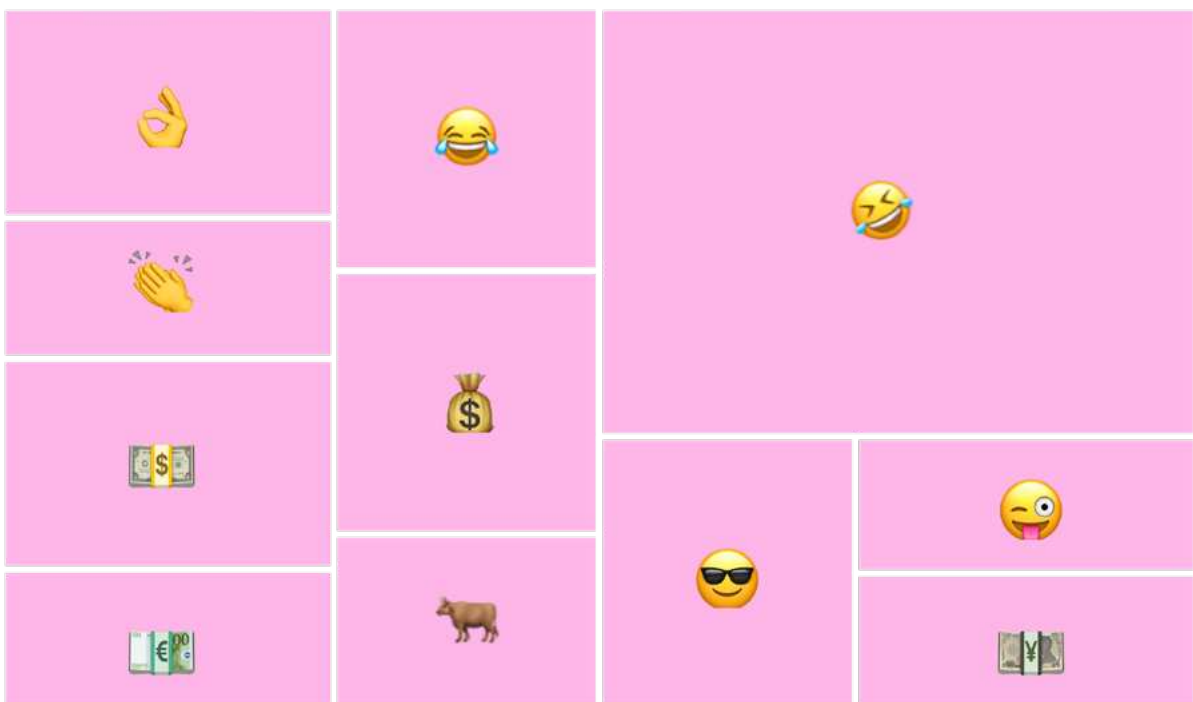


Figure 14. Most frequent emojis in the comments for Legislative Elections “other reactions”.

The results are not particularly noteworthy for the European Elections, but for the Legislative Elections, we found a peculiar collection of emojis with several money-related pictograms (money bills, money bag, etc.), besides the more predictable smiley faces.

3.2.4. Sentiment analysis

Sentiment analysis techniques were applied with VADER to the automatically translated contents of the posts and of the top 100 comments within those posts. Although this analysis yielded sentiment scores, the results were inconclusive. This task could not be fully carried out due to time constraints – and thus the preliminary results and visualizations that were elaborated were not considered suitable to be included, though that methodological approach remains a goal for further research.

3.3. Images

3.3.1. Image grouping

The images retrieved from the posts, totaling 187, were subjected to some basic sorting techniques with the software Image Sorter. Grouping images by color proved the most interesting approach, as those groupings served as guides for the team to focus on recurrent patterns, and as a crosscheck with the image features described in the next subsection.

Images with red, blue, and white, all found in IL's posts, were the most common, denoting not only consistent use of this template in the party's posts but also confirming their prevalence within posts with more interactions and more "other reactions", which, we may remember, were the primary criteria for corpus selection.

Images with green hues appear only in the European elections data, and these are mostly used for "green" content – i.e., posts with the category "Animal and Environmental Rights", which, as mentioned above, is the dominant subcategory in PAN's posts.

3.3.2. Image features

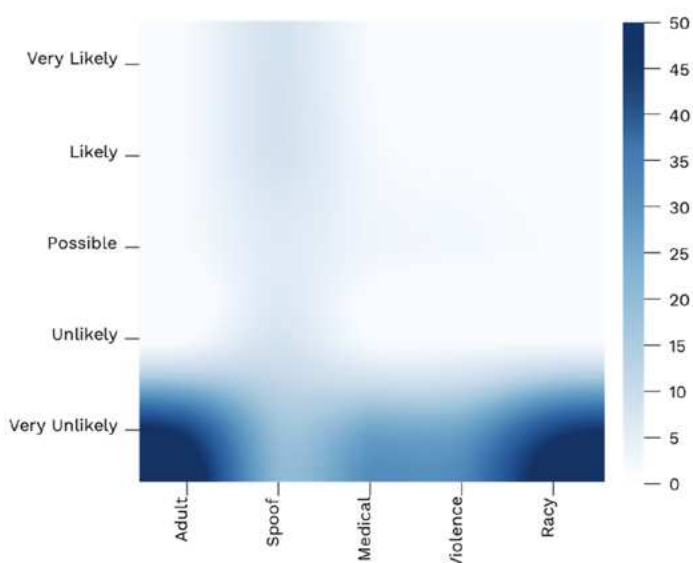


Figure 15. Heatmap for Safe Search features on images (European Elections).

The following heatmap visualizations show, according to Google Vision API's "Safe Search" module, the probability of having, in the images belonging to the corpora, features that may classify them respectively as "adult-oriented", "spoof or parody" (image modified, often to become offensive), "medical", "violent" or "obscene or provocative"⁹. As before, individual analyses were made for the European Elections (Figure 15) and the Legislative Elections (Figure 16).

9. Cf. <https://cloud.google.com/vision/docs/reference> and <https://cloud.google.com/vision/docs/reference/rpc/google.cloud.vision.v1#google.cloud.vision.v1.SafeSearchAnnotation>

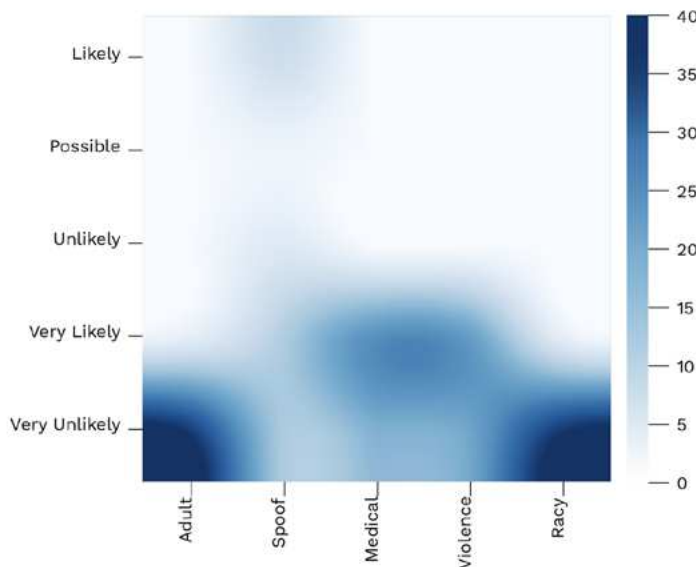


Figure 16. Heatmap for Safe Search features on images (Legislative Elections).

From what can be read in these visualizations, the overwhelming majority of the images was marked as “very unlikely” having any of the above mentioned features, though with some likelihood of spoofing for images both in the data sets from the European and from the Legislative Elections. In the case of those belonging to the latter set, the likelihood of having images with medical or violent content increases slightly, but still far from being unequivocal positives.

One image (Figure 17) that drew the attention of the team is indeed a spoof, a photoshopped image of PAN’s leader and main candidate André Silva in a post by this party. Both the image and the post content show that it was intentional humor – self-deprecating humor, if the expression suits – as an announcement for a forthcoming interview in a TV program hosted by a well-known comedian in Portugal.

One image (Figure 17) that drew the attention of the team is indeed a spoof, a photoshopped image of



Figure 17. Example of an image with “Spoof” features.

4. Key Findings and Discussion

As mentioned in the Introduction, the answers to our Research Questions should also consider the mapping of the parties according to their foundation time and ideological position, as represented above in Figure 1. Given that the selected corpora filter the posts from the two electoral periods according to the criteria of the highest amount of “other reactions” and interactions, this already shows that newer parties, except L (Free, left-wing), were overrepresented in our data subsets, a clue that we followed across each specific analysis. In the next paragraphs, we will address RQ1 and RQ2 with this in mind.

RQ1: How differently official parties try to engage with Facebook users in the two major 2019 elections periods in Portugal?

Regardless of the party and its specific positioning on the map, and also both for European and Legislative Elections, posts are predominantly from the main categories “National Politics” (the most frequent), “Fundamental Rights”, and “Self-Promotion”. “European Politics” was, surprisingly, barely a topic in the posts with more “other reactions”, even during the European Elections.

However, differences in the communication strategies become more manifest when considering the subcategories. IL favors “Economy and Fiscality” (a subcategory of “National Politics”) and PAN “Animal and Environmental Rights” (a subcategory of “Fundamental Rights”), thus allowing for classifying them as “single-issue parties”. And while left (and especially more left-wing) parties slightly favor broader concepts like “Democracy x Dictatorship” (a subcategory of “Fundamental Rights”), right-wing parties, especially newer and fringe ones (IL and CH), resort to themes that have a higher confrontational potential, such as “Corruption and Political Ethics” or “Political Ideology and Situationism”, if not outright “Confrontation with Political Opponents”. That agonistic approach seems to increase during the campaign periods.

The analysis of the most frequent words in the posts shows a common agreement regarding “freedom” (notably in the Legislative Elections), though only a deeper look at the content may reveal if that concept is understood consensually or not – i.e., whether political positioning or other differentiating features also correspond to diverse appropriations of “freedom”. Other concepts are too spread out (both considering posts and parties) and thus with frequencies too low to draw conclusions.

Emojis are rarely used as part of the parties’ communication strategies, with PAN being the exception (almost always using symbols that confirm their focus with “Animal and Environmental Rights”). However, two other newer parties (IL and CH) showed an increase in emoji usage for the Legislative Elections, which took place later in the year.

Using images is also a transversal strategy across all parties, with an over-representation of posts by IL, one of the newer right-wing parties. Though this may be due to a sampling bias, this party is very consistent regarding visual aesthetics, using their colors (white, red, and especially cyan) in almost all image posts.

For other parties, there is more chromatic diversity, but “risky” images – i.e., those that may be flagged as less appropriate in Google Vision API Safe Search detection algorithms – are for the most part avoided. Spoofing for humorous or parodic objectives, either to mock the opponents or as lighthearted forms of self-deprecation, was however found in a few images, even if Google Vision did not flag these with a high degree of certainty. Again, this particular approach to images tends to be more common with newer parties.

Globally, the newer and smaller parties PAN, IL, and CH are not only among the most represented in the corpora but also reveal more unconventional approaches in their posts. This happens either through specific themes – e.g., IL with posts about “Economy and Fiscality”, CH with “Corruption and Political Ethics” –, cues in image posts (PAN, IL), or emojis (PAN), authorizing the conjecture of a more informal style of communication favoring the “equalization hypothesis”, in line with the claim that minor parties make stronger use of social media (Gibson and McAllister, 2014), even surpassing major ones in engagement levels (going beyond Samuel-Azran, 2015). As such, it may be the case that “Facebook is an appropriate campaign tool for minor political actors to decrease their structural disadvantages” and “it may have contributed to the remarkable transformation of European political systems” (Bene, 2021: 17).

The more confrontational stance in the posts by CH, and to a lesser extent by IL, is also in line with the literature about the ascension of right-wing populism, namely that these political actors “seek a fast, direct, and unmediated connection to the people” (Engesser *et al.*, 2017: 1282), even if we could not fully explore to what extent were present the “three major dimensions of populist style: simplification, emotionalization, and negativity” (Engesser *et al.*, 2017: 1285). The almost non-existence of posts about European politics did now allow us to assess if Euroscepticism is part of their discourse, as proposed by Alonso-Muñoz and Casero-Ripollés (2020) for similar parties in the continent.

RQ2: What type of content receives the most attention and engagement from the users?

If solely considered from the perspective of interactions as a whole, some of the items and interpretations above-identified for RQ1 also apply to RQ2 if we switch from the “supply-side” to the “demand-side” and may inclusively be one of the explanations for the success in the voter turnout of those same newer parties. Comparing the Legislative Elections of 2019 to the previous in 2015, PAN rose from 1.39% to 3.49% and from 1 to 4 MPs, and the newcomers IL and CH (each with 1.35% of the votes), had just enough to earn an MP each.

PAN’s success has some nuances if confronted with those other parties: on the one hand, they are positioned at the center-left rather than on the right of the spectrum; on the other hand, they are, relatively speaking, the “oldest” and most established of the newer parties, with representation in the national parliament since 2015. The engagement with the audience seems to be achieved with their most common topic (“Animal and Environmental Rights”). This is also the party that receives more emojis in the comments, which may be due to a “mirror” effect: emojis in the posts may be read as an incentive to mimic this approach in the comments.

The engagement with image posts in these three parties seems to be particularly significant when considering “other reactions” (*Haha, Wow, Sad, Angry*), i.e., there may be a stronger correlation between image posts and these more polarized reactions than in the cases of *Like* or *Love*, a conjecture that can only be confirmed through a more thorough analysis which could not be done in the data sprint context.

No relevant fluctuations in the sentiments (in intensity or from positive to negative and vice-versa) could be detected. The team members that were more closely involved with this approach conjecture that, due to the idiosyncrasies of the Portuguese language and the lack of a toolkit specifically aimed at this language, the automatic translation into English required the complement of human-assisted verification. Though the time constraints did not allow it, that seems to be a rich path for future analysis.

Overall, and while acknowledging again the caveat that these results cannot be fully generalized due to the relative size of the corpora compared to the full original dataset, also the analysis of the “demand-side” favors the “equalization hypothesis”, i.e., newer and smaller parties tend to receive more engagement from the users, which may result from either a more ludic or more confrontational communication strategy (“supply-side”).

Some approaches contemplated at the outset of this research would have required additional time to be properly adapted. Such was not only the case of sentiment analysis but also of image network analysis, which was decisively discarded due to the lack of a more coherent strategy to make sense of the results.

Regardless of these shortcomings, the data sprint enabled the team to gather very useful results in the scope of a wider project, and both research questions could be at least partially answered, providing relevant clues for future work. We believe that despite the time limit and small sets of data points, the application of less common approaches in computational communication sciences to contents such as texts, emoticons, and images may result in a valuable contribution for communication researchers, giving a better and more interdisciplinary understanding of the exchanges between parties and citizens in social media platforms. That is particularly relevant in the Portuguese context, which, to the authors’ knowledge, is still short of academic work on the political presence online. The methodologies here applied to Facebook can be adapted to other platforms, thus providing further data and insights for engagement analysis and metrics.

Doing research in the context of a data sprint also proved to be an enlightening learning experience for the team, which was for the most part unfamiliar with this intensive and time-bound environment. Most of all, the diverse backgrounds (communication and other social sciences, humanities, data science, design) and levels of research practice promoted the multidisciplinary that is expected in this approach.

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Appendix I: List of political parties

The list below shows the 10 political parties and one coalition, from left to right in the political spectrum, and their hyperlinked Facebook pages:

1. PCP (Portuguese Communist Party): <https://www.facebook.com/pcp.pt/>
2. CDU (Unitary Democratic Coalition, between PCP and PEV): <https://www.facebook.com/CDUPCPPEV/>
3. PEV (The Greens Ecologist Party): <https://www.facebook.com/PartidoEcologistaOsVerdes/>
4. BE (Left Block) [changed page in November 2021; this page remains as the page of their official media outlet, Esquerda.Net]: <https://www.facebook.com/esquerda.net/>
5. L (Free): <https://www.facebook.com/LIVREoficialpt/>
6. PS (Socialist Party): <https://www.facebook.com/SedeNacionalPartidoSocialista/>
7. PAN (People-Animals-Nature): <https://www.facebook.com/PANpartido/>
8. PPD/PSD (Social Democratic Party): <https://www.facebook.com/ppdpsd/>
9. IL (Liberal Initiative): <https://www.facebook.com/iniciativoliberal/>
10. CDS-PP (Popular Party): <https://www.facebook.com/CDSPP/>
11. CH (Enough): <https://www.facebook.com/PartidoChegaOficial/>

Appendix II: List of categories

MAIN CATEGORY	SUBCATEGORIES
FUNDAMENTAL RIGHTS	Animal and Environmental rights
	Democracy x Dictatorship
	Digital Rights
	Equality and Inclusion
	Human Rights
INTERNATIONAL POLITICS	Europe
	Rest of the World
MISCELLANEOUS	Miscellaneous
NATIONAL POLITICS	Confrontation with Political Opponents
	Constitution
	Corruption and Political Ethics
	Culture
	Decentralization
	Economy and fiscality
	Education
	Elections
	Election Results
	Health
	Nativity
	Political Ideology and Situationism
	Public Administration
	Public Service Television
	Security and Justice
Yellow Jackets	
SELF-PROMOTION	Candidates
	Events
	Funding
	Internal Organizational Affairs
	Militants
	Online Presence
	Presence in the Media
	The Party in Europe
SOCIOCULTURAL ISSUES	Entrepreneurship
	The Media
	Political Correctness
	Poverty and Social Exclusion
	Precarity and Labor
	Religion

