Pablo Moral
https://orcid.org/0000-0003-3028-4369
pmoral@lsi.uned.es
UNED / Univ. Pablo de Olavide

Restoring reputation through digital diplomacy: the European Union's strategic narratives on Twitter during the COVID-19 pandemic

Abstract

Combining computational methods with qualitative analyses, this research explores how the European Union (EU) employed digital diplomacy to manage its reputation during the COVID-19 pandemic. To this end, it addresses two influential dimensions of digital diplomacy: narratives and social networks. First, to identify how narratives evolved during the different phases of the crisis, dynamic topic modeling is applied to a sample of 12,935 tweets in English published by eight central EU authorities from January 1st, 2020, to March 11th, 2021. The most representative tweets of the six most predominant topics on COVID-19 are analyzed through the strategic narratives' framework. Second, a social network analysis of the retweets of 215 authorities linked to the European External Action Service is conducted to identify the communication flow and the most influential actors. The results corroborate what the crisis communication literature anticipates. As the pandemic evolved, strategic crisis narratives became more consistent, and the diplomatic network less hierarchical and centralized. After an undetermined start, the COVID-19 crisis was ultimately rationalized as a challenge that reaffirmed the EU's functionality and values. During the acute phase of the crisis, diplomats were less spontaneous, since their content was more dependent on their superiors, but in later stages they produced proportionally more original content themselves. Therefore, the findings suggest, first, that the EU's performance on Twitter became more competent over time, and second, a potential correlation between narratives and networks: better defined strategic narratives seem to indicate a more genuine digital diplomacy.

Keywords
European Union, COVID-19, digital diplomacy, strategic narratives, crisis communication, topic modeling, social network analysis.

1. Introduction

The COVID-19 pandemic represented a reputational challenge for the European Union (EU), whose performance has been considered an example of how not to manage a crisis (Sottilotta, 2022). In March 2020, Brussels was criticized for reacting slowly and being incapable of

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coordinating a unified response to assist affected countries, such as Italy and Spain, as EU members unilaterally closed their borders and banned exports of medical equipment (Lichtenstein, 2021). Polls conducted in April and June 2020 showed that most Europeans were dissatisfied with the EU's response (Kantar, 2020a, 2020b), whereas members of the Italian government publicly questioned the EU's crisis management (Hall *et al.*, 2020). Even though this initial reaction was followed by a more cooperative approach in the next months (see European Commission, n.d.), in summer 2020 only 40% of Europeans had a positive image of the EU, and 48% tended not to trust European institutions (Kantar, 2020c).

This research examines how the EU employed digital diplomacy to manage its reputation on Twitter during the first year of the pandemic. Defined as the use of social media for diplomatic purposes (Bjola & Holmes, 2015, p. 111), digital diplomacy provides a direct channel to shape perceptions on international publics, influence medias' agenda and the conversation of digital users (Manor, 2019). Digital diplomacy is not only implemented by central institutions. Particularly during crises, diplomats and embassies help to disseminate the messages of their institution and to achieve its communication objectives (Cassidy, 2018). They are responsible for tailoring communications to the characteristics of foreign audiences, expand ties and help their followers make sense of the world around them (Manor, 2019, p. 291).

Former EU High Representative Federica Mogherini stated in 2014 that the EU was working on making Twitter one of its fundamental diplomatic tools (Mogherini, as quoted in Mann, 2015). Moreover, the EU Global Strategy (EUGS) (EEAS, 2016) stated that the EU would "enhance its strategic communications, investing in and joining up public diplomacy across different fields, in order to connect EU foreign policy with citizens and better communicate it to our partners." In a 2019 report on the implementation of the EUGS, the European External Action Service (EEAS) asserted that "public diplomacy and communication are critical," and the EU could therefore invest more in "positively communicating who we are and what we seek to achieve in the world" (EEAS, 2019).

Despite these intentions, scholars such as Tuñón Navarro *et al* (2019) referred to the EU's communication as a "failed subject" needing reform. There have not been many specific academic analyses on EU's digital diplomacy. Among them, Wright & Guerrina (2020) studied the narratives projected by EU's authorities on Twitter on women's day, whereas Bjola and Jiang (2015) examined the activity of the EU delegation in Beijing on Weibo. Some others applied case studies on member states' authorities on social media (see Collins & Bekenova, 2017; Valera-Ordaz & Sorensen, 2020; Tuñón Navarro & Carral Vilar, 2021; Drylie-Carey *et al.*, 2020). Moreover, in the academic literature there have not been many attempts to analyze EU's communication during COVID-19. The discourse analyses by Lichtenstein (2021) based on frames, Panebianco (2021) focusing on migration, and Manfredi-Sánchez (2022) qualitatively comparing strategic narratives from different countries, stand out.

The present research intends to enrich EU's digital diplomacy literature by integrating this developing field with the crisis communication and strategic narratives' approaches. Combining computational methods with qualitative analyses, this study seeks to examine how European digital public diplomacy was mobilized to "defend Europe against its detractors" in the "global battle of narratives" there was during the pandemic according to High Representative Borrell (EEAS, 2020, March 24th).

2. Strategic *crisis narratives*

Crises can be defined as "serious threats to the basic structures or the fundamental values and norms of a system, which under time pressure and in highly uncertain circumstances necessitates making vital decisions" (Rosenthal *et al.*, 1989, p. 10). To protect an organization from the harms of a crisis, crisis communication uses a variety of communicative interventions as part of the crisis management process (Coombs & Holladay, 2015). Three

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common types of crisis response strategies are *instructing information*, with messages designed to physically protect stakeholders from harm, *adjusting information*, intended to help people cope psychologically with the crisis, and *reputation management*[1], usually the most employed one, as it is designed to protect or to repair reputational damage (*Ibidem*).

Central to crisis communication and digital diplomacy is the projection of narratives. Health (2004, p. 175) holds that crisis communication "entails the telling of a story –the enactment of a crisis narrative," whereas according to Manor (2019, p. 116) in digital diplomacy influence can be obtained through narratives and social networks. Narratives are a causally connected sequence of events that are selected and evaluated as meaningful for a particular audience (Riessman, 2008), or as Hedling (2019) puts it, "stories that make sense of the social and natural world by identifying the significance of people, places, objects and events in time." Through narratives people connect events that are seemingly unconnected and create expectations about the actors involved and their behavior (Miskimmon *et al.*, 2013).

Narratives can be exploited for political aims. In the international arena, by means of characters (agents), a setting, environment, or space (agencies), tools and behavior (agencies), and a resolution or goal (purposes), international actors create strategic narratives to "construct a shared meaning of the past, present, and future of international politics to shape the behavior of domestic and international actors" (Miskimmon *et al.*, 2013, 2017). These narratives may seek to shape others' interests, identity and understanding of international relations in the long term (Miskimmon *et al.*, 2013, p. 3), whereas in short periods they are designed to structure responses to emergent events (Freedman, 2006, p. 22).

According to Miskimmon *et al.* (2017) there are three inextricably linked types of strategic narratives. "System narratives" describe how the world is structured, who the players are and how the system works. "Identity narratives" expose what the story of a political actor is and what values and goals it has. And finally, "issue narratives" set political actions in a context, with an explanation of who the important actors are, what the conflict or issue is and how a particular course of action will resolve the underlying issue (Miskimmon *et al.*, 2017, pp. 7–8).

Through strategic narratives, the EU has tried to forge a European identity and project a collective voice, bringing European states together in a cooperative project (Miskimmon, 2017). Cristian Niţoiu (2013) identified five main narratives projected by the EU: the EU as a security provider, as a democratizer and spreader of 'good' norms, as a good neighbor, as a contributor to global peace and as a contributor to the well-being of peoples around the world. Miskimmon (2017) agrees that the EU presents itself as a "force for good" whose success as a collective project makes it attractive to others. In this line, Manners (2002) characterize the EU as a *normative power* with strong soft power through the promotion of its norms and values. Aggestam (2008), furthermore, described an *Ethical power Europe* that proactively works "to change the world in the direction of its vision of the 'global common good'."

This study has two specific goals. First, it seeks to explore the evolution of EU's issue narratives related to the COVID-19 pandemic, which are presupposed to be largely aimed at reputation management. Second, considering the networked nature of digital diplomacy, this research aims at identifying the patterns of dissemination of EU's messages to digital audiences across its diplomatic network on Twitter.

3. Research design and methods

Based on these goals, the first of the two research questions addressed is:

RQ1. How did EU's strategic narratives on COVID-19 evolve during the first year of the pandemic?

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[1] Reputation is understood as a "set of beliefs about an organization's capacities, intentions, history, and mission that are embedded in a network of multiple audiences" (Carpenter & Krauss, 2011).

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Sellnow *et al.* (2019) suggest that crisis narratives unfold in a sequence that parallels the three crisis stages. Characterized by uncertainty and limited information, in the *pre-crisis phase* narratives are usually more contested and inconsistent. However, if the communication efforts succeed, during the *acute crisis phase* these competing narratives progressively converge, so that by the *post-crisis phase* there is a consistent, dominant narrative about the crisis (*Ibidem*). Based on this assumption, the first research hypothesis (H1) holds that *as the COVID-19 crisis evolved, EU's narratives became more coherent*. The second hypothesis (H2) considers the outstanding weight of EU's identity narratives found in literature and borrows Wright and Guerrina's (2020) claim that in the context of crisis we should "expect to see a more strategic articulation of core values in making the case for the EU and its role in global politics." Therefore, H2 holds that particularly during the acute phase of the crisis, when more focus on reputation management is expected, *issue narratives on the pandemic appeared interlinked with identity narratives.*

To verify the first two hypotheses, it is expected to corroborate that European authorities coordinately diffused narratives on Twitter by distinguishing interrelated narrative elements (agents, agencies and purposes) in their tweets. These narratives must experience changes along the different phases of the pandemic, and a progressive convergence of narratives should be noticed. Moreover, within the narratives associated with the pandemic it should be possible to distinguish elements from identity narratives, oriented to the promotion of European values and identity.

To answer RQ1, a sample of 12,935 tweets was obtained through the Twitter API[2]. These were tweets published in English[3] by eight EU authorities from January 1st, 2020, to March 11th, 2021, the latter being one year after the pandemic was declared by the World Health Organization (WHO, 2020). The selection of these authorities was based on their institutional centrality and their presumably main role in the projection of strategic narratives. These are the accounts of:
 – The European Commission (@EU_Commission)
 – The president of the European Commission, Ursula von der Leyen (@vonderleyen)
 – The European Council and the Council of the EU (@EUCouncil)
 – The institutional account of the president of the European Council, Charles Michel (@eucopresident)
 – The European Parliament (@Europarl_EN)
 – The president of the European Parliament, David Sassoli (@EP_President)
 – The European External Action Service (EEAS) (@eu_eeas)
 – The High Representative of the EU for Foreign Affairs and Security Policy, Josep Borrell (@JosepBorrellF)

To identify the most salient narratives over time, a two-step design is conducted. First, dynamic topic modeling (DTM) (Blei & Lafferty, 2006) is implemented to trace the monthly evolution of the most relevant topics of the corpus. Next subsection details the parameters of the model applied. From the topics identified, only the ones directly linked to the pandemic are selected for further qualitative analysis. The representative words for each topic cannot be taken as strategic narratives, but as an initial point for disclosing latent characters, roles and sequences (Isoaho *et al.*, 2021). Therefore, some of the most representative tweets of each topic are examined through thematic narrative analysis, that examines the content that a narrative communicates (Riessman, 2008).

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[2] The data was retrieved retrospectively in two batches, downloaded on February 25th and April 19th, 2021.
[3] English was considered the most representative language, as 87% of the tweets published by these authorities were in this language.

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The different phases of the crisis are determined by the number of deaths related to COVID-19 in the EU, according to the Johns Hopkins University's (JHU) data[4]. For analytic purposes, to parallel the monthly frequency of the DTM, the phases are roughly condensed in the following periods:

– Pre-crisis: January and February 2020
– Acute crisis (first COVID-19 wave in Europe): from March to May 2020
– Post-crisis: from June to September 2020
– Second acute crisis (second wave): from late October 2020 to January 2021

This division is expected to illustrate not only the evolution in terms of a traditional three-phase crisis, but also the contrast between two consecutive crises (the first and the second wave). Since the second wave was not as unexpected and uncertain as the first wave, different patterns in terms of narratives and dissemination are expected to be found.

The second research question inquires:

RQ2.How did the EU use its diplomatic network on Twitter to expand the reach of their narratives during the first year of the pandemic?

Crisis communication literature anticipates that during crises institutions may follow a bureaucratic management logic, with a focus on top-down control and hierarchical decision chains (Gilpin & Murphy, 2008). Hypothesis 3 (H3) aims to corroborate if this assumption applies to the digital realm, holding that *during the first acute phase of the crisis, the transmission of content was more hierarchical and centralized, reflecting a more rigid top-down approach than in other phases of the pandemic.*

To validate H3, a social network analysis (SNA) of the retweets of 215 European authorities linked to the EEAS is implemented. Through retweets it is possible to have a partial but meaningful indication of the flow of content, as a retweet reproduces the message (tweet) of a user to extend it towards new audiences. To match the narrative analysis, only retweets of tweets in English from January the 1st, 2020, to March 11th, 2021, were considered. The European authorities were selected based on the social media channels published by the EU[5] and on the websites of the EU delegations abroad[6]. These authorities include commissioners and agencies linked to foreign affairs, EU delegations and ambassadors (only if their accounts were verified by Twitter) and missions in international organizations[7].

SNA consists of a series of mathematical and computational techniques that, using network and graph theories, can be used to understand the structure and the dynamics of networks (Pozzi *et al.*, 2017). SNA enables to identify both the communication flow and the key actors in the dissemination of information (Park *et al.*, 2019).

To verify H3, first, a higher proportion of retweets during the first acute phase of the crisis should be noticed. Second, within the EU retweet network, the eight central accounts should have a higher share of retweets. This would be a first indication of higher hierarchy and centralization in the dissemination of content that must be further confirmed through higher centrality and density measures in the SNA, which is conducted through the software *Gephi* (Bastian *et al.*, 2009). Section 4 exposes the results of both, DTM and SNA, and in section 5 they are analytically discussed.

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[4] Johns Hopkins University. *COVID-19 Data Explorer. Daily new confirm COVID-19 deaths.*
https://ourworldindata.org/explorers/coronavirus-data-explorer?zoomToSelection=true&time=2020-03-01..20210311&facet=none&pickerSort=asc&pickerMetric=location&Metric=Confirmed+deaths&Interval=New+per+day&Relative+to+Population=false&Color+by+test+positivity=false&country=~European+Union.
[5] Available at https://european-union.europa.eu/contact-eu/social-media-channels_en#/search.
[6] A list with the EU's diplomatic representations is available at https://www.eeas.europa.eu/eeas/eu-world-0_en.
[7] A list of these accounts is available at Appendix 2: https://cutt.ly/XN4WsCJ.

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3.1. *On the parameters of dynamic topic modeling*

Topic modeling encompasses various computational algorithms employed to discover patterns in text data and analyze much larger collections than is possible by hand while attaining accountability, falsifiability and replicability (Di Maggio *et al.*, 2013; Isoaho *et al.*, 2021). This study uses Bertopic (Grootendrost, 2022), which as other models infers topics from the corpus, returning the probability of a document to belong to a topic and the probability of a word to represent a topic. This model seems to perform better than conventional methods such as LDA by using BERT embeddings[8] and different algorithms to sequentially cluster the topics (Grootendorst, 2022).

Unlike classic models, Bertopic does not require input on how many topics it should identify. Nevertheless, in large datasets it usually leads to an excessive number of topics. For example, in this research, without setting a fixed number of topics the model returned 260 topics, hindering the interpretation of the results. There is no ideal formula to anticipate an optimal number of topics: it rather depends on how interpretable the outputs are for human judgement (Di Maggio *et al.*, 2013). It is expectable that numerous topics provide more granular themes, whereas fewer topics would return more general outcomes (Murakami *et al.*, 2017, p. 245). Since this research seeks to explore the most salient themes treated by the users selected, an iterative trial-and-error evaluation of different outcomes from a range of 10 to 30 topics was implemented. Finally, 18 topics were considered the most optimal option for analytical purposes. More topics would generate semantically redundant clusters without adding much more relevant information, whereas a lower number would produce more mixed clusters and less informative results. Nevertheless, it is acknowledged that these 18 topics do not reveal all the matters discussed by European authorities, but rather give a representative overview of the corpus, as this study intends.

Bertopic was executed through its library in Python 3. The model was set to display the 20 most representative words of each topic, considering bigrams. Alphanumeric characters and stopwords[9] were removed, the text was lowercased, and different spellings of European Union and COVID-19 were unified[10]. To ensure reproducibility, the random state in UMAP was set to 42. Other parameters were set to their default mode[11]. DTM also was implemented through Bertopic[12], showing the frequency and the five most representative words for each topic every month[13]. Moreover, DTM enables "external validation" of the model's outcome, demonstrating that attention to topics responds in predictable ways to events that should affect their prevalence (Grimmer & Stewart, 2011; Di Maggio *et al.*, 2013).

4. Results

4.1. *From topics to narratives*

Table 1 shows the six topics that were directly related to the pandemic in the output given by Bertopic. The rest of the topics are shown in Appendix 1[14]. Each cluster of words represents a

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[8] Through word embeddings, words are represented as real-valued vectors that encode semantic information in a dimensional space. In Bertopic, these embeddings are built on Bidirectional Encoder Representations from Transformers (BERT), a state-of-the-art machine-learning model that can encode more complex contextual information, potentially boosting the quality of topic analysis.
[9] The stopwords considered were the default ones from the library Spacy (https://spacy.io/) plus the characters "rt", "amp", "re", "s", "d", "ve", "m", "ll", "nt", and "s".
[10] "European Union" was converted to "EU", whereas #EuropeanUnion was converted to #EU; "covid19", "covid 19", "COVID-19", covid 2019, and "coronavirus" were merged into covid19.
[11] Lemmatization was dismissed since it proved to be detrimental for the interpretably of the results.
[12] Global tuning was set to false, and the tweets were divided in monthly batches. The rest of the parameters were as default.
[13] This reduced number of words and timeslots were chosen to avoid dispersion and favor the manageability of the analysis.
[14] Available at https://cutt.ly/XN4WsCJ.

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topic, and the words (or bigrams) are displayed according to their probability of belonging to that topic, being the first word the most representative one. The right column presents an approximate description of each topic.

Table 1: Most prominent topics on COVID-19 discussed by the main European authorities on Twitter.

Topic	Most representative words	Description
0	digital, recovery, green, europe, nextgenerationeu, eu, economy, green digital, european, sustainable, resilience, digitaleu, climate, initiative, recovery resilience, recovery plan, citizens, resilience facility, citizens initiative, resilient	Recovery, digitalization, and environment
2	vaccines, vaccine, covid19, cancer, research, eu, covid19 vaccines, safevaccines, safe, vaccineswork, vaccination, safe effective, ema news, covid19 vaccine, eucancerplan, testing, tests, virus, countries, eu countries	Provision of health resources & vaccines
4	covid19, china, eu, global, covax, multilateralism, pandemic, cooperation, support, vaccines, eu china, unitedagainstcovid19, hong kong, hong, countries, globalresponse, covid19 pandemic, solidarity, crisis, partners	International cooperation
6	food, eu, budget, support, covid19, countries, meps, businesses, workers, term budget, long term, eu countries, crisis, parliament, jobs, eu long, farmers, eu budget, pandemic, debt	Economic measures
12	global, pledging, humanitarian, unitedagainstcovid19, globalresponse, covid19, globalgoalunite, vaccines, summit, air bridge, event, pandemic, pledging event, funding, covid19 globalresponse, eu humanitarian, humanitarian air, tests treatments, aid, vaccine tests	Humanitarian response
17	disinformation, factsmatter, apps, covid19, data, false, platforms, information, euvsdisinfo, misleading, media, facts, online platforms, data protection, pandemic, privacy, social media, fake news, fight disinformation, false misleading	Disinformation

Source: Own elaboration with data from Twitter.

Figure 1 shows the DTM outcome, displaying the number of tweets assigned to each topic every month. As it is further explained below, the frequency of the topics varies in predictable ways, demonstrating the validity of the model. For example, topic 2, related to vaccines, has higher prevalence in December, once the vaccine rollout started in the EU.

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Figure 1: Monthly frequency of topics and number of COVID-19 deaths in the EU[15]..
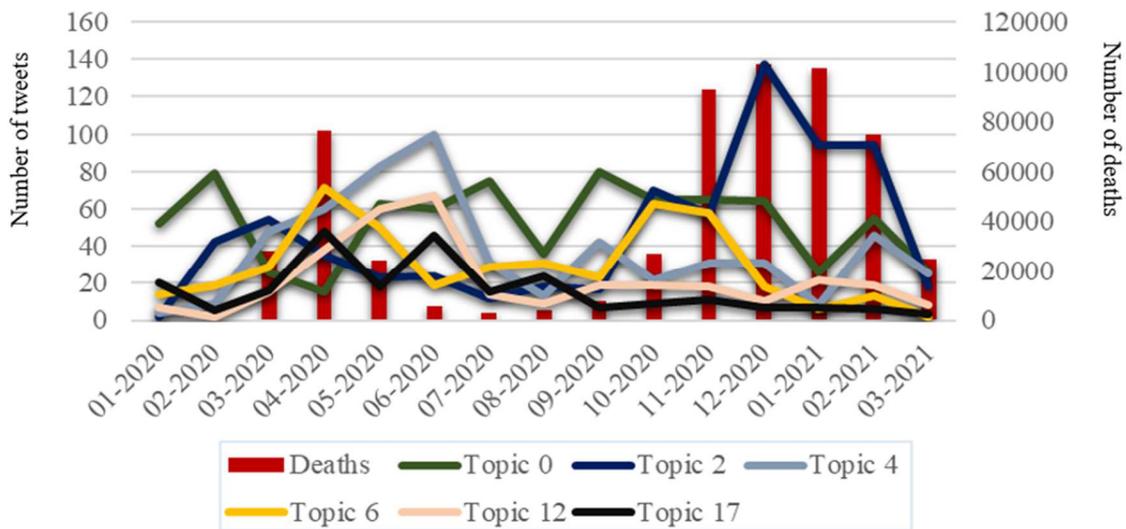
Source: Own elaboration with data from Twitter and JHU.

In the pre-crisis phase, during January and February 2020, the main European authorities did not pay much attention to the COVID-19 outbreak. Topic 0 was still focusing exclusively on digitalization and environmental protection, whereas topic 2 had not incorporated COVID-19 related tweets yet, as it mainly addressed cancer research. The few tweets that referred to the novel coronavirus before March (only 35 of 1,733 tweets) mostly served as amplifiers of videos of press conferences and institutional announcements (see EU Council, 2020, February 13th), a practice that had already been criticized as inefficient by Tuñón Navarro *et al.* (2019). Back then there was hardly any content on the virus specifically adjusted to Twitter. Some tweets focused on the assistance provided to China and the repatriation of EU citizens thanks to the EEAS (see EEAS, 2020, February 25th). Only by the end of February, when Italy registered its first deaths, COVID-19 became a salient issue. The EU was, according to its main authorities on Twitter, "working on all fronts" to tackle the outbreak, ready "to play a leading role" and doing "all we can" to help Italy, to which they stood in "full solidarity" (von der Leyen, 2020, February 24th; European Commission, 2020, February 27th, 28th).

Starting in early March, the first wave of the pandemic, or the first acute crisis, began with tweets insisting on the utilitarian role of the EU, which was already facing criticism for its lack of involvement to assist Italy. The authorities endeavored to explain the measures that Brussels was coordinating and implementing, as the EU was using all the tools "in their disposal" (von der Leyen, 2020, March 11th, see EU Council, 2020, March 19th).

Tweets on COVID-19 became therefore more numerous and thematically diverse. *Adjusting* tweets expressed support to health workers and sympathies with the ones affected by the virus (see Michel, 2020, March 10th, 16th); whereas *instructive* tweets recommended measures to contain the spread of both the virus and disinformation, as Topic 17 reflects (see Borrell, 2020, April 5th). The first of the two main hashtags on COVID-19, #StrongerTogether, was launched on March 18th, when Italy and Spain had already imposed severe lockdowns. The second, #UnitedAgainstCoronavirus was used for the first time by these accounts on April 24th. Indeed, as the first wave advanced these central authorities projected a more confident and coordinated approach.

Several tweets in topic 4 exhibit a timely performance of the EU, which by April had implemented 127 measures to support companies and livelihoods, according to the European

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[15] An interactive version of this figure is provided as supplementary material.

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Commission (2020, April 25th, 30th). Despite having a "shaky start" as admitted by Borrell (2020, April 19th), the EU had learnt the lesson, dismissed discord and embraced multilateral cooperation, as no Member State would be able "to handle the crisis on their own" (EU Commission, 2020, March 31st). In this way, the EU was placed "at the heart of the crisis response" (von der Leyen, 2020, April 24th), playing a global leading role (see Borrell, 2020, June 8th), presenting itself as a caring international partner, particularly towards its Western neighbors (see Borrell, 2020, May 6th).

The measures implemented were often seized to promote European values. For example, instruments such as SURE, to mitigate unemployment (see von der Leyen, 2020, April 1st), or the Next Generation EU (see von der Leyen, 2020, May 27th) were presented as indicative of solidarity, prosperity, or peace. Historical commemorations such as the Europe Day on May 9th also showed that European history could serve as an inspiration for the recovery of the pandemic (see von der Leyen, 2020, May 9th). Likewise, respect for human rights should "remain at the heart of fighting the pandemic and supporting the global recovery" (Borrell, 2020, May 5th).

By the end of the first acute crisis the EU was portrayed as a key contributor to the global economic recovery. Tweets allocated to topic 0 linked the recovery with the digital and green transition the EU had been promoting. References to European history were retrieved to advertise "unprecedented investment efforts," also referred to as "a new Marshall Plan" (Michel, 2020, April 23rd), to face a "defining moment" in a way that would meet the expectations of what previous generations did (von der Leyen, 2020, May 27th). Once more, the solidarity of the EU and its role as a decisive coordinator are highlighted, as seen in the success of the international pledging event launched in May (see Borrell, 2020, May 4th). This event and the summit and concert "Global Goal: Unite for our Future" were highly promoted during May and June, making topic 4 peak in that month (see European Commission, 2020, June 24th).

Once Europe progressively recovered from the first wave, the most representative tweets of topics 4 and 12 show that in the early post-crisis phase, EU's focus started shifting to the international aid, as the initiative #TeamEurope started its medical shipments to Eastern Europe and Africa (see EEAS, 2020, June 7th; European Commission, 2020, June 23rd). By September, these authorities displayed a triumphal tone. According to von der Leyen, the EU had overcome the adversities of the pandemic to emerge as a transformative actor that led the way into a brighter future (see European Commission, 2020, September 16th). Moreover, the EU was then considered an "example of multilateralism" during the pandemic, according to Borrell (2020, September 1st). The crisis had thus served as a "catalyst" to improve cooperation among EU members and appreciate the importance of European values, which had been jeopardized (Ibidem; European Commission, September 21st).

Despite the advent of the second COVID-19 wave in Europe from late October onwards, this optimistic approach was largely kept. In this acute crisis topic 2 largely predominates over the rest, as it incorporates vaccine research and distribution. Topic 0 and 6, dealing mostly with economic initiatives such as the #NextGenerationEU fund or SURE, also stand out (see European Commission, 2020, November 16th, December 20th). The prominence of these topics also indicates that the spotlight was on the role of the EU tackling the effects of the pandemic, rather than on the record high death toll. As the cases started rising again, European authorities began encouraging the public to get tested, providing support to governments to increase their testing capacities (see von der Leyen, 2020, November 18th). At the same time, the EU advertised its role coordinating the agreements with vaccine manufacturers, which were seen as "the light at the end of the tunnel" (von der Leyen, 2020, November 25th).

Finally, topic 2 exposes how vaccinations in the EU were interpreted as a "European success story" and a "touching moment of unity," as they had been undertaken in equal conditions for member states, without resorting to competition (see European Commission,

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2020, December 27th; von der Leyen, 2020, December 25th). After the tragedy brought by the virus, the EU provided hope (Ibidem), for Europeans but also for non-Europeans. Since January 2021, topic 4 addresses the vaccine distribution to the Global South through COVAX[16], as Europe would be safe "only when the world is safe" (von der Leyen, 2021, February 19th; see EEAS, 2021, March 2nd).

4.2. *From retweets to networks*

Table 2 summarizes the results of the SNA. The weighted in-degree centrality shows the percentage of all the retweets received by other users of the network (i.e., by the rest of European authorities selected). Density indicates a percentage derived from dividing the number of edges in the graph by the number of possible edges. The average weighted degree indicates the average number of retweets made to and received by other users in the network. Finally, the last column presents how many of the total number of tweets of European authorities were retweets from other European authorities.

Table 2: Centrality and density measures in each crisis stage.

	Accounts with the highest weighted in-degree centrality	Weighted in-degree centrality of the 8 central institutions combined	Density	Average weighted degree	% Retweets to EU authorities / total number of tweets
Pre-crisis[17] (January & February 2020)	@josepborrellf (16.4%) @eu_commission (12.4%) @eu_eeas (11.4%)	56.4%	2.9%	22.5	30.0%
First wave (March to May 2020)	@eu_commission (19.4%) @josepborrell (16.2%) @vonderleyen (10.6%)	64.6%	3.9%	52.5	35.7%
Post-crisis (July to September 2020)	@josepborrellf (17.1%) @eu_commission (17.4%) @vonderleyen (10.1%)	56.8%	3.8%	40.4	31.7%
Second wave (November 2020 to January 2021)	@josepborrellf (18.5%) @vonderleyen (12.5%) @eu_eeas(10.1%)	57.6%	3.0%	38.4	31.5%

Source: Own elaboration with data from Twitter.

During the whole period studied, four of the eight central authorities were by far the most retweeted accounts by other European authorities: @josepborrellf (17% of all the retweets), @eu_commission (14%), @eu_eeas (10%), and @vonderleyen (10%). This indicates that they played a central role as sources of content. However, the account of the European Parliament and its president were not so prominent in the network, as they only were the 43rd and the 17th most retweeted account, respectively. All in all, the most predominant topics discussed by the rest of the European authorities were overall concordant with those from central authorities (see appendix 1 and 3)[18], which further suggests the influence of the latter.

Table 2 shows that the first wave of the pandemic had an influence on the patterns of diffusion of content. A higher proportion of the tweets published by the European authorities in this phase consisted in retweeting other European authorities, which means that there was

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[16] COVID-19 Vaccines Global Access is a multilateral initiative that promotes equitable access to vaccines.
[17] This stage is one month shorter than the other ones. The average weighted degree is therefore expected to be smaller.
[18] Available at https://cutt.ly/XN4WsCJ.

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a smaller proportion of genuine, spontaneous content created by these individual accounts. Of all these retweets, the eight main European authorities represented almost two thirds, eight points more than during the pre-crisis and post-crisis. Unlike the other stages, when High Representative Borrell and the EEAS had higher centrality, during the first wave the European Commission was the most central account. Together with president von der Leyen represented 30% of the retweets made by European authorities.

Figure 2 shows a representation of the network during the first wave. The retweeted user is the target and the user that retweets, the source of a directed edge. The size of the nodes is proportional to its weighted in-degree centrality, and the colors depend on the institutional range of the users[19]. Higher proximity between nodes indicates higher connection. The algorithm used for the visual layout of the network is Force Atlas 2 with its default parameters in Gephi.

Figure 2: Network of retweets during the first wave.

Source: Own elaboration with data from Twitter.

Although the network does not stand out for being very dense, the density also increases in the first acute crisis, descending again during the second wave. Accordingly, the number of retweets made and received within the network follows a similar pattern: it grows from March to May 2020 and drastically falls over time afterwards. Indeed, the second acute crisis does not experience the same network patterns as the first one, as it is perceivable in Figure 3, where the nodes appear more disperse and the main institutions (for example, the European Commission and Council and their president) are less prominent.

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[19] Yellow: central authorities; green: other governmental institutions; dark blue: European Commission's officials linked to foreign affairs; violet: delegations and missions in international organizations; light blue: ambassadors.

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Figure 3: Network of retweets during the second wave.

Source: Own elaboration with data from Twitter.

5. Discussion: managing reputation through narratives and networks

The results are consistent with what literature on crisis communication anticipates. During the pre-crisis stage, the information given by the European central accounts was scarce and intermittent. In this period there were no stable narratives on the coronavirus nor content specifically designed for Twitter. No coordinated hashtags were deployed, and tweets largely consisted of replicating declarations and informing about institutional activity.

As the COVID-19 cases began to rise in Italy, narratives to diminish the reputational damage started to arise. The EU communicated its readiness to face the pandemic, anticipating what would become an overarching narrative for the rest of the pandemic: *the EU is useful,* contrary to the criticism received. In the first weeks of March, while the internal discord among Europeans aggravated, the EU was still doing all it could with the tools it had. As the acute phase advanced, European authorities kept portraying the EU as capable of matching concrete measures with ideational aspirations. For example, the EU appeared as a key coordinator whose initiatives and regulations ultimately prevailed over the unilateral measures adopted by member states. The EU's involvement enabled European countries to confront challenges together and equally, eventually having tangible advantages for their citizens, such as the receipt of health material and economic funds, or in a later stage, the equitable distribution of vaccines.

All these feats were achieved while *the EU remained loyal to its values,* a persistent narrative that incorporated references to EU's history and the promotion of multilateralism, human rights, solidarity, rule of law and freedom of expression. As H3 pre-assumed and the SNA revealed, in this acute crisis the transmission of messages was more rigid and hierarchical. The non-central authorities crafted proportionally less original content and functioned to a greater extent as transmitters of the messages published by their top superiors, making the European Commission and its president the most retweeted accounts. As less personalized content can be detrimental to achieve virality, engagement and the

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creation of bonds with the audiences (Bjola, 2019), this more rigid approach could have limited the potential of EU's digital diplomacy.

After the first wave the authorities could further focus on diffusing narratives for non-European publics. In accordance with what Niţoiu (2013), Manners (2002), Aggestam (2008) and Miskimmon (2017) hold, the EU was shown as a caring partner that provides welfare to its allies while promoting *good* norms. From July to September the retweets among European authorities decreased as well as the prominence of the central accounts in the network. The flow of content became thus more decentralized.

Starting in late October, during the second wave narratives converged towards a closure to restore the EU's reputation. The end of the pandemic was perceived to be close, so a complete narration with beginning, middle and end was more cogently exposed. According to the central authorities, the EU had learnt from its mistakes in the beginning of the pandemic. The challenging start had shown that the European principles, such as multilateral cooperation and solidarity, must prevail, as the discord among members emerged when they did not. Once the adversities were faced by a practical but principled approach, *the EU came back stronger than before*, ultimately becoming a key facilitator of the recovery. Therefore, as many Europeans might have seen the EU as part of the problem in the beginning of the pandemic, the EU progressively unfolded a narrative in which it eventually appeared as an indispensable part of the solution.

During the second wave the patterns of dissemination differed from those of the first wave. As crisis narratives became more consistent and hopeful, European diplomats were less dependent on their superiors to transmit the messages to their audiences. More autonomy and decentralization are perceived in the SNA, as well as less relevance of the European Commission as a direct source of information. That is, in a context of less uncertainty and more settled narratives European authorities appeared to show more willingness to publish genuine content. It is out of the scope of this research to investigate to what extent EU's reinvigorated digital diplomacy contributed to recovering the legitimacy lost, but admittedly the image of the EU improved over the following months. In December, a survey showed that 50% of Europeans had a positive image of the EU, the highest level since 2007, and almost three quarters agreed that the EU's recovery plan would allow their country to recover more rapidly (Kantar, 2020d).

6. Conclusion

This study explored the structural and thematic coherence of the most prominent COVID-19-related topics and their representative tweets. It showed that the EU's central authorities used strategic narratives to inform about the moral integrity and practical utility of the EU in a coordinated manner. As H1 pre-assumed, narratives gained coherence over time. A timid and undecided approach was perceivable in the pre-crisis and the beginning of the first acute crisis. However, by the end of the year the narratives had largely converged, making the content transmitted more compelling. In this process, as H2 expected, elements of identity and issue narratives appear interlinked. However, the promotion of the EU's values and history was noticeable not only during the acute crisis, but also during the post-crisis and the second wave. It therefore remains inconclusive if the focus on European identity was due to the advent of a crisis. Future studies could further explore this correlation, as they could also investigate the extent to which European governments assumed EU's narratives, by for example inspecting if the narrative convergence exposed by this study was replicated by member states' authorities.

The SNA showed that the flow of content on Twitter during the first acute crisis resembled the more rigid crisis management patterns expected by an organization. In this phase there was proportionally less adaptation of the content to specific audiences and less spontaneity, as the central authorities influenced the information transmitted through the

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network to a larger extent. However, during the second wave the network did not experience the same behavior. Therefore, both in the narrative and the network analyses, the second wave gathered more characteristics of a post-crisis phase than those of an acute crisis, which might be explained by its higher predictability and by the focus on the resolution of the crisis rather than on its dreadful consequences.

Literature on digital diplomacy holds that influence on social media can be obtained through narratives and social networks. This research suggests that these two dimensions might be interlinked. On the one hand, more consistent crisis narratives appeared to mean less centralized and more genuine content from non-central actors such as embassies and ambassadors. On the other hand, less consistent narratives seemed to suggest a higher tendency to replicate the content of other counterparts, which may hinder authenticity and spontaneity. Further research could specifically address this apparent correlation by verifying if narratives provide the network with more discursive resources to produce more personalized content.

The impact of these narratives in public opinion or the correlation between narratives were not addressed by this research and could be objects of ensuing analyses. Moreover, studies that focus on other languages and specific audiences or issues could complement this research, which did not seek granular outcomes. Likewise, it could be enriching to consider audiovisual content to scrutinize EU's digital narratives. Nonetheless, this research remains valuable for contributing both to the studies on the EU's digital diplomacy and the emerging discipline of Computational Social Sciences. Despite tackling a large dataset, the multidisciplinary approach adopted demonstrated a solid capacity of providing manageable, representative and reproducible outcomes. Narrativity patterns were identify through a comprehensive analysis of tweets that shed light on how Brussels tried to shape the perceptions of digital audiences during the COVID-19 pandemic.

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Von der Leyen, U. [@vonderleyen] (2020, April 1st). *This is European solidarity in action!* @EU_Commission *proposes the new short-time work scheme SURE...* [Tweet]. Twitter. Retrieved from https://twitter.com/vonderleyen/status/1245297406054465541

Von der Leyen, U. [@vonderleyen] (2020, April 24th). *The EU is at the heart of coronavirus global response...* [Tweet]. Twitter. Retrieved from https://twitter.com/vonderleyen/status/1253684957249187840

Von der Leyen, U. [@vonderleyen] (2020, May 9th). *If we remain united in solidarity and behind our values, then Europe...* [Tweet]. Twitter. Retrieved from https://twitter.com/vonderleyen/status/1259058410558980096

Von der Leyen, U. [@vonderleyen] (2020, May 27th). *Generations before us have built a Union of peace and prosperity...* [Tweet]. Twitter. Retrieved from https://twitter.com/vonderleyen/status/1265615607283752964

Von der Leyen, U. [@vonderleyen] (2020, November 18th). *There is light at the end of the tunnel...* [Tweet]. Twitter. Retrieved from https://twitter.com/vonderleyen/status/1331525863301640192

Von der Leyen, U. [@vonderleyen] (2020, November 25th). *To slow down the spread of coronavirus, we need to scale up testing...* [Tweet]. Twitter. Retrieved from https://twitter.com/vonderleyen/status/1329031292533542912

Von der Leyen, U. [@vonderleyen] (2020, December 25th) #COVID19 *has changed our lives and brought tragedy. But now there's hope...* [Tweet]. Twitter. Retrieved from https://twitter.com/vonderleyen/status/1342486487250694146

Von der Leyen, U. [@vonderleyen] (2021, February 19th). *We will only be safe if the whole world is safe. As announced in the #G7, the EU is doubling...* [Tweet]. Twitter. Retrieved from https://twitter.com/vonderleyen/status/1362763971149897729

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Appendix 1: Most prominent topics discussed by the main European authorities on Twitter (including all topics returned by Bertopic)

Topic	Most representative words	Description
0	digital, recovery, green, europe, nextgenerationeu, eu, economy, green digital, european, sustainable, resilience, digitaleu, climate, initiative, recovery resilience, recovery plan, citizens, resilience facility, citizens initiative, resilient	COVID-19, recovery
1	libya, turkey, eu, un, syria, support, solution, ceasefire, lebanon, jcpoa, efforts, iran, conflict, greece, iraq, region, cyprus, israel, humanitarian, beirut	Middle East Security
2	vaccines, vaccine, covid19, cancer, research, eu, covid19 vaccines, safevaccines, safe, vaccineswork, vaccination, safe effective, ema news, covid19 vaccine, eucancerplan, testing, tests, virus, countries, eu countries	COVID-19, provision of health resources & vaccines
3	President, josepborrelf, navalny, vonderleyen, conference, soteu, president vonderleyen, press conference, eu, sassoli, vice, david sassoli, vice president, representative, president david, foreign, ep president, alexei navalny, alexei, chancellor,	Agenda & declarations
4	covid19, china, eu, global, covax, multilateralism, pandemic, cooperation, support, vaccines, eu china, unitedagainstcovid19, hong kong, hong, countries, globalresponse, covid19 pandemic, solidarity, crisis, partners	COVID-19, international cooperation
5	rights, human, human rights, eu, democracy, social, sanctions, freedom, myanmar, regime, sanctions regime, law, eu4humanrights, people, violations, rights sanctions, global human, socialrights, rule law, worldpressfreedomday	Promotion of human rights
6	food, eu, budget, support, covid19, countries, meps, businesses, workers, term budget, long term, eu countries, crisis, parliament, jobs, eu long, farmers, eu budget, pandemic, debt	COVID-19, economic measures
7	conference, euco, press conference, eucopresident, eeas10, eudiplomacy, eu, video, picture eeas10, world image, eudiplomacy check, years eudiplomacy, image 10, covid19, image, eurogroup, leaders, video conference, meeting, european	Agenda
8	uk, agreement, trade, eu uk, negotiations, eu, brexit, transatlantic, partnership, borisjohnson, relationship, future, eutrade, cooperation, global, forward, withdrawal agreement, trade agreement, remain, ireland	Negotiations with the United Kingdom
9	travel, eu, migration, citizens, eu citizens, stranded, covid19, restrictions, repatriation, asylum, countries, travel restrictions, tourism, abroad, migration asylum, citizens stranded, essential travel, stranded abroad, flights, migrants	Migration

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10	belarus, ukraine, eu, belarusian, democratic, russia, georgia, elections, support, repression, eu ukraine, belarusian people, people belarus, democracy, territorial integrity, territorial, rights, canada, political, authorities	Promotion of democracy and sovereignty
11	aueu, africa, sudan, ethiopia, partnership, eu, asean, somalia, region, peace, support, minister, meeting, african, africanunion, cooperation, japan, sudanese, ministerial, humanitarian	International cooperation
12	global, pledging, humanitarian, unitedagainstcovid19, globalresponse, covid19, globalgoalunite, vaccines, summit, air bridge, event, pandemic, pledging event, funding, covid19 globalresponse, eu humanitarian, humanitarian air, tests treatments, aid, vaccine tests	COVID-19 response
13	defence, security, terrorism, attacks, eu, terrorist, eudefence, security defence, threats, cyber, 5g, attack, terrorist attacks, europe, cybersecurity, fight terrorism, france, extremism, cyberspace, secure	Security
14	Women, gender, gender equality, girls, internationalwomensday, violence, women girls, men, violence women, womesday, equal, eu4women, gender based, women rights, rights, women day, based violence, peace, eeaswomen	Gender equality
15	serbia, albania, kosovo, croatia, western balkans, balkans, eu, earthquake, macedonia, north macedonia, belgrade, belgrade pristina, pristina, croatian, pristina dialogue, andrejplenkovic, eu2020hr, minister, prime minister, reforms	Western Balkans
16	education, children, youth, young people, young, child, unicef, skills, opportunities, genital, genital mutilation, mutilation, europe, female genital, training, eu, traineeship, school, trainees, abuse	Children rights
17	disinformation, factsmatter, apps, covid19, data, false, platforms, information, euvsdisinfo, misleading, media, facts, online platforms, data protection, pandemic, privacy, social media, fake news, fight disinformation, false misleading	COVID-19, disinformation

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Appendix 2: Selected accounts

Username	Name	Representation	Destination
abassolsue	Andreu Bassols EU	Ambassador	El Salvador
akaminara	Androulla Kaminara	Ambassador	Pakistan
amb_klement_eu	Stephan Klement EU	Diplomat in mission	International Organisations
ambuetogo	Joaquín Tasso Vilallonga EU	Ambassador	Togo
ambuetunisie	Marcus Cornaro ماركوس كورنارو	Ambassador	Tunisia
andreafontanaeu	Andrea Matteo Fontana EUAE	Ambassador	UAE
angellosadaeu	Angel Losada	Diplomat in mission	Sahel
apacificieu	Attilio Pacifici	Ambassador	Uganda
bartouvryeu	Bart Ouvry	Ambassador	Mali
bnmarkussen	Birgitte Markussen	Ambassador	African Union
bplinkerteu	Barbara Plinkert	Ambassador	Singapore
carlhartzelleu	Carl Hartzell	Ambassador	Georgia
castiml	Maria Castillo	Ambassador	South Korea
cristiantudoreu	Cristian Tudor	Ambassador	Kuwait
dacconciaeu	Diana Acconcia	Ambassador	Ghana
delguygeo	EUDelegationGuyana	Delegation	Guyana
dubesunieropa	Vincent Piket	Ambassador	Indonesia
duegabongestp	DUE Libreville	Delegation	Gabon
dueniger	Delegation UE Niger	Delegation	Niger
eamongilmore	Eamon Gilmore	Diplomat in mission	European Union
eduardauereu	Eduard Auer	Ambassador	Kyrgyzstan
ep_president	Roberta Metsola	Government Institution	European Union
eu_armenia	EU Armenia	Delegation	Armenia
eu_commission	European Commission EU	Government Official	European Union
eu_echo	EU Civil Protection and Humanitarian Aid EU	Humanitarian	European Union
eu_eeas	European External Action Service - EEAS EU	Government Official	European Union
eu_in_india	EU in India	Delegation	India
eu_in_somalia	EU Del in Somalia	Delegation	Somalia
eu_in_sri_lanka	EU in Sri Lanka	Delegation	Sri Lanka
eu_near	EU NEAREu	Government Institution	European Union
eu_partnerships	EU International Partnerships EU	Government Institution	European Union
eu_sudan	EUROPEAN UNION IN SUDAN	Delegation	Sudan
eu_tashkent	EUDEL UZBEKISTAN	Delegation	Uzbekistan
eu_timorleste	European Union Timor-Leste	Delegation	Timor-Leste
eu_ungeneva	EU at the UN - Geneva #MultilateralismMatters	Mission	United Nations
eu2namibia	EU in Namibia	Delegation	Namibia
euambafg	Ambassador von Brandt	Ambassador	Afghanistan

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euambasean	Igor Driesmans	Ambassador	ASEAN
euambcanada	Dr. Melita Gabrič, Ambassador-designate	Ambassador	Canada
euambecuador	Charles-Michel Geurts	Ambassador	Ecuador
euambindia	Ugo Astuto	Ambassador	India
euambiraq	Martin Huth EU IQ	Ambassador	Iraq
euambks	Ambassador Tomáš Szunyog	Ambassador	Kosovo
euamblebanon	Ralph Tarraf	Ambassador	Lebanon
euambmauritius	Vincent Degert	Ambassador	Mauritius
euambme	Oana Cristina Popa EU	Ambassador	Montenegro
euambmng	European Union Ambassador to Mongolia	Ambassador	Mongolia
euambperu	Diego Mellado	Ambassador	Peru
euambph	Luc Veron	Ambassador	Philippines
euambus	Ambassador Stavros Lambrinidis	Ambassador	United States
euatoecd_unesco	EU Delegation to OECD & UNESCO EU	Mission	United Nations
euatun	EUEU at UN-NY	Mission	United Nations
eubih	EU in Bosnia and Herzegovina	Delegation	Bosnia and Herzegovina
eucopresident	Charles Michel	Government Official	European Union
eucouncil	EU Council	Government Official	European Union
eudelcoe	EU Delegation to CoE	Delegation	Council of Europe
eudeleg_rome	EU DELEGATION_ROME	Mission	United Nations
eudelegationht	Délégation de l'Union européenne en Haïti	Delegation	Haiti
eudelegationtur	AB Türkiye Delegasyonu EU EU Delegation Turkey	Delegation	Turkey
eudelegationua	EU in Ukraine	Delegation	Ukraine
eudelegationuk	EU Delegation UK	Delegation	United Kingdom
eudelegationvn	EU in Vietnam	Delegation	Vietnam
euinafghanistan	EUinAfghanistan	Delegation	Afghanistan
euinalbania	EU in Albania	Delegation	Albania
euinasean	EU in ASEAN	Delegation	ASEAN
euinaus	EU in Australia	Delegation	Australia
euinbarbados	EUinBarbados	Delegation	Barbados
euincanada	EU in Canada	Delegation	Canada
euincv	EU in CV	Delegation	Cabo Verde
euinegypt	EU in Egypt EUEG	Delegation	Egypt
euineswatini	EU in Eswatini	Delegation	Eswatini
euinethiopia	EU in Ethiopia	Delegation	Ethiopia
euingeorgia	EU Delegation Georgia EU	Delegation	Georgia
euiniceland	ESB á Íslandi	Delegation	Iceland
euiniraq	EU in Iraq EUIQ	Delegation	Iraq
euinisrael	EU in Israel EUIL	Delegation	Israel
euinjamaica	EU in Jamaica EU	Delegation	Jamaica
euinjapan	駐日欧州連合代表部EU	Delegation	Japan

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euinjordan	EU in Jordan EU JO	Delegation	Jordan
euinkazakhstan	EU in Kazakhstan	Delegation	Kazakhstan
euinkenya	EUinKenya	Delegation	Kenya
euinkorea	EUinKorea	Delegation	South Korea
euinkuwait	EUinKuwait	Delegation	Kuwait
euinlaos	EU in Laos	Delegation	Lao
euinlebanon	EU in Lebanon	Delegation	Lebanon
euinlesotho	The European Union in Lesotho	Delegation	Lesotho
euinlibya	EU in Libya	Delegation	Libya
euinmalawi	EU in Malawi EU	Delegation	Malawi
euinmalaysia	EUinMalaysia	Delegation	Malaysia
euinmoldova	EU in the Republic of Moldova	Delegation	Moldova
euinmongolia	EU Delegation to Mongolia	Delegation	Mongolia
euinnepal	EU in Nepal	Delegation	Nepal
euinnigeria	EU in Nigeria EUNG	Delegation	Nigeria
euinnz	European Union in New Zealand	Ambassador	New Zealand
euinorge	EUs delegasjon til Norge	Delegation	Norway
euinpng	European Union Delegation PNG	Delegation	Papua New Guinea
euinrussia	Евросоюз	Delegation	Russia
euinrw	EU Delegation Rwanda	Delegation	Rwanda
euinsa	EU in SA	Delegation	South Africa
euinsingapore	EU in Singapore	Delegation	Singapore
euinsouthsudan	EU in South Sudan	Delegation	South Sudan
euinswitzerland	EU-Delegation Berne	Delegation	Switzerland
euinsyria	EU in Syria	Delegation	Syria
euintajikistan	EU in Tajikistan	Delegation	Tajikistan
euintandt	EUinTrinidadandTobago	Delegation	Trinidad and Tobago
euinthegambia	EU in The Gambia	Delegation	Gambia
euinthegcc	EU in the GCC	Delegation	GCC
euintheph	EUinthePhilippinesEUPH	Delegation	Philippines
euintheuae	EU in the UAE	Delegation	UAE
euintheus	EU in the U.S.	Delegation	United States
euintz	EU in Tanzania	Delegation	Tanzania
euinug	EU in Uganda	Delegation	Uganda
euinyemen	EUinYemen	Delegation	Yemen
euinzim	EU in Zimbabwe EU	Delegation	Zimbabwe
eukosovo	European Union Kosovo	Delegation	Kosovo
eumissionwto	EU Mission to WTO	Mission	WTO
eummgeorgia_hom	Marek Szczygieł	Diplomat in mission	Georgia
eumordue	Simon Mordue	Ambassador	Kenya
eumyanmar	EUMyanmar	Delegation	Myanmar
euosce	EU at OSCE EU	Mission	OSCE
eupakistan	EUPakistan	Delegation	Pakistan

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eupalestinians	EU and Palestinians	Delegation	Palestine
eupasifika	EU Pacific EU	Delegation	Oceania
europarl_en	European Parliament	Government Official	European Union
europeinghana	European Union Ghana	Delegation	Ghana
eusimonpa	Patrick Simonnet	Ambassador	GCC
eusr_ca	EUSR CA Peter Burian	Diplomat in mission	European Union
eusr_rondos	Alexander Rondos	Diplomat in mission	European Union
eusrbija	EU u Srbiji	Delegation	Serbia
eutoau	EU Delegation to AU	Delegation	African Union
euunvie	EU Delegation Vienna EU	Mission	International Organisations
extspoxeu	Peter Stano	Government Official	European Union
fabrizisem	European Union Ambassador to Serbia	Ambassador	Serbia
fjponzcanto	Fernando Ponz Cantó	Ambassador	Guyana
frontex	Frontex	Government Institution	European Union
gioalibertieu	Giorgio Aliberti	Ambassador	Vietnam
imingassonue	Irène Mingasson	Ambassador	Senegal
janezlenarcic	Janez Lenarčič	Government Official	European Union
jansadek	Jan Sadek	Ambassador	Botswana
jborgstam	Johan Borgstam	Ambassador	Ethiopia
jmchataigner	Jean-Marc Châtaigner	Ambassador	DRC
joaoam_eu	João Aguiar Machado	Diplomat in mission	WTO
jorourkeeu	John O'Rourke	Ambassador	Algeria
josattler	Johann Sattler	Ambassador	Bosnia and Herzegovina
jose_sabadell	Sabadell Jose	Ambassador	Libya
josepborrellf	Josep Borrell Fontelles	Government Official	European Union
juttaurpilainen	Jutta Urpilainen	Government Official	European Union
larsgwigemark	Lars-Gunnar Wigemark	Diplomat in mission	Kosovo
llombartpatue	Patricia Llombart	Ambassador	Colombia
lsorecaeu	Luigi SorecaEU	Ambassador	Albania
mamereric	Eric Mamer	Government Official	European Union
mariahadjitheeu	Maria Hadjitheodosiou	Ambassador	Jordan
mattimaasikas	Matti Maasikas	Ambassador	Ukraine
mavromichaliseu	Petros Mavromichalis	Ambassador	Switzerland
michaelmanneu	Michael Mann	Diplomat in mission	Artic
michaelpulcheu	Michael Pulch	Ambassador	Australia
michalisrokaseu	Michalis Rokas	Ambassador	Malaysia
miroslavlajcak	Miroslav Lajčák	Diplomat in mission	Balkans

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nabilaeuspox	Nabila Massrali	Government Official	European Union
nberlangaeu	Nicolas Berlanga	Ambassador	Somalia
ninaobermaiereu	Nina Obermaier	Ambassador	New Zealand
olivervarhelyi	Oliver Varhelyi	Government Official	European Union
olofbskoog	Olof Skoog	Diplomat in mission	United Nations
panamaue	Unión Europea en Panamá	Delegation	Panama
pelayocastroue	Pelayo Castro EU	Ambassador	Nicaragua
pirkkatapiola	Pirkka Tapiola	Ambassador	Thailand
rasaostrauskai2	Rasa Ostrauskaite	Diplomat in mission	OSCE
rkionka	Riina Kionka	Ambassador	South Africa
sabatuccieu	Ranieri Sabatucci	Ambassador	Myanmar
sanninoeu	Stefano Sannino	Government Official	European Union
sterstaleu	susanna terstal	Diplomat in mission	Middle East
timoolkkonen	Timo Olkkonen_EU	Ambassador	Zimbabwe
toivoklaar	Toivo Klaar	Diplomat in mission	European Union
tomvenseu	Tom Vens	Ambassador	Sierra Leone
trade_eu	EU Trade EU	Government Institution	European Union
ue_au_maroc	UE au Maroc	Delegation	Morocco
ue_madagascar	Délégation de l'UE à Madagascar & aux Comores	Delegation	Madagascar
ueadjibouti	UE à Djibouti	Delegation	Djibouti
ueaubenin	UE au Bénin	Delegation	Benin
ueauburundi	UE au Burundi	Delegation	Burundi
ueaucameroun	UE au Cameroun	Delegation	Cameroon
ueaumali	UE au Mali	Delegation	Mali
ueausenegal	UE au Sénégal	Delegation	Senegal
ueautchad	L'UE AU TCHAD	Delegation	Chad
ueemangola	UE em Angola	Delegation	Angola
ueenalgerie	Union Européenne en Algérie	Delegation	Algeria
ueenarg	Unión Europea en Argentina	Delegation	Argentina
ueenbolivia	Unión Europea Bolivia	Delegation	Bolivia
ueenchile	UE en Chile EU	Delegation	Chile
ueenci	UE en Côte d'Ivoire	Delegation	Cote d'Ivoire
ueencolombia	Unión Europea en ColombiaEU	Delegation	Colombia
ueencostarica	UE en Costa Rica EU	Delegation	Costa Rica
ueenecuador	UE en Ecuador EU	Delegation	Ecuador
ueenelsalvador	Unión Europea en El Salvador	Delegation	El Salvador
ueenguinee	Délégation de l'Union européenne en Guinée	Delegation	Guinea
ueenhonduras	Unión Europea en Honduras	Delegation	Honduras

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ueenmexico	Unión Europea en México EUMX	Delegation	Mexico
ueennicaragua	UE en Nicaragua	Ambassador	Nicaragua
ueenparaguay	UE en Paraguay	Delegation	Paraguay
ueenperu	UE en Perú	Delegation	Peru
ueenrca	UE en Centrafrique	Delegation	Central African Republic
ueenrdc	UE en RDCEU	Delegation	DRC
ueenuruguay	Unión Europea en Uruguay	Delegation	Uruguay
ueenvenezuela	UEenVenezuela	Delegation	Venezuela
ueguatemala	Unión Europea	Delegation	Guatemala
uemauritanie	UEenMauritanie	Delegation	Mauritania
uembpy	Paolo Berizzi	Ambassador	Paraguay
uenobrasil	UE no Brasil	Delegation	Brazil
uetunisie	UE en Tunisie	Delegation	Tunisia
uni_eropa	EU in Indonesia	Delegation	Indonesia
unioneuropeard	Unión Europea RD	Delegation	Dominican Republic
valedealmeidaeu	ValedeAlmeidaEU	Ambassador	United Kingdom
vibattueuspox	Virginie Battu-Henriksson	Government Official	European Union
vonderleyen	Ursula von der Leyen	Government Official	European Union
wolframvettereu	Wolfram Vetter	Ambassador	Burkina Faso

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Appendix 3: Most prominent topics discussed by the rest of the European authorities on Twitter (all the accounts selected except the eight central ones)

These results were obtained with the same Bertopic parameters as the ones stated in the manuscript except for the number of topics selected. The most interpretable option in this case was considered 20 topics instead of 18.

Topic	Most representative words	Description
0	eu, covid19, support, youth, education, partnership, health, africa, economic, world, future, global, development, sustainable, young, teameurope, meeting, join, countries, assistance	Education & Development
1	eu, europe, today, european, turkey, president, europeday, ambassador, day, vonderleyen, delegation, solidarity, berger, uk, covid19, commission, 2020, president vonderleyen, eucopresident, canada	Agenda
2	kosovo, eu, albania, ukraine, president, law, reforms, support, accession, justice, elections, reform, rule, rule law, serbia, minister, political, process, westernbalkans, council	Eastern partners
3	asean, eu, china, agreement, partnership, eu asean, eutrade, cooperation, covid19, fiji, trade eu, europe, culture, european, region, economic, cultural, wto, asean eu, sigapore	Asia diplomacy
4	covid19, global, world, billion, pandemic, unitedagainstcovid19, pledging, globalresponse, vaccines, support, biodiversity, countries, solidarity, crisis, covid19 pandemic, health, funding, globalunite, humanitarian, wildlife	COVID-19, assistance
5	covid19, eu, support, crisis, recovery, corruption, global, civil society, society, pandemic, need, partners, world, teameurope, jcpoa, solidarity, europe, countries, cooperation, fight covid19	COVID-19, assistance
6	covid19, vaccines, vaccine, covax, safe, covid19 vaccines, eu, doses, strongertogether, countries, masks, pandemic, health, vaccination, safevaccines, equipment, effective, covid19 vaccine, protective, safe effective	COVID-19, vaccines
7	democracy, rights, human rights, belarus, sanctions, myanmar, journalists, freedom, democratic, regime, rights democracy, belarusian, russia, eu4humanrights, freedoms, authorities, worldpressfreedomday, sanctions regime, repression, elections	Promotion of human rights
8	climate, eugreendeal, arctic, energy, eu, climateaction, emissions, climatechange, 2050, planet, climate change, sustainable, climate neutral, 2030, economy, future, europe, biodiversity, nature, copernicuseu	Sustainability, fight against climate change
9	farmers, food, eu, forests, rwanda, support, forest, euinkenya, mongolia, coffee,	Sustainability, development & agriculture

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	agriculture, sustainable, project, agricultural, women, eufarm2fork, production, kenya, agribiz, funded	
10	multilateralism, global, peace, cooperation, un, world, eu, international, challenges, europe, nuclear, covid19, multilateral, multilateralimmatters, global challenges, iran, jcpoa, un75, foreign, transatlantic	Promotion of multilateralism
11	children, humanitarian, refugees, lebanon, beirut, support, covid19, eu humanitarian, bridge, air bridge, humanitarian air, vulnerable, migrants, child, lebanese, assistance, racism, aid, ventilators, refugee	COVID-19, humanitarian response
12	somalia, sudan, eu, ethiopia, uganda, support, kenya, africa, eu somalia, humanitarian, nigeria, covid19, somali, nberlangaeu, africanunion, mogadishu, partnership, ambassador, african, euinug	Africa diplomacy
13	eu, citizens, eu citizens, travel, stranded, repatriation, covid19, eeas, migration, countries, consular, abroad, stranded abroad, european, eu eeas, eu delegations, flights, citizens stranded, tourism, ambassadors	Consular support
14	victims, death, violence, holocaust, death penalty, terrorism, attacks, eu, today, trafficking, punishment, cyber, genocide, torture, antisemitism, rights, history, data, european, cybersecurity	Condemnation of violence
15	human, rights, human rights, disinformation, covid19, eu, factsmatter, pandemic, food, lives, people, health, information, humanrightsday, false, misinformation, misleading, support, humanrights, covid19 pandemic	Promotion of human rights, fight against disinformation
16	libya, eu, armenia, yemen, afghanistan, peace, support, iraq, al, meeting, kuwait, fac, foreign affairs, council, ministers, jordan, developments, ceasefire, discussed, need	Diplomacy in conflicts
17	syria, humanitarian, syrian, syriaconf2020, ceasefire, conflict, civilians, refugees, region, solution, syria region, violence, israel, peace, palestinian, syrian refugees, political, future syria, support, parties	Peace and humanitarian support in conflicts
18	film, films, erasmus, festival, competition, 2020, film festival, award, european, prize, languages, europe, winners, eu, short film, nataliprize, students, movies, euerasmusplus	Erasmus programme & culture
19	women, gender, girls, equality, women girls, internationalwomensday, violence, gender equality, peace, rights, equal, genderequalworld, lgbti, eu, gender based, based violence, international, genderequality, eu4lgbti, gender action	Gender equality