Monographic / Monográfico

#Covid-19: A hashtag for examining reactions towards Europe in times of crisis. An analysis of tweets in Italian, Spanish, and French

#COVID-19: un hashtag para analizar las reacciones en tiempos de crisis. Un estudio de los tweets en italiano, español y francés

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ABSTRACT

Hashtag research has established itself as a relevant research field, with various studies having analysed this polysemic collector in crisis and media events. Hashtags are used in social media, most specifically on Twitter. Further, between 2020 and 2021, hashtag studies linked to the COVID-19 pandemic have emerged. Accordingly, this study aimed to analyse the content of tweets during the first phase of the COVID-19 pandemic (March 4–11, 2020) that included the hashtag #Covid-19 in three different languages: Italian, Spanish, and French. For these analyses, we used emotional text mining. The goal of this study was to reconstruct the representation of the pandemic, of containment measures, and of Europe in tweets. We discussed the prevailing attitude towards Europe in times of crisis.

Keywords: Covid-19, emotional text mining, hashtag studies, public debate, Twitter.

RESUMEN

La investigación de los hashtags se ha consolidado como un campo de investigación relevante con diversos estudios analizando crisis y eventos mediáticos. Los hashtags se utilizan en las redes sociales, más específicamente en Twitter. Entre 2020 y 2021 han surgido estudios de hashtags vinculados a la pandemia de COVID-19. El presente artículo se propone analizar el contenido de los tweets que incluían el hashtag #Covid-19 durante la primera fase de la pandemia de COVID-19 (del 4 al 11 de marzo de 2020) en tres idiomas diferentes: italiano, español y francés. Para estos análisis, se empleó la minería de texto emocional. El objetivo de este estudio fue reconstruir la representación de la pandemia, de las medidas de contención y de Europa en los tweets. De esta manera, se discute la actitud predominante hacia Europa en tiempos de crisis.

Palabras clave: COVID-19, debate público, hashtag, extracción y análisis del contenido emocional, Twitter.

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INTRODUCTION

Italy was the first European state to be hit by SARS-CoV-2, the virus responsible for the COVID-19 pandemic. Soon after Italy, all other member states of the European Union (EU) were confronted with the virus, which thereafter made these countries engage in containment measures, such as lockdowns. Despite these containment efforts from various countries, this virus spread so rapidly and rampantly that, on March 11, 2020, the World Health Organization (WHO) declared COVID-19 a global pandemic. Indeed, it is during this period (from the beginning of March 2020 to the beginning of May 2020) that begins, for Europe and the world, what would later be called the first phase of the COVID-19 pandemic.

Without a doubt, what happened in the first phase of the COVID-19 pandemic can be described as a swift and overwhelming event. Perhaps more than any other, this event clearly tested the EU regarding its solidarity, integration, institutional capacities, and policy reactions, all which produced immediate and visible impacts on European citizens by providing feedback on the resilience of the idea of a unified "Europe" in the event of a crisis. In fact, this concept of a unified Europe was born after a collective and catastrophic event that came to be known as the Second World War. Considering this dire historical event, the COVID-19 pandemic seemed to be a good empirical test to verify how much of that ancient spirit—contained in the speech delivered on May 9, 1950, by the Minister of Foreign Affairs of France, Robert Schuman—has remained. Robert Schuman argued that world peace could not have been safeguarded without recurring to creative initiatives when we are at the height of the dangers that threaten us throughout history (Schuman, 1950).

This feeling of cohesion and solidarity seemed to hardly appear in the first days of the spread of COVID-19 in Europe, when this was an all-Italian problem. On February 27, 2020, Italy first asks Europe for help to deal with COVID-19; the second time is on March 5, 2020, when the Italian Minister of Health, Roberto Speranza, leaves the summit of EU Health Ministers in Brussels while asking for support and coordination at the European level (d'Argenio, 2020). These are the first days/weeks where Italy begins to become aware of the strength and impact of COVID-19 on health, economy, and of its supranational scope. Meanwhile, countries in Europe remain unaware of the scope and the effects of what is happening. Regarding the relationship between Italy and the EU, this initial misunderstanding will eventually lead the President of the European Commission, Ursula von der Leyen, to write a letter addressed to Italy on the *la Repubblica* on April 1, 2020, offering her apologies (von der Leyen, 2020): "Today, Europe is mobilizing alongside Italy. Unfortunately, it wasn't always like this". Here, she admits that, despite the need for a common European response, EU members were too focused on national considerations in the early days of the crisis; she further argues that what was missing was the community spirit (von der Leyen, 2020). Then, she talks about the selfishness of other nations that did not help Italy, the first to be hit hard by COVID-19, in the beginning of this crisis. Finally, she outlines the plan being developed to avoid future failures, which revolves around economic solidarity.

Now, it is April 23, 2020, when the heads of state and government reconvene virtually to discuss/decide on the request of the Mediterranean countries, led by France and Italy, on Recovery Bonds to prevent the recession (owing to COVID-19) from penalizing nations with less spending power owing to higher public debt. Initially, Northern Europe nations, including Germany and the Netherlands, do not want debt sharing (Ginori, 2020; Mastrobuoni, 2020); nonetheless, on December 18, 2020, the European Parliament and the Council reach an agreement on the mechanisms for recovery and resilience of these countries, the foundation on which *NextGenerationEU* rests (Magnani, 2021).

Although the COVID-19 pandemic has endured, this outlook at its first weeks in Europe serve to remember the attitude of governments and citizens towards this health emergency, the crisis it brought, and the actors to whom people/nations turned to for

help. On the topic of attitudes, social research has shown how people have increasingly been expressing their personal viewpoints/feelings about social facts through social media platforms, among which Twitter can be considered as a sentinel tool to monitor public opinion through discursive analytical strategies around hashtags (Bentivegna & Marchetti, 2015; Ross, 2019; Tavoschi et al., 2020). Hence, we chose to observe these social phenomena through Twitter. Specifically, we collected tweet data containing the hashtag #Covid-19 in different languages: Italian, Spanish, and French. We chose these languages because, considering the situation as a domino game with the initial domino being Italy, the lockdown measures owing to COVID-19 first touched the Italians (March 9, 2020), then the Spaniards (March 14, 2020), and the French (March 17, 2020)[1]; further, these were the first three Southern European countries to resort to this containment measure (i.e., lockdown) amid the beginning of the COVID-19 pandemic. We have chosen March 4–11, 2020, as the observation period in order to examine how the Italian, Spanish- and French-speaking communities prepared for the arrival of COVID-19. Two research questions guided our data collection:

- RQ1 – What is the representation of the pandemic, of the information disseminated about it, and of the measures implemented by governments to contain it, in tweets written in Italian, Spanish, and French? (Research question 1).

- RQ2 – Can the flow of Twitter conversations help us understand how we discuss Europe in tweets? Can this analysis yield information on the prevailing attitude towards Europe at the beginning of the COVID-19 pandemic? (Research question 2).

To answer these questions, we first conducted analyses for each of the three languages, and then examined the results for the three groups by identifying the proximity and distance in their contents.

Previous Studies

This study aimed, thus, to follow the evolution of the trajectories of the debate on the COVID-19 pandemic by analysing tweets in Italian, Spanish, and French.

Many recent studies analysing Twitter contents have helped to delineate its role in monitoring public debate. Among the first to formally use Twitter as a tool for analysing societal happenings is the book by Weller et al. (2014), *Twitter and society*. In its introduction, there is: a classification of the evolution of this social media (divided into three eras) which accounts for both the technological evolution of the tool and the changes in its use by users; and there is a report on the changes in research with and on Twitter. In the book by Burgess and Baym (2020), they expand this classification by describing the fourth era of Twitter; this is done by summarizing Twitter's shifts from a technology, to a company, and to a culture. Namely, Twitter has become a place where history and culture are not only recorded but written in real time. Twitter hashtags (bottom-up user-proposed tagging conventions) have played a key role in this process, with the hashtag innovation proposed by Twitter serving as the embodiment of user participation owing to it being related to information organization tasks (Chang, 2010). Further, the use of hashtags and Twitter have contributed to spreading activism and participation regarding political and social themes (e.g., Sharma, 2012; Bonilla & Rosa, 2015; Rambukkana, 2015a; Dobrin, 2020; Sebeelo, 2021).

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1 The Italian lockdown was introduced with 'D.P.C.M. (2020). Ulteriori disposizioni attuative del decreto-legge 23 febbraio 2020, n. 6, recante misure urgenti in materia di contenimento e gestione dell'emergenza epidemiologica da COVID-19, applicabili sull'intero territorio nazionale. (20A01475). Gazzetta Ufficiale Serie Generale, n. 55 del 04-03-2020' (https://www.gazzettaufficiale.it/eli/id/2020/03/04/20A01475/sg).
The Spanish lockdown was introduced with the 'Real Decreto 463/2020, de 14 de marzo, por el que se declara el estado de alarma para la gestión de la situación de crisis sanitaria ocasionada por el COVID-19, boletín oficial del Estado, n. 67, pp. 25390 a 25400' (https://www.boe.es/buscar/doc.php?id=BOE-A-2020-3692).
The French lockdown was introduced with 'Décret n. 2020-260 du 16 mars 2020 portant réglementation des déplacements dans le cadre de la lutte against the propagation du virus covid-19, JORF n° 0066 du 17 mars 2020, texte n. 2' (https://perma.cc/RX8L-4K2G).

Indeed, the use of hashtags has become increasingly relevant in Twitter; they have passed from being thematic aggregators to becoming polysemic collectors (La Rocca, 2020) that capture people's emotions. Accordingly, they have been analysed and theorized as tools to express collective responses (Ross, 2019), solidarity (De Cock & Pizarro Pedraza, 2018), and as sociotechnical events that generate discursive assemblages (Rambukkana, 2015b). Generally, there are two types of events that generate enormous amounts of reactions in Twitter hashtags: media events (major sports events, entertainment broadcasts, election-night political coverage) and acute events (natural disasters and political unrest) (Bruns et al., 2016).

Regarding media events, hashtags linked to official events are used to follow the evolution in the expression of shared fandom regarding the media event; one example is the study by Highfield et al. (2013) regarding a major, internationally televised annual event: the Eurovision Song Contest. These researchers followed the hashtags: #eurovision, #esc, and #sbseurovision. Another study has analysed the position and influence of Twitter users regarding the #brexit referendum (Grčar et al., 2017), which served to generate ad hoc audiences that contributed to the understanding of the Brexit debate, its results, and the roles of various stakeholders in this social media debate (Lynn et al., 2020).

Regarding acute events, studies on the Queensland floods 2010-2011 and those on the Christchurch earthquakes are representative (Bruns & Burgess, 2012; Bruns et al., 2012; Bruns & Burgess 2014); these studies assume that the onset of crises or disastrous events will naturally accompany Twitter hashtags about the events, mostly owing to the need of Twitter users related to sharing information, following the news, commenting on them, while using this unique collector, the hashtag. Supposedly, Twitter users use this single collector in order not to disperse the flow of information.

Therefore, it comes as no surprise that recent research has been deepening our perceptions of the COVID-19 pandemic through tweet analyses. For example, there is the project proposed by Kabir and Madria (2020), named the *CoronaVis* Twitter, which is a live application to observe the tweets on COVID-19 generated in the USA. The aim of this project is to use tweets (as user-shared data) in order to enable researchers to visualize topic modelling, study human subjectivity, and to model human emotions during the COVID-19 pandemic. Indeed, research has depicted very clearly that the importance of Twitter and its hashtags has grown during the COVID-19 pandemic. In fact, some studies have delved into the multiple hashtags linked to COVID-19 in order to understand changes in users' reactions on Twitter, finding that they can vary over a short period (e.g., Boccia Artieri et al., 2021a; Boccia Artieri et al., 2021b; Kurten & Belleuns, 2021).

Among these studies, we can clearly distinguish those who show an interest in building Twitter user reaction analysis models by following specific hashtags (e.g., #coronavirus or #Covid-19), and those who work on hashtag chains that comprise the COVID-19 pandemic, quarantine, lockdown, government decrees, and related elements. For example, Boccia Artieri et al. (2021a, 2021b) have worked on a single hashtag, #coronavirus, and defined the analysis conducted on Italian tweets as reactions to events; these authors found that both the reactions and the meanings of the #coronavirus hashtag changed in a few days owing to users' chase of news and novel information on decrees. Similarly, Kurten and Belleuns (2021) worked on Belgian tweets and demonstrated that significant events related to COVID-19 correlated with an immediate increase in the number of tweets addressing them, as well as that the content of these tweets changed quickly. In another study using sentiment analysis on Indian tweets about the lockdown, Manguri et al. (2020) collected data using two hashtags: #IndiaLockdown and #IndiafightsCorona. Again, using sentiment analysis, Bhat et al. (2020) explored two different hashtags: #COVID-19 and #Coronavirus, related to the pandemic in India.

Meanwhile, Addawood et al. (2021) explored Arab tweets to assess people's reactions to tweets regarding the COVID-19 pandemic; the hashtags they used were in Arabic and concerned the actions of the government, including the containment/prevention

measures adopted. The impact of government containment measures in Saudi Arabia have been analysed using sentiment analysis by Alhajji et al. (2020). A chain of hashtags linked to the COVID-19 pandemic events have been analysed by Kausar et al. (2021), which collected a dataset of more than 50,000 tweets posted in 2020 with hashtags like #covid-19, #COVID19, #CORONAVIRUS, among others; in their study, the set of hashtags used stemmed from 10 countries with COVID-19 infections and the Sultanate of Oman. Hence, to ensure comparable data sets and analyse the prevalence of hashtags expressing feelings/emotions regarding the COVID-19 pandemic (which differs by country), they chose to work only with the English-written tweets. In our study, we instead selected the hashtags in different languages (Italian, Spanish, and French), using a unique hashtag for data collection: #Covid-19.

The literature shows the relevance of Twitter hashtags to analyse attitudes, for example, towards Europe. Ruiz-Soler et al. (2019) used sentiment analysis on two Twitter hashtags of European relevance (#schengen and #ttip) to verify sentiments toward the public issue, toward the EU, and the type of framing. The growing influence of social media and Twitter has also touched the institutional narrative dimension of the EU (Bein & Chaban, 2016) and citizens have been using them to discuss the EU-related topics (Daniel & Obholzer, 2020; Marchal et al., 2021). On the matter, Hänska and Bauchowitz (2019) questioned the role of Twitter in creating a transnational European public sphere; remarkably interesting is their use of some concepts related to the Europeanization dimension—already explored by other scholars (de Vreese et al., 2001; Koopmans & Pfetsch, 2003; Koopmans & Erbe, 2004; Koopmans & Statham, 2010)—within the context of Twitter. Factually, Hänska and Bauchowitz (2019) developed a systematic approach to the Europeanization of public spheres, distinguishing three forms of Europeanized political communication: supranational, vertical, and horizontal; for each of these, they found the articulation within Twitter.

The Vertical Europeanization "consists of communicative linkages between the national and the European level" (Hänska & Bauchowitz, 2019, p. 2); they subcategorized it into the top-down (EU officials addressing national actors, EU actors using Twitter and being retweeted, quoted or replied to by users from EU-member nations) and bottom-up (national actors addressing EU actors; users addressing —criticizing—EU institutions or policy) dimensions. The Horizontal Europeanization was subcategorized into weak—, "refers to increased national media attention on issues or debates in another member state" (Hänska & Bauchowitz, 2019, p. 2)—and strong—, direct communicative linkages between actors in two or more EU countries (e.g., cross-border retweets, replies, quotes, and @messages). Finally, the Supranational Europeanization, determined by attention to what the EU and its actors have done; in our case, the discussion by EU Twitter users about the EU aid to member nations and the coping-related coordination.

Further, to examine the Europeanization of Twitter's activity, Hänska and Bauchowitz (2019) worked on the 2015 Greek debt negotiations, providing a method to examine tweet contents; we deemed this method useful for understanding the dimension of transnational Europeanization present in tweets. In our study, notwithstanding, we aimed to analyse how Europe appears in tweets with the hashtag #Covid-19, not Europeanization. Thus, Hänska and Bauchowitz (2019)'s decomposition methodology proved extremely useful for our analyses.

METHODS AND DATA RESULTS

A literature review showed us the widespread use of Twitter for social research; those hashtags have evolved to a separate research field; that the importance of hashtags for research led scholars to analyse them within the context of the COVID-19 pandemic; and that the European public sphere has been studied through Twitter hashtags. These are the foundations of our research and this paper.

Drawing on hashtag studies, we derived the descriptive characteristics of the "topical" hashtag —based on the classification by Bruns and Stieglitz (2012, 2013)— #Covid-19. Bruns and Stieglitz (2012) showed differences in hashtags by the flock of retweets and the incorporation of URLs that hashtags can generate, which depend on the event from which they originate; therefore, a hashtag with high percentages of retweets/mentions is defined as a topical hashtag, while non-topical hashtags are those that do not generate a high number of followers. This categorization led the cited authors to infer that there is an awareness of the use of tools and of the redefinition operation that can be generated through the hashtag dissemination circuit. Namely, topical hashtags are the ones that can generate ad hoc communities (Bruns & Burgess, 2015) around an issue. It is an ad hoc community that is generated around the hashtag and that does not consider users' characteristic traits.

Table 1. Descriptive characteristics of the dataset from March 4–11, 2020

	Italian Tweets	*Spanish Tweets*	*French Tweets*
Description of the tweets' collection			
Original tweets	112,503 (16.3%)	161,056 (12,6%)	68,941 (8.4%)
Retweets (RT)	824 (0.1%)	7,552 (0.6%)	536 (0.1%)
@replies sent	33,865 (4.9%)	61,307 (4.8%)	30,329 (3.7%)
Retweets and @mentions	542,322 (78.7%)	1,050,817 (82.0%)	722,108 (87.9%)
Total amount of tweets	689,514 (100.0%)	1,280,732 (100.0%)	821,914 (100.0%)
URL	174,662 (25.3%)	319,026 (24.9%)	176,631 (21.5%)
Tweets geolocation	5,852 (0.9%)	2,791 (0.7%)	1,658 (0.3%)
Corpora's lexicometric measures			
Type	103,601	145,343	76,089
Token	18,760,987	35,235,705	24,504,338
Type Token Ratio (TTR)	0.006	0.004	0.003
Hapax	35,608	47,849	23,350
Hapax%	34.4%	32.9%	30.7%

The topical hashtag we used, #Covid-19, was generated by an acute event and conveyed by the media. Owing to these characteristics, we can define it as a hybrid form of hashtag because, undoubtedly, the first wave of the COVID-19 pandemic had news related to it conveyed by TV and mainstream media (Boccia Artieri et al., 2021b), making it a media event per se. This may explain the high percentages of retweets in all three languages. Further, this phenomenon can be attributed to a specific conversational practice on Twitter: gatewatching (Bruns, 2005), which are activities (e.g., disseminating, sharing, and commenting) produced by users in real time related to the news coming from media outlets on social media platforms in case of acute events.

Further, we also used Faltesek's (2015) caveats on time, which describe the need to consider the historical-social contexts of hashtags and their spreading; this already

denotes, at baseline, that there may tweet meaning differences by language (among Italian-, Spanish-, and French-written hashtags), which differ by the moment in which tweets were collected; for this paper, we chose the moment when Italy was already in the COVID-19 pandemic. Since Spain and France entered the COVID-19 pandemic after Italy, upon describing the results, we started with Italian tweets and went to Spanish and French tweets, respectively.

Moreover, hereinafter, we will be referring to tweets by language (not country) because we know that languages can be spoken outside national borders, and we could not geolocate the tweets. However, we assume that the tweets can comprehensively depict these three Mediterranean societies at that time. Based on Bruns and Stieglitz (2012, p. 7), we used *yourTwapperKeeper* (see also Bruns & Liang, 2012), which utilizes Twitter streaming Application Programming Interface (API) and search API functionality to capture, in real time, any tweets containing the keywords or hashtags selected by the researcher (i.e., #Covid-19). Complying with Twitter's Standard Search API policies/parameters, we downloaded the tweets daily using the rtweet package of R statistics, version 0.7.0 (Kearney, 2020). Based on previous studies (Boccia Artieri et al., 2021a; Boccia Artieri et al., 2021b), we decided to apply Emotional Text Mining method (ETM) to data on the chosen hashtag (Greco, 2016a; Greco & Polli, 2020).

Owing to its characteristics, the ETM is a merged method (Gobo et al., 2021), merging quantitative and qualitative techniques. Based on Gobo et al. (2021), it was possible to indicate that: 1) our data that were subjected to ETM were co-constructed by users, all textual, and from Twitter, so they were too extensive to treat manually; 2) the data were relational and interactional outcomes, so, starting from tweets, we extracted their manifest and latent meaning, decomposed and re-composited them using quantitative techniques, and interpreted and attributed them to meaning categories based on the numerical values attributed to the cluster and sentiment; 3) in ETM, the chosen processing techniques determined how we looked at the problem and social reality; 4) the validity was represented by the number of documents and was entrusted at the beginning value for the lexical indicators; 5) our orientation was not to find an "out-there truth" but to create the best (social and relational) conditions for gathering information; 6) by using ETM, our aim was to identify meaning and emotions from existing documents by extraction methods. In addition, our findings resulted from the interpretations of the documents, which were examined based on multiple dimensions, including: their statistical representativeness; semantic and semiotic content; their organization in clusters; and the reduction into categories of viewable/shareable data (La Rocca et al., 2021).

We chose to use ETM for several reasons. First, ETM is based on a socio-constructivist approach, allowing for the semantic and semiotic contents conveyed by the text to be identified; this is operationalized by detecting the lexical profiles characterizing the hashtag and its symbolic aspects, both of which are relevant when attempting to explore public perceptions (Greco & Polli, 2021)[2]. Second, ETM is used for conducting a context-sensitive text mining approach on unstructured data—which constitutes 95% of big data (Gandomi & Haider, 2015)—and is suitable for analysing social media-based communication (Greco and Polli, 2020). Third, ETM uses an unsupervised bottom-up approach, making it suitable for the multilanguage corpora, allowing for comparing large size corpora in different languages, not being limited by the existence of a dictionary, and maintaining the semiotic and sematic meanings conveyed by the language (Greco, 2016b), the latter two being the expression of a specific culture (Vigotskij, 1934).

For our data analyses, we have conducted the following steps for each language:

1. We cleaned the messages (removing the links, emails, emojis, and emoticons) and kept only the text.

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2   ETM is a sentiment analysis that allows for a social profiling. This new analytical method was developed by Greco at Sapienza University of Rome jointly with Paris Descartes University from 2011–2015, being awarded by the University of Sorbonne Paris Cité and the Sapienza University of Rome. For an in-depth understanding of the ETM method, both regarding its theoretical and methodological background and statistical procedures, we suggest referring to Greco's studies (2016a; 2016b; Greco & Polli, 2020).

2. We removed retweets from the corpora and owing to message production differences by language (Table 1), we adopted a different document selection procedure for each language. This was aimed at obtaining comparable corpora, with one for each language. We selected all messages in the French language (n= 99,270), those with more than 9 words in the Italian language (n= 99,892), and a random sample of 99,000 Spanish messages.

3. We calculated two lexical indicators, the type-token ratio (TTR) and the percentage of hapax (H), to check for the possibility of using ETM (Giuliano & La Rocca, 2010). These indicators are used in linguistic statistics to determine the lexical richness of a text. The TTR is the ratio between word tokens (N) and word types. Tokens (N) measure corpus total size by counting all the graphic forms (i.e., words, lexias) present in it, while tokens (V) measure the extension of a corpus by representing the distinct graphic forms total, therefore bringing the data back to their lexical root. The hapax legomena were words that appeared only once in the text.

4. Each corpus was lemmatized, filtering out stop words, the term "Covid-19", and terms with a low rank of frequency to reduce the matrix-dimension (Greco & Polli, 2020).

5. We performed a cluster analysis on the term-document matrix with a bisecting k-means algorithm based on cosine similarity limited to 20 partitions, excluding all the tweets that did not have at least two co-occurrences (Savaresi & Boley, 2004; Steinbach et al., 2000).

6. To choose the optimal solution, we calculated the Calinski-Harabasz, the Davies-Bouldin, and the intraclass correlation coefficient (ρ) indices (Greco & Polli, 2020).

7. We performed a correspondence analysis on the term-cluster matrix (Lebart & Salem, 1994). Since the factors had the same terms ordered differently according to the absolute contribution value, to interpret a factor, we considered only terms with the highest absolute contribution value in the factor and excluded them from the other factors in which they have a lower value (Greco 2016a). This allowed us to identify the culture's symbolic categories framing the cluster in a symbolic space of sensemaking.

8. The interpretation process proceeded from the highest level of synthesis (correspondence analysis results) to the lowest one (cluster analysis results), assigning labels to factors and clusters (proceeding from the semiotic to the semantic level). After interpreting the results of each corpus, we compared them and redefined[3] the labels in order to highlight similarities and differences in COVID-19 representations between languages (Table 3).

9. The sentiment was calculated according to the number of messages classified in the cluster and its interpretation (Greco & Polli, 2020).

## Exploring Correspondence Analysis Results

The pre-processing resulted in three large sized corpora of almost 2-2.5 million tokens. Based on their largeness, both lexical indicators highlighted their richness (average TTR = 0.063; average H = 69.2%), indicating that we could proceed with the statistical analysis. The correspondence analysis detected three factors for the Italian corpus and seven factors for the Spanish and French ones, of which the first three factor(s) explained almost 60% of the inertia (Table 2 and Figures 1, 2, and 3).

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3 The classification procedure was completely automatic, but the researcher did have the possibility to assign names of labels, thus ensuring that the content that emerged from the analyses were reflective of the data set and respected the original information. Thus, while the software automatically classifies the terms and builds clusters, the researcher identified their meaning by enclosing them in a label.

Table 2. Correspondence analysis results

Factor 1 (inertia%)		Factor 2 (inertia%)		Factor 3 (inertia%)	
Neg Pole	Pos Pole	Neg Pole	Pos Pole	Neg Pole	Pos Pole
Italian					
Contagion (43.3%)		Intervention (35.2%)		Reaction (21.5%)	
Sense	Sensibility	Policy	Health	Space	Time
zona	perché	emergenza	positivo	nostro	tempo
Lombardia	pensare	governo	casi	paese	iorestoacasa
regione	bello	scuola	rosso	distanza	virus
ultimo	prendere	misura	morto	momento	Cina
contagi	sentire	marzo	terapia	Europa	vedere
repubblica	paura	decreto	contagiare	grande	mano
provincia	sperare	chiuse	intensivo	metro	italiani
a.c.% from 2.05 to 0.61	a.c.% from 1.46 to 0.19	a.c.% from 7.67 to 1.96	a.c.% from 3.59 to 0.90	a.c.% from 4.20 to 0.59	a.c.% from 6.98 to 2.24
Spanish					
Impact (24.0%)		Crisis (17.6%)		Intervention Level (16.2%)	
Local	Global	Economic	Health	Micro	Macro
panico	caso	pandemia	mano	dr	suspender
vida	confirmar	mundial	lavar	atacar	madrid
leer	primer	crisis	casa	calma	gobierno
dinero	nuevo	petroleo	bueno	preparados	cerrar
culpa	sospechoso	declarar	jabon	existir	espana
problema	Argentina	economia	mejor	algun	marzo
servir	Colombia	precio	agua	medicamento	actividad
a.c.% from 0.35 to 0.10	a.c.% from 11.29 to 0.89	a.c.% from 13.03 to 1.96	a.c.% from 4.88 to 0.56	a.c.% from 0.11 to 0.01	a.c.% from 4.87 to 2.03
French					
Impact (27.5%)		Intervention Level (17.5%)		Crisis (14.2%)	
Social	Productivity	Macro	Micro	Economic	Health
cas	prix	gouvernement	main	masque	stade
confirmer	prochain	propagation	cause	entreprise	macron
deces	solution	mettre	clore	annuler	pandemie
nouvel	perdre	mobiliser	laver	economie	fermer
mort	stock	plan	match	face	grippe
premier	penurie	service	gel	bourse	enfant
personnes	vendre	aide	hydroalcoolique	petrole	francais
a.c.% from 15.01 to 1.71	a.c.% from 0.43 to 0.12	a.c.% from 0.45 to 0.12	a.c.% from 7.43 to 1.38	a.c.% from 4.98 to 1.52	a.c.% from 1.51 to 0.30

Figure 1. Symbolic space emerging from the Italian corpus.
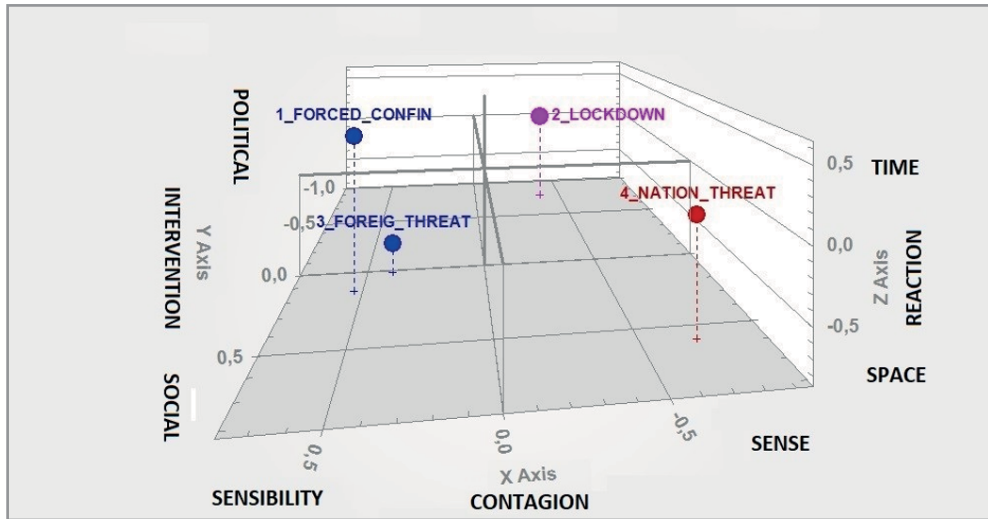
In Italian, Twitter users symbolized the COVID-19 pandemic by three main dimensions: contagion, reaction, and dimension (Figure 1). The first factor (43.3% of inertia) distinguished two opposite ways to perceive the contagion: using rationality (negative pole) or sentiments (positive pole) to face the emergency, with the latter being mostly guided through reaction of emotion (e.g., fear). Unsurprisingly, people's first reaction to the COVID-19 pandemic threat was to fight/flight, an automatic and physiological reaction to an event perceived as stressful/frightening. While rationality helps us prepare for a fight, emotional (negative emotions) assists us prepare for flight. The second factor (35.2% of inertia) reflected the reactions: distinguishing the political reaction (negative pole), which is aimed to face the COVID-19 pandemic threat, and monitoring health (positive pole), which is aimed at dispatching the daily news on the spread and victims of COVID-19. The third factor (21.5% of inertia) sets the space-time dimension of the COVID-19 pandemic spread: while one pole focussed mostly on the geographical spread of the virus (negative pole), the other reflected its time progression (positive pole).

In the Italian symbolic space, each cluster was explained only by two factors; research shows that this specific configuration of the factorial space tends to be found when people's lives are in danger (Greco, 2016b). It may be that keeping reason and emotion distinctively separated helps people in coping with threats by enabling them to think rationally while feeling frightening emotions. Based on Boccia Artieri et al. (2021b), this distinction can be detected when, in the text, words associated with rational thinking are not associated with emotional ones, and vice-versa.

Interestingly, the Italian messages were set by a limited number of symbolic dimensions while the Spanish and French ones presented a larger set of them. Since symbolic categories describe adaptive behaviours (Fornari, 1979), when people are in danger, they tend to use a reduced set of them (Greco, 2016b). The reason explaining this difference may owe to the Italian Prime Minister Giuseppe Conte's announcement of the Italian lockdown on March 4, 2020, a time when the plans of the two other countries were still under formulation owing to them being in different stages of the spread of COVID-19 and having diverging perceptions about its danger.

In the Spanish language, Twitter users symbolized the COVID-19 pandemic by three main dimensions: spread of contagion (24% of inertia), the crisis (18% of inertia), and the level of the intervention (16% of inertia; Figure 2). The first factor in Spanish shows some similarities with that of the French (Figure 3) and symbolizes COVID-19 both regarding the

related interventions and sense of emergency. The difference may lie in the symbolization of the spread; while French texts were characterized by their consequences on the social fabric, the Spanish ones focused on the distinction between global and local outcomes. Namely, the first factor distinguished the global spread of the virus (positive pole) and its national spread (negative pole). The other two factors were similar to those for the French texts: the second factor distinguished the economic crisis (negative pole) from the health crisis (positive pole), and the third distinguished interventions at the micro (negative pole) from those at the macro level (positive pole).

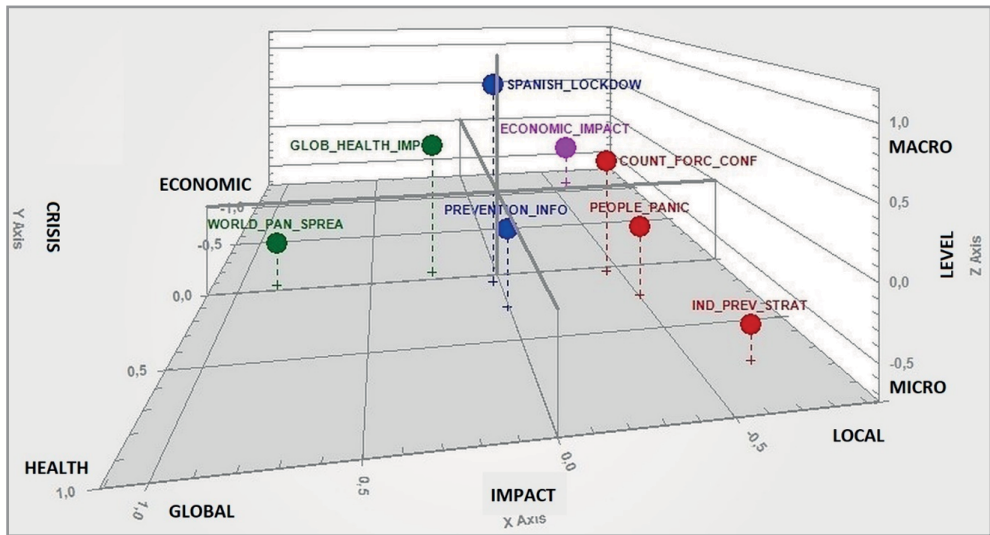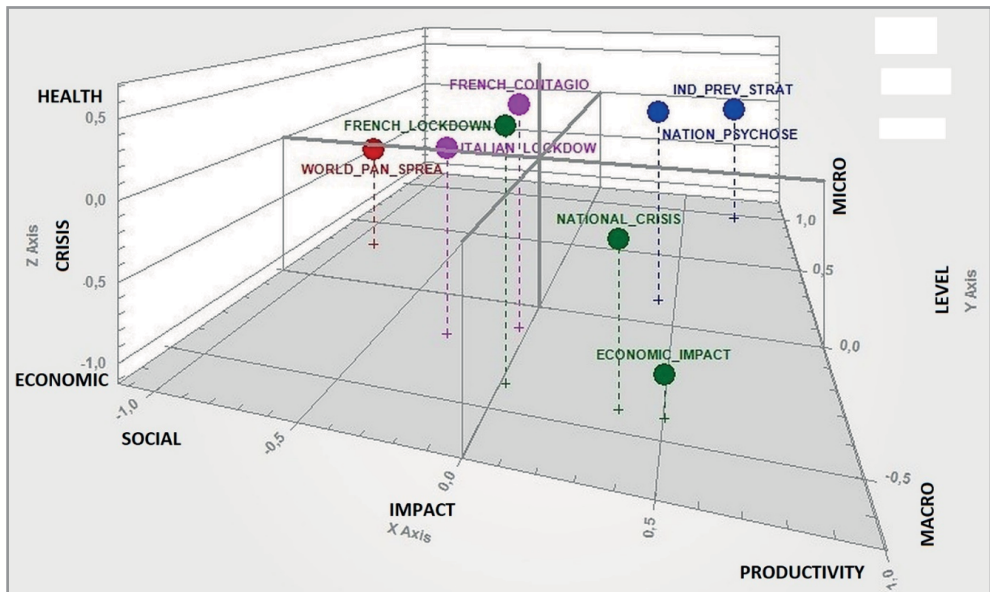**Figure 2.** Symbolic space emerging from the Spanish corpus.

Figure 3. Symbolic space emerging from the French corpus.

In the French language, Twitter users symbolized the COVID-19 pandemic by three main dimensions: the impact (28% of inertia), the intervention level (18% of inertia), and the crisis (14% of inertia; Figure 3). With the increasing spread of the COVID-19 pandemic, European countries were confronted with a greater risk of contagion, leading people to start to ponder about the consequences of the virus spread on the social fabric. The first factor distinguished the productivity impact (positive pole) from the social one (negative pole); specifically, focusing attention on the consequences regarding loss in productivity and in the economic sector, and focusing on the perception of a threat to human life. The second factor distinguished the interventions at the micro (negative pole) from those at the macro level (positive pole). Like what happened in Italy in the later stages of the lockdown, which was when the fear of death related to COVID-19 decreased (Boccia Artieri et al., 2021b), Twitter users distinguished actions that must be done to limit risks and damages, differing the political and institutional (macro) from the individual level (micro). Nonetheless, the Italian lockdown alarmed other, geologically close countries, making contagion and the subsequent lockdown a matter of time. The third factor focuses on the crises evoked by the COVID-19 pandemic, distinguishing the economic crisis (negative pole), owing to the expected slowdown in the productive sector, and the health crisis (positive pole) owing to by the spread of COVID-19.

Cluster Analysis Results in Multilanguage Corpora

The results of the cluster analysis showed that 780 terms selected on average allowed for the classification of 92.3% of the tweets on average, and the clustering validation measures showed that the optimal solution were four clusters for the Italian corpus and eight clusters for the Spanish and French corpora. This difference in the variety of representation could relate to the more intense emotional distress that characterized Italians (in the analysed period) compared with other European citizens. As aforementioned, Italy was the first European country that enforced lockdown measures. In the first stages of the lockdown, the perception of threat from COVID-19 was so intense that Italians totally delegated the government to the management of the health crisis and to solve the emergency, giving up their personal freedom; nonetheless, this delegation was partially withdrawn in later stages.

Unsurprisingly, the sentiment was overall negative for Italian and slightly neutral for Spanish and French; specifically, French corpus presented 11% of neutral sentiment connected with the cluster of the Individual prevention strategies, and the Spanish corpus showed a higher neutral sentiment (21%; Table 3). As we mentioned, data collection was not geo-referenced; still, we see importance in highlighting that, even if the Spanish lockdown started on March 14, 2020 (two days before that of the French), non-essential workers were ordered to remain at home only two weeks later, on March 30, 2020 (Marcos, 2020). Thus, it seems that, in our three-nation data set, the Spanish reaction was the slowest and the adoption of the restriction measures was more gradual; hence, apparently, the more the sentiment was negative, the faster was the adoption of the restriction measures.

Table 3. Cluster analysis and correspondence analysis results and sentiment description

Cluster	Tweet	Tweet %	Label	Sentiment	Factor 1	Factor 2	Factor 3
Italian					**Contagion**	**Reaction**	**Categories**
1	23,717	29.5	Forced confinement	Negative	Sensibility		Time
2	18,780	23.3	Italian lockdown	Negative	Sense	Policy	
3	19,332	24.0	Foreign threat of contagion	Negative	Sensibility		Space
4	18,740	23.2	National Threat: the Red Zone	Negative	Sense	Health	
Spanish					**Spread**	**Crisis**	**Level**
1	10,839	11.7	People panic	Negative	Local	Health	
2	9,854	10.6	Spanish lockdown	Negative			Macro
3	11,521	12.4	Prevention information	Neutral		Health	
4	10,218	11.0	Economic impact	Negative	Local	Economic	Micro
5	17,989	19.4	World pandemic spread	Negative	Global		Micro
6	13,339	14.4	Global health impact	Negative	Global		Macro
7	9,821	10.6	Individual prevention strategies	Neutral	Local	Health	Micro
8	9,090	9.8	Countries forced confinement	Negative	Local		Macro
French					**Impact**	**Level**	**Crisis**
1	12,630	14.3	French contagion	Negative			Health
2	11,514	13.0	National crisis	Negative	Productivity	Macro	
3	9,544	10.8	Italian lockdown	Negative	Social	Macro	
4	8,540	9.7	National psychoses	Negative	Productivity		Health
5	16,462	18.6	World pandemic spread	Negative	Social	Micro	Economic
6	9,532	10.8	French lockdown	Negative		Macro	Health
7	9,745	11.0	Economic impact	Negative	Productivity	Macro	Economic
8	10,471	11.8	Individual prevention strategies	Neutral	Productivity	Micro	Macro

Our cluster analysis results already provide a first representation of the three local contexts [RQ1] we analysed at the local and supranational level. From this analysis we also try to trace how Europe appears in tweets, in terms of waiting for help, which can be economic and social [RQ2] and if this can help us to rebuild a prevailing attitude towards it. The clusters also reported a difference in Italian tweets, which focused completely on confinement and dealing with COVID-19; this is probably because Italy was already in the COVID-19 pandemic, while those writing in Spanish and French were still preparing themselves for the pandemic, instead of coping.

In the Spanish and French clusters there is an echo of the Italian event. Within Italian clusters, instead, we could distinguish elements exclusive to Italy and the supranational context represented by Europe and China. The "forced confinement" (cluster 1) arose from national governmental choices (e.g., the introduction of the containment measures as a result of the Prime Minister's decrees) and its echo in the tweets is likely linked to the social communication campaigns activated by the Ministry of Health and the Department of Civil Protection, named "Leave the virus out the door", which linked the hashtag #iorestoacasa to its launch (#stayathome). This hashtag was repeated 4,211 times within the tweets classified in this cluster.

Tweet[4] cl-1 (forced confinement): *homework: take any notebook out and fill it as usual, but with this sentence: I have to stay at home, I have to stay at home, I have to stay at home, I have to stay at home, I have to stay at home, let's stay at home* (score[5] = 51,591.23).

Because they were forced to stay indoors, Italians dedicated themselves to "watching" (485[6]) "TV" (437).

This activity is also reported within the next cluster, "Italian lockdown" (cluster 2), where it appears as a "rewatching" (106) of "programs" (105). Nonetheless, watching TV did not seem to turn off Italians' minds, as within this cluster, an important awareness emerges among Italians, linked to the "economy" (273) and the difficulties that they will face because of the crisis produced by the COVID-19 pandemic. Here, we also begin to find the expectation of a "response" (172), a "support" (190) from the "EU" (176).

Tweet cl-2 (Italian lockdown): *Much more will be needed, but it will soon also be evident in other European and nations worldwide. The emergency engulfs the economic, decree, more resources for health; the government aims for billions* (score= 2,982.68175).

The Italians have already become aware about the consequences of the COVID-19 pandemic and, concomitantly, they already imagined that they will not be the only ones facing this, as Europe and the world will also be facing these consequences. The alternation between the national and the supranational dimensions can also be seen in the other two clusters.

In cluster 3, "foreign threat of contagion", the external dimension appeared in the identification of the enemy, as people perceived the need to preserve themselves from the invasion of a foreign threat. Accordingly, this is where the words start to appear: "fear" (535), "Chinese" (527), which become the "problem" (481), for which "rules" (459), "responsibility" (416) is needed, to save the "health" (401) and the "economy" (378) from the "crisis" (375). The perception of being unable to defend oneself from the contagion seems to have evoked anger and helplessness in Italians, but it also introduced the

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4   The translation of tweets, sometimes, may not respect the criteria of the English language. We have decided to respect the characteristics of the writing of tweets, modifying the construction of the sentences as little as possible; but making sure that the meaning of the tweets was clear to the reader.

5   The score is equal to the chi-square of the term (i), in text (j), classified in the cluster (k), multiplied by the ratio of nj= total number of terms in the text (j) classified in cluster (k) on nk= total number of terms in cluster (k) (Lancia, 2021).

6   The values reported on round brackets are the raw numbers of how many times the given "word" appeared in the tweets classified within the cluster.

possibility of starting to care for one's family, home, and being obliged to remain with one's family in own home, as well as to rethink the economy and the nation. Further, this was deemed as a sort of "break", a break from the known world, a suspension that was suitable for people to reflect.

Tweet cl-3 (foreign threat of contagion): *they told us, hug a Chinese, eat Chinese food, as they are not the virus. We are all Chinese now among us Italians, as we cannot even shake hands anymore. Coronavirus madness* (score= 5,851.40).

In cluster 4, "national threat: the red zone", the COVID-19 pandemic is considered as a national threat, placing the spread of COVID-19 within the nation's walls and leading to the consequent need to identify and demarcate the Red Zones. This is the time when COVID-19 takes hold of the country. The "positive" (2,899) "cases" (2,123) become a tangible sign that the COVID-19 pandemic has reached Italy. Thus, this represents the passage from a threat that was perceived as being outside the national border, linked to the events in China, to an internal and visible threat represented by the cases of "Lombardy" (2,185) and "Veneto" (410). The echo of this emerges from the word's "therapy" (896) and "intensive" (845).

Tweet cl-4 (national threat: the red zone): *ICU patients increased because new infections; health balance of healed and deaths for tomorrow, and evaluation of other red areas. Latest news* (score= 21,140.42).

The Italian tweets have four clusters, which, in turn, revolve around the element of confinement. Meanwhile, in the Spanish and French tweets, the clusters revolve around the element of preparation for coping. For Spanish tweets, we observed the clusters "prevention information" (cluster 3) and "individual prevention strategies" (cluster 7), which signalled the preparations for the arrival of COVID-19. Remarkably, we decomposed such preparation in two levels: primary-individual and secondary-supra-individual levels. Inside cluster 3, the words that took on a greater significance were "prevention" (2,064), "health" (3,513), "information" (1,626), "protocol" (579), and "Ministry" (583).

Tweet cl-3 (prevention information): *We met with the different departments of the institution to coordinate measures and actions before the arrival of the coronavirus in our country, reinforcing the prevention and containment measures of this virus* (score= 3,623.3846).

Hence, cluster 3 depicts how people were preparing to cope with COVID-19 since its arrival seemed inevitable, although they had the ability to look at Italy's status and have a few days of advantage. In fact, it was recommended to follow preventive measures to avoid the collapse of health facilities.

The measures to contain the spread of COVID-19 were, of course, declined at the level of individual strategies (cluster 7), such as "washing" (1,057) "hands" (2,941), "sneezing" (356) inside the elbow, avoiding "handshakes" (207), wearing "masks" (542), and maintaining a physical distance of at least one meter from each other. These measures of protection for oneself and others are all based on the guidelines of the WHO.

Tweets cl-7 (individual prevention strategies): *Hand washing, sneezing inside the elbow, are actions that reduce the risk of contagion of respiratory diseases. If possible, avoid crowds and close contact with other people when you have the symptoms of flu* (score= 6236.0296).

While the risk associated with the COVID-19 pandemic was generally contained in "people panic" (cluster 1) and "global health impact" (cluster 6), that allow us to distinguish a primary-local level from a secondary-global level.

Tweet cl-1 (people panic): *I went to the doctor today because I have been with a cold for a month and a half and I still have a stuffy nose, and maybe my doctor asks me if I have travelled. Then, I will say, "no", and his answer will be "ahh thank goodness". The covid run and it is not a simple flu* (score= 6,236.03).

In "people panic" (cluster 1), the "panic" (486) is concentrated on the possibility of contracting COVID-19 and on contact with other "people" (1,772), who are now seen as a COVID-19 vectors. Thus, "people panic" (cluster 1) is marked by actions that follow the appearance of COVID-19, about which people "talk" (833), owing to which people saw the need to "leave" (802) their work activities and to "think" (399) about what to do, and which concomitantly evoked "hope" (425), despite all happenings. Nonetheless, people also talked about how COVID-19 was spreading fast, coming from "China" (2,048), and there was already a second case in "Italy" (4,611).

Tweet cl-6 (global health impact): *an old man who returned from the north of Italy in March is hospitalized at the clinic. coronavirus second case* (score= 885,332).

In "global health impact" (cluster 6), we begin to connect the global and local dimensions, with the latter being represented by "Spain" (2,868), as well as the following words start to appear: "quarantine" (1,823), "nation" (2,396), "dead" (958), and "infected" (1,132). With the reports on the first Italian red zone, "Lombardy" (276), Italy also appeared in this cluster. Some names of Italian personalities also appeared, such as the past President of the Council of Ministers, Giuseppe "Conte" (91) and—close to the last positions—Angelo "Borrelli" (10), who was the head of the Italian Civil Protection. We also observed the words "France" (460), "Europe" (343), and a "flight" (359) that connects the "south" (240) and the "north" (200). We also can start to see the dimensions related to "risk" (459).

The local and supranational dimensions were seemingly and inevitably intertwined when we investigated the "economic impact" (cluster 4). Words and phrases such as the "pandemic" (3,274), being "worldwide" (1,963), and the "WHO" (1,783) taking care of the situation.

Tweet cl-4 (economic impact): *now, the coronavirus is declared as a pandemic by the World Health Organization* (score= 9,119.8506).

In "economic impact" (cluster 4), we can see the onset of concerns about what is, certainly, a "crisis" (1,824), which is also connected to "oil" (832) and influences the "economy" (910), the "price" (672) of crude oil, and the "market" (536). The repercussions are signalled by the "collapse" (411) of the "stock market" (478) and the "fear" (651) for what is looking like a "war" (294) owing to the "impacts" (423) and the "effects" (326) produced.

In the Spanish tweets, the supranational dimension shows even greater strength in the "world pandemic spread" (cluster 5), which evidences that COVID-19 knows no boundaries.

Tweet cl-5 (world pandemic spread): *It's official confirmed cases of coronavirus in Chile now. covid Chile pandemic* (score= 7,514.0878).

In this cluster, people are concerned about the "cases" (10,189) "confirmed" (3,095), "new" (3,054), or "suspected" (994), and about COVID-19 having "arrived" (1,538) in "Argentina" (1,525), "Colombia" (1,342), "Peru" (1,281), "Mexico" (930), "Venezuela" (926), "Chile" (864), "Ecuador" (755), "Panama" (602), "America" (453), "Brazil" (425), "Paraguay" (428), "Bolivia" (281), and in all "Latin America" (169). The inevitable consequences of this unstoppable advance of COVID-19 are the closure of markets and industries, which are measures that affect countries worldwide, including Spain. Nonetheless, in the clusters, the country "blocks" were differentiated into "countries forced confinement (cluster 8)" and "Spanish lockdown" (cluster 2).

In "countries forced confinement" (cluster 8), the messages outline a dimension that concerns the "world" (1,690), which not so metaphorically must "close" (828) the "door" (850). This reflection advanced following a sports event: the "football" (225) match of the "Champions League" (100) played by the "Atalanta" (29) and "Valencia" (150) teams at the San Siro stadium, in Milan, on 19 February 2020, which was attended by 36,000 people. After this event, all other events occurred behind closed doors or were suspended.

Tweet cl-8 (countries forced confinement): *Owing to the coronavirus outbreak, the UEFA confirms that the Champions League match between Valencia and Atalanta at Mestalla, and the Europa league match between Inter and Getafe at San Siro will be played behind closed doors* (score= 1,801.963).

Now, in "Spanish lockdown" (cluster 2), the "government" (1,813) of "Madrid" (2,083) "suspends" (1,764) all "activities" (763) in "March" (1,209), signalling the onset of the "lockdown" (1,058), which touches the "University" (622), "sport" (429), and the "school" (284). All is "cancelled" (195) "now" (659).

Tweet cl-2 (Spanish lockdown): *the Basque government will study each case to cancel events* (score= 1,247.5044).

When articulating clusters for French tweets, we observed a much more explicit alternation between local and supranational perspectives, to a point where they were equivalent in the representation of the COVID-19 pandemic. Notably, among the tweets belonging to "French contagion" (cluster 1), there is "coronavirusfrance" (2,585), which is an expression that nationalizes the hashtag. Hence, we can argue that the distinction between local and supranational topics originates in Twitter users' habits, signalling their conscious use of the platform and its spaces. In this cluster 1, the most meaningful words were related to nationalesque hashtags on COVID-19, represented by "coronavirusfr" (801), "coronavirusenfrance" (556), and the cluster was mostly dedicated to "France" (7,741), to the "French" (745), and to "Emmanuel Macron" (332).

Tweet cl-1 (French contagion): *Emmanuel Macron brings together general reports on research at Élysée with the primary objective of taking stock of possible treatments and vaccines against the virus and programs undertaken to fight it* (score= 812.378).

Although we collected tweet data during the initial phase of the COVID-19 pandemic, the "world pandemic spread" (cluster 5) describes a reality made up of "cases" (10,730), "deaths" (2113), and "confirmed", which crosses not only "regions" (338) but also "Senegal" (329), "Cameroon" (188), "Belgium" (361), "Egypt" (147), "Morocco" (243), "Africa" (304) and "Quebec" (157).

Tweet cl-5 (world pandemic spread): *Canada, Quebec new case of coronavirus infection in British Columbia which leads to an increase in the number of people infected in Canada* (score= 8,461.218).

Similar to the results for the Spanish tweets, French tweets also draw the contours around the portions of the world where the French language is spoken and around nations that have already touched each other or are close, either historically or culturally. In French tweets, the Italian situation also appeared and had a cluster entirely dedicated to its events, "Italian lockdown" (cluster 3), which are represented by the words "quarantine" (1,621), "Milan" (243), the "North" (282), its "ministers" (1,292), the whole "country" (1,195), and where everything has been "suspended" (281).

Tweet cl-3 (Italian lockdown): *the first outbreak of coronavirus in an Italian town, it has already produced some dead this Wednesday. To deal with the epidemic, the country has taken exceptional measures, deciding to close all schools and universities provisionally* (score= 1,234.0793).

In the cluster dedicated to Italy, "Europe" (387) comes into play, and it reappears in the "French lockdown" (cluster 6). In cluster 6, the tweets are dedicated to national events owing to the "epidemic" (3,950) which became a "pandemic" (738) when the "WHO" (593) decided upon it, producing "inexorable" (78) repercussions. These repercussions, in turn, were decided by "Macron" (1,340) and pertained to the "closure" (740) of "schools" (1,319) and "universities" (272). The flow of conversations also highlights a search for the "epicentre" (59) and for the "Chinese" (458), which are represented by "Wuhan" (326).

Tweet cl-6 (French lockdown): *the great confrontation about different opinions between Anne Hidalgo and Agnès Buzyn. Paris coronavirus there's or is just a small epidemic in China. Agnès Buzyn lies because, as a past Minister of Health, she knows that covid is not a classic flu* (score= 2,078.124).

Further, we extracted "individual prevention strategies" (cluster 8), which relates to tweets talking about a collection of tools useful for prevention and sanitation, such as the importance of "washing" (863), using "gels" (909), "hydroalcoholic" (432) solutions, and always having these "bottles" (90) with you, as well as to continue with social distancing.

Tweet cl-8 (individual prevention strategies): *because of the coronavirus COVID-19, we ask you not to shake hands or kiss to greet others* (score= 3,930.3231).

On the national dimension, there are two clusters: "national elections risk" (cluster 2) and "national crisis" (cluster 4). Cluster 4 signals the emergence of a collective fear/feeling linked to the approaching COVID-19 pandemic, thus greatly resembling "people panic" (cluster 1) in Spanish tweets group, although our different labelling respects the specificity of the languages and how the same sentiment was expressed in Twitter. For example, among significant words, "psychosis" (271) was higher than "panic" (165), both of which are fears dictated by "illness" (247) and connected to COVID-19. Moreover, there are words about symptoms, including "coughing" (324), and the "media" (274) and "Twitter" (130). The presence of the media brings forth questionings about their role in spreading the news about and in presenting COVID-19, the contagion, and the pandemic.

Tweet cl-4 (national crisis): *from in people realize that the Chinese government maintains psychosis. Nonetheless, it is so serious that we have at least two years of COVID-19 disease ahead of us* (score= 2,078.124).

Based on Falsetek (2015), to understand "national crisis" (cluster 4), we saw the need to remind ourselves of the French events during the period. The "crisis" (2117) was linked to the "elections" (465) of March 15, 2020, which were held despite the bulletins recording 4,499 infected and 91 deaths. The French people who were called to the polls felt at "risk" (671) and seemed to understand well that it this was a "political" (554) "question" (483). Accordingly, the words "Abstention" (55) (around 53–56%) and the "RT" index (136) appeared. The RT index serves to rate a disease's ability to spread by describing the average number of people that one infected person can pass the virus to. The tweets described a widespread concern about how the arrival of COVID-19 in the "municipal" (1,690) city of Paris would be managed by the authorities.

Tweet cl-4 (national crisis): *Agnès Buzyn says it has developed preventative management of the coronavirus. If it is so we must expect the worst for the Paris municipalities* (score= 2,624.8805).

Alongside this dimension of risk and crisis there are the "economic" (364) and "social" (261) ones. We deemed as being no coincidence that in both Spanish and French tweets we observed exclusive clusters for "economic impact" (cluster 7). As already reported for the Spanish tweets, the French tweets linked the economic crisis to "companies" (1144), "stock exchange" (627), "oil" (362), and evaluated that it would have an "impact" (477) "worldwide" (461). To address it, "protection" measures (375) were needed because they did not only concern "finance" (179), "banks" (184), or "euro" (111) but also those who worked in the "tourism" (152) and "show" businesses (161), as well as other "sectors" (125) that would stop. It was an "European" (115) crisis related to "white-collar" workers (79) and "workers" (28).

Tweet cl-7 (economic impact): *is it better to lose people or to bring down the world economy? Surprisingly, the point is that the old and the weak seem to be dying* (score= 565,635).

CONCLUSIONS

Our analyses and discussions provide a more comprehensive outlook in Italy, Spain, France, and the related communities/countries that speak the three related languages. Specifically, we observed how people were preparing for the arrival of COVID-19; governmental actions were perceived by citizens and commented on in Twitter; and the fears connected to the global dimension of the COVID-19 pandemic, its accompanying risks, and the crisis (especially economic) it entailed. The citizens in Southern Europe seemed to have a clear perception of the economic impact of the COVID-19 pandemic, which emerged in both the Spanish and French tweets and was related to Italian tweets talking about national lockdown measures [RQ1].

Our employment of ETM proved to be extremely useful for our endeavours to represent the COVID-19 pandemic and the containment measures adopted in individual countries, providing an analysis of people's attitude towards Europe during this public health crisis (Figure 4). Accordingly, analysing the COVID-19 hashtag and the sentiments in the relevant tweets allowed us to retrospectively comprehend the public debate at the studied period, as well as to understand how the level of risk of contagion produced different perceptions of the crisis (see Table 4). Specifically, the more the people perceived that COVID-19 was close to them, the more the governments increased the containment measures, and the more real the danger and consequences of an economic, social, and health crisis became. This variation can be explained by considering the caveats proposed by Faltesek (2015), which highlight the need to constantly keep in mind the social timeline of the collection of tweets and its importance in interpreting the results. In fact, we collected data on the three languages during the same period, albeit the conditions in Southern Europe were different. This may likely explain why the Italian tweets/clusters had no traces of the Spanish or French condition and why Italians were focused on lockdown measures.

In our discussions, we traced how and if Europe appears in the tweet-based discussions with the #Covid-19 hashtag [RQ2], which we deemed an extremely useful hashtag for examining reactions towards the crises evoked by COVID-19. Now, we will try and reconstruct this map of the presence of Europe within the clusters for all three languages by adapting Hänska and Bauchowitz (2019)'s scheme. Nonetheless, these authors had geolocation data on tweets, while our data set did not allow for such explorations because the respective nations were traceable for a small number of tweets: 0.9% for the Italian group, 0.7% for the Spanish, and 0.3% for the French. Furthermore, the cited authors applied their scheme to an event that occurred to a specific context in Greece, while we analysed an international/worldwide event. With these warnings, we endeavoured to organize the tweet clusters by the dimensions of Europeanization.

Table 4. The dimensions of Europeanization within tweet clusters

	Italian Tweets	Spanish Tweets	French Tweets
Vertical top-down	-	-	-
Vertical bottom-up	Italian lockdown (cl-2)	Spanish lockdown (cl-2)	French lockdown (cl-6)
Horizontal-weak	-	Panic people (cl-1)	Italian lockdown (cl-3)
Horizontal-strong	-	Global health impact (cl-6)	-
Supranational	Foreign threat of contagion (cl-3)	Economic impact (cl-4) World pandemic spread (cl-5)	Economic impact (cl-7) World pandemic spread (cl-5)

Source: Reworking starting Hänska and Bauchowitz's scheme (2019).

This analysis allowed us to expose a hidden dimension inside the tweets, which we defined as the attitude to write and talk about Europe inside Twitter in the initial phase of the Covid-19 pandemic [RQ2]. Hence, although past studies have analysed people's attitude through Twitter (Reavley & Pilkington, 2014), here we aimed to reconstruct a set of emotions and behaviours towards Europe through tweets at a particular moment.

The relevance of our results for depicting this attitude and its expression through tweets become even greater when we consider how the three languages we analysed are used across different communities and nations. Spanish is the official language of many states of South America. French is spoken in Canada (mainly in the provinces of Québec and New Brunswick and to a significant extent in Ontario and Manitoba), Belgium, Switzerland, numerous islands of the Caribbean and the Indian Ocean, Luxembourg, the Principality of Monaco, is the official language of about 30 states worldwide (as a legacy of the French colonial empire and Belgian colonization), numerous international organizations (e.g., the United Nations Organization), is one of the three working languages (together with English and German) of the EU, and it is also spoken, protected, and enjoys a co-official status (with Italian) in the Aosta Valley, Italy. Finally, Italian is the official language in San Marino, Switzerland, and the Vatican City, in parts of Croatia and Slovenia, and there are Italian language communities that can be found in states such as Albania, Argentina, Australia, Belgium, Bosnia, Malta, Egypt, Eritrea, other European States, Africa, the United Kingdom, and the United States of America.

Therefore, we deem that our analyses on attitudes may reveal the international attention placed in Europe amid the COVID-19 pandemic, even more so if we consider that, after China, Italy and Europe were the area's most quickly affected by the virus. Thus, Europe provided a unit of comparison upon which other countries could orient their actions about containment measures, such as the reduction of citizens' freedom.

Spanish tweets covered four of the five dimensions of Europeanization, showing a greater percentage of tweets dealing with Europe than the other groups. Furthermore, Spanish tweets were the only ones to have clusters attributable to the horizontal-strong dimension (Table 4 and Figure 4). Meanwhile, Italian tweets covered only two dimensions: vertical bottom-up and supranational.

Figure 4. Total percentage of tweets in Italian, Spanish and French that fall within the dimensions of Europeanization
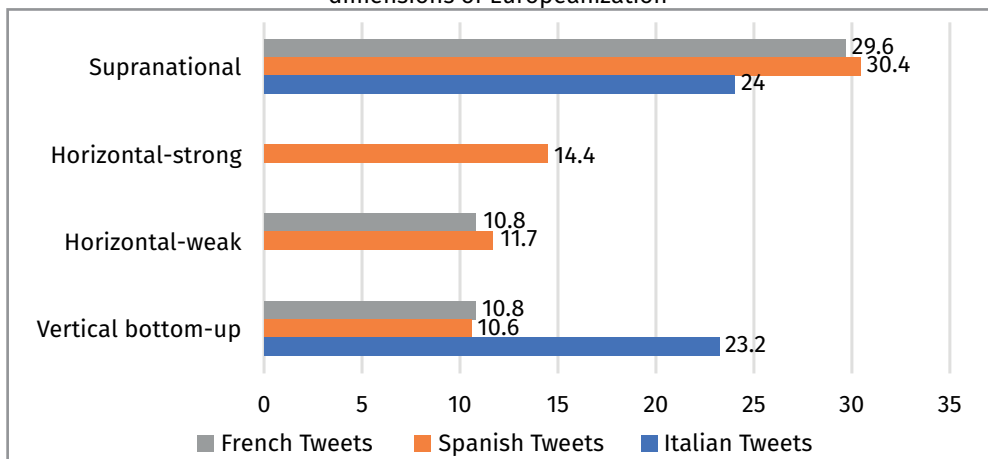
About these results, we warn that we do not know if this attitude can be extended after this period, that our results provide only a somewhat static "picture" of the attitude towards Europe in the studied period, and that although our tweets are in European languages, they are not exclusive to the three Member States of EU, namely France, Italy, and Spain. With this in mind, we remark the usability of our results for more comprehensively grasping the expectations that arose towards Europe during a time of crises; research shows that these attitudes can, in turn, influence: experience, social factors, learning, conditioning, and observation. Thus, we hope that the knowledge we provide here on people's expectations (and responses to these expectations) towards Europe for that period may contribute with our predictions for people's attitude towards Europe soon. In the tweets we analysed, the attitudes and expectations of people while writing about Europe developed along two dimensions:

— national concerns, that were represented by the clusters linked to confinement, contagion, and which intercalated the bottom-up and supranational dimension of Europeanization;

— global concerns, that were represented by the clusters linked to the borderless spread of COVID-19 and the economic effects of closures, and which intercalated the horizontal dimension (in its weak and strong forms) with the supranational dimension of Europeanization.

These results, although not generalizable, provide clues to help European organizations and political stakeholders on how to make the best use of resources and support, how to clarify and define their commitment to the fight against the COVID-19 pandemic and the crises it brought to the world, and how to identify areas of intervention and support inside and outside their borders.

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