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RESEARCH ARTICLE

Lockdown and Breakdown in Italians' Reactions on Twitter during the First Phase of Covid-19

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ABSTRACT: The article focuses on Italians' reactions to the pandemic on Twitter. During the first phase of the 2020 lockdown (from the beginning of March 2020 - to the beginning of May 2020), a real-time dataset was built, linking data scratching to three events related to the introduction of the Prime Minister's decrees and his press conferences. The chosen observation point is Twitter, platform that allows us to monitor the emergence of discussions on public issues, extremely synchronized with events and news – which is, moreover, a feature of use of this platform. The coronavirus hashtag was chosen as a mechanism to track the development of Italian reactions, following the evolution of its sense and sensemaking and considering it as a polysemic collector. The aim is to identify within the tweets the actors, the topics, and the tone of the debate in an open public space. Furthermore, the analysis is carried out in search of the Italians' perception of the lockdown and whether they are in favor of it because of the defense of public health or they see it as a restriction of their individual freedom. The analysis, which used the socio-constructivist approach of Emotional Text Mining, reveals two explanatory-dimensions in the governance of the crisis: lockdown and breakdown and allows us to understand the reasons for Twitter's instinct-reactions.

KEYWORDS: Coronavirus, Emotional Text Mining, Hashtag Studies, Public Debate, Twitter

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1. Introduction

The Covid-19 pandemic is for scholars a symbolic ground on which to build a discursive field for politics. The spread of the Covid-19 virus, and the restrictive measures adopted or not adopted in the different countries of the world, seem to have generated a double ground for politics.

First of all, we find a ground field built around the reactions to the civic conditions generated by the pandemic state, such as the choice or not of a lockdown, in which the actions carried out by governments have had and will have repercussions in terms of consensus. In this sense, as regards the short-term effects, it seems that the choices of rigorous containment applied in various Western European countries have been good for democracy. A survey conducted close to the end of the various lockdowns (Bol *et al.* 2020) shows among citizens a higher level of trust in the government and satisfaction for democracy, together with an increase in voting intentions for the Prime Minister's party/President. These results are not related to the ideology or political interests of the citizens, nor are they due to the rally' round the flag effect, i.e., a patriotic reaction produced by the crisis, but are more dependent on a recognition of the way in which the health crisis has rewarded those governments that have shown themselves to be more decisive in their containment choices (Boccia Artieri 2020).

These are effects that, while remaining in post lockdowns phases – e.g., the consent to the government in Italy in this September is 60% and that of Prime Minister Giuseppe Conte is 62% (Ipsos-September 2020) – must deal with the passing of months with the production of another discursive field. This second field is a symbolic field of potential political polarization that around the spread of the virus, the emergence of social distancing, the use of masks, and so on, consolidates on platforms denier groups, promotes no-mask street demonstrations, feeds pandemic sovereignty action on social media.

From this framework arises the need to monitor public opinions and the construction of them around the topics of consent/dissent for the Government, the perception of the crisis, and the lockdown. From this point of view, social research has shown how people express their personal viewpoints, including their feelings about social facts, in an increasingly common way through social media and that Twitter can be considered as a sentinel tool to monitor public opinion through discursive strategies around hashtags (Bentivegna and Marchetti 2015, Ross 2019, Tavoschi *et al.* 2020). The aims of our research were to monitor the Italian public opinion on coronavirus through Twitter using text mining to reconstruct the social representation of the coronavirus in relation to significant announcements of the introduction of the lockdown in Italy, of the extension of the lockdown and of the progressive exit from the lockdown. Two questions guided the extraction of data from Twitter:

[RQ1] What were the actors, the topics and the sentiment of the online reactions related to the pandemic on Twitter in relation to the choices of the government?

[RQ2] Do online reactions on Twitter reveal acceptance and respect for restrictive measures, or do they trigger an antagonistic debate on them?

To answer these questions, we have built a dataset of tweets by collecting them through the uses of the hashtag #coronavirus, following the methodologies based on hashtag studies, and considering previous studies on Twitter as a place for monitoring public debate and the uses of hashtags within it during crisis events.

1.1 Previous studies on Twitter and crisis hashtags

One of the first studies that formalizes the use of Twitter as a tool for analyzing what is happening in society, and therefore, as a tool for monitoring public debate is, without a doubt, the volume edited by Weller *et al.*

(2014a) *Twitter and society*. In its introduction there is a classification of the evolution of this social media, divided into three eras, which account for both the technological evolution of the tool and the changes in its use by users; together with the trajectory change in the research settings with and on it. To this typification, it is now possible to add a fourth, enclosed within a 2020 volume *Twitter: A Biography*, by Burgess and Baym, where the authors describe and summarize Twitter's shifts from a technology, a company, and a culture, from its origins as a personal messaging service to its transformation into one of the most globally influential social media platforms. Under this transformation Twitter has become a place where history and culture are not only recorded but written in real time. Reinforcing and expanding the first thought of Kligler-Vilenchik (2011) that explains as collective memory is best shaped at the intersection of the media memory and the public memory agendas, turning Twitter reactions into traces of moments when the past events most salient in the *legacy* media also become those perceived as most important by individuals.

The periodization contained in the introduction of the 2014 volume allows us to find the reasons that lead us to use this social media as an observation point for the formation of public opinions – as a reaction to a disastrous event – around a theme/event of the weight of the pandemic. If in the first period labeled as Twitter I, first generation Twitter, it is an urban lifestyle tool for friends to provide each other with updates of their where abouts and activities (Akcora and Demirbas 2010), in later eras it becomes something else. Over time Twitter II, datable to 2009, indeed brings a change in the setting of the stimulus question for writing tweets, which passes from "What are you doing?" in "What's happening?". According to scholars, this change gives rise to a shift from an ego to a reporting machine (Tate 2009). It is here that Twitter asserts itself as a tool to know what is happening and therefore, for sharing-information, marking the transition from an area of ambient intimacy (Dorsey 2006) to a tool that works well in the event of disasters, such as natural events, man-made events, conferences, and here the pandemic. These are "massively shared experiences" (Sarno 2009) on which an argument should be made about its significance in a specific event. In this passage – from Twitter I to Twitter II – hashtags come into play and become tools of great interest. First used to follow the evolution of news around an event, as in the case of their introduction for the San Diego fire (e.g., Weller *et al.* 2014b, Bruns and Burgess 2015), they subsequently establish themselves as an object of analysis by academics, because they have turned into *Hashtag Publics* (Rambukkana 2015), hence techno-social events generated by discursive assemblages. In this growing interest in Twitter as an object of study, the researchers began to focus their topic both on hashtags, intended as markers of meaning for tweets, but also on the volume of retweets and mentions. Bruns and Burgess (2015) also note the creation of *ad hoc* publics in the flow of those who follow a hashtag, underlining the following: "A high volume of such response messages would indicate that users are not merely tweeting *into* the hashtag stream but also following what others are posting; the number more such messages are contained in the hashtag stream–and the greater the total number of participants who engage in this way–the more the hashtag community can be said to act *as* a community" (Bruns and Burgess 2015, 21).

Regardless of the characteristics of the users, e.g., gender, age, level of income, they form an *ad hoc* public-community that discusses on that issue by expressing its emotions, feelings, and opinions. Tweets, retweets, and mentions become a gossamer tissue of meaning. We have undoubtedly entered in what is the third era of Twitter. In Twitter III, the social media abandons its physiognomy of a source of "pointless babble" and of a backchannel for interacting around an event and is increasingly affirmed as an emergency communication channel in times of disasters and other major events (Weller *et al.* 2014b). This is the use that is consolidated in the fourth era, where the studies on Twitter are closely intertwined with those of its hashtags. This is a process that began in the mid-2000s due to an increase in user-generated content within Web 2.0. From this time on, "the pool of potential participants in online crisis communication has broadened to include a much

larger proportion of the general population, as well as traditional media and official emergency response organisations" (Bruns and Burgess 2014: 374). There are studies on the Queensland floods 2010-2011 and the Christchurch earthquakes (e.g., Bruns and Burgess 2012, Bruns *et al.* 2012, Bruns and Burgess 2014), where there is already the idea that when crises or disastrous events emerge, Twitter hashtags are born with them, as a need felt by Twitter users to share information, follow news, and comment on them, using a unique collector – the hashtag – in order not to disperse the flow of information. Similar conclusions also come from those studies that deal with hashtags used during terrorist attacks (e.g., Gupta and Kumaraguru 2012, Burnap *et al.* 2014, Olteanu *et al.* 2015, Krutrök and Lindgren 2018), which come to define these tools as a space for meaning-making practices (Eriksson 2016). From our scholar's point of view, the pandemic is a disastrous event, the meaning of which is also constructed as it happens, while the Italians talk about it, live it, and try to give meaning to what happens while it happens. The difference with other events is that it is not circumscribed, it does not happen in one place, it spreads, and there is no possibility of feeling safe by changing city or country. So, we work on the idea that an *ad hoc* public has been created around the coronavirus hashtag, which established the use of this hashtag and uses it as "a space, an event and a network" to engage with (Sauter and Bruns 2015, 47). But we also realize the global reach of the event and the impact it produced on Italians, so we look at this flow of communication under the hashtag as a reaction from Italians to the pandemic event. We call them reactions, because as happens in chemistry, the addition of reagents changes the identity of the substances, which in turn are transformed into different substances. The *reactants* here are represented by the introduction of new decrees by the Prime Minister, which modify the substance of the event, as well as the news that passes in the mainstream media, such as the scientific discoveries, which are all *reagents* for us. In fact, having fixed three different observation periods – as shown better in the next paragraph –, we can observe how the content of the reactions changes over time.

2. The Research designs

Work with and on hashtags has grown considerably over the past decade, establishing itself as a new field of study. Here within, it is possible to select three main lines of research: 1. theoretical work on hashtags, 2. fields of application, 3. methodology on hashtags and big data. From the known studies we get some indications on how to set up our methodology.

Within the first group fall the works of scholars who wonder what the hashtag is, and what its function of use is. Recently Bernard in *The Theory of Hashtags* (2019) systematizes the origins and developments of this sign. His volume is a biography of the symbol #, that follows a line of retrospective analysis to define its importance. He defines the hashtag as a *lingua franca* which, starting from the function of thematic aggregator, develops a network of collateral meanings. Taking this extra-network of meanings into consideration, it becomes a polysemic collector (La Rocca 2020), a narrative *topos* within the Apps (Said and Silbey 2018), within which are anchored emotions (Boccia Artieri and La Rocca 2019, La Rocca and Rinaldi 2020), collective responses (Ross 2020), expressions of solidarity and support (Giglietto and Lee 2017), and strategies of inclusion oriented to creating a joint sense of being here together in the community that is formed around it (Kroon 2017). These effects – derived from the use of hashtags – are due to the affordances of the platforms, to the dynamics of digital environments, which allow momentary connectedness, which is a structure of polymorphic computer-mediated sociality that includes transactive as well as non-transactive phenomenological online activity, and which is based on hashtags' projected uptake that is a way of to look at the affordances of acts for future uptake (Rathnayake and Suthers 2018).

The first lesson that we take back from these studies is that the hashtag is a polysemic collector that changes its meaning over time and that contains within itself – when launched – a project uptake. Our choice was to follow "coronavirus", and this turns it into a narrative *topos* within Twitter.

Secondly, Twitter hashtag is a bottom-up user-proposed tagging convention and it also embodies user participation in the process of the hashtag innovation, as it pertains to information organization tasks (Chang 2010) and also to the spreading of activism and participation regarding political and social themes (e.g., Bonilla and Rosa 2015, Rambukkana 2015), or related to the viral phenomenon of racialized hashtags (Sharma 2012) or feminist movements – as #MeToo – (Dobrin 2020). In the study on #MeToo the digital activism and the hashtag's use is read on its cultural importance, emphasizing the symbolic role played by the hashtag in the emerging myth around the movement through its narrative use shaped by the producers (Dobrin 2020). Looking at the hashtag's representation and mechanics under the cultural dimension allow the reading of the hashtag as a cultural object that perpetuates the phenomenon's political agenda in the digital public sphere, and bridges personal and collective experiences at the #hashtag transformation. This is – without a doubt – the fourth era for Twitter and its hashtags.

By here, we draw a second lesson about the method of analysis we need for information mining. An approach capable of bringing out the symbolic space, that is the social representation that the Covid-19 hires through user actions. So, we choose Emotional Text Mining (ETM), (Greco 2016a; Greco and Polli 2020a) that is a particular kind of sentiment analysis based on a socio-constructivist approach, which allows for the identification of the elements setting people's interactions, behavior, attitudes, expectations and communication. Thus, ETM allows a social profiling to be performed. This has already been applied in different fields ranging from political debate, in order to profile social media users and to anticipate their political choices (e.g., Greco *et al.* 2017, 2018; Greco 2019, Greco and Polli, 2020b), to public health (e.g., Cordella *et al.* 2018, Greco and Polli, 2019, Greco *et al.* 2019, Greco and La Rocca 2020), the public perception of acute and media events (e.g., Greco and Polli 2019a, 2020c, 2020d, 2021), education (e.g., Cordella *et al.* 2020), business management (Greco and Polli 2020a, Greco *et al.* 2020), and disability studies (e.g., Greco 2016a, 2016b). In developing the research design, we have considered applications in working with big data and hashtag studies by linking them to our research purposes and to the traits of the pandemic event.

According to Bruns et al. (2016) there are two types of events that generate a large amount of reactions in Twitter's hashtags, such as: "acute events" (from natural disasters to political unrest), and "media events" (from major sports and entertainment broadcasts to election-night political coverage). Due to its characteristics, the #coronavirus falls into the Bruns et al. (2016) "acute events", although it is not possible to define it as such in pure form because the pandemic has certainly become a media event. We therefore found ourselves working with a hybrid hashtag, which in the semantic level is anchored to a disaster, and on a semiotic level it lives off the emotions and sentiments of the Italians, and the continuous relaunch of the pandemic through broadcasting and the series of new policies. We hook the construction of a dataset to three events of phase 1 of the first wave of the pandemic. The data collection is organized around three events characterized by Prime Minister Conte's press conferences:

- March 4th, announcement of the closure of schools and universities and, after, introduction of the lockdown (first time/*corpus* 1),
- March 24th, announcement of the first extension of the lockdown (second time/*corpus* 2),
- April 10th, announcement of the start of the second phase and the progressive exit from the lockdown (third time/*corpus* 3).

The hashtag thus becomes a mechanism to follow the formation of the reactions of the Italians while the three selected events take place. This choice adds a temporal reference to the formation of what we call the

reactions of Italians to events. We make here ours the perspective of Faltesek (2015), which reasons on the temporal question of public hashtags, which exist only thanks to the possibility of attention and recirculation that the event attributes to them. Furthermore, having built a dataset in real time, we add the application of its caveats, namely that "to pay particular attention to the temporality of their circulation as part of an unpredictable flow of messages that is both tightly controlled and beyond control at the same time. This practice of reading, thinking, and engaging must take place in the real time of the researcher inasmuch as the traces left by hashtag are a poor substitute of the phenomena itself" (Faltesek 2015: 84).

2.1 Working with #coronavirus Italy in tweets

Taking into consideration Faltesek's suggestions on the temporal issue and the meanings the hashtag assumes on and off social media, a real-time dataset was constructed. We have worked as Bruns and Stieglitz (2012: 7) already suggest, using *yourTwapperKeeper* (2012; see also Bruns and Liang 2012), which utilises 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, in our case #coronavirus. The tweets were downloaded daily using the *rtweet* package of *R statistics* (v.0.7.0; Kearney, 2020) in compliance with Twitter's Standard Search API policies and parameters. We collected three *corpora* of messages for a period from four to eight days each starting from the day of the Premier press conference. The choice to select three *corpora* is connected to the large amount of messages produced daily and the limitations of our data processing tools. Instead, the variation in the collection times of tweets (between four or eight days) is linked to the increase/decrease in the volume of tweets. The collection of tweets of the first-time is the longest of the three in terms of number of days, it depends on the chase each other of news, press conferences and decrees. In fact, with a first press conference on March 4th, Conte announces the closure of schools and universities, then – in another press conference – announces the national lockdown starting from March 9th.

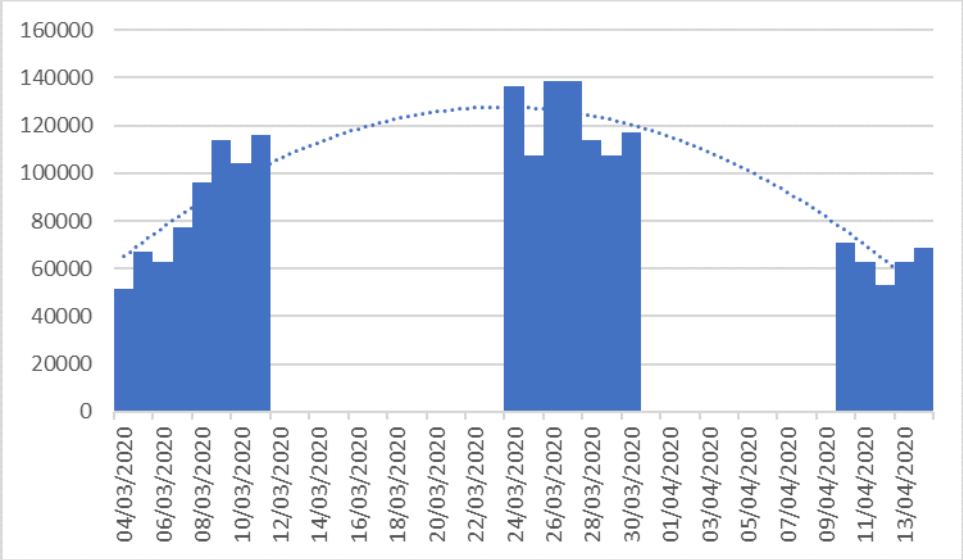
Data collection produced three large size *corpora* for a total of 1,884,670 tweets. The largest of them is the second *corpus* with 46.5% of tweets of the total, then there is the first with 36.6% of tweets, and finally, the third *corpus* with 16.9% of tweets. An unusual large number of tweets given the language (Italian) and the period of data collection: 17 days, with 81% of retweets.

Like Bruns and Stieglitz (2012) explain, a large number of retweets occur when there are natural disasters or crisis events (Bruns and Burgess 2015), and they fall largely into a category which may be best described as "breaking news" or "rapid information dissemination". This high number of retweets can be attributed to a specific conversational practice on Twitter: gatewatching (Bruns 2005). It is the activity produced by citizens in real time of disseminating, sharing, and commenting on the news coming from the media outlets on social media platforms in case of acute events.

In time of crisis, the daily tweet production in Italian language is usually about 20,000 on average and its trendline is a peak (e.g., Greco and Polli 2019a, 2020c) while, in this case, the daily twitter production is 100,000 on average and the trendline has an inverted U-shape with skewness (see figure 1). For these reasons, the total number of downloaded tweets was defined as unusual, like the event that generated them. Indeed, usually there is a fast increase at the beginning with a following slower decrease, and the social media reactions end in few weeks. During the lockdown, there was an initial fast increase, a following steady increase that continued for the whole month, and a slowly decrease the next month. Moreover, the number of daily messages was five time the normal production in time of crisis in Italy.

In fact, the distribution of tweets within the three subsets shows this process of sharing on Twitter the news coming from the external media context. The amount of messages produced every day increased along March reaching its peak at the end of the month and decreasing in the following month (see figure 1).

Figure 1 - #coronavirus trend in the three times



Studies on the spreadability of the coronavirus in Italians' media show the same trend in the television schedule. Scaglioni (2020) analyzed how the trend in the consumption of television programs changes in three different times of phase 1 of the epidemic, starting from 26th February 2020 and ending on 3rd May 2020; a date that coincides with the exit of the Italians from phase 1. The peaks of television consumption selected, are used to identify as there are three different "times of emergency", characterized quite clearly by a different role played by television in narrating and representing the crisis, and by rhetoric that the small screen is able to generate, acting as a relaunch for the hashtag as well. The audience's search for information in television programs is accompanied by the announcements of the Prime Minister, and those of the Civil Protection, following the contagion curve and the announcement of new measures. In the analysis that we propose of the reactions of the Italians on Twitter we follow a procedure of comparison with what happens outside the Twittersphere and which represents a sort of relaunch of the coronavirus hashtag. Following this approach, the highest levels achieved in Figure 1 are to be considered as moments/times in which the hashtag acts as a vehicle for connection between users and for conveying meanings and searching for information. Basically, an expression of feelings and opinions, which are to be contextualized, or to be linked – in their interpretation – to what is happening in the socio-political context.

We can assume that moving away from the "announcement times", the virality of the coronavirus is affected by a decrease, and then it can go up again following new announcements; although it is not possible to see this trend in Figure 1.

This specific trend in message production could be also related to the lack of symbolic categories underlying people's emergency coping strategies. Italians begin to perceive themselves as at risk in the same way as when natural calamities fall upon them; disasters due to climate change, consequences of nuclear technologies and biotechnologies, deficiencies in the protection of public health, and last but not least, fundamentalist terrorism.

3. Methods and data results

To extract information from the data and find answers to our research questions, we have followed these working steps for each of the three *corpora* (*corpus* 1, *corpus* 2, *corpus* 3).

1. We cleaned the messages keeping only the text and removing the links, emails, emojis, and emoticons. Then we removed from the *corpora* the retweets and the messages with less than 9 words.

2. We calculated two lexical indicators, the type-token ratio (TTR) and the percentage of hapax (H), to check whether it was possible to statistically process data (Giuliano and La Rocca 2010).

3. Each *corpus* was lemmatized, filtering out stop words, the term "coronavirus" and terms of the low rank of frequency to reduce the matrix-dimension.

4. 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 (Steinbach *et al.* 2000, Savaresi and Boley 2004).

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

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

7. The sentiment was calculated according to the number of messages classified in the cluster and its interpretation (coronavirus' representation) (Greco *et al.* 2017).

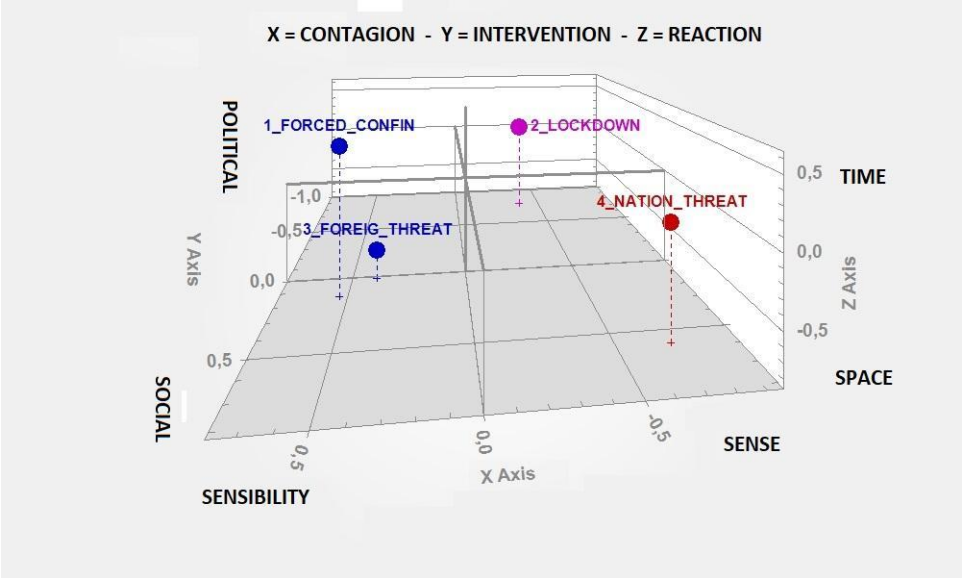
Thus, the interpretation process proceeds from the correspondence analysis results (semiotic level) to the cluster analysis results (semantic level). It is interesting to point out that this is an inverse process of social mental functioning, that goes from the semiotic level to the semantic one in generating the text (Laricchiuta *et al.* 2018, Greco *et al.* 2020).

3.1 Exploring correspondence analysis results

The *corpus* preprocessing reduced the three *corpora* to almost 15% of messages resulting in three large size *corpora* of almost two million tokens each (token 1= 1,991,942; token 2= 1,922,844; token 3= 1,526,210). Based on the large size of the *corpora*, both lexical indicators highlight their richness (TTR = 0.04 on average; H = 51% on average), indicating the possibility of proceeding with the statistical analysis. The results of the cluster analysis show that the term selected ($terms_{corpus\ 1}$ =814; $terms_{corpus\ 2}$ = 749; $terms_{corpus\ 3}$ = 739) allowed for the classification of 92.5% of the tweets on average and the clustering validation measures showed that the optimal solution were four cluster for *corpus* 1 and 2 and five clusters for *corpus* 3. Then, the correspondence analysis detected three factors for *corpus* 1 and 2, and four factors for *corpus* 3, of which the first three factor explain 82% of the inertia.

In Figure 2, 3, and 4, we can appreciate the symbolic spaces of the Covid-19 emerging from the Italian tweets during the first wave of the lockdown. They show how the Covid's representations (clusters) are placed in the symbolic space.

Figure 2 – Symbolic space after Conte's announcement of the lockdown on March 4th (*corpus* 1)



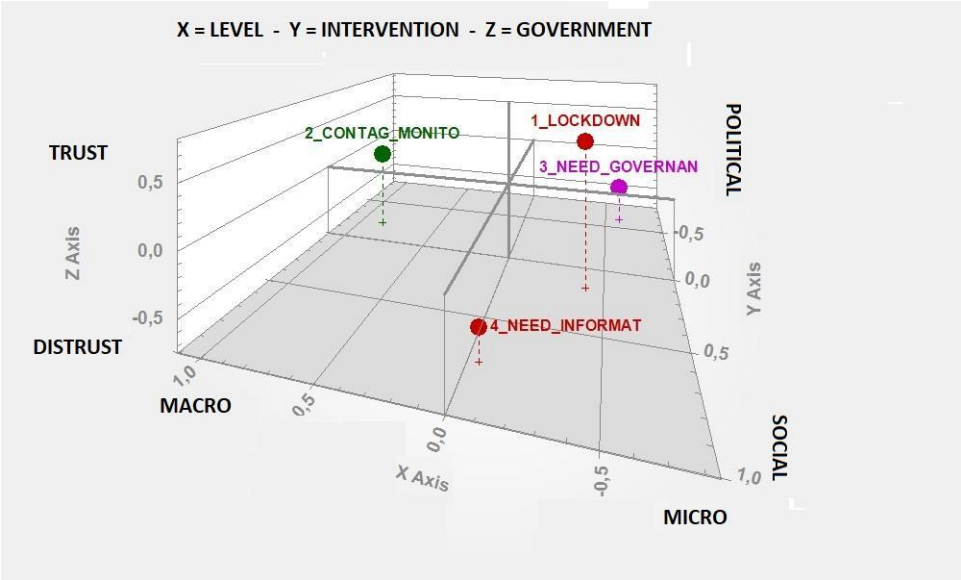
As shown in the figure 2, Twitter users symbolize the Covid-19 by means of three main dimensions at the beginning of the lockdown: contagion, reaction, and dimension. The first factor (43.3% of inertia) distinguishes two opposite ways to perceive the contagion: using rationality ('sense') to face the emergency (negative pole), and using sentiments ('sensibility'), through reactions mostly guided by emotions, such as fear (positive pole).

Not surprisingly that the first reaction of people to the pandemic threat is to fight or flight: that is an automatic and physiological reaction to an event perceived as stressful and frightening. Relying on the senses means to be prepared for the fight, while focusing on the negative emotions prepares for the flee.

The second factor reflects the reactions: distinguishing the political reaction, aimed to face the pandemic threat, and the health monitoring (35.2% of inertia) aimed at dispatching the daily bulletin of the virus spread and its victims. The third factor (21.5%) sets the space-time dimension of the pandemic spread. While the negative pole focusses mostly on the geographical spread of the virus, the positive poly reflects the time progression of the spread. The three factors define a three-dimensional space which is not entirely occupied by the cluster. In fact, each cluster is explained only by two factors. We can find this specific configuration of the factorial space when people's lives are threatened. This phenomenon is known, for example, in surgeons who must at the same time take care of the patient and destroy the disease (e.g., Greco 2016b). Keeping the reason and the emotion distinctively separated help people in coping with the threat, being able to think rationally but feeling frightening emotions at the same time. This distinction is detectable in the text as words associated with rational thinking are not associated with emotional ones, and vice-versa. Within this factorial plan, topics and sentiment related to the pandemic begin to rise [RQ1].

The unexpected increase in the social media messages around the topic of Covid-19 has probably played a role in the construction of new symbolic categories that appears in the following periods. After the press conferences announcing the first lockdown extension on March 24th, the ETM shows a different set of symbolic categories: the level (47.1% of inertia), the intervention (29.3% of inertia), and the government (23.6% of inertia) (see figure 3). The attention and reactions of the Italians begin to change; here we have a first breaking point. The first factor distinguishes between the macro impact of the pandemic (negative pole) from the micro level (positive pole). The second factor distinguishes the political (negative pole) and the social intervention (positive pole).

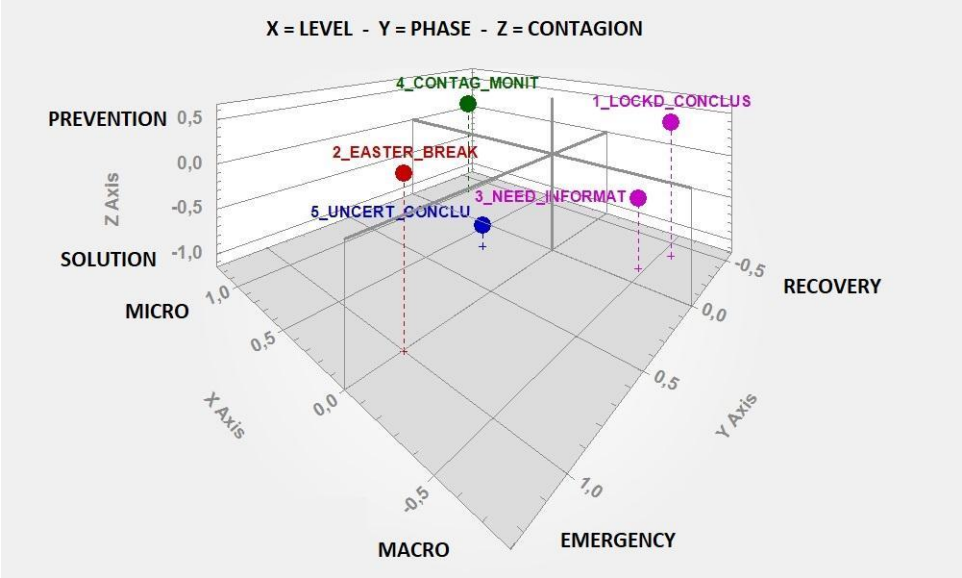
Figure 3 - Symbolic space after the press conferences announcing the first lockdown extension on March 24th (*corpus* 2)



At the beginning of the lockdown, the politicians were symbolized as immune while the people were represented as prey, as the former were symbolized as empowered and decision makers while the latter were represented as passive victims of the virus who need to remain at home. At the end of March, the people assume a more active positioning, particularly engaging in promoting information. A feeling of coping with the pandemic advances, as consequent reaction to the impact associated to this event of crisis and rupture with the daily flow of existences. The third factor focuses on the distrust (negative pole) or trust (positive pole) in the government. Twitter users seem to be divided over the news of the extension of the lockdown, as some enthusiasts identify the government as responsible for the persistence of the threat. Here emerges a central element in the management of the crisis linked to the trust that is necessary to place in those who lead the country but which, at the same time, can fail [RQ2]. In fact, the trust in the communication of the institutional source, represented here by politicians, refers to the citizens' expectation that the message received is true and reliable (e.g., Renn and Levine 1991), and that the communicator demonstrates competence and honesty, transmitting accurate information and in time, so that those who receive them can adapt their behavior.

The second lockdown extension on April 10th led to a symbolic space like the previous one. The general dimensions setting the symbolic coordinate of sense-making are the level (38.2% of inertia), the phase (23.6% of inertia), and the contagion (20.5% of inertia) (see figure 4). The first factor distinguishes between the macro and the micro level of virus' impact as on the end of March. Nonetheless, the second factor reflects the idea that a recovery is possible, and that people are out of the woods on one hand (negative pole), and on the other hand, it reflects the idea that the emergency is still ongoing, counterposing optimists and pessimists. This distinction between optimists and pessimists lasts also in factor three, which symbolizes the contagion as solvable (e.g., vaccine or cure) (negative pole) or just as preventable through the reduction in social interactions and the use of barriers (e.g., mask).

Figure 4 - Symbolic space after the second lockdown extension on April 10th (*corpus* 3)



4. Discussion and conclusions

The results of the cluster analysis showed that the selection of 767 on average terms allowed for the classification of 93% of the messages on average (see table 1). Two main dimensions characterize the governance of the Covid-19 pandemic: the defense and the protection from the contagion and their consequences. Unsurprisingly, sentiment is overall negative, except in April, following the lockdown, where 24% of messages are positive [RQ1]. Italians have expressed a sentiment of fear of Covid-19 and their first reactions on Twitter are all aimed at safety and health, accepting restrictive policies, and not developing an antagonistic debate on them. [RQ2].

The analysis of clusters and the sentiment associated with them allow us to answer our first research question: What were the actors, the topics and the sentiment of the online reactions related to the pandemic on Twitter in relation to the choices of the government? [RQ1].

By looking at the actors, the topics and also the moods of communication, we can highlight that the topics connected to Covid-19 are in the first period focused on: the forced confinement (30%), the lockdown (23%), the contagion and the foreign threat (24%), the national threat and the red zone (23%). The forced confinement focused mostly on the need to stay at home, which is an Italian choice encouraging other citizens to do the same.

The forced confinement is not exclusively linked to the externalization of a voluntary choice in terms of security. It comes from external choices, such as the introduction of the containment measures of the Prime Minister's decrees, and its echo in the tweets is linked – nevertheless – to the social communication campaigns activated by the Ministry of Health and the Department of Civil Protection "Leave the virus out the door", which linked to its launch the hashtag #iorestoacasa (#stayathome). A hashtag, a segment that is repeated 4,211 times within the tweets classified in this cluster. This mechanism of joining a hashtag to the communication campaign, in turn activates a joint narrative mechanism of two *topoi*: #coronavirus plus #iorestoacasa, which attributes an – additional – connotation to the #coronovirus. The operating mechanism seems to be this: the

social communication campaign points out a way to reduce the contagion by staying at home; the word "home", within the tweets collected in this cluster, is the first with a weight of 5,003. This is a solution to defend oneself against the coronavirus; when users find themselves typing "coronavirus", it is now possible for them to indicate a solution or defense strategy. Having to stay indoors, Italians dedicate themselves to "watching" (485[1]) "TV" (437). This activity is also reported within the next cluster "lockdown", where it appears as a "rewatching" (106) of "programs" (105).

Table 1 – Cluster analysis results and sentiment

Time	*Cluster*	*Tweet*	*Tweet %*	*Label*	*Sentiment*
From	1	23,717	29.5	Forced confinement	Negative
March 4th, 2020	2	18,780	23.3	Lockdown	Negative
To	3	19,332	24.0	Foreign threat of contagion	Negative
March 11th, 2020	4	18,740	23.2	National Threat: the Red Zone	Negative
From	1	26,007	28.3	Lockdown	Negative
March 24th, 2020	2	26,468	28.8	Contagion monitoring	Negative
To	3	20,566	22.4	Pandemic governance	Negative
March 27th, 2020	4	18,797	20.5	Need for information	Negative
From	1	16,921	23.9	Lockdown conclusion	Positive
April 10th, 2020	2	12,589	17.8	Easter tradition breakdown	Negative
To	3	18,848	26.6	Need for information	Negative
April 14th, 2020	4	13,956	19.7	Contagion monitoring	Negative
	5	8,492	12.0	Uncertain conclusion	Negative

2020-03-10 Tweet: *homework takes any notebook and fill it as it used to be 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 home coronavirus* (score[2] = 51,591.23).

The Lockdown cluster brings together other reasons related to staying at home, which account for the closure of production activities, gyms, schools decided by the Government.

2020-03-04 Tweet: *the government has ordered the closure of schools and universities from tomorrow until March due to the coronavirus emergency and a complicated moment let's try to remain calm and take the precautionary measures that advise us, we will come forwardmontemarano* (score = 11,401.96).

In the cluster of the "Foreign threat of contagion" the guilty was identified: people perceived the need to preserve themselves from the invasion of a foreign threat. Here appears the "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 evoked anger and helplessness, but it also introduces the possibility of starting to

[1] The value reported in brackets refers to how many times the "word" occurs in the tweets classified within the cluster.
[2] The score is equal to chi-square of the term (i) in the text (j) classified in the cluster (k); nj= total number of terms in the text (j) classified in cluster (k); Nk= total number f terms in cluster (k) (Lancia 2018).

take care of the family, of one's home, being obliged to remain within it with one's family. To rethink the economy and the nation. A sort of break, a break from the known world, a suspension suited to reflection.

2020-03-04 Tweet: *they told us hug a Chinese eat Chinese they are not the virus we are all Chinese now among us Italians we cannot even shake hands anymore novababe coronavirus madness* (score = 5,851.40).

2020-03-06 Tweet: *with the coronavirus it is an excellent opportunity to understand how much we are still able to walk with our legs take care of our home our family our work our economy our country a bit of healthy selfishness if we are the better, we are all better off* (score = 10,447.90).

The cluster of the national threat highlight the need to identify and demarcate the Red Zones. This is the time when the virus takes hold in the country. The "positive" (2,899) "cases" (2,123) become the tangible sign of this pandemic in Italy. It is a passage from a threat perceived as 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 broadcast of the reportage of TV La7 in the *Piazza Pulita* program "Coronavirus, inside the intensive care unit", which accompanies us towards a redefinition of the situation (episode of 5th March 2020). The echo of this emerges from the word's "therapy" (896) and "intensive" (845).

2020-03-06 Tweet: *coronavirus latest news ICU patients increase new infections healed and deaths tomorrow evaluation of other red areas coronavirus latest news* (score = 21,140.42).

It is only in the second period, when the extension of the lockdown is announced, that two new topics emerge: the governance of the pandemic (22%) and the civil society's reaction seeking for information (21%). While the lockdown (28%) and the contagion monitoring (29%) remain almost unchanged.

Hence, the first answers to our second research question: Do online reactions on Twitter reveal acceptance and respect for restrictive measures, or do they trigger an antagonistic debate on them? [RQ2].

The governance of the crisis becomes relevant only over the course of time, when the fear allows for further consideration about the political, economic, and social consequences of the pandemic. Time marks a difference in the perception of Italians and their reactions on Twitter. Time-elapsed with respect to the introduction of the lockdown, time-uncertain about the end of the lockdown, time-of metabolization with respect to an unexpected event that bursts into everyone's lives and marks a breaking point.

The lockdown cluster focuses on the governance of the crisis which is now beginning to be criticized and brings out some weaknesses of institutional communication and the figure of the Prime Minister. These are the anticipations of possible new closure measures, which are chasing each other in the mainstream and social media, even before being officially communicated to citizens. People, on the other hand, await – closed at home – the press conferences of Conte, which are subject to constant postponements. It is these elements that a crisis undermines the trust that citizens place in those who govern them.

2020-03-24 Tweet: *coronavirus in viral transmission another draft of another government decree law that overlaps the first on a health emergency the second on a fiscal emergency and on an economic emergency not to be confused with the dpcm which are administrative acts* (score = 7,721.66).

2020-03-26 Tweet: *emergency a recurring word that never leaves us emergency debt public emergency immigration emergency coronavirus always late unprepared an Italy that lets itself be overwhelmed by the events it must chase Italians deserve more deserve serenity* (score = 10,142.16).

The contagion monitoring, a cluster that remained almost stable over all the lockdown highlighting the constant need to know the impact of Covid-19. It is characterized by words like: "positive", which occurs 5,813 times, "dead" (5,013), "cases" (3,781), "contagion" (2,612), "death" (1,582), "update" (1,194), "tampons" (1,176), and "bulletin" (956).

2020-03-24 Tweet: *coronavirus update italy new cases and new deaths spain new cases new deaths germany new cases new deaths uk new cases new deaths stay calm* (score = 108,836.49).

In the cluster of the need for pandemic governance, people were aware of the economic impact that the lockdown would produce and started to talk about the possible solutions. This is where the awareness emerges that the pandemic is not just a war on the virus because the pandemic is a triple-crisis: economic, political, and of public health.

2020-03-26 Tweet: *coronavirus conte promises no less than billions of euros to families and businesses this morning, premier giuseppe conte spoke to the senate to begin presenting the next economic decree what it should guarantee* (score = 10,649.58).

The need for information cluster highlights the need to access information to understand the reason for the pandemic, the cause, the treatment, and its impact the origins of the virus. This cluster talks about the places and actors from which information would be expected. They are the "doctors" (1,693), the "mayors" (1,209), the "hospitals" (1,125), the "laboratories" (858), the "sick" (701), "China" (641), and for Italy "Bergamo" (639), the city that becomes a symbol of the need to understand what was happening.

Within this cluster there is the "Leonardo" program TV (834) and the "tgr" (440), which tell us about how an old television report from 2015, on a virus created in the laboratory, is relaunched by social media, and attract attention by generating disinformation.

The infodemic exacerbates the need to obtain information from reliable and credible sources. As other studies have shown (Lovari 2020), we are facing a progressive erosion of trust in public institutions and a general state of information crisis in health and science, which required and still requires a joint effort between the Ministry of Health and platforms, in order to mitigate the spread of disinformation and to offer updates to the online public.

2020-03-25 Tweet: *from tgr leonardo rai three of the report on a super pulmonary virus coronavirus created by the chinese with bats and mice very dangerous for man tgr leonardo via youtube* (score = 9,654.91).

2020-03-26 Tweet: *Coronavirus quarantined staff elderly alone in the nursing home the mayor without food via republica* (score = 8,973.06).

In the third time, doubt arises about the possible end of the pandemic (the lockdown conclusion 24%); the doubt of resolving the pandemic (12%), and, above all, the breakdown with daily life and popular traditions becomes tangible (the breaking of Easter traditions 18%). Important information for the governance and the analysis of the Covid-19 crisis comes out by looking into two clusters, whose presence remains unchanged over time: the contagion monitoring and the need of information. We find here another group of actors [RQ1], the politicians, such as: "Conte" (2,931), and "Salvini" (1,163); and institutions: government (1,525), and "Europe" (619). And then, next to each other, "quarantine" (1,360), "May" (1,277), "reopen" (799), "crisis" (763). Here are four simple words that tell the emotional swing of Italians.

In the lockdown conclusion cluster, Italians are coming out of the lockdown and are divided on the evaluation about the choices of the government and the opposition, especially for what concerns the economic sector and the conduct of political leaders.

Italians are torn between a feeling of liberation and one of uncertainty about what their life will become. It is an uncertainty that is also expressed by workers in the most affected sectors, and who are now subjected to new restrictions and containment measures that force them to rethink their business. This is, for example, the case of workers in the catering and entertainment market.

2020-04-10 Tweet: *coronavirus count measures extended until may task_force of experts for the eurogroup phase step forward but insufficient on mes salvini and meloni lie and weaken italy in the EU in fattoquotidiano* (score = 9,265.63).

The cluster of the Easter tradition break highlights how Covid-19 does not only affect the health, social, political, and economic dimensions, but it forces Italians to give up their traditions.

2020-04-12 Tweet: *once at easter the easter eggs were received and opened today the masks are received and opened happy easter to all easter easter stayathome holyeaster easterathome coronvirusitalia covid italy covid italy covid coronavirus* (score = 21,448.31).

In the cluster of the need for information, the messages focus on the social aspect. It seems clear to the Italians that everything will be different; however, reliable information does not arrive regarding the variation in daily life of this diversity. Italians are told that they must learn to live with the virus, but how this then translates into daily routines is unclear. It is certainly indicative of the moment of madness and the consequent need to obtain information from some political or scientific source, the first position that within this cluster ordering occupies "why" (2,040), followed by "virus" (1,146). It is along this line of interpretation, marked by the search for an anchor, that the high presence in the tweets of this cluster of the verbs "think" (922), "speak" (847), and "understand" (725) must be read. As in a stream of consciousness, or in a process of reconstructing the latent demand from these tweets, the receivers of the "why" emerge, represented by the "world" (505), "WHO" (303), "public health" (290), "Roberto Burioni" (216), "Germany" (189), "Conte" (181). National and supranational institutions represent here another class of actors that emerge from the tweets.

2020-04-13 Tweet: *when we go back to a restaurant it will be different and it will be not_only because of the distances because we will be different and because this phase will leave us with a huge responsibility to always have to look around even when we sit at a coronavirus table stayathome* (score = 2,951.57).

The contagion monitoring is a topic that remains all through the lockdown: the contagion bulletin broadcasted information on the progression of the pandemic. The words most associated with this cluster do not change much compared to the second time, as they follow one after the other: "new" (3,569), "positive" (3,377), "cases" (2,928), "April" (1,932), "contagions" (1,819), "death" (1,627), "heal" (1,465), and "dead" (1,404).

2020-04-12 Tweet: *victims and healed new cases the point yesterday total positive total swabs total dead total healed of which totally healed and clinically healed the division by province province of nap* (score = 41,565.76).

The cluster of the uncertain conclusion is the smallest one classifying only 12.0% of messages. While the lockdown could have an end, the idea remains that the fight against the virus is not finished yet.

2020-04-14 Tweet: *coronavirus blitz by the financial police at trivulzio are the dead between the pious hotel and via repubblica historical appeals still starts from trivulzio* (score = 14,215.18).

The discussion on twitter focused mostly on the government decision and on the spread of the contagion. A variety of social actors are associated to the Covid-19; they are Italian politicians, national and supranational institutions, other European states, doctors, scientists, all those who – for various reasons – are called and are perceived as those who must give an answer to the crisis and uncertainty. The national sentiment seems to have played a relevant role in allowing people to face the first phase of the Italian contagion. During the lockdown, many messages concern the government, which most of the time is perceived as reliable (Greco and La Rocca 2020), but slowly this reliability is scratched by uncertainty and the succession of often conflicting voices of politics and science.

4.1 Conclusions

The pandemic represents for Italians a moment of rupture with everyday life and assigns an onerous task to both politicians and citizens: to live the crisis, manage the crisis, and lead the crisis. Morin defines what we are going through as a triple crisis: 1) biological and linked to the pandemic that threatens our lives, 2) economic and born from restrictive measures and 3) civilization, with the abrupt transition from a civilization of mobility to an obligation of immobility (Scialoja 2020). This last dimension, represented by the persistence of the topic lockdown, is at the center of the data collection and analysis we have carried out. Investigating the reactions of Italians on Twitter to the lockdown implied viewing it as an acute, long-lasting, and bottom-up event.

The hashtag #coronavirus was chosen as a mechanism for revealing and tracking the evolution of Italian reactions and made it possible to follow the evolution of the meanings attributed to the state of pandemic. This path-analysis took into consideration the emergence of three times that characterized the Italian lockdown and the hashtag #coronavirus (the announcement of the closure of schools and universities and, after, introduction of the lockdown, its extension and the announcement of the exit from the lockdown).

The three selected times allow us to follow the changes in mood and the shift of interest of Italians on various topics related to the pandemic. A more in-depth analysis of the content of the clusters offered us the further possibility of identifying the moment in which the attitude of Italians changed on Twitter, starting from the second observation time (*corpus* 2). According to the public opinion expressed on Twitter, this is a moment in which the political processes that characterize the pandemic governance escape, the control of the actors who are responsible of them. The speed with which topic reactions within Twitter conversational flow change marks them as instinctive reactions. The instinctive reactions also tell us about the gatewatching mechanism that is activated on social media, as a reflection of what has passed on TV. In fact, TV seems to go back to the times of the *powerful media*, and audiences react to the decrees and bulletin updates as if they were a magical bullet for them.

Instinctive-reactions give voice to the search by Italians for a capacity/competence, not yet found, to handle the emerging new meanings/symbols necessary to build networks of relationships. The lockdown forces us to deal with already acquired beliefs, attitudes, values, and their holding in the pandemic, and the sense of

dynamic density collapses (Durkheim 1893). It is a systemic breakdown, which reactions try to shape. It is a government of the crisis of social relations and identities that emerges from these online reactions.

Two explanatory-dimensions are pulled out of our analysis:

- the lockdown, which is an external consequence that is imposed as a defense system against contagion;
- the breakdown, which is an internal consequence that emerges as a secondary effect of the lockdown.

Along these two dimensions, information is organized to answer our research questions.

The actors and topics that occupy the discussion space on Twitter and that are configured as elements emerging from the factorial space, are represented first by Covid-19, then by politicians and scientists. In the three times, Covid-19 moves from being an invisible enemy to a visible one; it is a change in the processes of signification represented by the evolution of the factors, for which we first have the contagion, then the reactions and interventions, the government and the phases (entry and exit from lockdown) [RQ1]. It is a process which, analyzed diachronically, allows us to follow the evolution of the perception that Italians have had of an event that has upset their lives. If in the first period, the fears and reactions are related to the contagion and consequently to the methods of transmission of the infection by expressing interest in public health, then they begin to move towards the issue of lockdown and breakdown. These last two aspects, it is the case to specify, are not related to the loss of individual freedoms as a political-social claim. The lockdown of the first pandemic wave is perceived as necessary although it brings upheavals. Furthermore, the methods of communicating data on infected, hospitalized, deceased with the note at 06.00pm on the national network – as war bulletin – have sharpened this perception and made the lockdown an accepted necessity. In online reactions there is no trace of an antagonistic debate to the lines of government, if anything, in the last period, there is uncertainty regarding what will come [RQ2].

The breaking points with the daily routine are chasing each other in the analysis of the clusters; they are represented by: the forced need to stay at home, the change with the acquired lifestyles, the renunciation to Easter traditions and May 1st trips, the entry into phase 2 which cannot be experienced as a return to life before the pandemic. Although the Italians have shown to be aware of the need to interrupt their everyday life, they have found themselves projected into a transformation of their own experiences and daily life because of the delicate emergency phase.

It is here, in this uncertainty, that the request for the monitoring of the contagion, the governance of the pandemic and information arises. These are elements that emerge following the announcement of the first extension of the lockdown and that allow us to evaluate the tone of voice of the reactions, accompanying it with sentiment analysis [RQ1]. Although sentiment is negative – after all, the pandemic does not have many positive implications – the demands that come from below are practical demands on how to cope with individual and collective economic collapse. The request is plane: give the much-announced economic aid. Political leadership is required for far-sightedness and identification of development trajectories, overcoming bureaucratic barriers. These three clusters represent a constant until the end of the periods examined here, but we know well that they are still persistent today in the midst of the second wave of the pandemic in Italy.

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