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AUTHORIZED TWITTER VOICES DURING THE COVID-19 PANDEMIC: ACTORS, VOCABULARY, AND FEELINGS AS AN INTERPRETIVE FRAMEWORK FOR ORDINARY USERS

Voces autorizadas en twitter durante la pandemia de COVID-19: actores, léxico y sentimientos como marco interpretativo para usuarios ordinarios

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Abstract

This work addresses the communicative role of authorized voices on Twitter during the COVID-19 pandemic and their interaction with ordinary users. They are defined as public profile users who have a big number of followers, and whose messages are massively disseminated on the platform by ordinary users. A set of tweets was collected over two months through the Twitter API, and then a subset of data was formed with the tweets replicated more than 100 times. Labeling, data mining, and sentiment analysis techniques were applied to it. It is observed that the interpretive framework of the pandemic is modeled by the media, although there are perceptions of ordinary users about the pandemic as a time of economic, health, political and personal crisis that are not present in the authorized voices. It is concluded that the media and front-line government officials are the ones that achieved the greatest adherence and amplification of the word by ordinary users, although there is a significant gender gap between the voices of men and those of women.

Keywords: Confinement; Coronavirus; Covid-19; Gender; Government; Health; Health Crisis; Media; Pandemic; Twitter.

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Resumen

Este trabajo intenta comprender el funcionamiento de las voces autorizadas en Twitter durante la pandemia de COVID-19 y su interacción con los usuarios ordinarios. Se define a las voces autorizadas como usuarios de perfil público que poseen gran cantidad de seguidores, y cuyos mensajes son diseminados masivamente en la plataforma por los usuarios ordinarios. Para ello se recolectó un conjunto de tuits a lo largo de dos meses a través de la API de Twitter, y luego se formó un subconjunto de datos con los tuits replicados más de 100 veces. A este subconjunto se le aplicaron técnicas de etiquetado, minería de datos y análisis de sentimientos. Se observa que el marco interpretativo de la pandemia se encuentra modelado por los medios de comunicación, aunque existen percepciones propias de los usuarios ordinarios acerca de la pandemia como un momento de crisis económica, de salud, política y personal que no se encuentran presentes en las voces autorizadas. Se concluye que los medios de comunicación y los funcionarios de gobierno de primeras líneas son los que lograron mayor adhesión y amplificación de la palabra por parte de los usuarios ordinarios, aunque se observa una brecha de género importante entre las voces de los hombres y las de las mujeres.

Palabras clave: Confinamiento; Coronavirus; Covid-19; Crisis Sanitaria; Género; Gobierno; Medios; Pandemia; Salud; Twitter.

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1. INTRODUCTION

Since COVID-19 spread, first in Europe and then in America at the end of February 2020, social networks have played an important role both in the construction of public opinion and in the distribution of information produced by the media, government agents and other public figures. The Twitter platform plays a fundamental role in this case, as it had already done in the dissemination of information during other pandemics, such as Ebola and influenza A H1N1.

The emergence and spread of the disease COVID-19, also known as "coronavirus", especially in the initial stage of the pandemic, caused uncertainty worldwide both because of its high contagiousness and because there was no vaccine or palliative treatment. Therefore, governments around the world decided to take measures to reduce social contact and thus reduce contagion. Added to these two conditions is the lack of knowledge of the world's population about the modes of contagion, prevention and effects of the disease, as well as the uncertainty about the global economic situation caused by the measures of social isolation and the changes in daily life produced by the

transfer of central activities of social life, such as education and work, to the domestic sphere. This disruptive situation at various levels of social life led to a demand for information on the subject. Different reports show that, since the appearance of the first cases of coronavirus in Europe and America, the consumption of news, focused on those produced by renowned traditional media, grew significantly (El Universal, 2020). Digital media, portals, apps and social networks functioned as the main access to such news (Victoria-Mas, 2020). According to the Reuters digital news consumption report, more than half of global respondents have accessed news about the pandemic from social media (Newman et al., 2020).

Without denying the main role of social networks as disseminators of information produced by the press media, we understand that social platforms also fulfill other functions in the current media scheme, as is the case of Twitter. The existing literature points out that Twitter is used as a platform where users share their opinions on various issues, as what Castells (2012) calls mass self-communication; while also disseminating the messages produced by authoritative voices, defined as public profile users who have many followers follow a few, so that their messages have a greater chance of spreading. Politicians, *influencers* and media accounts, among others, have these characteristics (Calvo and Aruguete, 2020).

2. OBJECTIVES

This paper first attempts to understand the functioning of authoritative voices on Twitter during the COVID-19 pandemic. We propose to identify them in relation to the activation of their messages through the diffusion in terms of retweets and the adhesion in terms of favorite marks they receive from ordinary users, and then aggregate them according to their social and communicative function, also taking into account their distribution with respect to the gender variable. Secondly, we seek to determine to what extent the two communicative spheres that converge on Twitter, that of authoritative voices and that of mass self-communication, relate to each other. To do so, we studied, from a lexical analysis with text mining, the messages issued by the authorized voices, and then we contrasted them with those issued by ordinary users.

In a previous article (Cebral Loureda and Sued Palmeiro, 2020) we studied the daily experience of the pandemic in Spanish Twitter users based on a set of 231372 tweets collected between March 19 and May 23, 2020. In that study we performed a lexical and sentiment analysis from which it was possible to reconstruct a collective perception of the pandemic as well as its temporal evolution throughout the indicated period. On this occasion we constructed a dataset from the same base formed by the tweets that have been retweeted more than a hundred times, which gave us a total of 451. A subsequent verification of the Twitter profiles of the users who had produced them led us to identify them as authoritative voices, mainly because of their membership in the media, politics, government and social activism.

3. PREVIOUS STUDIES

The relationship between information dissemination on Twitter and states of emergency caused by diseases has been studied in recent years mainly in reference to the Ebola virus and influenza A H1N1, from the field of the interrelation between health and media studies. In addition, during the year 2020, some articles have been published on the same topic but with reference to the new coronavirus. Given the purpose of this paper, this state of the art will be mainly oriented to identify pre-existing works that refer to the role of authoritative voices and the media in the aforementioned contexts.

Percastre-Mendizábal et al. (2019) study the communicative management on Twitter of Spanish officials and media during the Ebola pandemic declared in 2014. The authors highlight the relevance that traditional media acquire in the dissemination of information on the platform and highlight the scarce participation of media and institutional actors in the communication of information about the pandemic. Towers et al (2015) address the relationship between media, digital media and user behavior also during the Ebola pandemic, but in the United States. Despite the fact that in that country the level of contagion was close to zero, the authors register a high level of activity on Twitter and Google, related to the amount of information that the news provided about the virus. The authors note that when the quantity increases, so does the search data on digital platforms and, conversely, when it decreases, so do digital queries and searches. They conclude that traditional media coverage determines audience concern. On the other hand, Roy et al. (2019), carry out an analysis of the attributions of responsibility for the spread of the disease towards certain social actors, such as the government, migrants, the media, the inhabitants of a territory with infected people or global health authorities. Although focused on a specific topic, the article finds patterns that shape the interpretative frameworks of network users in the face of the epidemic.

With regard to the COVID-19 epidemic and the production of messages discriminated by actors, Rufai and Bunce (2020) analyze the use of Twitter by political leaders who are part of the G7 in the context of the pandemic. Their content analysis revealed three types of use: informative, which was the predominant one, moral reinforcement of the population, and political discussion that seeks to raise points of debate, which is mainly in the case of the president of the United States. For Kullar et al. (2020), Twitter has a main value in disseminating health messages to both medical professionals and the general public, and both in the current situation and in the past pandemics of avian flu in 2009 and Ebola in 2014. Regarding the gender variable, Thelwall and Thelwall (2020) conduct a comparative lexical study between women and men. They conclude that while sport and politics are associated with men, social distance, home and family are associated with women.

The first studies about COVID-19 in social media were produced in China. Two of them are related to this study. On the one hand, Gao et al. (2020) relate exposure to social networks with states of anxiety and depression; on the other hand, Han et al. (2020) perform a classification of content and sentiment of messages produced on the microblogging network Sina Weibo during the first stage of the pandemic. In contrast to

the previous study, the authors made a classification of topics and subtopics most frequently referred to by users of the social network, including recommendations for social isolation, blessings and prayers, objective comments on the disease, protective measures or willingness to return to work, among others.

The works reviewed recognize the role of Twitter for the dissemination of relevant public information in times of health crisis, while contemplating the platform as a space for expression and construction of meaning on public issues. This paper aims to contribute in that direction, understanding the platform primarily as a space for the dissemination of public messages, but also as a space where ordinary users can construct meaning around the coronavirus pandemic.

4. METHODOLOGY

The data for this study were obtained through the Twitter API (Application Program Interface) between March 19 and May 23, 2020. A set of 231372 tweets containing the word "coronavirus" was collected, avoiding the collection of retweets. Methodologically, a subset of that same database was constructed with the 451 tweets that have been retweeted more than 100 times. Although this subset is small, it should be noted that the sum of their retweets amounts to 358089 and that they received 1051717 marks as favorites. This shows that, on the one hand, the level of involvement of users regarding these messages is high; and on the other hand, that, quantitatively, the amplification of voices is greater than the expression of ordinary users. Of the selected subset, 50 tweets have received more than one thousand retweets, and 400 have received between one hundred and one thousand retweets. Only 8 tweets received more than 10,000 retweets. Manual tagging, statistical analysis and text mining techniques were applied to this subset with RStudio, an integrated environment for handling R programming language commands.

Previous studies confirm that Twitter functions as a site where the voice of authorized users is amplified as an echo chamber, as well as a space where ordinary users are integrated into the public conversation through the use of hashtags and the following of public figures and media (Kwak et al., 2010, Colleoni, et al. 2014, and Burgess and Baym, 2020). These two communicative spheres converge from the *engagement* that ordinary users establish with authorities, expressed in retweets and favorites (Rogers, 2018).

Moreover, recent research considers that the action of retweeting contains a communicative intention that implies, from the point of view of the message, an agreement with what is transmitted, as well as an emotional concordance with the content of the message. The convergence between the publications of authoritative voices and their replication and adherence by ordinary users implies that social networks function as something more than the gateway to the news of the journalistic medium or government decisions: the messages of authoritative voices constitute a framing that contributes to constructing meaning about a public event (Calvo and Aruguete, 2020). Consequently, we consider in this paper that the number of times a

message is retweeted or marked as a favorite does not have to do with the veracity, importance or success of the message, but rather responds to a certain social interest (Rogers, 2018) and an implicit agreement with what is expressed.

To process the information contained in the database, the manual tagging technique was combined with automatic techniques for the discovery of new information. The former allowed us to organize ten categories of users according to their social function, depending on whether they were media, government officials, politicians or *influencers*, among others. On the other hand, based on pre-existing studies that point out gender gaps for authoritative voices in the media (Vega Montiel, 2014 and De-Miguel et al., 2017) as well as in political and government bodies (Camarena et al., 2015 and Ceciarini, 2019), we labeled the tweets in relation to the gender of their issuers. In order to perform the labeling, we controlled the description that users provide in their profile. Being, in general, recognized voices, data such as function, place of work, place of residence and gender were easily identifiable. The vast majority of the sample, 94%, could be categorized through profile analysis. Only 26 tweets remained unidentified. In terms of location, bearing in mind that the study only collected tweets in Spanish, it should be noted that approximately 25 percent of the sample came from Spain, 17 percent from global media, 10 percent from Mexico, another from Argentina and the last from Venezuela. The rest is divided between other Latin American countries, Chile, Colombia, Peru, Ecuador and El Salvador, and the rest of the world.

As for the second technique, text mining was used for the discovery of new information extracted automatically (Moreno and Redondo, 2016). The main libraries used have been *rtweet (*Kearney, 2020), *tidytext* (Silge and Robinson, 2020), *widyr* (Robinson, 2020), *ggraph* (Lin Pedersen, 2020a) and *tidygraph* (Lin Pedersen, 2020b) and *igraph* (Csárdi, 2020); ancillary also *tidyverse* (Wickham, 2019) has been used for information management and handling. Additionally a sentiment analysis was performed according to the classifier created by the National Research Council of Canada, known as NRC (Mohammad et al. 2013). This classifier assigns, to a large number of words, values with respect to various feelings: fear, confidence, sadness, anger, expectation, disgust, joy, and surprise. Although created in English, the classifier has been translated into many languages, including Spanish.

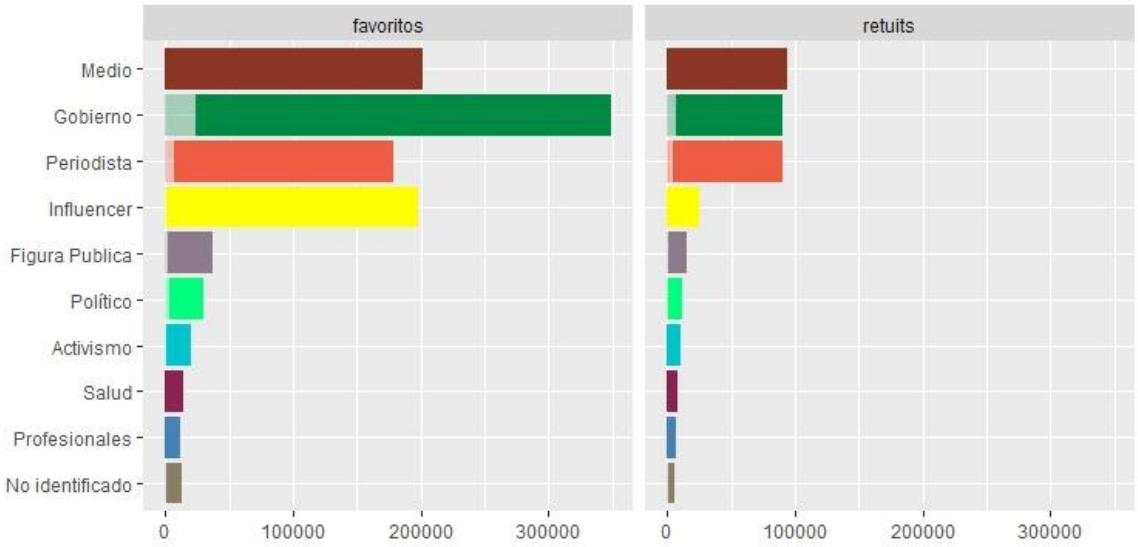
Respecting the ethical considerations published by the AoIR (Franzke et al., 2020), the study is based on data published online that are presented in an aggregated form, so it does not produce prejudices in third parties of any kind. In this work, all the databases have been anonymized respecting the privacy of the users: their names are not published, nor are tweets correlated with user names but, as indicated, we are interested in examining the actors by their social role through manually assigned tags.

5. FINDINGS

5.1. Authorised voices

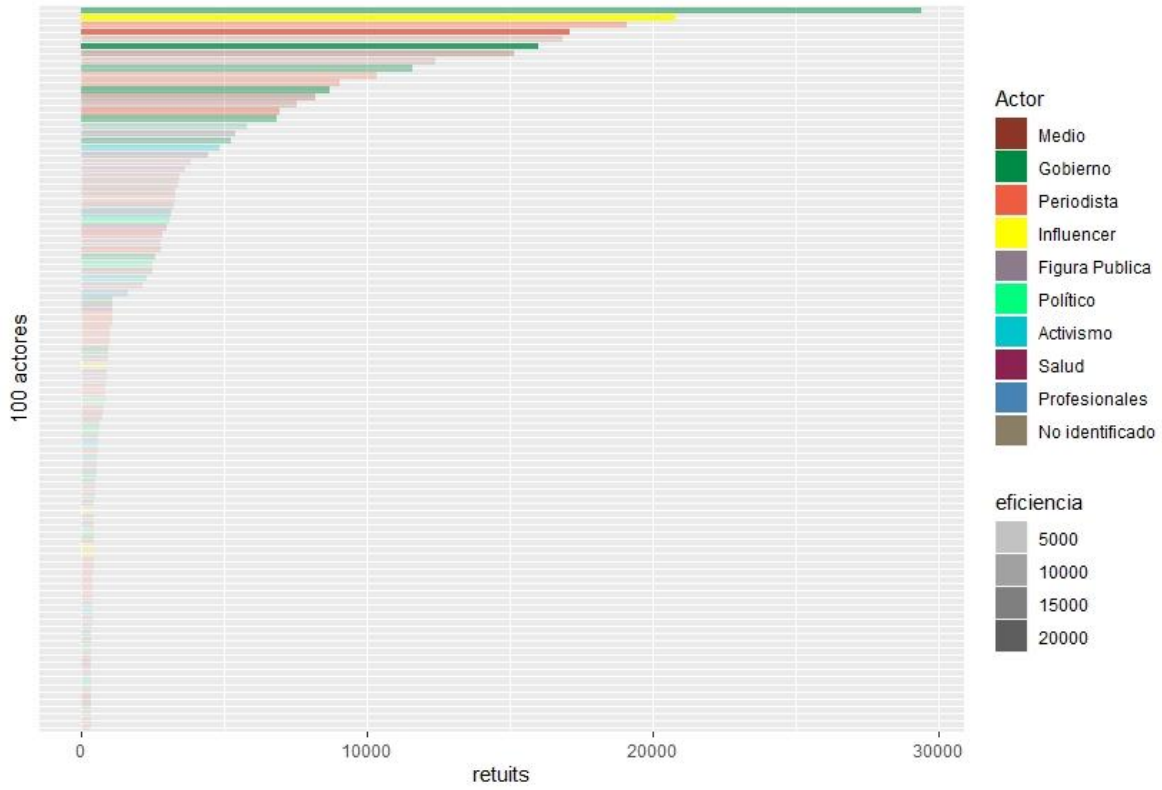
Graph 1 presents an aggregate of tweets by type of authoritative voice and discriminated by gender. It can be seen that, on the one hand, the media are the ones that receive the most retweets, while government figures and institutions are, of the ten categories identified, the ones that receive the most favorites. This last interaction represents a lower engagement of users, but it can be read as a support to the decisions that governments need to take in the pandemic. The difference in retweets is smaller between media and government, but widens if the media and journalism categories are considered together. However, we should not underestimate the weight and possibilities of government messages to reach ordinary users, given that, in this sample, media messages reach approximately 90 thousand retweets through 26 tweets; while the media reach an approximate of those 90 thousand retweets with up to 151 tweets; from which it can be deduced that government tweets are much more effective. It is also observed that between the media and governments is the interpretive framework for users to give meaning to the coronavirus and its consequences in terms of health and economy, leaving far behind the category of doctors and health specialists.

The gap between the authoritative voices of men and women is wide. Of the subset of 451 tweets, 217 could be categorized by gender, of which 183 belong to men and 34 to women. That is, out of every 10 tweets with more than 100 retweets, 8.4 belong to men and 1.6 belong to women. The clearest tonality in Graph 1 shows that the gender variable presents great differences in the dissemination of messages produced by men and women, especially in the categories of journalists, where only 12.5% of retweets belong to female voices, in politics and government, where 20.5% of retweets belong to women, and in some categories there are no tweets with more than 100 retweets issued by women, as it happens in the categories of health and professionals.



*Number of favorites and retweets by aggregate group and gender***.**
Source: Own elaboration.

Graphic 2 shows the type of actor and the efficiency of the 100 most retweeted actors in the base. At the top of the scale, interest is divided between government and media actors. The first places are distributed among government actors, with six tweets out of the top twenty generally corresponding to presidents and governors, while media and individual journalism figures issued ten of the top twenty tweets. Finally, *influencers*, celebrities and some activists issued the remaining four. Within those top twenty, only one tweet is issued by a woman, a high-level government official. It is also interesting which actors have been retweeted the least: non-government politicians are far behind government officials, and the media far above health experts. In this case, the transparency/opacity variable in Figure 2 indicates the efficiency of each tweet, that is, the total number of retweets according to the number of tweets issued by the user.



Graphic 2. *100 actors with more tagged retweets according to the type of actor.*
Source: Own elaboration.

5.2. Lexical analysis by type of authority

When applying the lexical analysis through text mining to the corpus, it is evident that the COVID-19 epidemic acquires different aspects and characterizations according to the type of actor, which is visualized in graph 3. In this graph, the 35 most used terms by each type of actor are represented and linked through different coloured edges. The thickness of the edges indicates the frequency with which each type of actor uses the term in the sample as a whole. The size of the labels indicates the degree of centrality of each term, that is, the greater or lesser number of nodes it connects.

To begin with, the difference between the media cluster and the government cluster is evident. Although the media itself places the government as a main actor, its messages are more about terms related to cases, contagions and deaths: "dead", "deceased", "cases" and "pandemic" are among the most frequent words. On the other hand, government messages give priority to information and the necessary care to face the disease: verbal forms that include citizens and that, affectively, transmit positive messages stand out, with "home", "contagion", "pandemic" and "health" being the most frequently used terms. It is noteworthy that this sample is made up of 151 media tweets and 26 government tweets, so that government tweets are few but very replicated. The

media reach a high total of retweets but with a higher production of messages. All the words mentioned have a higher value of centrality, that is, they are the most shared words by the different actors, which is shown through the size of their tags.

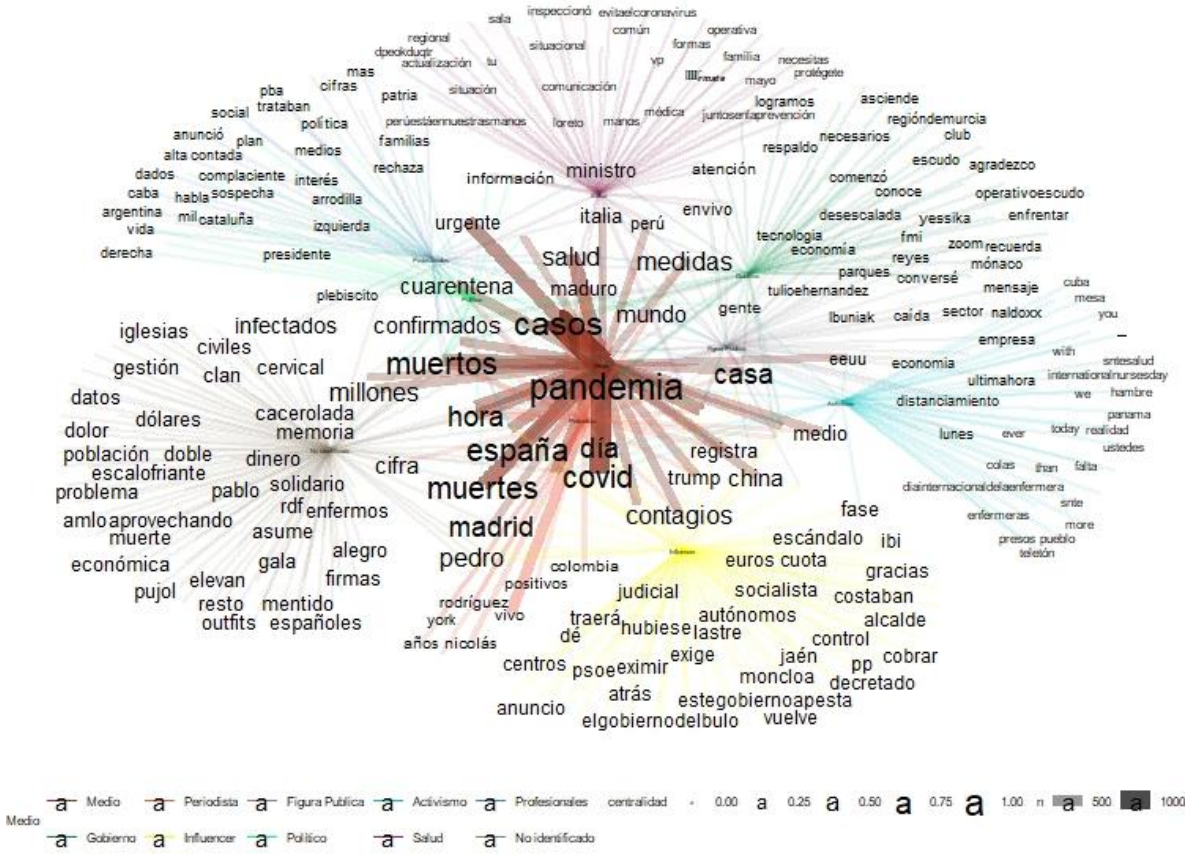


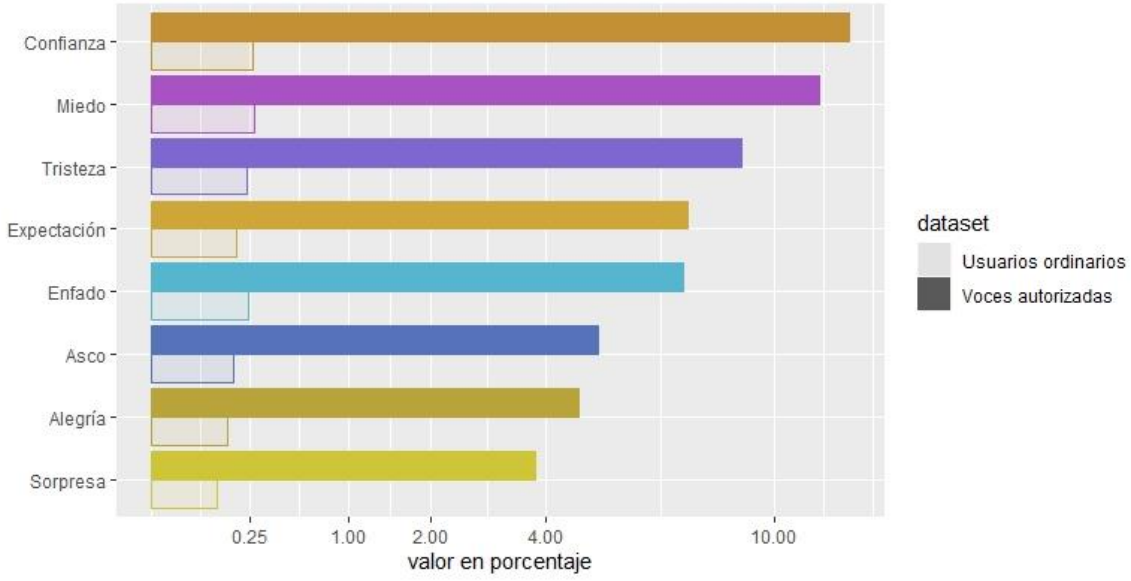
Figure 3. *Lexical network.*
Source: Own elaboration.

On the other hand, the messages of activism are oriented towards denunciation, although their objects are heterogeneous and vary according to the country of origin. They range from the situation of prisoners in jails to demands and claims to the rulers focused on the economic crisis and the increase of poverty as a consequence of the pandemic. The political cluster also refers to terms related to the economic moment. The so-called *influencers*, whose content production refers both to Twitter and to other platforms, are harsh and ironic with governments. This is a politicized cluster, as are the unidentified users and the activist cluster. In contrast, the health cluster is small and aims, unsurprisingly, at caring measures. It can be concluded that, due to their centrality and the use of the most frequent words, the media establish the interpretative framework in the set of tweets studied. On the other hand, the positive messages of the rulers can explain the largest number of favorites received: a discourse that generates the adhesion of users.

5.3. Sentiment and lexical frequency analysis

Extending now the frequent words to the whole corpus, including both the tweets that received more than one hundred retweets and those that received less or no retweets, a sentiment analysis was performed according to the NRC library (Mohammad et al., 2013), which associates a set of words to a set of eight emotions, which are shown in Figure 4. The light shades represent the words of ordinary users, while the dark shades represent those of authoritative voices.

Three central issues are evident: first, the authorized voices contain a much greater sentimental load -it must be taken into account that the data are normalized, that is, the sentimental value is calculated in relation to the total number of terms counted in each case-; second, it is observed that the feelings of fear and trust are those that top the list in both sets, although in an inverted way; finally, in the third place of the authorized voices we find sadness, while in the ordinary users we find anger. This would allow us to affirm that, with a very similar sentimental structure, fear and anger are filtered or amplified more in ordinary users than the rest of the feelings; which can be very enlightening in order to understand the social tension and polarization that social networks produce in ordinary users, accentuating precisely these types of feelings.



Sentiment analysis with the NRC classifier.
Source: Own elaboration.

The feeling of expectation also stands out in fourth place among the authoritative voices. It is linked to words that convey a certain urgency and uncertainty, as can be seen in table 1. It can be seen that this is lower in ordinary users, as urgency and uncertainty are usually conveyed by words specific to the media, such as "time", "urgent" and "situation". If the table is also correlated with graph 3, it can be seen that the terms with the highest centrality in the first one were classified with feelings of fear

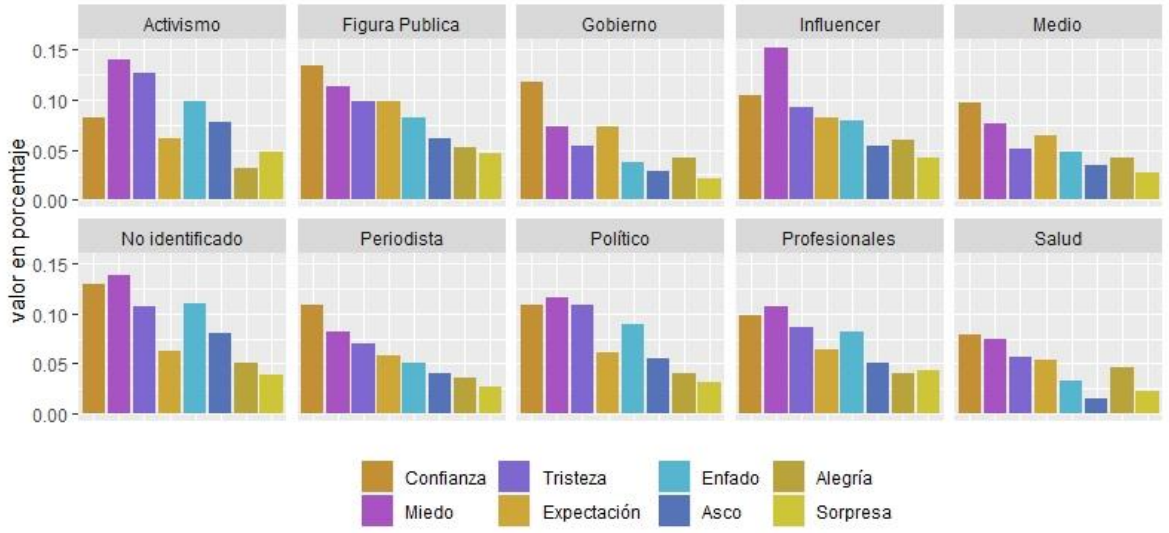
and sadness, while the terms of care do not reach such centrality. This difference is produced by the number of media tweets included in the sample, which is comparatively higher than the number of government tweets.

Table 1*. List of the most frequent terms in authorized users' messages according to the NRC library dictionary sentiments grouped by lexeme or root.*

Feeling	Associated terms
Fear	cases, contagion, deaths, pandemic, deaths, prevent, urgent/cia, combat, government, confinement, deaths, pandemic, pandemic, deaths, prevent, urgent/cia, combat, government, confinement
Trust	health, confirmed, president, medical, units, help, registration, housing, hospital, president, health, confirmed, president, medical, units, help, registry
Sadness	cases, deaths, deceased, pandemic, loss, confinement, hospital, sick, abandonment, restrictions
Anger	death(s), combat/go, fight(s), loss(s), confinement, threat, restrictions, abandonment, common, hit(s)
Expectation	death/s, time, time, account, waiting, urgent, viv/a/o/o/ir, continue, doctor/s, patient/s
Disgust	contagion/s, death/s, disease/s, social, infected, loss, see, situation, confinement, denouncement
Joy	health, live, affections, sunshine, celebrate, pay/r, healthy, daily, grow, kids
Surprise	death, alarm, health, exit, shouting, urgent, present, treatment, waiting, organizing

Source: Own elaboration.

Graph 5 shows the distribution of the same sentiments in relation to the type of authorized voice. In this graph, the values are normalized in relation to the total number of terms computed for each actor, which is why they appear as percentage values. Thus, although the total sentimental load of the media is greater than, for example, that of activism, proportionally it is observed that it is the actor that, together with health, contributes the least sentimental load. It can be observed that if the intention of governments is to instill confidence, the results of the analysis show that they have achieved it, since in the messages emitted by this type of actor this sentiment stands out above the others. However, in the actors who contribute the most emotional charge to the sample, negative feelings prevail. These messages come mainly from *influencers*, activists and unidentified users. In general, these are types of actors who, strategically, embody some kind of opposition to governments and who, therefore, must have an interest in disputing their interpretative framework. In them, the value of the feeling of fear is greater than that of trust. Finally, it is worth noting that the health sector, despite having the responsibility to inform about the disease, its symptoms and consequences, is the one that contributes the least sentimental load.

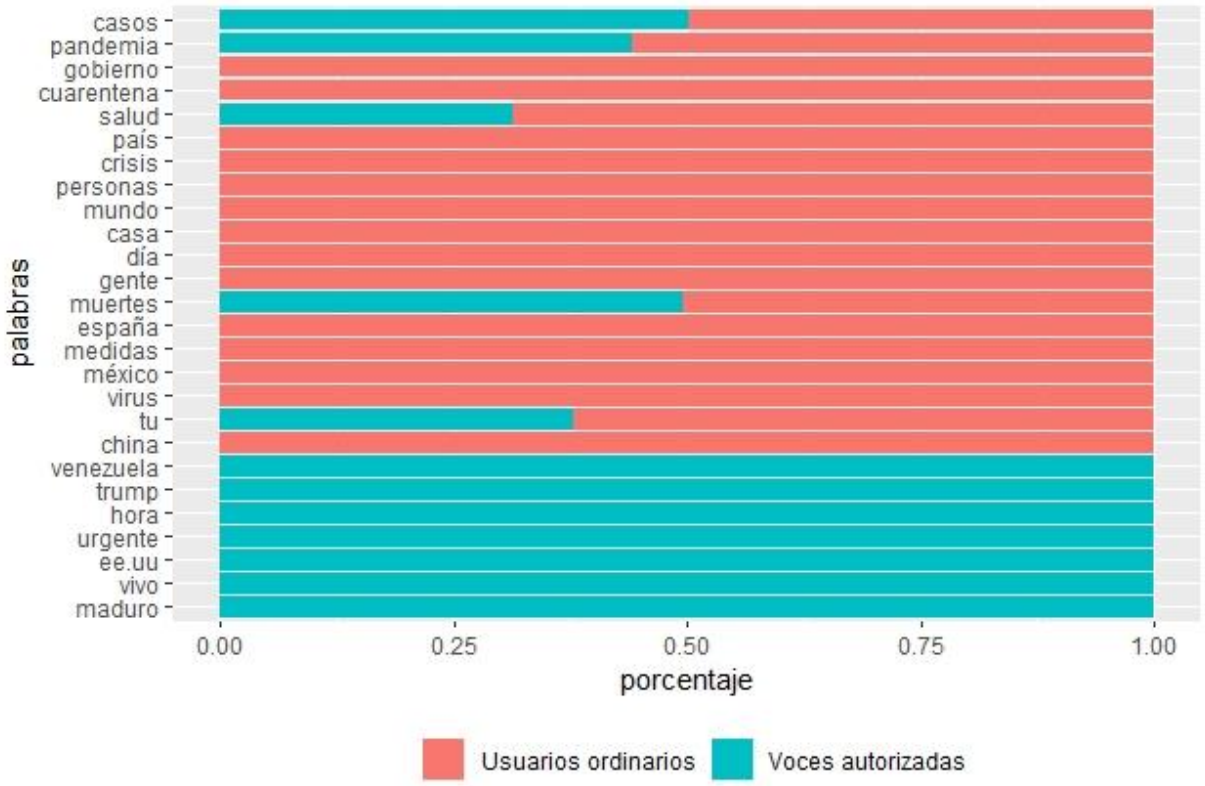


*Sentimental burden of each type of actor analyzed***.**
Source: Own elaboration.

5.4. Authorized Voices and Ordinary Users

When comparing, in graph 6, the lexicon of authorized voices with that of ordinary users, and taking into account the greater influence, detected above, of the media and the government, a certain disparity can be observed in the topics to be dealt with. To appreciate this in more detail, this lexicon can be divided into several groups. First, terms such as "cases", "health", "pandemic", "dead" and "deaths"; another lexical group, used only by authoritative voices, with terms such as "Trump", "time", "urgent", "Maduro", "USA"; and a third group, which appears only in the set of ordinary users, with terms such as "government", "quarantine", "measures", "crisis" and "contagions".

These three lexical groups show different interpretative frameworks for the pandemic. On the one hand, ordinary users take up the media's own interpretative frame, since it is the one that highlights the tragic aspect of the pandemic, with its count of cases and deaths. The second group of words is also identified with the media, which places the pandemic in an international political context, but this is not replicated by ordinary users. In the third lexical group, it is evident that they have their own terms to represent their experiences, such as "quarantine", "virus", "people", "people" or "house". But in this third group, there is also a set of words such as "crisis", "measures" and "government" that associates the pandemic with a crisis that is not evidenced either in the governing group, which emphasizes care, or in the media, which highlights the tragedy and the urgency of the information.



*Comparative lexical analysis between authorized voices and ordinary users according to the percentage of use of the 20 most frequent words for ordinary users and authorized voices***.**
Source: Own elaboration.

The word "crisis", however, is used in a variety of contexts: whether to refer to the economic problems caused by the pandemic, to a health crisis associated with health care systems, or even to a personal crisis, which generates uncertainty in individuals. Of course, in all these cases, "crisis" is, in turn, associated with the word "coronavirus": the "coronavirus crisis" is an umbrella term for the different aspects of the pandemic. Examples of the use of the word are given in Table 2. It should be noted that this sample corresponds to the first months of the pandemic, in which the global economic crisis is emerging as the days go by. This emergence of the crisis, which is reported by ordinary users and not by the media or the government, can be correlated to the higher rate of feelings of anger and disgust identified in the previous paragraph.

***Table 2**. Examples of the use of the word "crisis" by ordinary users.*

Context of use	Example
Economical	The Emergency Economic Plan seeks to protect the income of those who will not be able to work in the coming weeks and provide financial assistance for companies, especially SMEs, to get through this crisis.
Politician	China turns crisis into an opportunity to exercise global leadership via @LANACION
Staff	From my "roller coaster" of emotions, I wholeheartedly wish you all the best and that we get through this #coronavirus crisis soon with God's blessing.
Health	The #Coronavirus crisis can be an opportunity for people to get vaccinated and remember that vaccines save lives.

Source: Own elaboration.

Finally, the lexical set used by government actors, as detailed above, refers mostly to care measures. Above we have identified the adherence of ordinary users to this discourse through the assignment of a large number of favourites. However, this adherence or sympathy towards government messages fails to be activated in the messages issued by ordinary users, who rather reproduce the media's perspective, adding critical aspects resulting from their own experience.

6. DISCUSSION

Based on the procedures described above, the media and governments were identified as the two types of authoritative voices whose messages received the greatest circulation, although with certain differences. In the first place, the discourse of the media is the one that is most retweeted and the one with the highest frequency of use linked to the terms that have more centrality in the sample. However, governments achieve a great approach to ordinary users, given that with 26 tweets they achieve a level of retweets similar to those of the 151 media retweets. In addition, the large number of favorites received by government messages, mostly oriented to the care of the population, show the adhesion of ordinary users, since despite not replicating the message with retweets, they do imply sympathy with it by marking them as favorites. It should be taken into account that government messages are focused on the care of the population and, in fact, it has been seen how in them the feeling of trust predominates over others.

Regarding the gender variable, the sample analyzed showed a large gap in word circulation between male and female authoritative voices, in a ratio of 8.4 to 1.6 between men and women. This gender disproportion is consistent with the pre-existing literature on women's presence on Twitter, which is devalued in various ways, and the gender gap in the media, which is similarly very wide. However, more studies are needed on the circulation of voices by gender on this platform.

7. CONCLUSIONS

This study reviewed the role of authoritative voices on Twitter in Spanish in relation to the circulation and meaning of their messages during the first months of the coronavirus pandemic. It did it with digital techniques of data collection, textual mining and sentiment analysis.

The methodology employed proved efficient for quantitative analysis to identify the different types of authoritative voices, to obtain a general lexical mining of the corpus, and to make comparisons between the terms used by authoritative voices and ordinary users. These techniques worked well with large data samples, but have not proved efficient for specific cutoffs, for example for the lexical analysis of women journalists, governors and politicians, as these subsets were very small.

The greater adherence of ordinary users to government messages is, with respect to the existing literature, the novelty observed in this pandemic with respect to government messages in the 2014 Ebola pandemic in Spain, according to the work of Percastre-Mendizábal et al. (2019) reviewed above. Similarly, in the same work, the relevance of traditional media on Twitter during the same pandemic is pointed out. The present work adds that, despite this adherence to government messages, the feelings that most permeate the population are those of fear and anger, in greater proportion to what is found in the authoritative voices. The sample studied suggests that these are encouraged by political actors not linked to government actors and generally in opposition, as well as by activist actors, who probably distrust the government's messages and put on the agenda issues of greater conflict.

It has also been shown that there are a number of terms linked to different crises affecting the population as a whole that are hardly present in the authoritative voices and are very relevant to ordinary users. These messages manifest a tragic vision of the pandemic in opposition to the government messages, which focus on the care of the population.

Regarding works that have addressed the relationship between media and user behaviors, such as Towers et al (2015), reviewed above, this work agrees that the media provide an interpretive framework to ordinary users located in a tragic narrative, but also identifies their own experience in the expression of the pandemic as an economic, health, political and also personal crisis, lived through a quarantine, attentive to the day to day and the lives of people in their homes rather than prevention and care measures.

This study is consistent with the informational and moral function of government messages previously identified by Rufai and Bunce (2020) during the COVID-19 pandemic. The continuity of government actors in this regard is critical, in order to convey messages of care that can overcome pessimistic views underpinned by feelings such as fear, sadness and anger, and reinforce a sense of confidence.

Regarding the studies produced in China by Gao et al. (2020) on the relationship between social media and depression and anxiety, the present article cannot determine such a relationship, but should be attentive to the feelings of fear, anger and disgust that are evident in the content analysis, which on the other hand, differ from the positive trend identified by Han et al. (2020). This work sets a precedent for future studies that investigate the relationship between media and moods of the population in health crises.

Undoubtedly, as demonstrated by Kullar et al. (2020), Twitter has great potential in the dissemination of health messages, and in the current pandemic it has been shown that the public adheres to such messages. However, a permanent reinforcement should be worked on so that the value of Twitter in health communication is not only a reference for specialists and patients, but also for the general public. This study shows the potential of the messages of front-line governors, such as presidents, governors and mayors, who also have a large number of followers, for the transmission of care messages. Based on these findings, it is recommended that government communication advisors insist on care messages from relevant government actors.

The imbalance between messages with respect to this variable did not allow us to generate a comparative lexical study such as the one produced by Thelwall and Thelwall (2020), so future studies may delve deeper into that aspect.

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