Social unrest through new technologies: Twitter as a political tool

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Abstract
Introduction. The 15-M movement (also referred to as the Anti-austerity Movement, the Indignados Movement, and Take the Square), marked a turning point in the way of understanding politics at all levels in Spain. Even today, political party *Podemos* is considered to be the direct heir of this movement, which occupied the front-pages of newspapers around the world in the weeks following the demonstrations of 15 May 2011 and sent aftershocks across the globe. The power of the Spanish civil society was manifested in full force, turning aside from political parties and politicised groups. This revolution was made possible by online social networks, which allowed previous movements to unify into one. Thanks to today's technology, social networks can be monitored to capture their importance in the genesis, development and maintenance of this popular movement. **Methods and results.** The study is based on the review of Twitter's key indicators, such as the trending topics and hashtags, as well as the review of the birth of the movement and its main lines of work, based on the dissemination of its activity, rather than on a sociological or content analysis perspective. The conclusions are in line with those drew in previous research works, which have served as the statistical corpus to frame the data obtained through empirical methods that are not commonly used in the social sciences.

Keywords: 15 -M, Twitter, #acampadasol, social networks, #spanishrevolution, Politics 2.0, Popular Democracy, Occupy.

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1. Introduction

Classic works form the 19th century have argued that war was the only sport rich people invite the poor to play. Today, that sport is perhaps suffrage, commonly known as democracy in the West. Popular movements that have emerged around the globe thanks to ICT and social networks have been studied from the most varied perspectives: Castillo, Gracia and Smolak (2013), from the perspective of communication strategies; Fernández, Feixa and Figueroas (2013), from the historical and activist aspect; Ríos (2105), from the perspective of political news chronicle and new journalistic narratives; Ferreras (2011), from the perspective of the social change enabled by social networks; Levy (2007), focusing on historical cyber culture; and, more recently, Congosto (2011a and 2011b), from an analytical view of content, and Toret (2013) and Sampedro (2014), based on new electronic politics and their functionalities. All of these scholars have interpreted 21st century politics, as Castells (2009) would say, based on "mass self-communication", understood as a genuine political manifestation at the dawn of the 21st century, after the politics, wars and technologies of the 19th and 20th centuries wiped out some of the most powerful countries and help others rise to lead the world.

Below we analyse the origins of what Ruiz del Olmo and Bustos call the "public communication space, which greatly expands and even overflows the field of interaction defined by traditional political action" (2016, p. 110).

1.1. Origins

In Spain, this new political formula emerged in Madrid on 20 June 2005, after a demonstration promoted by the Movement for Dignified Housing (which emerged in 2003 as the Platform for Dignified Housing), an event that is understood here as the starting point of the mass demonstrations. A little later, on 14 May 2006, the so-called Platform for People Affected by Mortgages called for sit-ins in Madrid -in Puerta del Sol square- and Barcelona --Catalonia Square-, Seville, Zaragoza, Bilbao, Logroño, Córdoba, Murcia (mostly via mobile messages)--, with a turnout of 300 and 500 protesters. These protests were considered to be spontaneous given their low participation, although after five hours the Madrid sit-in headed towards the Congress of Deputies, where the manifestation was dissolved by the police, which received some media attention.

From that moment and every Sunday for a month, new unauthorised sit-in demonstrations were organised through the wiki www.viviendadigna.es, which was enabled from the blog of journalist Ignacio Escolar, the former editor of the *Público* newspaper (then printed) from 2007 to 2009. Stable mobilisations began around these demonstrations, especially in Madrid and Barcelona, where activists founded the *Assembly Against Austerity and for Dignified Housing* and the *People's Assembly for Dignified Housing*, which together organised the first "non-spontaneous" event, authorised by the government delegation on 2 July to avoid problems with the police. The event was organised by the *Assembly for Dignified Housing* in Madrid and Barcelona and by about 20 cities more and was supported by the *Platform for Dignified Housing* and other organisations. This was the first time a spontaneous movement was organised by an anonymous entity. The motto of the demonstration was "Against precariousness and speculation. Housing is a right, not a business". The assemblies were held in Madrid and Barcelona and were joined by groups from other cities. These assemblies were

coordinated through the website *V de Vivienda* (Spanish for "H for housing"), which is word play on James McTeigue's 2005 film *V for Vendetta*, which portrays the fight against the tyrannical power of the State, which fits with the philosophy of these movements.

Figure 1. Website of *Vivienda Digna*: www.viviendadigna.es/

Figure 2. Website of *V de Vivienda*: www.sindominio.net/v/

These protests were followed by better organised manifestations in Barcelona, on 30 September, and in Madrid, on 28 October. In December 2006, the *V de Vivienda* assembly, part of the Movement for Dignified Housing, used anonymous emails to call people to participate in the "Week of Fight for Dignified Housing" in Madrid, and to be prepared for the demonstration on 23 December. Soon, supporters emerged in other cities and districts in Madrid and Barcelona. The 23-D demonstration in Barcelona blocked Via Laietana, a major thoroughfare, for two hours, with 15,000 protesters shouting "You will never own a house in your fucking life"; in Madrid, about 3,000 protesters chose Puerta del Sol as their meeting point and then marched to the Congress of Deputies, where the National Police responded by beating protesters; in Valencia, 4,000 protested shouted "We can't go back home for Christmas because we haven't even left home yet" in their way to the centre. In the other cities, about 20, there were less than 1,000 protesters, except in Bilbao, with 1,500. These were the largest

manifestations of this type organised through SMS. 2006 was the beginning of this type of social protests in the main cities, with participations in Buenafuente's TV show, occupations of public buildings and cinemas and even a *zapatillada* (a symbolic act in which protesters leave their shoes) in front of the Ministry of Housing in Madrid.

The first national demonstration took place on 24 March 2007, in view of the local and regional elections on 27 May. In Madrid, 15,000 people marched from Puerta de Sol to Cibeles and from there to Atocha, where the police wounded three protesters. In Barcelona, 15,000 people protested in Catalonia Square and the Stock Exchange. In other cities, about 50, the protests were joined by 500 people on average. On 5 May 2007, the Citizens' Coordinating Committee for the Defence of the Territory (formed by 600 citizen groups) convened a demonstration under the motto "S.O.S. National Emergency", which had a mixed reception, except in Murcia, where 15,000 gathered to chant "Murcia is not for sale". From 13 to 27 May 2007, the Assembly for Dignified Housing and *V de Vivienda* called a camp out that ended up settling in the University City of Madrid until 27 May (the election day), although some campers stayed until after the summer, when the police eventually removed them. Until 6 October, *V de Vivienda* called a demonstration under the motto "You will never own a house in your fucking life". It was the first demonstration that enjoyed significant media coverage, including an interview with the spokesperson of *V de Vivienda* on the debate TV show *360 Grados*. Due to the crisis, the housing issue started to gain relevance on the media.

Closer in time and as national precursors of the anti-austerity movement, is the students' general strike of 30 March 2011 against unemployment and job precariousness, cuts, the European Higher Education Area, and the increase in university fees. On 7 April, the 'Youth Without Future' platform called for a march against the economic crisis and the bipartisan political system (PP-PSOE or PPSOE), which was supported by *No les votes* ("Don't vote for them"). This is the framework of reference that incubated the civil disobedience movement that splashed our map and the movement on which this article focuses:

The 15-M movement (also referred to as the Anti-austerity Movement, the Indignados Movement, and Take the Square), was born on 15 May 2011 with the camping of 40 people in Puerta del Sol, which was called by several associations, including the then recently constituted Real Democracy NOW (Spanish: *Democracia Real YA*) and Youth Without a Future (Spanish: *Juventud Sin Futuro*), which evolved into popular protests and demonstrations in about 40 Spanish cities in the following days. It ended after 26 days on 12 June 2011.

The term *Indignados* ("outraged") was taken from the Spanish title (¡Indignaos!) of the 32-page book *Indignez Vous!* (English: *Time for Outrage!*) (2010), written by French nonagenarian diplomat Stéphane Hessel, ambassador, activist, concentration camp survivor and cowriter of the Universal Declaration of Human Rights of 1948, whose prologue in the Spanish version (2011) was written by economist José Luis Sampedro. In other words, the book was written by a neo Erich Fromm or a neo Herbert Marcuse of May 1968. In France, this author is also seen as inspiring of the street protests in defence of public health that took place on 2 April 2011.

¡INDIGNAOS!, les dice Hessel a los jóvenes, porque de la indignación nace la voluntad de compromiso con la historia. De la indignación nació la Resistencia contra el nazismo y de la indignación tiene que salir hoy la resistencia contra la dictadura de los mercados. Debemos resistirnos a que la carrera por el dinero domine nuestras vidas. Hessel reconoce que para un joven de su época indignarse y resistirse fue más claro, aunque no más fácil, porque la invasión del país por tropas fascistas es más evidente que la dictadura del entramado financiero internacional. El nazismo fue vencido por la indignación de muchos, pero el peligro totalitario en sus múltiples variantes no ha desaparecido. Ni en aspectos tan burdos como los campos de concentración (Guantánamo, Abu Gharaib), muros, vallas, ataques preventivos y "lucha contra el terrorismo" en lugares geoestratégicos, ni en otros mucho más sofisticados y tecnificados como la mal llamada globalización financiera.

¡INDIGNAOS!, repite Hessel a los jóvenes. Les recuerda los logros de la segunda mitad del siglo XX en el terreno de los derechos humanos, la implantación de la Seguridad Social, los avances del estado de bienestar, al tiempo que les señala los actuales retrocesos. Los brutales atentados del 11-S en Nueva York y las desastrosas acciones emprendidas por Estados Unidos como respuesta a los mismos, están marcando el camino inverso. Un camino que en la primera década de este siglo XXI se está recorriendo a una velocidad alarmante. De ahí la alerta de Hessel a los jóvenes. Con su grito les está diciendo: "Chicos, cuidado, hemos luchado por conseguir lo que tenéis, ahora os toca a vosotros defenderlo, mantenerlo y mejorarlo; no permitáis que os lo arrebaten".

¡INDIGNAOS! Luchad, para salvar los logros democráticos basados en valores éticos, de justicia y libertad prometidos tras la dolorosa lección de la segunda guerra mundial. Para distinguir entre opinión pública y opinión mediática, para no sucumbir al engaño propagandístico. "Los medios de comunicación están en manos de la gente pudiente", señala Hessel. Y yo añado: ¿quién es la gente pudiente? Los que se han apoderado de lo que es de todos. Y como es de todos, es nuestro derecho y nuestro deber recuperarlo al servicio de nuestra libertad.

No siempre es fácil saber quién manda en realidad, ni cómo defendernos del atropello. Ahora no se trata de empuñar las armas contra el invasor ni de hacer descarrilar un tren. El terrorismo no es la vía adecuada contra el totalitarismo actual, más sofisticado que el de los bombarderos nazis. Hoy se trata de no sucumbir bajo el huracán destructor del "siempre más", del consumismo voraz y de la distracción mediática mientras nos aplican los recortes.

This is the page (the 4th) that campers began to hand out to passers-by on 19 May and it was immediately tweeted.

The motive of 15-M movement can be summarised in the *Manifesto* issued by Real Democracy NOW, which was signed by 70,647 people:

We, the unemployed, the low-paid, the outsourced, the precarious, the young... we want a change and a decent future. We are fed up with anti-social reforms, that left us unemployed, with the banks that have caused the crisis, that raise mortgages and take our homes, with laws that limit our freedom for the benefit of the powerful. We blame the political and economic powers for our precarious situation and demand a change of course. Through

this platform, we want to help coordinate global and common actions among all those associations, groups and citizen movements that, through different avenues, are trying to change the current situation. (This text is a summary of the contents of press releases issued since May 17 by campers)

The 15-M movement was mainly constituted by isolated individuals but also by more than 200 organisations and associations, such as Real Democracy Now and "Don't Vote for them" (internet users against the anti-internet piracy law) and "Ecologists in Action".

This breeding ground clearly reflected the need for rapid, mass, effective, participatory and cheap communication.

Figure 3. Possibly the first tweet about the demonstration that inspired the sit-in and the occupation of Puerta del Sol in 15 May, posted by *#15-Mani*, Carmela Ríos (Source: *How the #15-M changed the news*, 2015).

As the technology of the time was limited, social networks were the most widely used medium because they could be operated via mobile phones (computers were not very portable, and tablets were yet to be popularised). Facebook and Twitter were the most accessible solutions for people. Many journalists, such as Carmela Ríos, used Twitter, which was also used in the Arab spring, to report what was happening at Puerta del Sol, because it was harder to censure. Journalists were retweeted by their followers, who in turn exponentially expanded the news. The possibilities of these social networks, so common today, are considered a breakthrough by many. Herrero et al. (2011), for example, point out that Facebook allows users to automatically repost content posted on their wall be reposted on their Twitter page (p. 546).

Initially, social network users used the hashtags #spanishrevolution (the initial name of the movement abroad), *#democraciarealya*, *#nonosvamos*, *#15-M*, *#notenemosmiedo*, following the decision of the electoral boards, *#juntaelectoralfacts*. The most direct hashtag was *#acampadasol*. This was a response to the actions agreed upon in the Assembly of the 15-M movement:

- Creation of debates

- Creation of new media
- Use of public and influential figures
- Immersion in the media
- Social media

With regards to social networks, all analysts agree on the importance of their use from the outset to advertise the movement. It can be said that the 15-M movement began its public journey with a mobile phone. Its main channels were:

- Twitter: dozens of accounts related to the movement, including @globalcamp, @democraciareal, @*propuestas15-M,* @*IndignaosYa,* and the official accounts of the camps in each city, such as *15-Mlondon.*
- Facebook: In addition to the official Facebook account of the movement in Spain, most cities with camps also had an account on this social network, such as *15-M Valladolid.*
- Tuenti: The least employed network due to its younger user base.
- Blogs: Many individuals created blogs to express their opinions on the movement and make proposals, etc.
- Online newspapers: There were several outlets run by supporters.
- Print newspapers: Madrid 15-M (which started on 12 February 2012, way after the occupation).
- Wiki 15-M: https://15-Mpedia.org/wiki/Portada

Figure 4. Official Twitter account of 15-M, @*democraciareal*. Hundreds of provincial, municipal and neighbourhood assemblies also opened accounts afterwards.

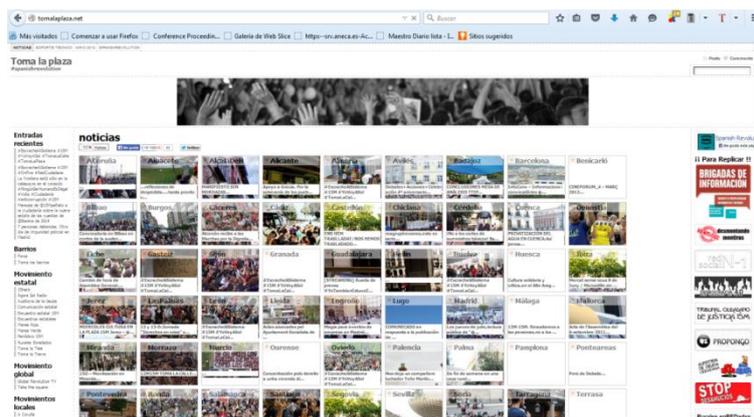**Figure 5.** Facebook page of Real Democracy NOW

Figure 6. Official national website of Take the Square (updated)

With regards to the creation of media, it is important to emphasise that a printed newspaper was created in addition to the digital websites.

Figure 7. Newspaper of the 15-M movement in Madrid

Figure 8. Frontpage of the Madrid 15M.org newspaper

The previous figures show the title and frontpage of the first number of the 15-M newspaper, which had no editor or editorial team to encourage freshness, spontaneity and truth, and to move away from the rigid structures of the mainstream press. This free, 16-page long newspaper was launched on 12 February 2012 and reached a circulation of 20,000 copies.

Figure 9. Logo and website of the radio station that broadcast the 15-M news published by the online newspaper. Accessible in: www.agorasolradio.org

Finally, and synoptically, we find this website reporting on the causes of 15-M movement: https://movimientoindignadosspanishrevolution.wordpress.com/paginas-web-oficiales-del-15-M-en-espana/

Figure 10.

Below is one of the last tweets with the hashtag *#acampadasol* on the dismantling of the 15-M occupation of Puerta del Sol on 12-13 June.

Figure 11. Carmela Ríos' tweet (Source: *How the #15-M changed the news*, 2015).

Of course, the mass media were a vehicle longed for by the promoters of the 15-M movement, who were aware the streets are conquered with images and voices and not only with acts.

2. Materials and methods

We have selected as primary sources for our work the websites created by activists participating in the movement and by journalists who covered first-hand the manifestations and protest camps.

Following in the footsteps of Congosto (2011a and 2011b), and in order to be able to quantify the value of the communications, since their penetration into the population derives directly from the number of impacts achieved, we have analysed tweets posted on 15 May with the hashtags #15-M, #democraciarealya, #nolesvotes, #tomalacalle and references to @carmelarios, as a true reflection of the importance of instant media 2.0.

Given the complexity of the data, we have faithfully followed the steps established by the BIFI research group (Physical Biocomputing and Complex Systems) of the University of Zaragoza (2011). We used a descriptive method, which is typical of complex network theory, to carry out a more graphical-statistical characterisation (in order to understand the results) of the temporal evolution of the phenomenon. Part of this method is inherited from the technical sources consulted and their data collection techniques, such as the statistical measurement of the concepts: complexity, self-organisation, freedom scale.

3. Results

Coinciding with the ideas developed by Sampedro and Sánchez (2011) about the origins of the 15-M movement, like all of its kind, is based on three pillars:

1. Practical horizontality. Organisation and generation of proposals. Feedback from the classic top-down scheme of the information-ordering system.
2. Change and dynamism with atomisation of participation through numerous commissions (in Iceland, 25 ordinary people were tasked by several popular assemblies to amend the Icelandic Constitution and submitted a draft on 29 July 2011 to Parliament).
3. No hierarchies or leaders to avoid arbitrary politics and entourages.

The nature of two-way media enables these actions. It is therefore not surprising that Taibo (2011) predicted four possible endings for the movement:

1. Disappearance.
2. Absorption by external instances or internal divisions.
3. Becoming a generalised instrument of civil protest and contestation.
4. Becoming a referent for a model of assembly and self-management.

The result is debatable and for this reason we do not want to start making value judgement. Instead, we argue that social networks in all possible readings of their development have been the perfect tool for the operation of the movement according to its programmatic aspirations. Below we present the main results through graphs to be as clear as possible.

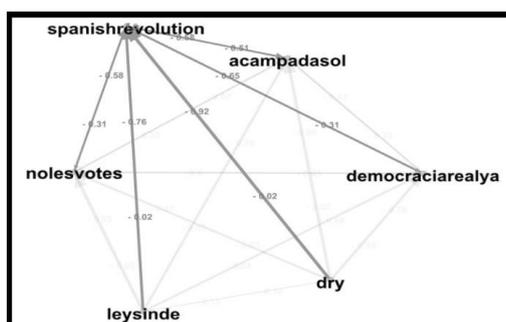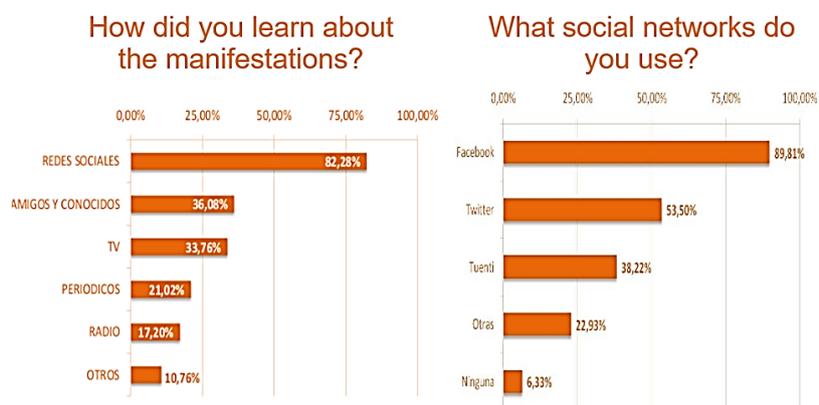The most followed hashtags were, according to "DatAnalisys15-M" (available at: https://datanalysis15-M.files.wordpress.com/2013/06/tecnopolitica-slides.pdf):

Figure 12. Hashtag clusters

Figure 13. Main YouTube channels related to the 15-M movement

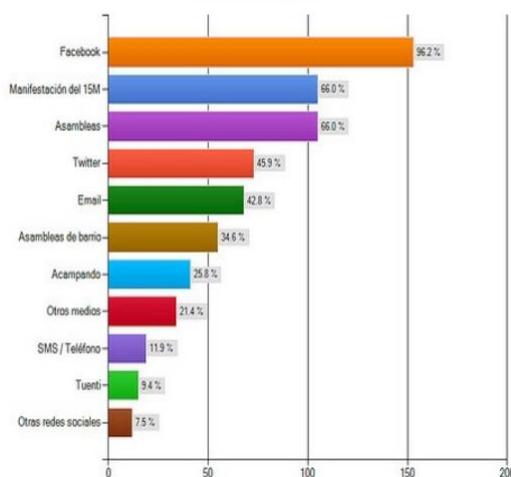Results of survey about the 15-M movement. Source: Gather Studios SL (2011)

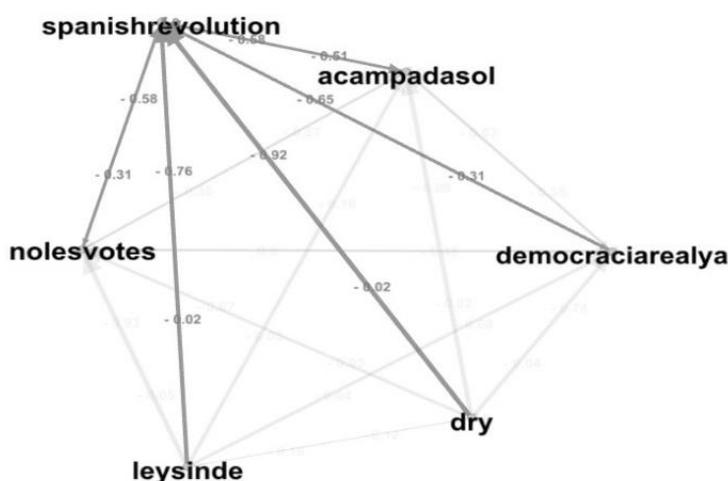**Figure 14.** Forms of participation in the #15-M

Figure 15. Influence of #nolesvotes on #spanishrevolution. 31% of users of #spanishrevolution migrated from #nolesvotes.

The data confirm that the most tweeted words were, according to data extracted from Congosto (2011 b): Democracy, Spain, Movement, PP, Square, Vote, Politicians, Electoral, PSOE, door (as in revolving door). To give an example of a very retweeted journalist: between May and June, Ríos posted more than 2,000 tweets. Here it is important to remember that these types of individual hashtags are not considered in the official counting, despite their high generation of traffic.
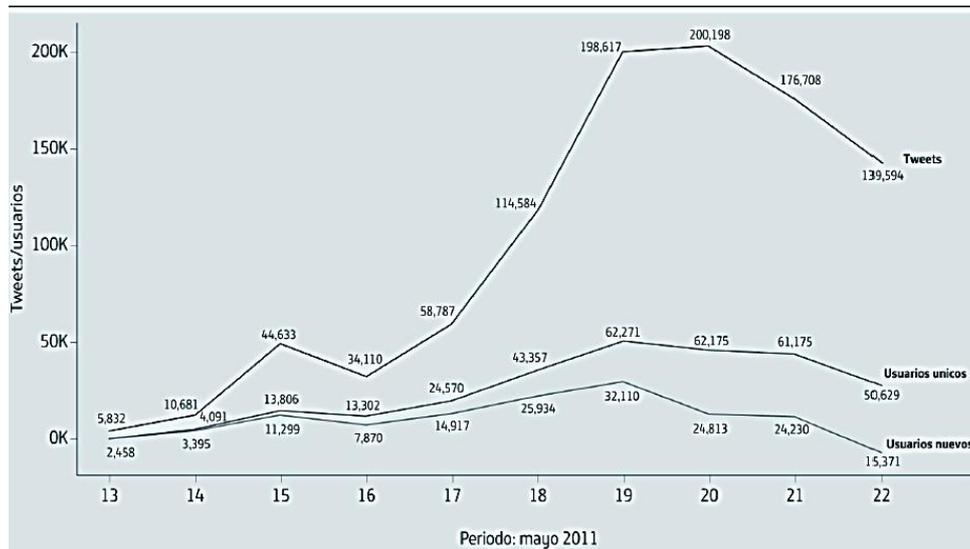

Figure 16. Traffic data generated by unique users (Source: www.barriblog.com)
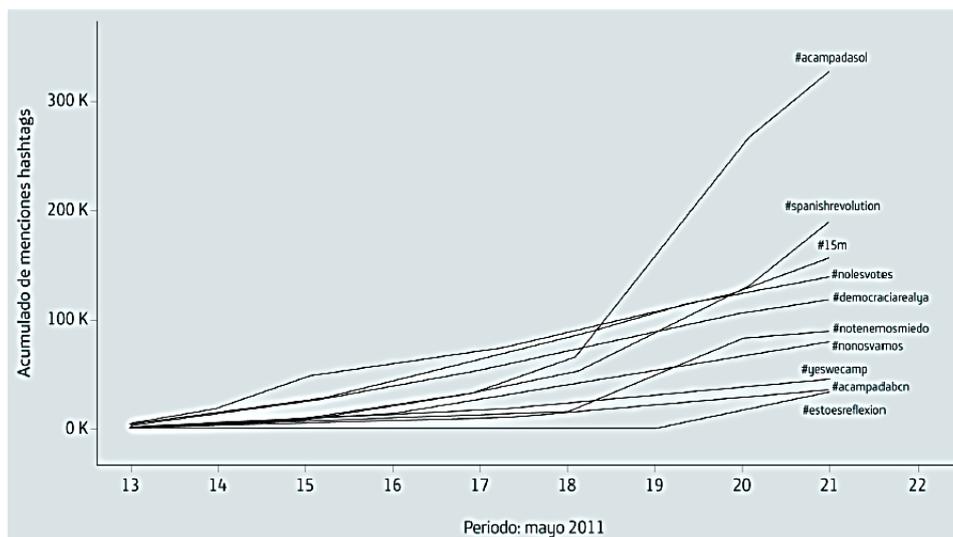

Figure 17. Official report of most used hashtags (Source: www.barriblog.com)

The mass media also amplified their coverage of the protest camps (Twitter data from journalists working in these media are omitted):

	Official accounts	Followers
El País	5	518.993
El Mundo	3	75.691
ABC	3	35.242
La Razón	1	3.196
Público	2	108.413
La Gaceta	1	2.741

Figure 18. (Source: Ferreras, 2011, 7)

In other words, Twitter enabled the success of the information traffic related to the 15-M Movement and all its acts, such as marches, camping, protests, manifestations, because, as Orihuela points out (2011), it existed in the historical, social and cultural context of the time, a necessary condition which was the popularisation of the culture produced by, developed in, transmitted through, and extracted from smart mobile phones.

> Twitter has changed the web and completed the social shift started by blogs in the late 1990s [...] On Twitter, words are worth a thousand images. The platform has become the still in which the culture of our time is distilled [...] Even if Twitter disappeared in the future as a brand or as a platform, what it has achieved will remain, since it has changed the way we understand and practice communication on the internet (Orihuela, 2011, p.11).

Twitter's success as an information and communication tool is due to the possibility of real-time access to information, that is, the possibility that it offers its users to launch or collect direct and immediate testimonials and be able to change plans on the go, according to the needs of the events. In the words of Orihuela (2011), its success is based on a simple and intuitive interface, a local and global social dimension and on its accessibility through mobile phones. The 15-M movement, advanced in the use of the social network as the main communicative and organisational tool (both in its internal sphere and in its relation to external agents), takes advantage of the hashtags to articulate and organise semantically any act, comment, reflection, request, suggestion or complaint, whose access is free, direct and immediate.

What is true, and it is still an achievement, is that the success of Twitter as an informative and communicative tool during the phenomenon of the 15-M movement has changed the way public communication was understood until that time and how to make it, professionally speaking, but also from a more novice view. The traditional audience is in the past, it has changed, and with it, certain cultural spheres are being transformed, or certain forms of understanding culture are being transformed, so a change in the media is necessary. For this reason, today it is very difficult to find a TV programme, including newscasts, that does not resort to social networks such as Twitter or similar '*microblogging*' systems to connect with the audience through the so-called second screens. It is not easy to predict how long the success of networks like Twitter will last, but for the moment, this virtual tool has managed to modify the way in which information is produced, distributed and consumed.

> The 15-M movement has been able to combine its action strategies in the online and offline scenarios, which has strengthened and boosted the crowds. So far, it is the ultimate paradigm of social movement generated through an anonymous call of crowds through ICT. (Haro and Sampedro, 2011, p. no page number).

The combination of the movement with social networks, specifically with Twitter, as we point out, has managed to exponentially increase the visibility of the phenomenon, enabling, in the process, some peripheral public spheres whose concerns were hitherto impossible to introduce into the central public sphere and become notoriously important. Visibility is necessary for the movement to stay strong, and those responsible for the 15-M movement have made an exemplary use of Twitter to maintain its popularity:

> They know and understand the logic of social networks and the Internet, as well as their conditions for disseminating contents and information. We have seen that hashtags on Twitter have changed on different occasions, becoming trending topics on several occasions [...] so that the algorithm of the system picks up new topics and the movement does not lose visibility or influence. (Ferreras, 2011, p.10).

The 15-M movement, one of the most paradigmatic examples of cyber activism, was born on the web and remains on the web, because "trying to collect all the protests, demonstrations and campaigns that took place in numerous cities in a documentary or a book was something unreachable" (Calvo, 2013, p.26). For this reason, a sort of Wikipedia was created to collect all the documentation related to 15-M movement. The movement emerged under the protection of social networks and it made a communicative use of them to organise and mobilise a large numbers of citizens, using these new tools as a means of articulating their proposals, their actions and their camps. Twitter's success rewarded the movement with enormous visibility, but once it was extinct, one wonders whether the only real beneficiary of the 15-M movement was actually Twitter. Finally, it is important to point out what Caldevilla (2008) already predicted:

> Other elements that distinguish this information society are the speed with which information is generated, transmitted and processed, on the one hand, and the tendency to space decentralisation, on the other, corresponding to this end the propagation of messages (traditional or hyper-textual) to communication networks organised through the Internet. One of the fruits of this new society is Global Communication above information, given that the platforms interact with each other with the advantages provided by new technologies and networked society. Therefore, feedback mechanisms have been implemented in such a way that they are modifying the very structure of the classic communication system (telegraph model or paradigm) developed by Lasswell in the 1930s (Sender-Receiver-Message-Channel-Effect), which is an imitation of the classic, and more complete, Quintilian hexameter developed in the 1st century (*Quis, quid, ubi, qhibus auxiliis, cur, quomodo, quando*)", that is, Twitter fully meets the information needs.

4. Discussion and conclusions

As the basis of our conclusions we will quote some of the conclusions reached by some of the most outstanding and rigorous academic works on this subject, which analyse the importance that has been attributed to social networks in the birth, development and future of new political communication:

First, a qualitative study carried out by the CIS, between 19 October and 16 November 2011 in Madrid, Barcelona and an anonymous city of Castile and León, titled "Political representations and the 15-M movement" (study number 2921, available at: www.cis.es/cis/export/sites/default/-Archivos/Marginales/2920_2939/2921/IM2921.pdf, with technical data broken down in www.cis.es/cis/export/sites/default/-Archivos/Marginales/2920_2939/2921/Ft2921.pdf). The study is based on in-depth interviews with eight focus groups that aimed to be representative in terms of age, social class (defined by employment situation and occupation), degree of associationism and participation in the 15-M movement. Participants were people involved in the demonstrations and camping, whether as activists, members of the association movements or supporters. The interview was divided into 4 items: 1) Origin of the 15-M movement; 2) What is the 15-M movement? (characteristics, profile, values, differences with respect to other types of movements, relationship with parties, trade unions, press, etc.); 3) goals, objectives and results; and 4) future of the 15-M movement.

This study has concluded, with regards to the group of people most involved with the movement, that the 15-M movement had one (1) origin that they considered was the burst of a previous magma that was being forged in certain sectors of Spanish society through social networks. Some experiences allowed the articulation of a network of organisations that finally converged in the demonstration of 15 May: Real Democracy NOW, Youth Without Future, Association of Internet users against the Anti-Piracy Law, and the Movement for Dignified Housing, among others. In relation to the (2 and 3) lines of debate, the study considered that this movement plays an observer role, taking advantage of the mechanisms offered by new technologies and the development of social networks to carry out its evaluation and quality control of Spanish democracy. And finally, with regards to the (4) future of 15-M movement, the study argues that social networks helped in the dissemination of the 15-M movement and its model. Among the sympathies, the study points out that in the future, the movement should focus on specific aspects and continue working on the issue of social awareness, which draws a lot of attention and visibility. We can consider that the cross-cutting 2.0 models lead us to demand to be heard because:

> …the transcendence of the use we make of these social networks is increasing, and in developed countries life without being present in any of these networks is unconceivable. The use of these networks has surpassed any other online activity. The power of these general social networks should not be downplayed because on several occasions they have proven to be the most effective tool for citizen organisation, such as the camping in Puerta del Sol, which began as a demonstration on 15 May 2012, which was organised by many people through social networks, which subsequently encouraged hundreds of people, of different latitudes, to gathered for several weeks in the well-known central square of Madrid to call for political change" (López, 2014).

In a more technical line, the BIFI research group of the University of Zaragoza conducted a study (2011) based on the profiles of the 20 most active young, tech-savvy, activist users, working as information professionals, to examine the evolution of the size of the network, from 25 April, with 123 users, to 22 May, with 45,731, and including the 4,544 users in the emblematic 15 May. The BIFI created a very interesting video-animation that shows the communication flows between the various geographical points of development of the movement, throughout 31 days, from 25 April to 26 May, with 87,569 users analysed and 581,749 messages (available at https://youtu.be/H5w4amBIHj4).

The study is based on the idea that "the network formed by users exchanging information follows the scale-free networks model, similar to that of neural networks or those networks through which epidemics are most efficiently propagated". In the case of the 15-M movement, the study considered that "their network was scale free, which implies that, like other natural or social networks with this structure, it is created without external intervention to adopt its final topology, that is, it is a self-organised network". This is because according to this study "as the impact of the 15-M movement increased, [from few small groups to interconnected groups according to other parts of their study], new users exchanged messages with users of the existing network and almost always made it to the most relevant nodes.

In this way, people related to the same relevant users were grouped over time and within the Network several communities have been cohesively created. There are a few nodes that receive the most messages. Although each community can be made up of hundreds of people, their organisation has been sensitive to the existence of a few relevant users who are the most efficient points to publicly receive the information and thereby contribute to their dissemination throughout the network. These relevant users have different profiles and not all of them belong to the Movement. This network topology turns out to be the most robust in the face of spontaneous losses, but fragile in the face of targeted attacks. The vast majority of nodes are not decisive for the Network to function while a few relevant nodes keep it together. Even if many users stopped participating, the network of the 15-M movement would remain as 10% of its users have generated 52% of the messages. A small percentage of users propagate the information to many, while the vast majority only pass the message to a few. This is also detected, as mentioned, in the reception of messages.
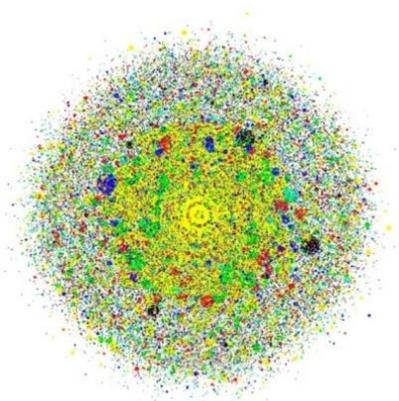

Figure 19. For animated version go to http://15-M.bifi.es/images/g4.0.jpg

The following graphic, whose viewing should be animated, shows the abrupt (not gently progressive) maturation process. In six days, its size went from small to encompassing the entire collective. "This effervescence also supports the hypothesis of "spontaneity" or emergency, which drives away rumours that the movement was somehow manipulated to influence the 22-M election result. The movement's growth pattern recalls other well-known examples in the field of self-organised criticality (critical phenomena in physics, economy, avalanches, earthquakes, etc.)".

The previous graph shows "how the network of Twitter users who exchanged messages evolved during the ten days following the start (15 May 2011) of the protest camping at Puerta del Sol in Madrid. Each node in the network represents an individual, whose size is proportional to the total number of messages that the user sent or received in the analysed period. Two nodes are connected if they have exchanged at least one message. The colours code the "age" of the node: the first active users are represented in yellow, while black is used for the last users to join the network".
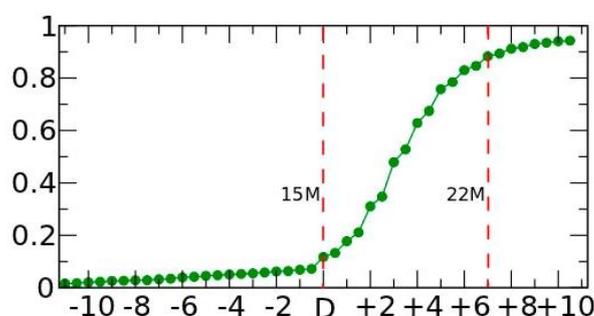

Figure 20. Evolution of the size of the system across days

The previous figure shows that the promoters of the protest camp had a low or very low level of connectivity in the previous days. From 15 May, with the appearance of the hashtag *#acampadasol*, after its dissemination in the media, the system becomes saturated in just 7 days after exponential growth. This implies that the day of the local elections, 22 May, does not represent any major change in the movement. The data represented are accumulated.
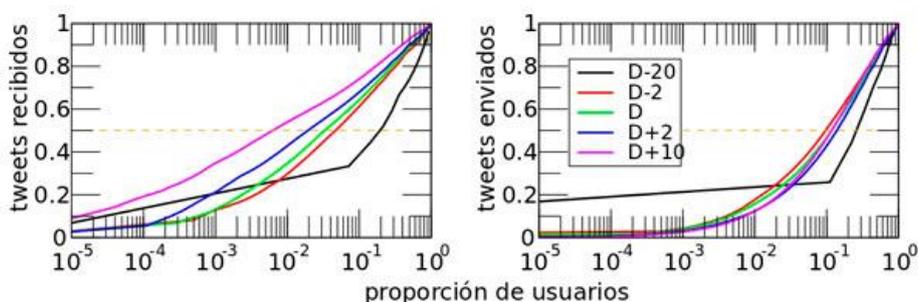

Figure 21. Received and sent tweets

These graphs show the faction of messages that were sent (right) and received (left), based on the density of active users for different days (D indicates 15 May). It is concluded that "if one considers 50% of the total message traffic (horizontal dashed line), it is easy to note that approximately 10% of

users generated that amount of information by sending messages. This happens on every day of mobilisation (note that the curves on that graph are practically overlapping); on the contrary, the graph on the left shows that there are drastic changes for different days. The more days that pass since the start of the mobilisation, the more the information that concentrates in a more pronounced minority. Thus, on 13 May (D-2, red line), 50% of messages were received by 5% of the nodes; on Day +10 (25 May, magenta line) less than 1% of the nodes concentrated 50% of the information. In conclusion: the information is generated (sent) in a distributed manner but is processed (received) in a radically centralised way".
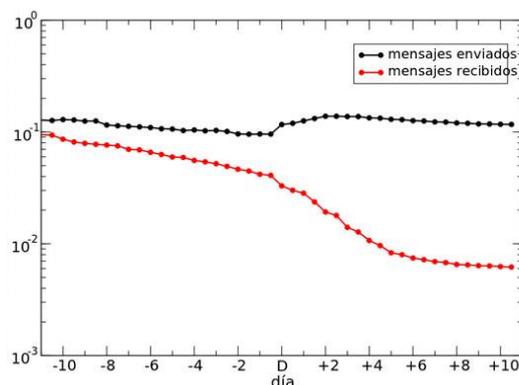

Figure 22. Proportion of users that manage 50% of the information flow

The study is complemented with this graph that shows 50% of the messages circulating on the network for different days. It is concluded that "in the week leading up to 15-M movement, the proportion of users responsible for 50% of the generation and reception of messages remained approximately symmetrical; from the "explosion" of movement there is a deep asymmetry, which causes fewer and fewer nodes to receive more information. This asymmetry accentuates the hub role of the dynamic of a minority of nodes".

In short, this study has determined that this connectivity system has 4 fundamental characteristics that define the use of social networks and their value:

(1) Network nodes are highly heterogeneous. Many nodes have little connectivity (they have sent or received few messages), while a few have very high connectivity. This mechanism is also reflected in the fact that most of the information (more than 50%) is generated by only 10% of users. In the end the information reaches the whole Network through other users who in turn send it to their contacts, and so on until they reach a large percentage of the social network. Contrary to what it may seem, this mechanism is very efficient.

(2) The existence of super-connected nodes (hubs), agents that receive many messages, implies in turn that the information is sent in a decentralised manner, but received centrally. Hubs dominate the information dissemination dynamics.

(3) The free-scale network, like the one generated in the 15-M movement, is a robust network: the disappearance of a significant part of the system (for example, internet connection failures that prevent the use of social networks to multiple users) does not affect the dynamic performance of the system. Also, these networks are fragile if the affected nodes are just the hubs.

(4) Scale-free networks are dynamically efficient. In the case of 15-M movement and its reflection in social networks: it is not necessary to send messages to many contacts to keep the whole system informed; rather, fruit of the emerging self-organised process, sending the information to some key agents (hubs) is enough to reach the entire system. This creates a hierarchy in the processing of information.

Therefore, network technicians who have analysed the connectivity distributions define the 15-M movement as "scale-free network" (connectivity distributions - messages sent and received- are represented in a logarithmic scale; its straight form indicates freedom of scale from the beginning of the movement.
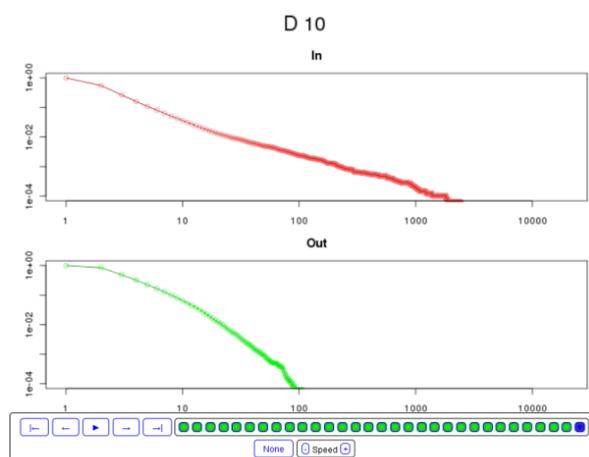

Figure 23

The results of the study carried out by the BIFI research group are reflected in the previous graph which shows the evolution of the distribution of the number of sent and received messages at the final moment (Day +10 and 25 May). The exponents γ are:

$$\text{Received: } P(k\_in) = k^{-2.15}$$
$$\text{Sent: } P(k\_out) = k^{-3.38}$$

The study remarks that "for received messages the exponent is in the range of $2 < \gamma < 3$, while for send messages the exponent is $\gamma > 3$. This means that received messages are within the "genuine" regime of scale-free network, with the dynamic implications that this has; whereas for the case of sent messages the range is close to an exponential regime". This is attributed to the fact that "until the appearance of the Web 2.0, it has not been very common to have temporary data available: now it is possible to know, in social networks, not only who sends and who receives a message (which defines the classic triad: node-origin, node-destination, link between two), but also when that event occurred".

The study also emphasises that "one of the interesting aspects in this field of changing networks over time is the dynamics of opinions: how an element (whether a Wikipedia article, a character or a trend in social networks) is born (appears on the network) and develops; and how a few of these entities can become popular. Understanding these phenomena is interesting because "popular entities" have an

impact on opinions, culture, politics and even on commercial gain (see the following graph for a better understanding):
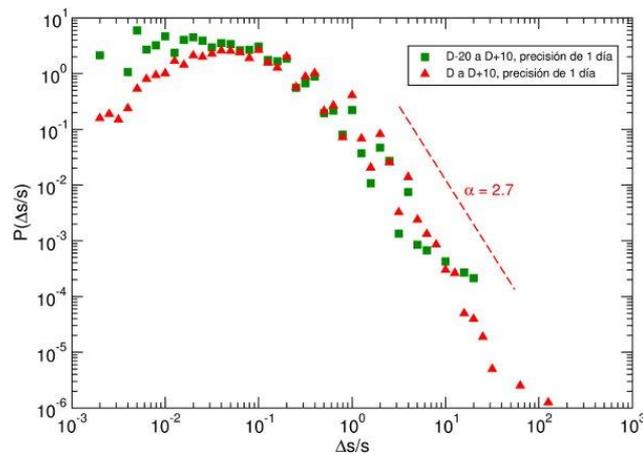

Figure 24

In this case, the "effervescence" of the popularity for the whole system (all nodes) is shown. The popularity of most nodes hardly changes (left area of the graph). However, a very small fraction does experiences significant increases (right area, the tail of the distribution). This pattern is not unique to this activist movement, but it is in fact observed in other contexts. Finally, the evolution of the outstanding subsets of nodes (not just on 15 May) helps shed light on the importance of Twitter.
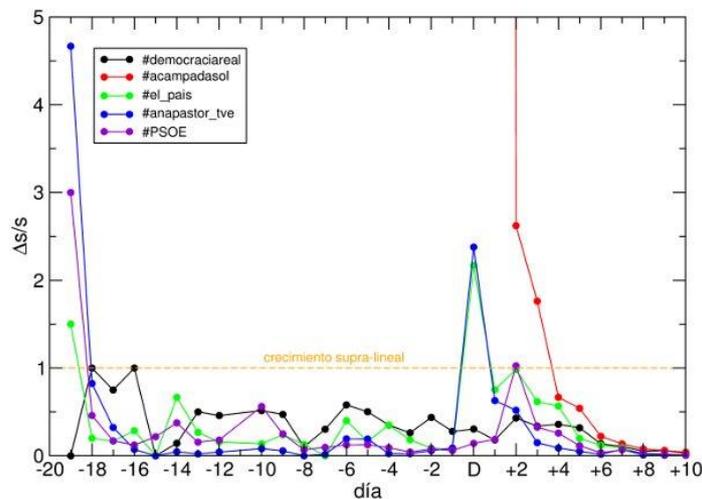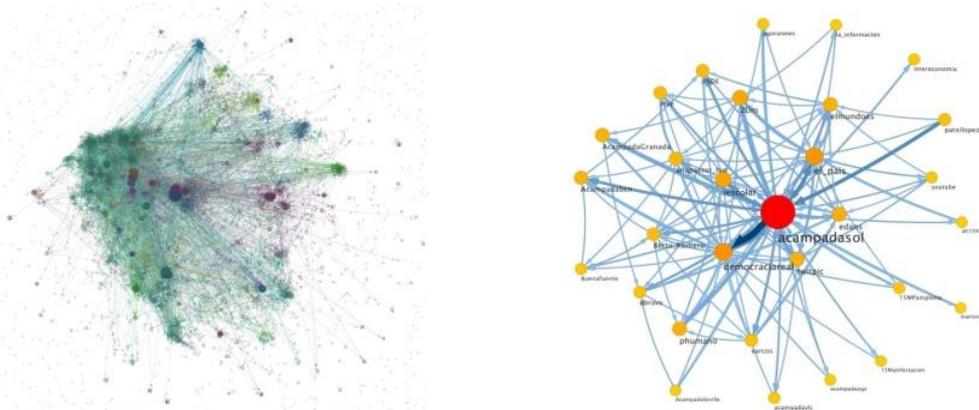

Figure 25

The previous graph shows the evolution in the popularity for a subset of nodes that stand out due to their importance in the network. As it can be seen, the peaks in which popularity grows are irregular and can appear at different times. This lack of regularity is similar to that reported for other areas of the web 2.0. With regards to the organisation in communities, which is something very typical of the philosophy of the 15-M movement, the following graphs show that distinguishable groups, separable in communities, emerge from the interactions accumulated by users of the social network.

Figures 26 and 27

The graph on the left we can see that the nodes of the network have been classified into different communities, as detected by a clustering algorithm. On the right, to facilitate a more intuitive view, there are only the 30 most relevant communities of the movement. Each node represents a "compacted" community, and the hashtag that accompanies each node corresponds to the most dynamically relevant hashtag in that community (in other words, their unifying element)".

It is concluded that "although it is not universal, it is common for complex systems to be organised into modules or communities. Informally, we define "community" as a set of nodes whose mutual connectivity (intra-community connections) is much denser than their connectivity to other modules (inter-community connections)". Therefore, "it is possible to distinguish several dozen well-defined and relevant communities [...] (those made up of more than 100 nodes) as well as a node whose role within its community is cohesive: the module is organised around it like a cluster, so in intra-community terms that node is a local hub. It should be noted that these nodes are easily identifiable: hashtags related to the protest camps, political parties and the media (or media figures) abound as "community-builders".

Paradoxically, these data mean that: (1) "the existence of separate communities according to the geographical organisation of the movement (camped in Madrid, Barcelona, Zaragoza, Valencia, Granada, Pamplona, etc.) suggests that, far from promoting long-distance relations, the tools of social networks tend to bring together people who are physically close"; (2) the prominent role of political parties and the media indicates that those involved in the mobilisations to change the Spanish democratic system show great activity precisely around the social agents that define the system itself; and (3) the aforementioned "geographical trait" seems to confirm the sovereignty of organised assemblies in cities.

It is clear that the 15-M movement reproduces the characteristics of the birth and evolution of a complex network based on social networks: impossible planning and difficult prediction regarding the birth of such events. Finally, it is important to mention that the presentation of content generated by the government's opposition fulfils what Segado et al. consider as a "preference for the expression of opinions and criticisms" over the messages in social networks that are made by those who prefer the

"construction of their public image, especially self-promotion and 'what do I do now type of messages'" (2015, p. 168)

4.1. Rethinking and extracting the communication factor of the 15-M movement

If the 15-M movement has used large-scale social networks and has set a precedent for its use by subsequent formations and initiatives, it has been, in fact, thanks to the plurality of its composition. Following Pastor (2011): "it is true that in the world of social networks there was a certain feeling of discontent with the political class. We could have perceived this in a park, in a bar, in a friend's house, but the new generations also manifest it on social networks.

We have already mentioned that social networks are just another channel, but also that they facilitate citizen participation in public affairs, allowing a more direct and healthy democracy even if this was not their original objective, because "social networks emerged as a gathering of people, known or unknown, who will interact with each other, redefining the group and refuelling it", but given their ability to influence, we can also argue that "the Internet and social networks can be used to modify behaviour, create new opinion movements, political parties and activist platforms, to promote demonstrations, create support groups for specific causes and to set trends that generate the consumption of a certain product. The law is increasingly closing this information trafficking that undermines the ruling party's interests. The relationship between users of platforms such as social networks goes from vertical to horizontal, enabling a symbolic equality that allows any internet user to send messages, produce content, and transmit or receive information" (Caldevilla, 2014).

Candón warns us that "social networks and the Internet are also part of the communicative framework that confirms the perceived injustice of a crisis that is not only economic, but also political and cultural. Both the Internet and the other media disseminate information of the social context which will be the subject of the outrage expressed by the movement but, above all, the Internet will be a space for debate, confrontation of ideas and opinions and for the interpretation of a reality perceived as unfair" (Candón, 2013).

We are faced with an unparalleled mobilisation tool since the generalisation of the printing press. By making individual participation possible, social networks fight the apathy and abstentionism that characterised European democracy in recent decades; enabling a return of the citizen to the field of the *zoon politikon* (Aristotle).

With more than 85 million users worldwide (in 2011, more than 325 in 2019), Twitter's microblogging system has since been among the preferred options for political leaders to reinforce their communication, attract new supporters, spread messages linked to their campaign and ultimately set up what Trivinho calls "trans-political capital", alluding to the set of texts, images and sounds that are adapted from the mass public scene to a more interactive scenario where action "escapes the administration, management and control of the political institutions inherited from modernity" (Trivinho, 2011, p.116, cited in Quevedo *et al.,* 2016, p. 87).

Twitter has proven to be an irreplaceable tool for social mobilisation, since its immediacy and scope are not afforded by any other social network. This can be a double-edged weapon: that same ability and dissemination speed coupled with its short messages, as a microblogging network, has often caused misunderstandings and clashes between users. The anonymity and impunity that it allows have served as cover for situations of harassment, manipulation or infoxication, as well as for the generation of false rumours and the manipulation of evidence. It is not adventurous to say that the phenomenon of the 15-M movement found on Twitter its main support from the outset because it is more dynamic than the SMS system (which was the protagonist, for example, in the mobilisations against Aznar's government after the 11 May 2004) and free (provided users have Internet access).

Twitter encourages the gathering and contact of diverse social profiles, the search for information and the immediacy necessary for change of plans on the fly according to the events. During the 15-M movement, it was enough to look at Twitter to learn about the latest mobilisations: their time and place, their agenda and goals. Twitter even became a shield against police abuse: it was commonly used to warn about police raids or evictions so that activists could dodge them, or to post videos of police abuse, which was forbidden by the new citizen security law. Those videos could reach thousands of people in minutes and force the authorities to react to avoid public opinion turned against them. There is a clear correlation between the decline in popularity of politicians and the increase in Twitter use in Spain.

Twitter allows users to make lists where they can include only those accounts they use primarily as sources of information, to receive first what we want to know with priority. It also offers the possibility to send direct and private messages to any follower.

Ultimately, Twitter served, in a way that is still difficult to measure in all its impact and complexity, to create permanent bonds between people who would otherwise never have been able to establish them. With the possibility of making contact through trending topics and events with a dynamic of continuous interaction, it is relatively easy to find people with whom one shares political positions, ideologies or cultural tastes. Much of the current militancy of parties met on Twitter, and the groups created function as lobbyists more consistently and effectively than individuals, mainly through the more decisive action that Twitter enables, the Retweet, to inform all our followers. According to Félix Ovejero, this new context, of individualistic origin as a result of the deterioration of civic culture, has shattered traditional ecosystems of political socialisation.

Matellanes (2011) argues that "the capacity to participate does not come from destroying culture but from writing about it, modifying it, correcting it, expanding it, giving it a greater diversity of perspective and then putting it back into circulation, reintroducing it in the dominant media for their free movement", which leads to highlight the plural character of the parties involved in communication 2.0.

It will really take years to gain perspective on Twitter's true impact on politics and social movements, although its popularity is evident and remains the main subject under debate, not only among anonymous private users, but among political representatives, opinion leaders and citizens. Journalists have made it their main means of work. This was unthinkable in 2011 and, with its shadows, we can

say that, after the popularisation of Twitter, we live in a more active and participatory democracy, which allows us to know and react instantly. Although far from being a determining factor for real change in institutions, beyond local politics, it is now unthinkable that a candidate lacks a Twitter account, which is a popular victory. Never before had a future public authority participated voluntarily in such an exhibition.

Discerning whether, in short, Twitter is a tool for change or a means for the domestication of social conflict is something that we can only do with guarantees thanks to the perspective that time will give us. What is certain is that we are talking about a fluid medium for increasingly liquid politics.

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