

Evaluación de los movimientos sociales en la era digital: Participación, interacción y empoderamiento en el contexto de la movilización #Metoo*

Assessing Social Movements in the Digital Age: Participation, Interaction and Empowerment in the Context of the #Metoo Mobilisation

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Resumen: Este artículo propone un marco para analizar los movimientos sociales en la era digital, desde tres conceptos: i) participación digital, ii) interacción social, y iii) empoderamiento (modelo PIE). Además, se aplicó al movimiento #metoo. Se recopilaron tuits en 12 meses, según determinadas palabras clave. Se recogieron más de un millón de tweets (y retweets) de 1.450.000 cuentas. Se trató de generar una herramienta holística para estudiar en profundidad el impacto de la cibermovilización en el entorno físico, y viceversa, pudiendo usarse para estudiar otros movimientos sociales.

Palabras clave: Redes sociales; feminismo; #metoo; movimientos sociales

Abstract: This article proposes a framework to analyze social movements in the digital era, from three concepts: i) digital participation, ii) social interaction, and iii) empowerment (PIE model). In addition, it was applied to the #metoo movement. Tweets were collected in 12 months, according to certain keywords. More than one million tweets (and retweets) were collected from 1,450,000 accounts. The aim was to generate a holistic tool to study in depth the impact of cybermobilization on the physical environment, and vice versa, which could be used to study other social movements.

Keywords: Social networks; feminism; #metoo; social movements

1. INTRODUCTION

Before 2006, "me too" was simply an expression that denoted conformity with another person's statement, or a similar situation that one had experienced, lived or suffered. However, in the same year, the phrase "me too" started out as an expression of vindication and empowerment by the civil rights activist Tarana Burke. But it was not until October 2017 that it acquired notoriety in the international arena, when actress Alyssa Milano used the phrase to denounce her sexual harassment by Harvey Weinstein. Within a few hours of its publication, "#metoo" took on a new global meaning, comprised of empathy, support, denunciation, etc. (Hosterman, 2018). Ultimately, the phrase came to symbolise a cross-border network of fighting sexual abuse and supporting women's empowerment. Milano's publication served as a catalyst for its consolidation and an increase in its sympathisers and militants, exercising an important role in preventing violence against women (Fairbairn, 2020; Suk, 2019; Naik, 2020).

Therefore, this study analyses effects of the digital community's behaviour on certain social events. It also identifies the primary actors and spaces for participation, from the perspective of collective and community social intervention in the digital environment. Considering this objective, a new model was used to study the aforementioned behaviour, developed from the viewpoints of participation in the digital environment, measured through tweets on the movement, its impact, and the number of people who tweet on this; collective and community social interaction, measured through the communities generated, their interactions, and the identification of key agents who act as the driving group in the intervention; and, empowerment, analysed from the impact of these messages on events like the US elections (PIE model).

2.1. New models of participation in the digital environment

To understand the #metoo movement, it would be useful to analyse 'participation' as a concept, specifically after the eruption of new technologies, and from the new social paradigm of so-called 4.0 society. As already mentioned, hyperconnectivity and cyber-physical systems have generated several social changes, resulting from the rapid digitalisation of society. These have caused changes in the concept of participation and citizenship, allowing for 'digital citizenship' (Rendueles, 2016).

This new concept of citizenship blurs the borders between digital and physical environments, affecting the idea of identity itself by means of anonymity and pseudonymity. In this context, the redefinition of participation becomes clear, and necessary to be analysed from the perspectives of new social movements or new forms of intervention through social movements, through the media of social networks and the Internet (Rendueles, 2016).

In the specific case of participation in the digital environment, one observes new models of participation, which take advantage of the opportunities generated by historical discontinuities in identity and geography. These discontinuities make it possible to generate or promote changes on a global level, and open up participation for people who, because of being oppressed for belonging to a certain social group, are unable to denounce their situation, thereby causing a greater impact and offering greater possibility of participation (Rendueles, 2016; Bhattacharyya, 2018).

Within these new models of participation, and in movements like #metoo, one can identify two characteristics offered by Rendueles (2019): communication guerrilla and cyber-mobilisation. The former is an effort to break away from the hegemony of traditional media by telling stories about populations that these platforms usually 'protect', in this case, Twitter. Thus, it is important for revealing information that would otherwise remain invisible (Rendueles, 2019). Despite these objectives, it should not be forgotten that these platforms are limited by their own algorithms and codes, the weight of traditional media in interactions, and dissemination of these movements. The #metoo movement was able to overcome these objectives to some extent, by becoming a trending topic with great echo in media, such as the *Time* magazine.

In the context of the latter, #metoo can be linked to Rendueles' definition of cyber-mobilisation as 'large protests organised around the Internet' (Rendueles, 2019, p. 340). These protests are closely linked to analogical practices, such as the #metoo women's strike organised on March 8th, mobilisations against Bolsonaro or Trump, and the parallel movement created in Argentina, #NiUnaMenos. These mobilisations even impacted the European Parliament, through the declarations and actions of some women MPs (El País, 2020).

It must be noted that although the opportunities provided by these new models of participation seem to meet their objectives, they face several difficulties. One problem that hinders participation is the lack of an Internet connection to be on social networks; another is the lack of knowledge of how they work. These are essential conditions for availing digital citizenship (Rendueles, 2016).

In turn, one must consider aspects like the adaptation and inclusion of cultural differences in a global movement, such as the social resistance to women's communication, or the public-private distinction that hinders their participation. These continue to affect women and other disadvantaged groups. In addition, the perception of futility and a lack of hope is linked to their feeling of being in an immobile situation in their countries (Hassan, 2019; Leung, 2019). Thus, it seems appropriate to link this aspect to social interaction and empowerment, and analyse the impact of the #metoo movement with relation to its main drivers and their situation.

2.2. Community and collective social interaction

As mentioned above, social relations and interactions have been modified by the rise of digitalisation, as greater fluency in the latter creates discontinuities that generate primary social groups that were not previously considered, such as social networks and the Internet. Furthermore, the commitment to social movements and new models of participation have changed, with simply sharing posts, tweets, or signatures on Change.org being considered participation in or support for the movement (Rendueles, 2019; Rendueles, 2016).

These points, in addition to the previously mentioned limitations to participation, indicate the need to study these communities' behaviour, and identify their leaders and their commitment. This would not just allow assessing the movement's capacity for mobilisation, but also the interaction between its participants, the diversity it encompasses (or not), and the social resistance that it may (or may not) have faced in certain societies. The aim is to know the community and make a digital social diagnosis which can ensure that cyber-mobilisation is complemented by community and collaborative social interventions of an analogous type, similar to community social intervention (Barbero and Cortés, 2005).

This analysis utilised the theory of intervention in community social work developed by Marco Marchioni (1990, 2004), and Barbero and Cortés (2005). These theories suggest the need for a driving force in interventions, that promotes collective action in the society or community. Therefore, as part of knowing the community and making a social diagnosis, it would be appropriate to first learn

about the history of the movement itself (as discussed in the introduction), establish contact with the participants through their leaders, study the community's feelings of belonging and behaviour, analyse the role played by the main agents, media, social agents and institutions, and compare participation in possibly unfavourable social contexts, such as the #metoo movement in Bangladesh, as proposed by Bhattacharyya (2018).

2.3. Empowerment

To deepen relationships and remove the obstacles faced by certain groups within new models of participation in the digital environment, it is necessary to study the models' semantics, rhetoric, and capacity to attract the population (Xiong, 2019; Hoerl, 2019). Furthermore, in case of movements like #metoo, which are based on the telling of personal stories, and whose participants have faced psychological abuse, it is relevant to study the aspects linked to women's empowerment, and in this case, make them public (Bhattacharyya, 2018; Porrúa, 2010).

Empowerment is complex; it is multidimensional and influenced by a large number of environmental factors. Moreover, the process of empowerment is individual, and intervention and interaction can only generate opportunities for it. In its initial stages, it can be defined as the process of change whereby people, in this case oppressed women, acquire the capacity to intervene at the personal or societal level, for reducing or eliminating inequality (Janssens, 2009; Kabeer, 1999). This change must be understood within the reality of power relations that lie at various intersections, such as of race, class, culture, and affective sexual orientation (Charmes, 2003; Rowlands, 1995). Therefore, both the concept of empowerment and the PIE model can be extrapolated to the cyber-mobilisation of different social groups.

According to the above-mentioned definition, the concept of empowerment can be applied to the process of change of any oppressed social group, that culminates in the reduction, or even eradication, of inequality. This is the reason why this model can be extrapolated to the cyber-mobilization of different social groups or classes.

The concept of empowerment is complex because it incorporates several possible levels of analysis: individual, relational, community, or collective (Zimmerman, 2000; Rowlands, 1995). Given the interactions inherent to social networks and the Internet, and through an analysis of networks and heatmaps, it shall be possible to understand the relational and community sphere, as well as the common process followed as a group and the work carried out by the community. The content analysis shall make more information available to the field of social psychology, considering Zimmerman's (2000) results of empowerment.

Finally, in the context of women empowerment, the United Nations Development Programme (UNDP) generated the Gender Inequality Index (GII) and Gender Social Norms Index (GSNI). These indicators have been created in recent years, based on the theory of Martha Nussbaum and other empowerment indexes (Charmes, 2003), parallel to other human development indicators (UNDP, 2020).

The objective of GII was to analyse the gaps in reproductive health, empowerment, and the labour market. The GSNI was proposed and introduced by the UNDP in 2019. It is constructed on the basis of responses to seven questions in the World Values Survey, and studies the prevalent biases against women. These biases directly affect the development of women in their countries (UNDP, 2020). Thus, the #metoo movement's impact can also be analysed in relation to the country's GII and GNSI. It must be noted that the existence of these indicators at the international level favours this model's analysis of impact and empowerment, but this would not hold true if the model is applied to other groups, such as people with disabilities or non-normative affective sexual orientation.

3. METHODOLOGY

This study utilizes Twitter as a means of obtaining information about the #metoo movement and its participants. We used Kampal[®] Social, an application that allows collecting tweets from Twitter, and monitoring and analysing the data gathered. It is designed to provide companies, institutions or researchers knowledge about products, events, politics, social concerns, etc., and their impact on society. The application uses complex network techniques, by considering those features of networks (topology) that complement classical and statistical approaches, which do not encompass interactions among individual elements. This is useful, for instance, for identifying communities of users who are related to each other, and measuring the centrality of their members or the relevance of different users within these communities.

Kampal Social allows collecting tweets by applying two types of filters: usernames and hashtags (or text strings, in general). It collects messages containing either the selected usernames or hashtags. However, we did not select usernames, but only the hashtag #metoo. Tweets were collected according to these keywords over a twelve-month period (from 28th May 2019 to 27th May 2020).

Table 1 summarises the data collected during this period. Monitoring the hashtags enabled us to collect more than one million tweets, more than 1,450,000 users and retweets, and almost 850,000 mentions among users.

Table 1. Summary of the Data Gathered Between May 28th, 2019 and May 27th, 2020.

Summary of the gathered data

Total number of tweets	1,013,294
Number of users	1,457,746
Number of retweets among users	2,008,457
Mentions among users	854,861
Replies among users	419,872
Total hashtags	101,178

Figure 1 locates the hotspots on the world map, according to the distribution of tweets containing the monitored hashtags. The European continent, North America and India were the most active areas, and have therefore provided most of the information for this study.

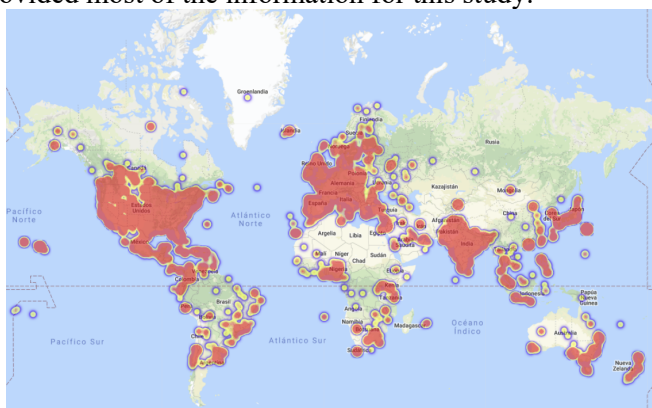


Figure 1. Distribution of hashtags monitored on the world map.

4. RESULTS

As shown in table 2, the first step in the analysis was extracting statistics and rankings from the data, relating to, for example, the most used keywords, most active users (those who produced the greatest number of tweets), users most mentioned by other users, most retweeted messages, etc. At the individual level, the relevance of a user in a specific conversation (in this case, concerning #metoo) can be estimated from the number of mentions or retweets they receive. We considered the number of mentions a better proxy than the number of retweets because it is easier to retweet than mention someone else; the latter requires effort and a certain interest (positive or negative) in the person in question.

Table 2. Top 10 Most Used Hashtags

Hashtags	Matches
MeToo	1,013,064
timesup	19,371

GE	10,603
metoounlessitsbiden	8,427
feminism	8,213
TaraReade	7,592
CORPGOV	6,907
BelieveWomen	6,619
believeallwomen	6,318
FCPA	5,769

Our study found that Alyssa Milano was the most mentioned user, according to our study, i.e., those who were mentioned the most in others' tweets. This could be because her tweet is considered to have begun the #metoo mobilisation. However, as already mentioned, Tarana Burke's use of the phrase was the precursor to the #metoo movement.

We have also mentioned that our period of data collection coincided with the US presidential elections. Thus, with regard to Joe Biden and Donald Trump, a large number of tweets mentioning Biden were collected. This was because, during the election campaign, Alexandra Tara Reade accused Joe Biden of sexual harassment. This generated much interactions, news and debates during the period.

It was also found that the most mentioned traditional media accounts included CNN and New York Times, and politicians included Nancy Pelosi and Hillary Clinton, who supported Biden. Another commonly mentioned user was Rose McGowan, an actress who had also denounced Weinstein for sexual harassment, and confronted some Hollywood colleagues for covering it up.

In light of the theories about new social movements, revolutions 2.0, and interactions linked to social action presented above, it seemed appropriate to categorise the accounts for analysis, on the basis of the PIE model. This categorisation, presented in Table 3, helps detect the profiles which were the main nodes, i.e., those most listened to and/or most influential in the movement's discourse. This shall facilitate further discussion on theories of the horizontality and participation of other similar movements. The classification codes refer to: i) practitioners, people linked to communication in the workplace, ii) community leaders and feminist referents, iii) relatives or politicians, iv) people in the arts and entertainment, and v) traditional media. Observing the number of retweets by different users reveals that posts on this topic by the swim_shu account were retweeted the most, followed by those by some other profiles, such as RealCandaceO.

Table 3. Users Most Retweeted

User	# Retweets	Type of user
swim_shu	91,800	Arts and entertainment

RealCandaceO	44,840	Practitioner
Looktarnspwdee**	22,814	-
shin_shr190506	18,837	Community leader
charliekirk11	17,423	Related
alexdatig	12,470	Practitioner
JillWineBanks	11,401	Practitioner
zornitsaxx	11,109	-
DeAnnaTLorraine*	9,763	Related
lilyallen	9,739	Arts and entertainment

* Suspended account. ** Closed account

We also examined the time dependence of the hashtags. Figure 2 presents how the use of the selected hashtags evolved over the monitored period. It is clear that the use of these hashtags was regularly distributed across time, with a typical weekly profile, and fewer appearances on weekends. The two outliers at the end of July and March were due to maintenance work at the datacentre, where the application server was installed. Some of the defined peaks are connected to important dates and reports on #metoo.

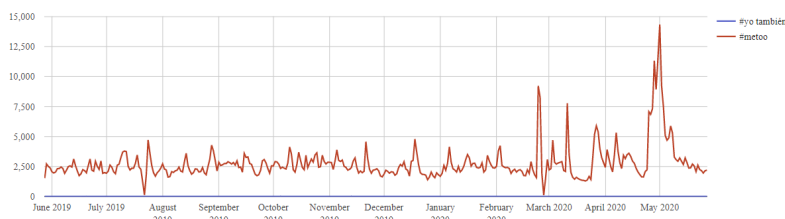


Figure 2. Use of hashtags through time (number of occurrences).

However, this is not just an important individual performance. The relationship between users and their environment, the capacity to connect with other users, and users' contributions to the dissemination of messages are also relevant. In this context, this study's framework analysed the global network of all the users who tweeted on the topic. To conceptualise this network, we considered that two users were related if one mentioned the other in at least one tweet. We then defined a link between each pair of nodes (users), weighed by the number of mentions between them, and used complex network techniques to represent and analyse the network formed in this manner (Boccalletti et al., 2006).

One of the best ways to understand how a global network works is by representing it graphically as a position map, where the nodes are represented by circles (or any other geometrical figure) and the links by lines. We used force-directed algorithms (Fruchterman and Reingold, 1991) and a Monte Carlo process to separate the overlapping nodes, and obtain graphs that display the

nodes with close relationships (i.e., wherein there are more mentions between them). This provides a geometrical vision of the network, and helps identify users with strong internal relations and fewer interactions outside the group. This also corresponds to the intuitive concept of communities. To enable the automatic detection of these communities, walktraps (Pons and Latapy, 2006) and leading eigenvector algorithms were used (Newman, 2006).

Figure 3 presents the results of this representation, where each point in the network is a Twitter user part of this study's framework.

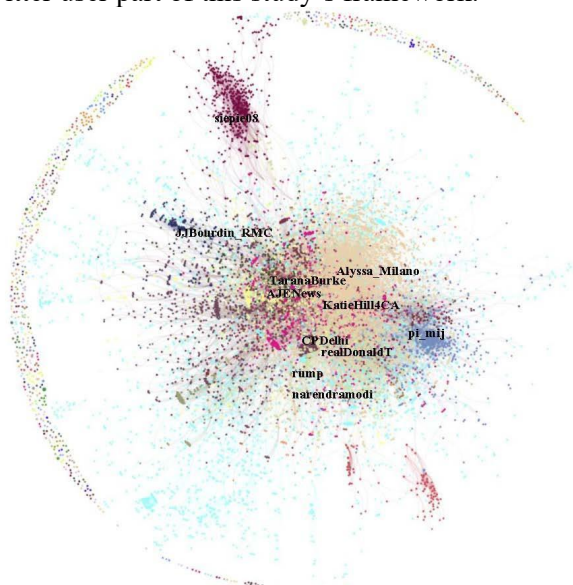


Figure 3. Global network.

Table 4 lists the main communities in the network, and their principal characteristics. The Alyssa_Milano community stands out from the rest, both in its total number of mentions and mentions made within the community (we named each community according to its most-mentioned node).

Table 4. The Main Communities in the Global Network

Community name	Total mentions	Internal mentions (within the community)	Number of members
Alyssa_Milano	15,876	12,012	2,673
realDonaldTrump	7,187	5,059	1,136
CPDelhi	5,757	1,819	812
navendramodi	4,586	2,543	2,203
TaranaBurke	3,079	1,309	619

pi_mij	2,818	2,051	560
KatieHill4CA	2,212	977	409
siepie08	1,676	1,627	378
AJENews	1,6	705	286
JJBourdin_RMC	989	791	149

We also determined which users were more relevant, from the point of view of connectivity in the network. For this, we calculated two different measures of centrality: betweenness (Freeman, 1977; Newman, 2005), which provides an estimate of the node's importance relative to different parts of the network, and page rank centrality (Page et al., 1998), which indicates the number of important nodes that point towards it and provides an estimate of its relevance in its neighbourhood.

The comparatively more central nodes, according to betweenness, are listed in Table 5. The list is topped by the user @DavidAgStone, whose account was suspended because of non-compliance with Twitter rules; this is followed by @TaranaBurke, the practitioner who became a community leader, @FirstThemNOW, whose account was also closed, and @Alyssa_Milano, an actress who became a community leader. This betweenness list is populated by community leaders from activism, arts and entertainment. They built bridges between different communities, without directly belonging to large corporations.

Table 5. Most Central Nodes According to Their Betweenness

User	Mentions	Betweenness	Type of user
<u>@DavidAgStone*</u>	437	0.29	-
<u>@TaranaBurke</u>	2,377	0.18	Community leader Practitioner
<u>@FirstThemNOW**</u>	162	0.13	-
<u>@Alyssa_Milano</u>	24,663	0.07	Arts and entertainment Community leader
<u>@nytimes</u>	2,947	0.04	Traditional media
<u>@ReadeAlexandra</u>	1,703	0.03	Community leader
<u>@jodikantor</u>	337	0.02	Practitioner
<u>@THR</u>	620	0.01	Traditional media
<u>@yashar</u>	553	0.01	Practitioner
<u>@NBCNews</u>	1,488	0.01	Traditional media

*Suspended account. ** Closed account.

The comparatively more relevant nodes, according to page rank, are listed in Table 6. Their magnitude is related to the users' local influence in their neighbourhood, particularly to their number of mentions.

Table 6. Most Central Nodes According to Page Rank

User	Mentions	Page rank	Type of user
@TaranaBurke	2,377	1.00	Community leader
@Alyssa_Milano	24,663	0.92	Arts and entertainment and Community leader
@JoeBiden	23,827	0.63	Related
@realDonaldTrump	11,158	0.34	Related
@YouTube	6,883	0.31	Traditional media
@nytimes	2,947	0.20	Traditional media
@rosemcgowan	2,793	0.19	Arts and entertainment
@jodikantor	337	0.15	Practitioner
@BreitbartNews	2,005	0.13	Traditional media
@CNN	5,344	0.13	Traditional media

In addition to the leaders outlined before, this list includes professionals who wield authority over their surroundings, such as [@TaranaBurke](#) (1.00) and [@Alyssa_Milano](#) (0.92).

To summarise, women, especially community leaders and those in arts and entertainment, have initiated disseminating information and raising awareness of the #metoo movement in social networks, especially on Twitter. However, they are accompanied by other relevant figures who play a similar role—for example, traditional media and practitioners, among others.

5. DISCUSSION

5.1. New models of participation in the digital environment

According to the results presented in Figure 2, the most activity was recorded on two dates: March 24th and May 1st. On the first date, 9,225 uses of hashtags were registered. On this date, some events in the physical space acted on the digital movement. A lot of activity was also recorded in the days leading up to it, when Harvey Weinstein was sentenced to 23 years in prison for cases reported in Hollywood (Laborde, 2020). Moreover, on March 22nd, Weinstein tested positive for COVID-19 (ElMundo, 2020), and on March 23rd, Salmund, a

former Scottish chief minister, cleared allegations of sexual abuse by nine women (Fresneda, 2020). Further, this date marked the anniversary of #MeTooEscritoresMexicanos, when five women had complained against Mexican writers (Camacho, 2020).

The second date, May 1st, is important in the context of the USA. On this day, Tara Reade accused US presidential candidate Joe Biden of sexual abuse. During the election campaigns, numerous statements were made on this issue, by Biden and other celebrities, both on and off social media. They went so far as to question the prior two tenures of Obama (Monge, 2020).

The collected data reveals a relationship between digital and physical environments. #Metoo can be defined as cyber-mobilisation, with reference to Rendueles' (2019) theory. As other studies have also found, these mobilisations impact events and decisions in their physical environment, such as the US presidential elections (Flesher, 2017; Brown, 2017; Micó, 2013; Barassi, 2013; Rendueles, 2019; Mattoni, 2017).

However, it is interesting to observe how, in turn, events in the physical environment impact those in the digital environment, and increase participation. These results demonstrate the parallelism between events in the digital and physical environments, and their bidirectional effect on each other. This reflects Society 4.0's own cyber-physical systems (Rendueles, 2016). Based on this, we can predict important physical or digital events, by monitoring both. An example that reinforces this idea is the study 'Early warnings of COVID-19 outbreaks across Europe from social media' (Lopreite, 2021). This study shows that there were warning indicators on Twitter of the arrival of a disease like COVID-19 in Europe. We propose the same idea for social diagnosis.

This model can also be linked to the idea of 2.0 revolution, and a reshaping of traditional organisations in favour of horizontality and greater democracy (Castells, 2012). The PIE model allows analysing who participated, how they participated, and how this led to the formation of communities.

5.2. Community and collective social interaction

As is evident, #metoo is a symbol of the global community's unity in the movement. Social networks provide the opportunity to create symbols associated with social movements, and analyse their counter-movements (for e.g., Trump or RituG15). This situation was unthinkable a few years ago.

Furthermore, it was found that the major driving forces of action (Marco Marchioni, 1990, 2004; Barbero and Cortés, 2005), which are assimilated to the central nodes in this case, refer to those user profiles which were already relevant in the public space, even before the movement. Examples include those of actresses, politicians, community leaders and traditional media (Tables 3, 4, 5, and 6).

According to the scale of psychological abuse applied in the couple (Porrúa, 2010; Porrúa-García, 2016), certain strategies can be commonly observed in cases of violent psychological abuse of women, such as isolation, controlling and manipulating information, controlling personal life, emotional abuse, and imposition of thinking and a servile role.

Seen in this light, the creation of a digital community that extends beyond the physical environment can help detect these strategies for avoiding abusive situations, even outside of the kind of sexual harassment for which it was initially created. Furthermore, a series of myths on violence against women have also been detected (Bosch-Fiol, 2012), against which the #metoo movement and other forms of feminist demands seem to have acted.

An example of the importance of the symbolism of #metoo is the impact of physical media reports and testimonies narrated on social networks, as seen in the analysis of the dates with most activity. With such supportive reactions, women would have a friendlier and more optimal environment to denounce and fight the violence they suffer. In addition, they can respond to counter-movement communities and close their main accounts.

5.3. Empowerment

With relation to the above, we observed progressive empowerment in the community, since their first cyber-mobilisation. The women's allegations as part of #metoo led to many counter-movement communities being suspended or shut down, for breaking rules and even making threats. This study too found that many accounts which were most mentioned, retweeted and followed were part of the #metoo countermovement. Despite their popularity, which was initially positive for the social network's algorithm, the #metoo community's strength and the social pressure it generated led to the closure of most of these accounts. Therefore, it can be said that the #metoo community has overcome the limitations of the social network's algorithm to a certain extent, thanks to social pressure and Twitter rules.

Nevertheless, the results presented in Figure 1 imply that there are still some countries where participation is low or non-existent. In Figure 4, we resorted to UNDP's GII and GSNI to analyse its possible causes.

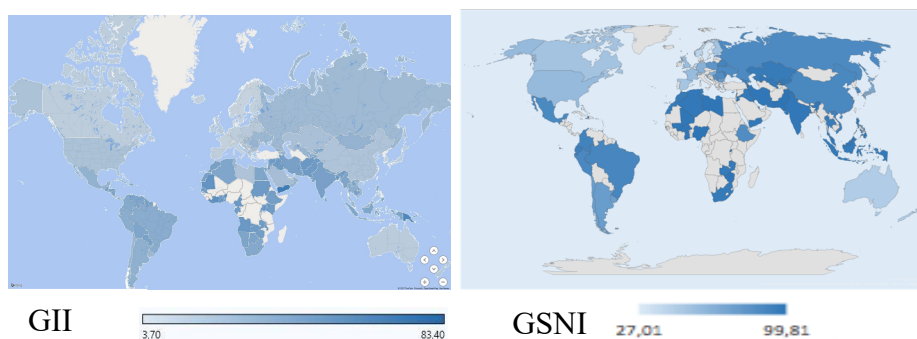


Figure 4. GII and GSNI on the world map based in UNDP (2020). (Countries shown in white and grey are those for which data could not be obtained).

Figure 1 shows that countries with less participation include Russia, Brazil, Canada, Algeria, Libya, Sudan, Kazakhstan, China, Mongolia and Australia. This could be because, in large countries where the population is concentrated in a few regions, the image of participation might be distorted. Therefore, as shown in Figure 5, we calculated the geopositioned tweets per population, by increasing the real percentage of participation. This is an important consideration for understanding the real data.

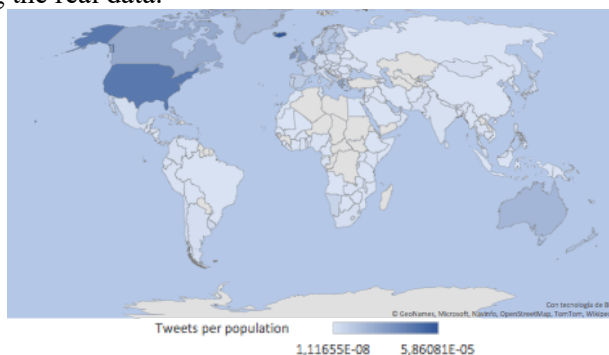


Figure 5. #Metoo tweets per population on the world map based. (Countries shown in white and grey are those for which data could not be obtained).

The new information reveals that countries like Canada and Australia actually had better #metoo movement participation data. In fact, the countries with less participation per population were Dem. Rep. of Congo, Afghanistan, Ethiopia, Bangladesh and Angola. It is important to highlight that there were also countries with poor results, such as Russia, Brazil and China. By comparing our results with the GII and GSNI, it can be stated that there are two principal categories of countries.

On the one hand are countries with high GII and GSNI, such as Ethiopia. In other words, in such countries with high gender inequality, a large percentage of the population is prejudiced against women. These results can be related to empowerment theories that affirm the community's relevance (Zimmerman, 2000; Rowlands, 1995).

On the other hand, are countries wherein certain factors have a greater effect on women's participation in this kind of mobilisation; hence, this category is more important. These countries have a lower GII, but higher GSNI. In other words, they have an apparently low gender inequality, but large percentages of the population are prejudiced against women. Some such countries are China and Russia.

Based on high rates of participation, we identified additional two categories of countries. On the one hand are countries with low GII and GSNI, such as the USA, Sweden and the Netherlands. Their social factors are adequate for empowering women to fight for their rights. On the other hand, are countries with high participation, and high GNSI and GII, like India and Kyrgyzstan. In this case, going by existing literature, we can state that the important factors are cultural referents in Bollywood, socioeconomic factors that enable women to access the Internet, and new models of participation in the digital environment—i.e., digital citizenship (Rendueles, 2016).

These results highlight the importance of promoting actions that combat social prejudices, parallelly with actions in the legislative and/or formal sphere. Failing to do so would make women's empowerment ineffective, given that they would not reach the maximum possible extent of participation. This is consistent with the results of other studies (Naik, 2020; Hassan, 2019; Bhattacharyya, 2018).

Finally, we state two principal limitations of this study. The first is language; despite using the same hashtag, the messages of some communities (for e.g., Japan) are in another language, limiting interaction in the digital sphere. The second limitation, linked to research on cyber-mobilisation, is the closure of accounts associated with the counter-movement for other external causes, such as the assault on the capitol (not #metoo). This highlights that the digital environment is ephemeral and fast-paced, which prevents studying the links between the closure of these accounts and their manifestation as a counter-movement to #metoo.

6. CONCLUSIONS

The effect of digital transformation on all social spheres is unquestionable. It has changed the traditional forms of action in social movements, such as demonstrations, strikes, performances and community meetings, by converting social networks into a space for demonstrating, protesting and interacting.

Participation and interaction on social networks democratise communication and discussion between ordinary users and personalities like Pulitzer Prize winners, presidents, actresses, and the top 100 women ranked by BBC. This is linked to the problems and demands of the social movement.

Faced with this complexity, it seemed necessary to create a framework that would analyse this new digital environment, and its social repercussions, in a holistic and interdisciplinary manner. To this end, a PIE framework was created, which encompasses all the features and aspects of cyber-mobilization. This model can make participation more visible, at both the individual and collective levels. It allows for the social diagnosis of a problem linked to a specific environment, at the global level. It geolocates countries with both the highest visibility and lowest participation, inducing reflection on the specific situation with respect to the problem.

It also allows analysing the community at a global level, through mentions which reveal the most influential users in the movement as well as the counter-movement. An analysis of the community's top 1000 retweeted users revealed those who most actively transmitted this information, and the overall activity and vigour of the community that retweets. This provides a more realistic picture and, in the future, can help detect fictitious communities based on a single user's bots or retweets. In short, the study's applicability in real scenarios helps capitalise and show what digitalisation offers for the effective analysis of social movements.

In the future, this model can be used to analyse other social movements and their impact on the digital environment. Moreover, it can semantically analyse messages and users (and their characteristics) with the greatest impact on the community, enabling the optimisation of the movement's dissemination.

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