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From Cyber-Activism to Technopolitics: A Critical Take on Historical Periods and Orientations in the Use of Digital Technology by Social Movements

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In this article, we perform a critical analysis on some academic contributions of the past 10 years that either offer a periodical historical overview of the relationship between social movements and digital communication or convey conceptual distinctions that facilitate the identification of different logics of action in the former. The text highlights both a multidimensionality of factors that influence the ways in which social movements use technology and the coexistence of technopolitical orientations in different sociohistorical contexts. We also present our own historical periodization in an attempt to counteract overly compartmentalized, evolutionary analyses. The proposed periodization differentiates clearly between the evolution of technological development on the one hand, and the different cycles of protest on the other. Finally, the article suggest that a general shift is traceable in social movements from cyber-activism toward a wider technopolitical frame of interpretation that is currently determining collective action in contemporary society.

Keywords: technopolitics, cyber-activism, ICT, social movements

This article is based on a critical analysis of theoretical contributions over the past 10 years that have either established a historical time line with which to identify a number of stages in the relationship between social movements and digital communication or have made conceptual distinctions that allow for identifying different, separate logics of action when assessing such a relationship (Bennett & Segerberg, 2012; Gerbaudo, 2017a; Juris, 2012; Robles & Ganuza, 2011; Rovira, 2017). We contend that these periodizations have proved to be fairly useful when mobilizing a diachronic perspective on the way social movements have incorporated digital technology into their media strategies. Nonetheless, whether consciously or not, in our view some of these works also paint a compartmentalized and evolutionary picture in which new technology-enabled logics of action (Juris, 2012, p. 266) seem to replace previous ones. Even

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though the periodizations examined here by no means represent homogeneous undertakings (evaluating, for example, the same periods or inquiring into the same phenomena), we believe that a critical comparison between them should still allow us to establish a series of benchmarks with which to frame our own time line and conceptualization proposal in the second section of this article. While this proposed periodization is in fact partly drafted as a synthesis of the contributions analyzed in our own theoretical framework, it also represents an attempt to counteract the aforementioned closed, evolutionary tendencies, offering a more heuristic time line. Finally, our periodization is also original in that it provides further insights into the current moment at which the wave of digital optimism generated in 2011 seems to be giving way to a more strategic and nuanced use of commercial digital media by progressive social movements.

Our sociopolitical positioning as male, Hispanic academic researchers has inevitably determined both the theoretical scope and the general inclusivity of a short, theoretical text such as this one Nonetheless we have tried to cover as much ground as possible. Inequalities in terms of status and power have serious implications when attempting to understand how social movements use digital technology, with the digital divide converging with other sociocultural forms of marginalization in relation to gender, sexual orientation, race, and class (Flesher & Gillan, 2017). This is the case for women and Black people who very often come across hostile environments online (Rodino-Colocino, 2014), which in turn can affect how technology is used by female and Black activists. In social movements such as Black Lives Matter, for instance, the idea of a "Black Twitter" has been frequently discussed (Brock, 2015), while cyberfeminism has pioneered the discussion on the ways in which the physical and the virtual overlap (Zafra & López, 2019).

Also, unlike previous academic work on the topic, the methodological perspective put in place differentiates clearly between the evolution of technological development on the one hand, and the different cycles of protest on the other. Such a distinction between digital media and sociological analysis allows us to detect the intersections and relationships between spheres that have developed in response to very different contexts and factors. This exercise suggests the presence of two distinctive ways of addressing the use of ICTs by social movements: the development of autonomous tools and the disruptive use of technology developed by actors outside the movement. Mainly theoretical, this article's empirical dimension is based on more than 50 in-depth interviews and five focus groups on the topics of social movements and digital media. These were performed over the past 10 years with activists of different social movements, primarily 15-M in Spain and the #YoSoy132 movement in Mexico. This research also draws from diverse processes of participatory observation undertaken in a number of contexts and initiatives, including Indymedia Estrecho, the digital origins of the platform Democracia Real Ya, and the network Lorea N-1, among others, as well as from several hackmeetings (in Madrid, 2009; Malaga, 2008; Marinaleda, 2014; Vallbona, 2012).

Throughout the article, the focus will be placed on digital communication. However, our approach to the relationship between the media and social movements attempts to foreground a media ecology perspective (Treré, 2019; Treré & Mattoni, 2016), emphasizing whenever possible not only the ways in which digital communication overlaps with more traditional practices involving mass media but also how different technopolitical orientations coexist at different points in time. Similarly, the proposed periodization will address the materiality of technological change as a key factor in the emergence of different technopolitical orientations over time. This does not necessarily imply conceiving technology as the main element determining how social movements relate to the media. Instead, our working hypothesis

points to a multidimensionality of factors (Milan, 2013) influencing the ways in which digital technology is used by social movements.

Finally, the article is structured as follows. We start by discussing the theoretical contributions serving here as our primary object of study, engaging not only with the periodizations proposed to date but also with the conceptual foundations underpinning them and the ways in which each one links the use of digital technology to the culture and identity of social movements. We then define our own periodization on the basis of a series of specific temporal, methodological, and conceptual criteria. Our work points to the existence of a visible general shift from cyber-activism activities toward a broader technopolitical framework in the way social movements use technology. One of the main contributions of our study is that it identifies and discusses a fairly recent development in social movements that, in light of cases such as those of Snowden and Cambridge Analytica, are now treating the hegemonic spaces of digital culture with greater caution. The article ends with a conceptual reflection that places the spotlight on three types of factors (pragmatic/utilitarian, strategic/tactical, and ideological/identity-related) that we believe are essential when considering the preeminence of one or other orientation as regards the use to which diverse social movements have put digital technologies at different times.

Theoretical Framework

In a much cited article, Jeff Juris (2012) proposes a distinction between a "logic of networking" and a "logic of aggregation" (p. 259). Although his theorization also associates both logics to the social justice movement (networking) and to the more recent square movements (aggregation), unlike Gerbaudo (2017a), Juris (2012) consciously avoids a clear-cut, compartmentalized distinction between both logics, warning that logics of aggregation "have continued to exist alongside rather than entirely displacing logics of networking" (p. 261). Nonetheless, the focus here is not so much on the strategic use of digital media, but rather on the cultural frameworks that such media foster in social movements, generating specific patterns of interaction associated with technological change. A logic of networking focuses therefore on connecting autonomous elements (movements, organizations, groups, etc.) that share information freely and collaborate in a decentralized way. A logic of aggregation, on the other hand, brings together individual actors who may create a collective identity through the process of struggle itself. Viral communication flows are essential as they make it possible for individuals to occupy public spaces. Subsequently, as Juris goes on to explain, this logic of aggregation redefines the relationship "between the virtual and the physical, between the online world and the square" (Juris, 2012, p. 267).

In a similar vein, Paolo Gerbaudo (2017a) examines the concept of digital activism by establishing a historical periodization with two stages. The first corresponds to the early popularization of the Internet in the mid-1990s and is related to the alter-globalization movement. In this context, digital activism initiatives focused on hacktivism and on the appearance of alternative media like Indymedia (Juris, 2008; Wolfson, 2014). The second stage saw the advent of Web 2.0 and privately owned social networking sites like Facebook, Twitter, and YouTube and the use to which they were put by social movements like 15-M, #YoSoy132, and the Arab Spring. In an attempt to surmount techno-deterministic tendencies, Gerbaudo (2017a) associates these two stages with the concept of ideology understood as "a worldview and value system which shapes collective action" (p. 478). Thus, in the antiglobalization movement digital activism is characterized by a "cyber-

autonomism" that links to a long tradition of alternative media and to the do-it-yourself (DIY) culture of the first Internet. On the contrary, what Gerbaudo calls "the movement of the squares" falls into the category of "cyber-populism," which has a more inclusive discourse and seeks to rally individuals around specific banners.

Gerbaudo (2017a) talks about "the complex imbrication between politics, culture and technology" (p. 481) that occurs within social movements and goes on to define cyber-autonomism and cyber-populism as two technopolitical orientations associated with different, separate moments in the development of digital technology. He does so by foregrounding the cultural and political transformation that started with the alter-world creation of media spaces beyond the control of the state and capital and has led to the attempts made by social movements over the past decade to appropriate commercial networks for the purpose of bringing about social transformation.

Feminist researcher and activist Guiomar Rovira (2017) also discusses two types of communication actors who have arisen from the relationship between social mobilization and digital communication: "activist networks" and "connected multitudes." As with Gerbaudo (2017a), Rovira pinpoints the time when these two collective actors appeared on the scene. Thus, "activist networks" refer to the use of digital technology in the alter-globalization movement during the 1990s and the first years of the new millennium. The logics of action of these "activist networks" have to do with the possibility of evading the control of the mass media through the creation of radical online media. In line with Gerbaudo (2017a), Rovira (2017) also identifies the quest for autonomy as the central principle of these actions. Nonetheless, she identifies with much greater precision the cultural and political currents shaping these activist networks, from the punk movement and cyberfeminism (Zafra & López, 2019) to the squatters' movement through, of course, the hacker movement and its emphasis on experimentation. Thus, Jello Biafra's famous line, "Don't hate the media, become the media," goes a long way to illustrate this confluence between the need for alternative information, the DIY "spirit of free software" (Kelty, 2008, p. 104), and the nonconformist aspirations of the punk movement.

Versus this logic of action, the "connected multitudes" concept emerged at the end of the first decade of the 21st century. Unlike the leading role played by activists, counterinformers, and computer programmers, here it is the activities of "anyone" (Moreno-Caballud, 2015) that count. Rovira (2017) identifies a technopolitical shift aimed at appropriating mainstream digital tools and networks to mobilize people and explore new forms of collective action. Identity-related links had thus become less important, bonds were being continually reforged, allowing for logics of aggregation that had made it possible to glimpse a politics that went way beyond understanding democracy as a mere exercise of representation.

Bennett and Segerberg (2012) take a different stance when distinguishing between two different logics of action when it comes to how social movements use digital technology: one of "collective action," referring to the leading role played by formal organizations and the presence of a solid collective identity, and one of "connective action," in which organizational tasks are fashioned by the use of communication technologies to share highly personalized content. Bennett and Segerberg do not focus on the advent of Web 2.0 as a major technological milestone, but on the role that digital technologies play in relation to organizational and identity-related aspects in each movement. Such technologies, by reducing the costs associated to collaboration (Shirky, 2008), allow people and groups to connect regardless of their physical location and even without necessarily sharing a defined ideology (Earl & Kimport, 2011). This facilitates a "logic of connective

action" (Bennett & Segerberg, 2012, p. 749) that does not demand that individuals know each other, share the same political views, or even interact in the physical world. The only requirement is to collaborate around loosely defined aims and radically inclusive frames of action (99%, Indignados, etc.).

Although Bennett and Segerberg (2012) point to the 1999 Seattle WTO protests, in which the iconic coalition of the "teamsters and turtles" occurred (Wainwright, 2007, p. 182), as marking the advent of this logic of connective action, their theorization is not aimed at establishing clear-cut stages. Nevertheless, their article does indeed suggest a certain evolutionary logic. A great deal of attention is now being paid to how networks are used to articulate action, with a detailed typology discussing networks in terms of whether recourse is made to institutional networks (collective action), whether those enabling open networks of action are formal organizations (connective action) or whether self-organized networks are involved (connective action). Taking this distinction into account, the authors apparently frame the action of alter-globalization social movements principally in a context in which it is organizations that promote the appearance of inclusive networks in a sort of early connective action. Whereas the most recent social movements, such as 15-M, Occupy Wall Street, Black Lives Matter, and #MeToo, are in keeping with the more evolved logics of action of self-organized networks, emerging from and managed on social networking sites.

Lastly, Robles and Ganuza (2011) distinguish between what they call "politics *on* the Internet" and "politics *with* the Internet" (pp. 248–249) in an attempt to problematize the interpretations that attribute the Internet a mainly instrumental role. Thus, while "politics with the Internet" basically involves using the Web as a dynamic element within representative democratic structures, "politics on the Internet" approaches digital technology as a political sphere in its own right, in which there is a struggle "to control the production and distribution of knowledge and political information, as well as to appropriate digital tools" (Robles & Ganuza, 2011, p. 249). To describe this conflict, both authors discuss the Internet's origins and the links to scientific values and hacker ethics, as described by Himanen (2002).

The shift in the technopolitical orientation of social movements, from autonomist logics of action toward populist and citizenist dynamics, from activists' collectives to connected individuals basically highlights a general trend in their culture, identity and strategies. In this respect, different authors have observed, for instance, a "self-limiting radicalism" (Cohen & Arato, 1992, p. 493) in the movements of the 1960s and 1970s; an orientation combining the desire to bring about the total transformation of society by means of micro struggles in daily life (as happens, for instance, in the feminist movement), with the renunciation of formal politics and institutional power. This approach was mainly based on the creation of critical communities focusing on countercultural revolution (Romanos, 2018), committed to building from below through the accumulation of micro revolutions. Subsequently, in the antiglobalization cycle, there was a process of contamination in action (Della Porta & Mosca, 2007) and the emergence of a new organizational culture that "stresses diversity, rather than homogeneity; subjectivity, rather than obedience to the organizational demands; transparency, even at the cost of effectiveness; open confrontations oriented to consensus building, over decisions; contamination, rather than ideological puritanism" (Della Porta, 2005, p. 33). A "conjunctive culture" (open and aggregative) that imposes itself on a "disjunctive culture" (closed and divisive) when planning protests or shaping discourses that channel discontent (Calle, 2013, pp. 67–101).

In the alter-globalization movement, however, both the militant identity and the desire to construct another alternative world remain in place. Although a process of *aggregation* is generated in which different movements encounter each other and collaborate together, there is no phenomenon *generating* a new identity differing from that of the classical Left. This new identity, which challenges the militant attitude of the traditional Left, is being built in the current phase with movements like 15-M, which "have striven to construct a movement of 'anyone' based on a terribly inclusive 'us', whose intention is to surmount the ideological or partisan affiliations, self-referential dynamics, organizational forms, discourses and identities of traditional social movements" (Romanos, 2018, p. 5). In the occupation of squares and campouts in the streets, there is a sense of inclusivity, based on empathy, markedly orientated toward 99% of the population. So, recent movements have promoted a much more open and transversal identity, more citizenist than leftist.

Nonetheless, it is important to note that well-established activist traditions, logics of action, identities and predigital media practices have all survived and adapted to the new conditions brought about by changes in digital media technology. Very frequently an insufficiently qualified association between specific, now dated, technological resources with concrete periods in the history of social movements has, consciously or not, produced the effect of suggesting that ground-breaking technological developments have ended up completely transforming the ways in which social movements organize their media strategies. The idea of media ecologies, often reclaimed to call attention to the importance of predigital media in the context of social movements' communication strategies (McMillian, 2011), is in fact equally useful for evoking how older digital media have also adapted to the different configurations of the media ecology in a process of coevolution (Treré, 2012). To quote from Nardi and O'Day's (1999) seminal study, coevolution involves acknowledging that "information ecologies are filled with people who learn and adapt and create" (p. 53). And so do media practices. Rather than simply disappearing or being replaced by new practices, they adapt and evolve to survive in a rearranged media ecology. Any analysis of political phenomena needs to consider a number of causes and determining factors, digital technology being one of them. The discussion becomes even more complex when considering the question of malleability (Manovich, 2005) regarding new communication technologies. The latter allow for a number of uses in their relation with more traditional media systems in a process of remediation (Bolter & Grusin, 2000) and convergence that blurs the lines between different types of media.

It is also important to emphasize that all of the periodizations analyzed fail to account for the phenomenon of right-wing activism, nor do they comprehensively address the question of the political economy governing commercial digital media platforms. As discussed in the fourth stage of our own periodization, the impact that such phenomena have had seems so far-reaching that some scholars have even argued that today's social media offer an uneven playing field, one that favors conservative views more clearly aligned with the interests of the digital corporations that control the most popular online platforms (Schradie, 2019, p. 7). In fact, inclusive and proactive movements actually act as a counterpart of other reactive and exclusive movements (Ullán, 2016, pp. 66–70), such as extreme right-wing populisms or xenophobic, nationalist groups now on the rise, particularly in Europe and the United States.

From Cyber-Activism to Technopolitics

Our own contribution does not question the utility of the historical periodizations or any of the conceptual distinctions analyzed above, although it does indeed decidedly underscore the need to understand

such proposals as heuristic tools that solely portray ideal types in the theoretical dimension. Their usefulness principally resides in their ability to guide research and weigh concepts against a much more complex empirical reality where stages overlap and opposing visions coexist, even within the same social movement. Our proposal draws from the definition of a series of fundamental milestones both technological and relating to the logics of action of social movements themselves, as shown in detail in Table 1.

Table 1. Technopolitical Orientations of Social Movements.

ICT	Social movements	ICT + social movements
Early experimentation (1960s, 1970s, and 1980s)		
1961. Paul Baran submits the B-265 report on packet switching	1963. Second wave of the feminist movement. Washington march. Civil Rights Movement	ICTs are rarely used by social movement until the 1990s. Indirect influence through social values influencing experimentation.
1965. Lawrence Roberts connects computers in Massachusetts and California via a telephone line	1964. Peace movement, protests against the Vietnam War	1973: Community Memory BBS
1969–90. ARPANET	1968. The French May	1983. Richard Stallman's GNU
1975. Microsoft	1969. Gay movement, the Stonewall riots	1985. The WELL
1976. Apple	1970. Environmental movement, first Earth Day	1987. Institute for Global Communications (PeaceNet, EcoNet, and LaborNet). Cyborg Manifesto by Donna Haraway
1978. UNIX	1991. Third wave of the feminist movement	1990. Electronic Frontier Foundation
1990. 100,000 computers connected, TCP/IP protocol, e-mail, and newsgroups		
The Web 1.0 (1990s)		
1991. Berners-Lee publishes a summary of the WWW project	1994. Neo-Zapatista rebellion	1991. Linus Torvalds completes Stallman's GNU system giving rise to GNU/Linux
1992. A million computers connected	1999–2001. Alter-globalization movement	1992. net.art and A cyberfeminist manifesto for the 21st Century
1993. First navigator (Mosaic) and search engine (Wandez)		1994. Zapatista communication war
1995. PHP		1997. Cyberfeminist international
		1998. First hackmeeting in Italy

1996. 10 million computers connected		1998. Reclaim the Streets in London
1997. Google		1999. Indymedia
1999. Dot-com bubble		
The Web 2.0 (2000s)		
2000. Dot-com bubble bursts	2003. Global protests against the Iraq War	2004. 13-M protests called by SMS
2001. First popular blogs	2004. 13-M	2006. Fight for Housing movement protests called by e-mail
2002. Friendster and LinkedIn	2006. Fight for Housing movement	2010–16. Movements of the squares use commercial networks (Facebook, Twitter, YouTube, etc.)
2003. MySpace and AdSense	2010–16. Movements of the squares	
2004. Flickr and Facebook	2010. Arab Spring	2011. 15-M migrates to N-1
2004. O'Reilly popularizes the term "Web 2.0"	2011. 15-M, Occupy Wall Street, Geração à rasca	
2006. Twitter	2012. #YoSoy132	
2009. WhatsApp	2013. Black Lives Matter, Passe Livre movement in Brazil, and the Gezi Park protests in Turkey	
2010. Instagram	2013. Fourth wave of the feminist movement	
2011. Snapchat and Google+	2015. #NiUnaMenos movement against femicides in Argentina	
2013. Telegram	2016. #ViajoSola in Ecuador. Violet Spring #24A in Mexico	
	2016. Nuit Debout	
Current "post-Snowden" era (2010–present)		
2009–11: First big data companies Cloudera and Hortonworks.	2014. Podemos and Morena	2019. When WhatsApp closes Podemos's accounts in campaign, the party resorts to Telegram,
	2017–18. Feminism, Me too, 8-M strike, #AbortoLegalYa in Argentina.	

2010. WikiLeaks		Alexandra Ocasio-Cortez closes her Facebook account
	2020. Protests against the death of George Floyd	
2013. Snowden		
		2020–21. Facebook and Twitter take action against sexism and racial hatred
2016. Trump campaign		
2018. Cambridge Analytica		

Our ultimate intention when clearly separating both realities is to identify temporal coincidences and common ground that should enable us to analyze the relationship patterns between both categories, highlighting the technopolitical orientations in each stage.

We have tried to avoid not only the technological determinism that some of the aforesaid authors explicitly reject but also a kind of "pendulum effect" that often occurs in academia and which, in this case, would involve a shift from techno-deterministic one-dimensionality toward an also shallow culturalist or overly ideological vision that ignores the sheer materiality of technology. It is essential to bear in mind how technological development conditions its possible uses by movements that, ultimately, operate in an environment determined by the technology available to them (Lévy, 2007). We thus consider that it is essential to address, on the one hand, the evolution of technology per se and, on the other, the changes in action repertoires and social mobilization cycles. Evidently, both dimensions are related, but also tread independent paths that intersect at specific moments. To our mind, methodologically separating technological development from the history of movements is far more useful for identifying the common ground that triggers specific technopolitical orientations and technologically mediated logics of collective action.

At a conceptual level, all the aforementioned authors tend to differentiate between autonomous, countercultural logics and openly inclusive ones. The former are based on a more hermetic conception of identity and give precedence to the creation of autonomous media and to the coherence between the means and the ends in a performative strategy. On the other hand, inclusive logics of action are conceived in citizenist terms; they are more plural, open, and propose a utilitarian and pragmatic use of ICTs. We consider that such technopolitical orientations can be generally defined as two basic forms of addressing the use of ICTs by movements: the development of autonomous projects (radical and independent media, technological sovereignty, free software, etc.) and the disruptive use of external technology (mainstream media, commercial social media, etc.).

Obviously, this dualism is in itself simplistic and, to a certain extent, even reductionist. Four issues should be qualified. Firstly, these orientations are not incompatible, signifying that sectors prioritizing one or another can coexist in the same movement; even each activist can opt for one or the other according to the ends being pursued (e.g., leveraging autonomous projects for internal organization and external technology for aspects such as dissemination). Secondly, it is important to recall that there are different levels of autonomy associated with each tool and communication channel. Thus, sectors with a greater commitment to technological sovereignty (Candón-Mena, 2012, 2013; Haché, 2014) do not tend to regard commercial networks like Twitter and Facebook in the same way as other activists in a single movement. It

is also important to stress the decisive influence that ideology and collective identity exerts on issues of this type. For instance, the perception of risks and drawbacks in a commercial network or the availability and usability of an alternative autonomous tool are factors that will ultimately have as much weight as the initial preference for one or other orientation.

Finally, we also need to emphasize that the orientations identified here are inextricably linked to specific actions and aims within concrete social movements whose approach to digital technology may differ widely. It is therefore important not to overstate the significance of digital technology and to avoid a reductionist form of presentism (Postill, 2012), for instance in relation to concepts such as autonomy. Even if we only discuss media strategies, it should be recalled that there may be a number of strategic actions involving nondigital autonomous media such as free radios, pamphlets, or print newspapers, among others playing a significant role in activists' quest for autonomy. A media ecology perspective is key here even in relation to studies focusing exclusively on digital technology as, on many occasions, they may inadvertently end up conveying the idea that digital media represent the only media technology available to activists.

In the following pages, we will focus on the four different stages that we propose as the bases of our own periodization of different technopolitical orientations in social movements.

Early Experimentation

The first of the four stages considered here corresponds to early technological experiences that would result in the advent of the Internet. This initial stage would correspond to the 1960s, 1970s, and 1980s. Digital, on-line technology would not be used by social movements at least until the early 1990s. However, since the 1960s, a series of analogical innovations have played a pivotal role in the way movements now understand digital culture. Photo-offset printing, for instance, opened up an experimentation period in which desktop publishing became the focus of the so-called Offset Revolution (McMillian, 2011, p. 7). In the same decade, countercultural movements were deeply involved in the emergence of the clandestine press and the publication of radical fanzines, facing some of the challenges that would resurface 40 years later with the arrival of a progressive, leftist blogosphere on the Internet. John McMillian (2011) identifies some of these common elements, pointing to "democratizing the media, rapidly circulating information, influencing the agenda of the mainstream press, and building communities among like-minded groups" (p. 190). The experience of the clandestine press would subsequently have a direct influence on the first attempts at technological appropriation, such as the Community Memory Bulletin Board System by Lee Felsenstein, in 1973, in San Francisco, and The Well Bulletin Board System in 1985 (Rheingold, 1996; Turner, 2006, pp. 141–174).

The beat movement, hippy culture, psychedelia, pacifism, and the sexual liberation movement, including the gay movement, emerged at the same time and roughly in the same place (the San Francisco Bay area) as the Internet came into being. The San Francisco Bay area was also home to technological industries linked to prestigious academic institutions like Berkeley, Stanford, San José State, and Santa Clara. Owing to the new social movements impregnating Californian academic culture (Candón-Mena, 2013; Castells, 2001, pp. 25–56), plus the impact of the countercultures associated with them, such as the DIY practices of the punk movement (Padilla, 2012; Rovira, 2017), individual autonomy and sovereignty,

freedom, the rejection of hierarchies and, among more clearly politicized groups, social solidarity would become fundamental values, shaping the hacker ethic during the initial stage of the Internet. Also, in the 1960s, a certain amount of technological experimentation linked to science and academia can be observed (Castells, 2001). This was mostly done by scientists who were clearly influenced by social movements during the 1960s and 1970s and their experiments with the clandestine press.

In this period, it is actually impossible to distinguish between an autonomous option and the disruptive use of external tools by social movements. The sense of early freedom, when developers could experiment unreservedly with technology, began to wane when software started to be conceived commercially, restricting access to source codes and denying the possibility of sharing, modifying, or studying programs. This new privative conception of software was promoted by companies like Microsoft and Apple, founded in 1975 and 1976, respectively. Both companies appropriated countercultural values, particularly the individualistic and meritocratic aspects of the hacker ethic, giving rise to the entrepreneurial spirit of Silicon Valley (Markoff, 2005; Turner, 2006) and the so-called Californian ideology Barbrook and Cameron (1996) described. Both were opposed to communalist values that placed greater importance on free software. Alternatives began to appear from the very outset of the privatization and marketing of software. However, the tipping point was undoubtedly the development of the GNU operating system by Richard Stallman in 1983, which was subsequently completed with Linus Torvalds' kernel giving rise to the GNU/Linux system (Stallman, 2004). The start-up of Stallman's project was a technological milestone, inasmuch as the development of an operating system was the first step toward achieving full-fledged technological sovereignty. The Free Software Foundation (FSF) allowed for the development of not only the basic principles and freedom of free software in relation to programing (Stallman, 2004, pp. 59–60), as reflected in the values of hacker culture, but also formed the legal basis for GNU licenses. Even then there was a true awareness that the original freedom was under threat. Efforts were being made not only to develop open-source alternatives, but also to conceptualize free software and the idea of technological sovereignty, although restricted to the academic field, where the alarm bells first rang and the first alternative proposals were put forward.

Enter the World Wide Web

The 1990s saw the advent of the World Wide Web, and companies started to enter the Internet business in droves, leading to the so-called dot-com bubble. This exacerbated many of the existing conflicts over the medium's commercialization and privatization. It was a stage characterized by the importance of online commercial services, which nonetheless would not come into their own until the subsequent arrival of the Web 2.0. The threat to the early freedom of the fledgling Internet was now clearly perceived.

The response of social movements to the increasing commercialization of the Internet involved prioritizing autonomous development. Free software models did actually serve as inspiration for organization formulas among social movements (Kelty, 2008). Following multitude theory (Hardt & Negri, 2004) and the view that it was indeed possible to collaborate in a context characterized by plurality and diversity, the global movement was then conceived as "a movement of movements" (Juris, 2008, p. 111). Cooperation to create free software was also foregrounded as an emerging model that social movements could actually copy and imitate (Coleman, 2013; Deseriis, 2017). The debate on technopolitical orientations now made

sense, with the "cyber-autonomist" option described by Gerbaudo (2017a) prevailing. Nonetheless, commercial services did not yet have the importance that they would gain in the next stage, and therefore nor would the utilitarian and pragmatic argument be decisive when opting for their disruptive use. The identity of the alter-globalization movement would still be distinguished by a militant, radical, and antiestablishment attitude, which was also reflected in the preference for the autonomous development of ICTs, unrestrained by the major companies and commercial services.

That process was brought to fruition in 1999 with the creation of the network of independent media Indymedia (Juris, 2008) on the basis of the hypertext preprocessor (PHP) programing language that emerged in 1995 and was originally designed for creating dynamic Web pages. Technical and social innovation went hand in glove with the creation of Indymedia, which could be defined as the union of the network of networks and the movement of movements (Della Porta & Mosca, 2005). Such a convergence between the Internet and the social justice movement gave rise to what Wolfson (2014) defined as the Cyber Left, differing from both the Old and the New Left. Wolfson's term foregrounded a new array of processes and practices in which activists used digital, online tools to open up new possibilities in relation to issues such as organizational structure, democratic governance and also media strategies as exemplified by Indymedia. This project was started up in an environment in which priority was still given to autonomy in the development of the Internet, but nevertheless already put the accent on a mass audience, even before the popularization of social media with the so-called "Web 2.0." Indymedia leveraged the innovations of PHP for open source and interactive publishing. The Indymedia.org site was pioneering insofar as it facilitated the publication of textual and multimedia information generated by activists participating in the protests.

Web 2.0

In the wake of the dot-com debacle in the year 2000, this stage was characterized by the predominance of commercial social media in what has become to be known as Web 2.0, a technology package for managing online information (RSS, folksonomies, blogs, tagging, etc.). Web 2.0 was the result of innovations affecting software applications and protocols, particularly as regards the concept of interoperability, which redesigned the Web as a platform. Platforms were defined by their programing ability and APIs allowing for the development of third-party apps (McKelvey, 2011). Social media facilitated the decentralization of data production and the recentralization of data processing (Gerlitz & Helmond, 2013) and reduced cooperation costs, as well as spatial limitations for communities (Earl & Kimport, 2011; Shirky, 2008). It should be noted that the term "platform" did not only refer to a series of technological innovations but was also used in business for political reasons to present specific economic interests in a neutral or positive light (Gillespie, 2010). Therefore, companies were able to bring considerable pressure to bear on the Internet's technical development and its regulation. In spite of this, Web 2.0 paved the way for sharing knowledge via more interactive channels, expediting the publishing and sharing of information, and enhancing the accessibility and usability of tools (Haché, 2014). Social networking sites like MySpace, Facebook, and Twitter became enormously popular, displacing to a certain extent other services, such as e-mail and blogs.

In this phase, social movements such as the Arab Spring, 15-M in Spain, Black Lives Matter, #MeToo, and the Occupy movements in the United States, Geração à rasca in Portugal, #yosoy132 in Mexico, Passe

Livre in Brazil, the Gezi Park protests in Turkey, and Nuit Debout in France used social media in a number of ways, and to various degrees. Activists in these movements realized that hugely popular commercial networks like Facebook and Twitter had the potential to be appropriated by them for their own interests, notwithstanding the handicap of losing a fair amount of control and ownership over technology. On the whole, a certain pragmatism in the use of the Internet prevailed, albeit not without criticism or conflict. The debate in relation to social networks was presented in terms of "affordances" and "constraints" (Cammaerts, 2015). With a long academic tradition (Gibson, 1983), the very idea of "affordances" generates an interplay among regulation, adjustment, and reconstitution strategies, between power and resistance, that is apparently inherent to "technological dramas" (Pfaffenberger, 1992). Social movements in this period foregrounded the logic of appropriation and the instrumental and constitutive role played by digital technology in the context of global protests. The predominance of pragmatist approaches did not mean the obliteration of autonomous development projects. In fact, the dilemma about whether to resort to free technologies developed autonomously or to attempt to appropriate commercial networks took on its full meaning at the time.

Social movements during this period tended to foreground citizenist ideals, which differed greatly from those of previous periods in terms of ideological dynamics, forms of action, political culture, and subject interpellation mechanisms. These were radically inclusive movements, pitching the citizenry against institutional, oligarchic power (Gerbaudo, 2017b, pp. 7–10). They performed a significant shift from the idea of protest based on class struggle that had been predominant throughout the 20th century. Nonetheless, renewed identities and discourses do not imply abandoning material claims and struggles for a fairer distribution of wealth that, actually, gained momentum in a context of crisis (Flesher, 2017). In fact, material claims and a renewed inclusive approach to protest coexist with social movements based on gender (#MeToo) or race (Black Lives Matter) and their struggle for recognition (Fraser & Butler, 2016).

The Post-Snowden Era

We believe that there are strong indications of a new stage that, in the near future, may alter yet again the balance between the use of commercial technologies and the commitment of social movements to the development of autonomous projects. Over the past few years, social movements seem to reveal higher levels of awareness among activists and the general public in relation to the political economy of the major social media corporations and how their interests might play a role in the political arena. It is still early days to predict how this will affect technopolitical orientations within social movements themselves. However, it is clear that social media platforms are no longer solely perceived as tools for mobilization but also as spaces of political conflict pervaded by commercial and strategic interests that establish the rules of the game.

In this new phase, it is important to stress the growing relevance of gathering and using the personal data of users by commercial networks, employing data-mining and microsegmentation techniques for persuasive campaigns. This phenomenon has now gone beyond the realm of commercial advertising to penetrate the terrain of political and electoral propaganda, leading to the rise of "computational management" in election campaigns (Kreiss, 2012, p. 23), such as Obama's in 2008 and Trump's in 2016. On the other hand, the major public disclosures made by WikiLeaks, in 2010, and Edward Snowden, in 2013, plus the Cambridge Analytica scandal, in 2018, are also noteworthy when identifying the risks of surveillance, control, and manipulation involved in the use of commercial networks. Moreover, data-mining is now widely perceived as

an essential part of the business plan of many commercial platforms, making privacy, censorship, and transparency key concerns in the debate on the possibility of using these platforms to promote a progressive sort of activism.

From the point of view of social movements, it should be observed that in this new stage the protest cycle seems to be evolving toward a growing institutionalization, with at least some of the previous social movements leading to the creation of new political parties or to open support for outsiders. This can be observed between the 15-M movement and Podemos in Spain and between the #YoSoy132 movement and Morena in Mexico. So, it is in this stage that we can claim more categorically that there has been a clear shift from cyber-activism toward the increasing relevance of a technopolitics pervading the general sphere of politics given, for instance, the growing importance that traditional political parties now attach to the use of ICTs in election campaigns, to the point that digital activism has become the norm in the current communication and political climate, coopted by governments and institutional political actors (Karatzogianni, 2015).

There is now a certain amount of pessimism in debates on issues such as fake news, bots, trolls, and disinformation campaigns. Such debates have had a direct impact on social networking sites, like Facebook, which were formerly perceived as tools with a huge potential for social liberation. In this changing climate, awareness about the risks posed by current technological development has become more widespread. This might translate, for example, into a conscious toning down of messages posted in commercial, social media by members and organizations within a specific movement, either in response to an increasing awareness of widespread surveillance or simply as the result of an adaptive process to the liberal logics that dominate these networks. The Black Lives Matter movement, for instance, has been widely labelled by scholars as a rejection of the "respectability politics" model that animated the African American Civil Rights movement (Harris, 2015, pp. 37–39; Taylor 2016, pp. 153–191). However, recent studies of Twitter messages posted between 2015 and 2016 by organizations affiliated with the Black Lives Matter movement show that a very low percentage of those issuing calls to action actually urge their followers to pursue disruptive repertoires of contention, opting instead for routes more clearly inscribed within the existing political system, such as petitioning government agencies, contacting elected officials, and voting (Tillery, 2019).

As we have already explained at different points, this periodization proposal has a heuristic purpose and should be contrasted with the empirical reality to underscore the issue's complexity, particularly as regards the coexistence of different logics and uses that transcend each of the proposed stages. Due to space constraints, we will offer just a few examples that serve to illustrate such a coexistence and can hopefully counteract any evolutionist image that might be derived from this theorization.

For instance, the 15-M movement usually appears as a paradigm of the cyber-populist orientation and the pragmatic use of commercial networks. However, the fundamental role played in the movement by people with a track record in cyber-autonomist projects is less known. The case of the computer programmer "manje" is paradigmatic. He had collaborated in the creation of the Indymedia Estrecho node in the context

of the global movement at the turn of the century.[2] However, at the dawn of the 15-M movement, he was an active user on Facebook, a commercial network that had nothing to do with the hacktivist ideal. Yet, with 15-M already under way, the same activist ended up developing the N-1 network (Haché, 2014) from Lorea, the seedbed of federated social networks. Given its limitations for organization and long-term debate, 15-M promoted a mass migration from Facebook—which, nonetheless, was still used for dissemination tasks—to N-1. The autonomous character of the new network is clearly reflected in one of the slogans used: "The master's tools will never dismantle the master's house" (Lorde, 2001). This sentence by activist Audre Lorde (2001) speaks of the different ways in which racial and feminist struggles (Jabardo, 2012) have influenced protest in radical European movements. It is also the case of the hacktivist, female community Donestech,[3] which was among the first promoters of the N-1 network. It is also remarkable how, after 15-M campouts, many of these hacktivist collectives joined the movement, including the hacklab of the occupied social center Patio Maravillas, which would promote HackSol and, together with other collectives, would create a completely autonomous technological infrastructure at the service of the 15-M movement. In sum, as Zeynep Tufekci (2017) has cautioned repeatedly, it is the sociological context and the needs of particular social movements, rather than the tools themselves, that mostly determine how media platforms are used.

Conclusion

As we have stressed, the periodization described above simply represents an attempt at identifying dominant technopolitical orientations in specific periods. These can coexist, reinforce each other or adapt to different contexts. Such theorization is useful inasmuch as it helps us to detect a series of supplementary factors that may influence technopolitical orientations with respect to the use of ICTs for collective action in each specific case. We are of the opinion that the following three factors are the most relevant: pragmatic/utilitarian, strategic/tactical, ideological/identity related.

Pragmatic/Utilitarian Factors

Although proposals such as Gerbaudo's have the merit of underlining the ideological or identity-related motives, we consider that the practical utility of the tools available at a given time is also relevant. These pragmatic and utilitarian factors should be understood in both a positive and negative sense. In the positive sense, the wide dissemination of commercial tools like Facebook and Twitter would be an important reason why activists use them in the same way as they have been using mass media strategies such as protest dramatization, in spite of their critical stance toward mainstream media outlets. In this case, the argument would not be qualitative, but quantitative, for activists choose to use Facebook or send press statements not because they believe these media are particularly well suited to activism, but because everyone else does. In the negative sense, the perception of the risks of censorship, control and repression that are increasingly more present in both the activist environment and society as a whole also has an impact. Of course, these utilitarian factors equally influence the use of autonomous tools. The availability of alternatives that, in addition to being more coherent with the ideas and principles of activism, are practical, useable and stable, is also essential.

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[2] Data based on participant observation processes.

[3] See http://www.donestech.net

Strategic/Tactical Factors

The specific strategies and tactics of social movements affect technopolitical orientations. The periodizations or distinctions between the logics of action analyzed here serve to order reality theoretically at the cost of simplifying it. The aims and objectives of specific social movements themselves are hardly addressed. This begs the question of why different movements use technological tools and to what purpose. It makes perfect sense, for instance, that the movements of the 1960s and 1970s, which were committed to the aforementioned self-limiting radicalism and focused on the creation of alternative communities, gave priority to the techno-autonomist orientation. This was not only due to the importance of the performative strategy, but also to their more self-referential orientation. The aim of more inclusive movements, like the 15-M, was to produce an impact on general public opinion and to triumph in institutional politics so as to change the existing world, rather than constructing other alternative worlds. It made sense to give priority to a pragmatic technopolitical orientation and, therefore, the coherence between the means and the ends of their performative strategy were not questioned so stringently. Furthermore, in their inclusive, populist or rather citizenist strategy they required tools, such as commercial social networking sites, that allowed them to engage everyone.

Secondly, as to tactics, social movements do not use new technologies in a general fashion, but put them to specific uses in each case. For activists, there are tasks and tasks, the emphasis being placed, for instance, on the internal ones of debate, organization and coordination, at the expense of those of dissemination and calls to action. As is to be expected, this has an impact on the importance that they attach to choosing between autonomous and commercial tools.

Ideological/Identity-Related Factors

Lastly, identity-related factors also have a profound effect on the logics of action of social movements. The use of technologies is not only instrumental; the tools themselves symbolize cultural values signifying that activists identify with the medium. Using an operating system like GNU/Linux is not only a question of utility but also a countercultural hallmark (Padilla, 2012, p. 41). Neither is this cultural identification dichotomous, nor does it respond to a clear distinction between autonomous and commercial media. By and large, activists identify with the technopolitical principles that are consistent with the values of new movements. Thus, as most of our empirical research confirms, commercial networks like Twitter and Telegram are perceived in a more positive light than are Facebook and WhatsApp, despite the fact that all of them are commercial platforms.

When these factors are taken into consideration, they ultimately paint a useful, but problematic picture. What can be glimpsed is a struggle for hegemony between the different technopolitical orientations forming part of the digital action repertoire of social movements. Thus, more than an end point, these periodizations should be conceived as departure points that encourage us to ponder further on the complex network of dynamics that determines the communication actions of these movements in the digital world.

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