

Data activism as the new frontier of media activism

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Abstract

With the diffusion of big data, citizens become increasingly aware of the critical role of information in contemporary societies. This awareness nurtures new social practices rooted in technology and data, which I term ‘data activism’. Data activism addresses massive data collection as both a challenge to individual rights and a novel set of opportunities for social change. It represents the new frontier of media activism, as it appropriates technological innovation for political purposes. It emerges from pre-existing sociotechnical networks, such as the hacker and the open-source movements, but overcomes their elitist character to involve ordinary users, thus signaling a change in perspective towards massive data collection emerging within civil society. This chapter offers a theoretical and empirical approach to investigate data activism. It places data activism in relation to the global social movement ecology, and examines the evolution of the “media activist” figure and role in relation to technological innovation.

Haiti, January 2010: a catastrophic earthquake hits the capital Port-au-Prince, affecting an estimated three million people. A global network of technologists, student volunteers and

diaspora Haitians join forces to operate a live crisis map of the country, repurposing a piece of open-source software called Ushahidi. Over 40,000 eyewitness accounts submitted via email, mobile text and Twitter are plotted on the map, providing crucial information for disaster relief operations ¹.

The ability of generating and making sense of ever-larger quantities of data has prompted observers to speak of a new breakthrough phase in human history, which Hellerstein ² termed the “industrial revolution of data”. Big data include the various databases generated by governmental agencies in their functions; the text, video and audio files, links and tags that result from online distribution and archiving; the communication metadata ensuing from mass-interception and government snooping; the information generated by human interactions in social networking platforms and by the indexing processes of web activities. But they can result also from the process of “datafication”, that is to say the “ability to render into data many aspects of the world that have never been quantified before” ³, such as friendships in the form of “likes”. Immense datasets are continuously generated by technologies as diverse as aerial sensors, radio-frequency identification readers, surveillance cameras and personal mobile devices. Each day in 2013 Google alone handled 24 petabytes of data (24 million gigabytes); over 10 million pictures were uploaded to Facebook ⁴. People leave behind digital footprints of their doings and whereabouts, in a myriad of software logs and communications metadata incessantly collected by service providers. “Open data” (i.e., data that citizens can use, reuse and redistribute) have become a crucial governance tool in the era of the government-as-platform ⁵: as the editor of the Guardian Data blog Simon Rogers recently explained, “we are surrounded by data. Governments around the world are opening up their data vaults, allowing anybody access to it” ⁶. Citizens can

contribute to improve public services like education, transport, and health care by actively participating in monitoring and overseeing.

But dark shadows hang over the data revolution. As we know from whistleblower Edward J. Snowden, a former US intelligence contractor, national security agencies consistently engage in blanket data collection to the detriment of their citizens' privacy, and often in cooperation with the industry ⁷. In the “informational” state, characterized by “shifts in the nature of power and its exercise via information policy”, “governments deliberately, explicitly, and consistently control information creation, processing, flows, and use to exercise power” ⁸. For example, social media monitoring is increasingly employed for predictive policing and prevention of protest ⁹. Data profiling has been used to reinforce social exclusion and inequalities of poor people, communities of color and migrants ¹⁰. The rise of “computational politics” goes hand in hand with a “shift away from demographics to individualized targeting, the opacity and power of computational modeling (...) and the growth of new power brokers who own the data” ¹¹. Data end up “standing in” for the individual, who is made to disappear in favor of a representation that can be effortlessly classified and manipulated ¹².

We are at a critical juncture, where governments and firms are taking advantage of the “new oil” ¹³ of big data, thanks to blurred legislation and the users' inclination to trade privacy for better services. Citizens face a moral paradox, typical of phases of rapid change, when legislation and corporate and/or state practices are not yet aligned with social norms. On the one hand, they see big data as a set of novel opportunities for social change, while, on the other, they equal them with social control. Slowly, however, people become increasingly aware of the critical role of

information in modern societies. This growing awareness nurtures new social practices rooted on data and technology, which I have termed “data activism”.

Data activism embraces the broad range of social mobilizations taking a critical stance towards massive data collection and big data more in general. From the sociological point of view, we can consider data activism as an “emergent movement praxis”¹⁴. It represents the new frontier of media activism, as it appropriates information and technological innovation for political purposes. Like some previous forms of citizens’ media, it identifies spaces for people to enact their democratic agency beyond traditional means of civic participation¹⁵. Similar to the media activism of the 1990s, which seized the nascent digital technology to spread the voices of the streets¹⁶, data activism aims at uncovering stories of injustice or change. Data activism, too, emerges from the fringes of society, and taps on the broker and sense-making role of a relatively small group of tech-savvy activists. However, contrary to earlier instances of media activism, data activism does not remain confined to small circles of experts who are the repositories of the know-how, but aims at reaching out to laymen, thanks to software that makes complex tasks such as data analysis and visualization or encryption much easier to perform.

This theoretical chapter explores data activism as the newest form of media activism. It puts forward the notion of data activism as a heuristic tool able to bring democratic agency back into the analysis of how big data affect contemporary society.¹⁷ It straddles three streams of literature, namely media studies (and the sub-field that scrutinizes alternative media in particular), social movement studies, and science and technology studies (STS), in view of offering an all-round theoretical and empirical approach to investigate people’s critical engagement with massive data

collection.

In the context of this chapter, I take big data to indicate “things that one can do at a large scale, that cannot be done at a smaller scale, to extract new insights or create new forms of value, in ways that change markets, organizations, the relationship between citizens and governments, and more”¹⁸. This definition emphasizes the transformative and empowering potential of data, focusing on the complexity of the tasks that can be performed, rather than data magnitude. In addition, it stresses the human agency aspect, that is to say what people can do with data.

In what follows, I provide an analytical definition of data activism, and I place it in relation to the current social movement ecology. Secondly, I distinguish between two forms of data activism, namely proactive and reactive. Thirdly, I provide historical grounding to the concept, placing data activism within the contemporary movement ecology and analyzing its role in relation to technological innovation and to media activism in its historical and current interpretations. Finally I offer some epistemological and methodological notes that in my view could successfully guide the empirical study of data activism, and explore three possible approaches to data activism, seen respectively as an incipient data epistemology, a set of new forms of civic participation, and a range of emerging forms of social organizing.

Defining data activism

Data activism is rapidly growing empirical phenomenon at the intersection of the social and technological dimensions of human action—hence it is sociotechnical in nature, because while it

is technologically animated, it unfolds in the context of socio-political processes and seek to alter power distribution¹⁹. It interrogates the politics of big data, assuming that both data collection and the manifold ways data are put to use are not neutral but carry socio-political agendas and programs. It calls into question the overall epistemology of big data, and interrogates our way of making sense of the “political” in relation to information—but also our ways of understanding development, change, and the relation between individuals and society.

The action repertoire of data activists includes examining, manipulating, leveraging and exploiting data, alongside with resisting and meddling their creation and use: in other words, the “antiprograms”²⁰ citizens enact as “line[s] of escape from the determinism” of algorithmic-mediated big data²¹. They are mostly counterhegemonic tactics, that is to say defensive tactics that seek to alter the relationship between citizens and big data/massive data collection by empowering users to be more critical²². Similar to what Hackett and Carroll termed “democratic media activism”²³, data activism is unique in the panorama of contemporary social movements to the extent that it treats big data simultaneously as the tool and the end of struggle.

Data activism is simultaneously enabled and constrained by software, which can be seen as the *sine qua non* condition of this genre of organized collective action to emerge and develop. Code, that is to say the technical environment that supports software and the internet²⁴, takes central stage not only in the activists’ analysis of the socio-economic forces that animate the informational state, but also in the actual activist practices. On the one hand, activist acknowledge that code does “format our action”²⁵, and as such is a locus of power in societies that are highly reliant on algorithms: by underpinning the technological environment in which

people move, code both enables and sets boundaries to human action. On the other, they develop and use code to facilitate a series of actions of resistance and subversion as well as of data manipulation, making the engagement of the non-tech-savvy sectors of the population possible.

The geographical span of data activism extends over different territorial levels, from local to transnational. At the local or national level we see activists leveraging the availability of open data to support campaigning efforts, or advocating for governments to adopt Freedom of Information Acts giving their citizens access to data. At the global level, more and more thematic networks emerge in both the proactive and reactive subfields: for example, the global network Hacks/Hackers, with its several national or city-bound chapters, is an innovative alliance of journalists (“hacks”) and technologists (“hackers”) for skill exchange in the area of data journalism, that is to say the craft of getting stories out of complex datasets by means of social science and computational methods; the platform OpenSpending allows non-experts to explore over 13 million government financial transactions from 66 countries around the world. It is worth noting that local, national and transnational networks often show similar features for what concerns tactics, identities and organizational forms, similarly to what I have noted elsewhere for other forms of tech-oriented mobilizations ²⁶.

Not unlike other contemporary mobilizations, data activism is characterized by a complex articulation of individual and collective practices which is inscribed in the very same object of activism: data and the material cultures associated with it. As Renzi and Langlois observed, “data bridges individuals, modulating the relation between the *I* and the *We*—our sense of ourselves both alone and as members of a community” because data has the ability to establish new

relations and is also “a vector for the circulation of affective and emotional bonds”²⁷. While promoting individual action, as for instance also individuals can effectively engage in data tinkering, data activism is essentially collective because knowledge and skills become relevant in the context of the group of peers. However, individual action and critical practices of technology use such as the adoption of encryption constitutes activism also when they are not explicitly shared within the group, on the ground that, as social movement scholars have observed, “there is protest even when it is not part of an organized movement”²⁸. These individual forms of protest, in the vein of collective ones, provide people with a “moral voice”, and “an opportunity to articulate, elaborate, alter, or affirm one’s moral sensibilities, principles, and allegiances”²⁹. They activate imagined communities of resistance that can be mobilized at need, for example in case of threats to established norms and practices, or when a political opportunity for change arises³⁰.

Culturally and ideologically, data activists look back at the hacker and open-source tradition³¹ at the radical tech activism of the 1990s³², at statactivism, or activism that targets statistics³³, and at the do-it-yourself culture of hacklabs and hackerspaces³⁴. From their forerunners, data activists have borrowed the hands-on attitude and the enthusiasm for code tinkering, collaboration, access to information, and world improvement through technical fixes³⁵. But, not unlike those portions of the media reform movement preaching direct engagement with technology as a way of confronting elite expertise³⁶, data activists actively seek to overcome the elitist character of tech activism to involve ordinary users. For instance, activists organize “cryptoparties”, which have been equaled to “a Tupperware party for learning crypto”³⁷, in view of introducing the basics of cryptography to the general public.

At the heart of the antiprogram

Analytically, we can distinguish two forms of data activism, namely reactive and proactive collective action. Re-active and pro-active are two facets of the same phenomenon: both take information as a constitutive force in society able to shape social reality³⁸. Further, both have as ultimate objective the “development of new or alternative forms of material culture”³⁹. By increasingly involving average users, they signal a change in perspective towards massive data collection emerging within the citizenry at large.

We have re-active data activism when citizens resist the threats to civil rights, and privacy in particular, that derive from corporate intrusion and government surveillance. They do so primarily by means of technical fixes or by creatively subverting and hijacking the monitoring and snooping with tactics like counterveillance and obfuscation⁴⁰, but adopt also more traditional movement strategies such as campaigning. For example, in 2014 the American Civil Liberties Union and other US-based nonprofits launched a charter of civil rights principles for the era of big data⁴¹. But while advocacy efforts are still in their infancy, much has been taking place in the realm of data and technology, and their software and hardware architecture in particular, on the ground that “[r]esistance to power programmed in the networks also takes place through and by networks”⁴². In order to protect users’ privacy, activist developers run proxy servers, maintain software enabling anonymous browsing, or create new privacy-minded platforms from scratch. Examples include privacy-minded alternatives to commercial social networking platforms such as Crabgrass (US) and Lorea (Spain), which put users in control of their data, and the Tor network which allows users to conceal the destination of the information they send from network surveillance and traffic analysis. These tactics are re-active, in that they provide technical fixes to

external hazards that are normally outside of their remit and reach, namely corporate intrusion and government profiling. Contrary to earlier initiatives of this kind, activists seek to move beyond the expert niche to engage also ordinary users. For example, in Facebook Resistance workshops activists develop adds-on that also non-tech-savvy users can easily use ⁴³.

Proactive data activism, on the contrary, actively takes advantage of the possibilities for advocacy and campaigning that big data offer, and use and appropriate data to foster social change. It articulates the link between the right to use data and a functioning public sphere on the ground that access to data equals empowerment. ⁴⁴ However complex, data show patterns and tell stories, and civil society is progressively acknowledging the value of such stories for civic engagement. Access to data, however, is not enough: users willing to put data to new uses need advanced data-analysis skills. Proactive data activists position themselves as interpreters of data, acting as facilitators also thanks to the growing availability of user-friendly data analysis tools facilitating the engagement of laymen. They take advantage of the decentralized peer production and distributed human capital of the global networks of developers and users of data-crunching tools and platforms, as the live crisis mapping in post-earthquake Haiti illustrates. For example, Occupy Data, a spin-off of the Occupy Wall Street mobilizations which emerged in the fall of 2012 in New York but rapidly spread across the world, seeks to support the “initiatives of the Occupy Wall Street Movement through data gathering, analysis, and visualization” ⁴⁵; journalists and hackers collaborate more and more often ⁴⁶; the non-profit Tactical Tech Collective has recently published a manual on visualizing information for advocacy, encouraging activists to empower their advocacy efforts by representing facts in ways that are at the same time “emotionally powerful, morally compelling and rationally undeniable” ⁴⁷. A variety of online

platforms ease the task: for instance, the non-profit Open Knowledge Foundation has developed the open-source data portal CKAN, used by civil society as well as institutional actors like the US government to explore data.

Within the contemporary movement ecology

Data and data-based advocacy are gaining terrain in the realm of contentious politics: for example, the very same slogan of the recent Occupy mobilizations was a data query, calling attention to the disempowered 99 percent being disenfranchised by the 1 percent ⁴⁸. While “metadata corrals activism into processes of capital accumulation (e.g. through data mining)”, it might likewise “create the conditions for the development of new activist practices (e.g. campaigns around hashtags)”; data, in addition, is “actively implicated in circulating affects and fostering social relations” ⁴⁹. At the same time, movements are growing more concerned about government and corporate snooping, and are increasingly eager to learn how to defend themselves from surveillance and repression. It should then not surprise that contemporary data activism does not exist in isolation, but is embedded in the complex ecology of contemporary social movements. But what is the role and space of the data activist in relation to contemporary movements, and media activism in particular?

Like media activism, data activism is “more about constructing a ‘politics of connections’ than it is about constructing its own composite action system” ⁵⁰. It occupies the spaces in-between, more often than not serving other causes and movements, spread as it is across the field of movement politics. In that respect, it has a “boundary-spanning” capacity and works as a “point

of articulation *between* movements” rather than a movement *per se* ⁵¹. For example, reactive data activists provide trainings in the use of encryption to other activists and like-minded people, while proactive data activists, too, offer training but also engage in interpreting and visualizing data at need. Further, it is worth noting that data activists might themselves be directly involved in other forms of political action. Finally, data activism is supported by a variety of social sources outside the movement sphere and only occasionally intersect the path of data activists: they include professionals like data analysts, data journalists and software developers, and advocates and social groups that might need access to data to advance their demands.

In earlier writings, I distinguished three decades in the emergence of communications and information as a site of struggle, from the 1970s onwards. The 1995-2005 decade, in particular, saw a renaissance of media activism, thanks to the unprecedented availability of cheap and easy-to-use digital technology like camcorders, as well as the expansion of the world wide web. It was back then when the “media activist”, who embodied a particular skillset and was the repository of expert cultures of critical usage of technology, became a distinct identity within the social movement ecology: a specific figure at the service of movements, and instrumental to other struggles ⁵².

The figure of the media activist changed substantially with the diffusion of commercial web 2.0 platforms, such as microblogging and social media. On the one hand expertise in media usage became seemingly irrelevant, as everyone could master the tools. On the other, however, with social media introducing “new patterns of protest that shape movement dynamics beyond the realm of technological practice” ⁵³, media activists took up the role of “ ‘soft leaders’ or

choreographers, involved in setting the scene, and constructing an emotional space within which collective action can unfold”⁵⁴. So, while everyone, including non-tech-savvy individuals, can become a media activist, media activists are not solely concerned with the management and production of information, but have moved to the core of action itself.

The advent of data activism, however, gives back to media activists the role of bearers and interpreters of technological innovation. Tactics of resistance to massive data collection and appropriation of data for social change (still) require the filter of experts, in particular for software development, training and the crucial interactive “meaning work”⁵⁵ as it is associated with making sense of technology and its potential for political action. But, similarly to what happened to the media activist in times of social media, data activists have the ability to act not only in the sphere of communicative action, but also in connection with direct action itself⁵⁶.

In what follows I offer some epistemological and methodological notes for the empirical study of data activism.

An agenda for the study of data activism

The notion of data activism represents a conceptual innovation at the crossroads of a sociological process (organizing collectively in order to take action), a cognitive activity (making sense of complex information), and a sociotechnical practice (software is central to data activism). How do we study a social phenomenon that is rooted in communications technology (and information), and is positioned between the social and communicative dimensions of human

action? Adopting an interdisciplinary approach able to take into account the multidimensional nature of the phenomenon is key. Potential disciplines include political sociology, and social movement studies in particular, for its ability to understand collective action dynamics and activists' sense-making activities and organizing strategies in particular; media studies to appreciate the communicative action inherent in data activism, as well as its intersections with journalism, alternative media, social media and so on; international relations to track the shifts of power within the transnational civil society brought about by big data; software and platform studies to unpack the specifics of the technological supports; science and technology studies for its ability to simultaneously think about the “technological” and the “social”.

In consideration of its sociotechnical nature, data activism is best studied through a mixed method approach able to allow the researcher to capture several layers of human action: what people think and say (i.e., how they perceive big data and massive data collection), what people do (i.e., how people mobilize in reaction to massive data collection, or engage proactively with data), and how algorithms mediate what people think and do (i.e. the role of software in empowering and shaping activism). In addition, it allows us to explore both the “social” and the “technological” dimension of data activism. In the STS fashion of considering technology as an interpretively flexible object ⁵⁷, I argue that in order to capture the multilayered nature of data activism we have to allow for some flexibility in the combination of methods that do not necessarily share the same ontological and epistemological assumptions. Firstly, qualitative data, in their nature of “data enhancers” that boost data to make it possible to see aspects of the object of research that might otherwise be neglected ⁵⁸, are particularly apt to the study of relatively unexplored realms of human action such as data activism. In-depth interviews and focus groups

aid to capture what activists believe they do, their stated motives and interpretations of their social world; ethnography of infrastructure ⁵⁹ can help to uncover how software shapes activism practices. Secondly, computational methods can prove useful to approach data collection to the ways “in which social practices are defined and experienced” ⁶⁰ in other words, I argue in favor of adopting also algorithm-based methods to explore a social phenomenon that is rooted in algorithms. Computational methods might, for example, help exploring code repositories like GitHub, which hosts much of the software used by data activists: one might, for instance, mine “fork&pull” projects, in other words branches of existing software developed starting from existing software available on the platform, looking for the evolution of software functionalities or the developers’ social graphs.

Finally, what can we look for in addressing data activism as a field of study? Here I briefly outline three possible approaches to the study of data activism: albeit proving only partial views, each helps illuminating a specific aspect of the phenomenon, while having the added value of leveraging different literatures and disciplinary traditions. The first way to look at data activism is its nature of emerging data epistemology. Data is a way of making sense of our realities ⁶¹: what do we gain or lose from the shift towards massive, quantitative data? How does people’s perception of themselves, their social reality, and their relational being-in-the-world evolve under the pressure of these developments? How does this impact activism and democratic participation? A second lens through which we can interpret data activism is its ability to bring about “new” forms of civic participation, which range from data journalism to data visualization, from video streaming to app-mediated engagement. How do these new forms contribute to change the tactical repertoire of social movements? How do they influence the individual vs.

collective tension typical of much of contemporary activism? What do they mean for the sustainability of political activism over time? Lastly, we can investigate data activism by analyzing the emerging forms of social organizing it promotes. The notion of “social movement rhizomes”, in other words the horizontal and network-like form of contemporary social movements ⁶², might be useful to approach the question. What new, unexpected rhizomes emerge, which bring together groups and identities that have rarely interacted before? How do these rhizomes work in terms of decision-making and internal structures? Are they sustainable over time?

In conclusion

This chapter has introduced the notion of data activism as a heuristic tool that allows us to investigate how big data affect contemporary society without dismissing the democratic agency of citizens. It argued that we need to develop a new vocabulary of interdisciplinary concepts and mechanisms, as well as innovative methodological approaches if we want to capture the complex sociotechnical nature of this emerging empirical phenomenon.

Data activism indicates the complex and dynamic ecosystem of organized collection action and individual engagement that takes a critical stance at big data and massive data collection. It examines, manipulates, leverages and takes advantage of existing data, but also resists and meddles data creation and use—and these tactics can be seen as antiprograms to pre-set hegemonic uses of data and software. Data activism can take two forms: when activists seek to resist corporate and government snooping we are in presence reactive data activism; on the

contrary, we are in presence of proactive data activism when people appropriate and use big data for advocacy and social change. Present-day data activism has its roots in earlier movement traditions, such as the hacker culture, statactivism, and the open-source software movement. It is rooted and enabled by software; comprises both individual and collective practices, and has a geographical span from local to global. Vis-à-vis contemporary movement scenes, data activism occupies a space in-between, putting skills at the service of other causes and groups.

We have seen how data activism brings back into the long tradition of media activism its historical role of bearer and interpreter of technological innovation, as critically engaging with massive data collection still requires a certain amount of skills and expertise. There remains to see whether data activism will be able to fascinate a broader sector of society, and whether and how its various souls and tactics will be able to bring about change in the ways big data are collected, used and redistributed.

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² “The Commoditization of Massive Data Analysis - Data,” 2008, <http://strata.oreilly.com/2008/11/the-commoditization-of-massive.html>.

³ Kenneth Cukier and Viktor Mayer-Schoenberger, “The Rise of Big Data: How It’s Changing the Way We Think about the World,” *Foreign Affairs* 92, no. 3 (2013): 28–40,

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⁴ Viktor Mayer-Schönberger and Kenneth Cukier, *Big Data: A Revolution That Will Transform How We Live, Work, and Think* (Boston: Houghton Mifflin Harcourt, 2013).

⁵ Anne-Marie Slaughter, “Government as Platform,” *The Wired World in 2013*, 2012.

⁶ Michele Bonechi, *Interview with Simon Rogers, Editor Guardian Data Blog, London* (London, 2012), <http://www.youtube.com/watch?v=bU8DiD2J-tw>.

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¹³ Perry Rotella, “Is Data The New Oil?,” *Forbes*, February 4, 2012, <http://www.forbes.com/sites/perryrotella/2012/04/02/is-data-the-new-oil>.

¹⁴ Robert A Hackett and William K Carroll, *Remaking Media: The Struggle to Democratize Public Communication* (New York; London: Routledge, 2006), 84.

¹⁵ C. Rodriguez, *Fissures in the Mediascape. An International Study of Citizens' Media* (Cresskill, NJ: Hampton Press, 2001).

¹⁶ M. Pasquinelli, ed., *Media Activism: Strategie E Pratiche Della Comunicazione Indipendente* (Roma: DeriveApprodi, 2002); Stefania Milan, *Social Movements and Their Technologies: Wiring Social Change* (Palgrave Macmillan, 2013).

¹⁷ It is worth noting that as an analytical category data activism is a theoretical construct: although data activism does exist as a composite and dynamic empirical reality, the unity of the conceptualization presented here is the result of the author's active framing. In other words, many of these activists might not refer to themselves as "data activists" but as "open data activist", "hacker", "data journalist", and so on.

¹⁸ Mayer-Schönberger and Cukier, *Big Data*, 6.

¹⁹ For a definition and contextualization of sociotechnical objects in STS, see Madeleine Akrich and Bruno Latour, "A Summary of a Convenient Vocabulary for the Semiotics of Human and Nonhuman Assemblies," in *Shaping Technology/Building Society. Studies in Sociotechnical Change*, ed. Wiebe E. Bijker and John Law (Cambridge, MA and London, England: MIT Press, 1992), 259–64.

²⁰ Wiebe E. Bijker and John Law, eds., *Shaping Technology/Building Society* (Cambridge, MA: MIT Press, 1992).

²¹ Berardi in Geoff Cox, *Speaking Code. Coding as Aesthetic and Political Expression*, Software Studies (Cambridge, MA and London, England: MIT Press, 2013), x.

²² For a distinction between counterhegemonic and reformist tactics, see R. A. Hackett, “Taking Back the Media: Notes on the Potential for a Communicative Democracy Movement,” *Studies in Political Economy*, Autumn, 63 (2000): 61–86.

²³ Hackett and Carroll, *Remaking Media*.

²⁴ Lawrence Lessig, *Code 2.0* (New York: Basic Books, 2006), <http://codev2.cc/download+remix/Lessig-Codev2.pdf>.

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²⁶ Milan, *Social Movements and Their Technologies: Wiring Social Change*.

²⁷ Alessandra Renzi and Ganaele Langlois, “Data Activism,” in *Compromised Data: From Social Media to Big Data*, ed. Greg Elmer, Ganaele Langlois, and Joanna Redden (London: Bloomsbury, 2015), 202–25. Italics in the original.

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²⁹ Ibid., 15.

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