Social networks as a model of algorithmic governance

Redes sociais como modelo de governança algorítmica

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ABSTRACT

The typical way in which contemporary society, associated with neoliberalism, is managed can be characterized as algorithmic governance. Social networks like Facebook are taken as a model for the operation of this type of governance. To comprehend its dynamics, algorithmic governance is examined in three fundamental dimensions. The first is the relational dimension: the individual is fragmented in his digital traces, which are recombined in multiple relationships. From there, the vectorial dimension unfolds: these relationships are oriented, capturing trends and embedding projections about the future. Finally, this orientation originates the agential dimension, playing the roles of amplifying the affinities and containing the differences.

Keywords: Social networks, Facebook, algorithmic governance, algorithms, neoliberalism

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RESUMO

O modo de gestão do social típico da contemporaneidade, associado ao neoliberalismo, pode ser caracterizado como governança algorítmica. As redes sociais, como o Facebook, são tomadas como modelo de seu funcionamento. E, para apreender sua dinâmica, a governança algorítmica é examinada em três dimensões fundamentais. A primeira é a dimensão relacional: o indivíduo é fragmentado em seus traços digitais, os quais são recombinados em múltiplas relações. A partir daí se desdobra a dimensão vetorial: tais relações são orientadas, captando tendências e embutindo projeções sobre o futuro. Por fim, essa orientação deslancha a dimensão agenciadora, desempenhando os papéis de amplificação de afinidades e contenção de diferenças.

Palavras-chave: Redes sociais, Facebook, governança algorítmica, algoritmos, neoliberalismo

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INTRODUCTION

IN HIS 1978-1979 course named *The birth of biopolitics* at the Collège de France, Michel Foucault (2004b) mobilizes the concept of governmentality to discuss liberalism and especially neoliberalism. This concept covers a range of questions that Foucault (2004a: 92) outlines in his preceding course, in 1977-1978: "How to govern oneself, how to be governed, how to govern others, by whom one must agree to be governed, what to do to be the best possible governor?"[1] Combining the significants *government* and *mentality* (*gouvernement* and *mentalité*, which compose gouvernementalité in the French original), Foucault's neologism describes a way of leading and thinking. And the idea of leading pervades both the government of self and that of others.

[1] In the original: "Comment se gouverner, comment être gouverné, comment gouverner les autres, par qui doit-on accepter d'être gouverné, comment faire pour être le meilleur gouverneur possible?" This and the other translations were made by the author.

In another article, I attempted to demonstrate that devices such as social networks, which surfaced in the web 2.0 environment, can be seen as representative illustrations of neoliberal governmentality (Castro, 2016b). This article advances this theoretical course and simultaneously adds some considerations to the foregoing elaborations. My intention is to show how social networks function as a model of the government of others, relating their *modus operandi* with similar variants of social management in the contemporary world. For such, I use the concept of algorithmic governance.

Civil society, in the sense that matures in the 18th century, is an essential component of the liberal apparatus of governmentality, interposing itself as a field of forces bounded by the state and the market, which provides the adjustment of legal and economic logics (Foucault, 2004b: 299-301). Within this topology we can perceive a symmetry between the two branches of biopower: discipline, directed at the individual body, and biopolitics, aimed at the social body, which is conceived as an aggregate of individual countable units. Certain social sections are ruled by disciplinary institutions, under the aegis of the state (prisons, barracks), the market (factories) or both (schools, hospitals). The administration of society as a whole, in turn, is the goal of modern biopolitics, which encompasses the care with birth, health, hygiene, sexuality, etc. In the 17th century, the work of William Petty, who Marx (1962: 288) considers to be "the father of political economy and in a sense the inventor of statistics"[2], already has a biopolitical purport. Petty advocates governing the social body through statistical data, bridging what he calls "political anatomy" (Petty, 1899a) and "political arithmetic" (Petty, 1899b). Further, it is within the scope of biopolitics that statistics spreads in the 1820s and 1830s, when a real "avalanche of numbers" (Hacking, 1982) or "explosion of numbers" (Porter, 1986, p. 11) is observed. This profusion of

[2] In the original: "Der Vater der politischen Ökonomie und gewissermaßen der Erfinder der Statistik."

quantitative data promotes the flourishing of a probabilistic social analysis, which gauges regularities, calculates averages, and isolates deviations, constructing interpretations anchored on this analysis. Émile Durkheim's (1897) sociological monograph on suicide is emblematic of this approach. The calculation of probabilities reveals the rationality inherent in the notion of risk – it becomes evident that accidents, illnesses and deaths are not mere snares of fortune or manifestations of divine designs but obey detectable statistical patterns. This foreshadows the maturation of a whole paraphernalia in social scale to deal with risk, comprising insurance companies, mutual assistance cooperatives, and the welfare state (Ewald, 1986). Thus, liberalism ends up shifting toward a style of social regulation in which legal logic is tonified vis-à-vis economic logic. In the strife between workers and capitalists, as exhaustively reported by Marx (1962) in Book I of *The capital*, the interference of law in response to social tensions is constant. These tendencies deepen in the 20th century, although thinkers such as Keynes and politicians like Roosevelt persist in labeling themselves as liberals, which is why Ruggie (1982) calls the period of Fordist accumulation of the second postwar era "embedded liberalism", a qualification endorsed by Harvey (2005) when contrasting this period with neoliberalism.

In recent decades we have witnessed the decline of the disciplinary regime and the reconfiguration of biopolitics. The paradigm of algorithmic governance, glimpsed by Deleuze (2003) as "society of control"[3], emerges in our time alongside neoliberalism. This paradigm is valid for sections of the social life and for society as a whole, permeating the actions of corporations and the state. It is rooted in changes that occurred during the course of the last century, including theoretical advances such as game theory, cybernetics and theories of complex systems, and technological advances in computing and computer networks. Algorithmic governance includes Big Data, which corresponds to an enlarged version of the avalanche of numbers, and the algorithmic treatment of these data, which takes the probabilistic analysis of the 19th century to a more intricate level. At this juncture, we can recognize the mutation of the finitude prevalent in the 19th century thought, according to Foucault, into the "unlimited finite"[4] in contemporary thought described by Deleuze (2004: 140). Each algorithm consists of "a finite set of rules that gives a sequence of operations to solve a specific type of problem" (Knuth, 1997: 4), but the algorithms coupled to Big Data bring about a situation in which "a finite number of components yield a practically unlimited diversity of combinations"[5] (Deleuze, 2004: 140). If internet users – in social networks, as this article wishes to highlight, but also in search engines, e-commerce, games, dating applications, etc. – incessantly face algorithmic governance, the

[3] In the original: "société de contrôle."

[4] In the original: "fini-illimité."

[5] In the original: "un nombre fini de composants donne une diversité pratiquement illimitée de combinaisons."

latter appears likewise in the world of finance (Martin, 2013), in consumption (Lury, 2009), or in the monitoring of terrorism (Amoore, 2009), epidemics (Roberts; Elbe, 2017) and natural disasters (Hristidis et al., 2010).

Big Data denotes the injunction of measurability that affects all walks of life and is beholden to competition. The latter looms as an intrinsic value to neoliberalism, dissociating itself from cooperation through the division of labor, established as the standard of economic organization by Adam Smith (1981) and of social structure by Durkheim (1893). Competing implies collating one's performance with that of others and requires the proliferation of metrics, often stipulated with market support. In the social structure, the algorithmic treatment of data presupposes the indetermination attributed to the market by neoliberal authors. Indeed, the unfeasibility of centralized planning of the economy is a prime motto of neoliberalism, since the perception of reality is scattered among market agents: "The problem of what is the best way of utilizing knowledge initially dispersed among all the people is at least one of the main problems of economic policy" (Hayek, 1948: 78-79). Algorithmic analytics projects the market framework into the social sphere and amounts to a kind of risk management – the goal is no longer to neutralize risk, as in the welfare state, but to coexist with it. Hence, algorithmic governance coheres with neoliberalism. And, it is curious to note that, although as far as data collection and analysis are concerned, algorithmic governance exacerbates the transformations unleashed in the 19th century, its impact is the reverse of those transformations, representing a pendular shift from legal logic to economic logic.

Here, we must clarify the preference for the concept of algorithmic governance rather than "algorithmic governmentality"[6] (Rouvroy; Berns, 2013). The entire string of questions attached by Foucault to governmentality, as shown in the quotation transcribed in the opening paragraph of this article, is pertinent to the conduction of individuals and populations. Now, as we shall see, the individual unity collapses and the reach of algorithmic governance expands beyond the fragments of individuals, insofar as these fragments articulate with the world of objects. In addition, if governmentality in the national state has an unequivocal bond with the society under its jurisdiction, this bond, as Enroth (2014) observes, is undermined by the current trend of global governance, exercised diffusely by a plethora of institutional actors without referring to a specific population. On the other hand, the notion of governance, which underlines the process of governing in relation to its agents, has some advantages. Concerning all kinds of institutions, this notion shuffles the distinction among these institutions and its use reflects, in particular, the neoliberal propensity to generalize corporate management instruments, from where it originates, to all areas, including the public sector.

[6] In the original: "gouvernementalité algorithmique."

Governance implies "governing without government" (Rhodes, 1996), not only by distancing itself from the concept of government as state administration, but by favoring horizontal, distributed, networked styles of command. What we have here is the technocratic point of view according to which "political decisions are based on neutral facts or rational arguments" (Lemke, 2007: 54). And the normative connotation of this term is made explicit when one speaks of "good governance", which is usually understood as less government (Rose, 2004: 16). Anyhow, albeit linked with the neoliberal project, one cannot assert that algorithmic governance is a prerogative of this project. If neoliberalism, which is still hegemonic on the planet, admittedly gives way to either "reactionary populism" or "progressive populism" (Fraser, 2017), as a denouement of political contentions on the horizon, it cannot be ruled out that both alternatives preserve significant elements of algorithmic governance, given the ingrained nature of this governance. Considering these reflections, although this article fits into a broader proposal to study neoliberal governmentality, using social networks as an illustration, it concomitantly assumes that algorithmic governance does not exactly conform to the conceptual beacons of both governmentality and neoliberalism.

Another related expression is "algocracy" (Aneesh, 2006; Danaher, 2016). Albeit not the intention of its proponents, the word itself, which refers to the power of algorithms (as democracy literally expresses the power of the people), conspicuously evokes the predominance of technology over man, a topic dear to science fiction. In a similar vein, a conference held in New York picked as its gist the "tyranny of the algorithm" (Bernstein Institute for Human Rights, 2016). The danger incurred by such lexical choices is to obscure the political nuance of the power in question, masking the effective agency ultimately underlying that power. After all, capitalist domination is the domination of man by man and has a distinct class character, no matter what methods are used. Algorithmic governance is not the governance *of* the algorithm, but *through* it.

To characterize algorithmic governance, this article postulates that it consists of three fundamental and interlinked dimensions– the relational, the vectorial, and the agential –, which it proposes to track. The point is to show how algorithmic governance is anchored in relationships, identifies vectors that animate these relationships, and manages behaviors guided by these vectors[7].

[7] These three dimensions are similar to the three stages proposed by Rouvroy and Berns (2013) and appear recurrently, together or isolated, in the vast contemporary theoretical literature on algorithms.

RELATIONAL DIMENSION

Several theoretical approaches highlight the proliferation of data underlying each person in contemporary society. To designate someone's traits compiled

electronically from his everyday activities, such as the use of a credit card, Alan Westin (1967), harbinger of digital privacy even before the blossoming of the internet, coined the term "data shadow", which resonated only decades later. Laudon (1986) warns about the advent of a "dossier society", in which information from various sources converges to form what he calls the "data image" of each person. Poster (1990: 97-98) claims that data banks act as "the multiplication of the individual, the constitution of an additional self, one that may be acted upon to the detriment of the 'real' self without that 'real' self ever being aware of what is happening". In *A thousand plateaus*, Deleuze and Guattari (1980: 421-422) use the word "dividual" (*dividuel* in French), which comes from "individual" (*individuel* in French), taken as "universal" in the substantivized sense – as Raunig (2016) demonstrates, its roots lie in Latin and medieval philosophy. Two years after this work's publication, Red Brigades activists Renato Curcio and Alberto Franceschini used it in consonance with what they called the "ideology of control", in a text later quoted extensively by the collective Tiqqun (2011: 49). Nevertheless, it is in the outline of Deleuze's (2003: 244) society of control, in 1990, that "dividual" begins to allude to a portion of the individual data. Inspired by Deleuze, Haggerty and Ericson (2000) call "data double" the purely virtual, dematerialized assemblages of an individual's traits.

Although one's digital traces can be considered jointly, and the whole set may be reconstituted in certain circumstances (for example, when security agencies aim to identify or track a suspect), as a rule, algorithmic governance operates in another way in practice. Dissenting from 19th century biopolitics and statistics, its unity is not the individual, but each of his traits.

The emphasis of algorithmic governance on traits tends to facilitate data capturing. In many cases, this task is performed surreptitiously, i.e., the individual is unaware that data emanating from his actions are being recorded. And even if the subject is aware, the fact that they are scattered information items tends to cause little alarm. For the same reason, the collection of data usually conforms without snags to legal norms that protect privacy, or that curb discrimination based on individual attributes such as race, gender, age, and so on. In the United States, the initial impetus for the development of the abstruse credit scoring schemes in place in recent decades comes precisely from the design to evade anti-discriminatory legislation.

Nevertheless, the intention of avoiding privacy concerns or legal restrictions does not suffice to explain the focus on the infraindividual terrain. The crucial engine for this is, in fact, a structural factor: algorithmic governance is organized around graphs. In mathematics, these are structures composed of dots connected by lines. Roughly speaking, dots syntactically enact the role of nouns and lines

are equated with verbs. Segmenting someone into his multiple digital traces (dots on the graph) allows a slew of relationships (lines on the graph) to be forged with traits drawn from other individuals and with objects of all kinds, from information to goods. These relationships derive from the use of increasingly sophisticated algorithms, whose improvement relies on the active collaboration of machines (empowered by machine learning).

In modernity, the idea that the social structure is based on the division of labor bestows upon it an organicity similar to that of complex organisms; hence, Durkheim (1893) speaks of "organic solidarity"[8]. In this structure, each individual occupies a relatively delimited space. Contrastingly, in algorithmic governance the articulation among traits derived from individuals is much more fluid: traits taken from different individuals can recombine in innumerable ways, through parallel, simultaneous relationships. Each individual constitutes a bundle of relationships of a dynamic nature, for new relationships are contrived at every moment and the existing ones are continually reconfigured. In turn, each relationship rests on some traits coming from the individual while ignoring the others. When a trait of an individual is part of a relationship, the remaining details of that individual are irrelevant; he only subsists within the relationship due to the detail which corresponds to that trait and is enclosed by that relationship. Therefore, there is a certain autonomization of the individual's disaggregated traits – which are data on data, or metadata – regarding himself. By concatenating these traits, relationships leave in the background the individuals from whom they are withdrawn. This preeminence of relationships vis-à-vis concrete individuals consists in the relational dimension of algorithmic governance.

[8] In the original: "solidarité organique."

While the novel and the cinema, except for a handful of avant-garde wagers, are based on the narrative form, current media assert primacy of the database form, as Manovich (2001) points out. In relational databases, such as Microsoft Access, queries show the interlacing of the material stored in tables; with an abundance of relationships in every direction, however, this becomes counterproductive. The software genre consistent with the relational dimension of algorithmic governance is not the relational database, but the graph database, ordered as a network. In fact, "graph databases are utilized when the relationships between data items (nodes of information) are more important than the data items themselves" (Millham; Thakur, 2016: 186).

To address the issue of individual fragmentation in social networks, we can start from the premise that, in line with sundry criteria, threads of each person's existence coalesce in these networks. As a user coexists with acquaintances from various walks of life and participates in dissimilar universes of interest, he stretches out into disparate facets. The repertoire of these facets varies for each

individual. Some can be more or less important than others, and their importance can change over time. There is no set number of these facets, nor a limit to that number; they may come and go. Facebook induces its users diligently to disclose every aspect of their lives on the site. Its creator, Mark Zuckerberg, justifies this practice to Kirkpatrick (2010: 199) by arguing that "having two identities for yourself is an example of a lack of integrity" and that "the days of you having a different image for your work friends or co-workers and for the other people you know are probably coming to an end pretty quickly."

Algorithmic governance, however, implies that, the individual's fragmentation in the networks occurs in a deeper stratum, involving the graphs that capture the interactions. Moreno (1934), pioneer of group therapy and creator of psychodrama, uses graphs – which he dubs "sociograms" – to map relationships among members of a group, such as students in a classroom. In a classic textbook devoted to graphs as a branch of mathematics, originally published in 1936, König (1990: 48) notes that "perhaps graph theory owes more to the contact of mankind with himself than to the contact of mankind with nature." The term social graph spreads after Zuckerberg mentions it in a conference organized by Facebook in 2007. The Facebook entry page in most languages supported by the site presents the stylized representation of a graph lumping together 13 people (seven women and six men) distributed over the world and their interrelationships. Actually, on the Facebook platform, the social graph does not exclusively comprise ties among people, but combines "objects" and "associations" (Bronson et al., 2013). Objects can be users, places, and contents (including status messages, photos, videos, check-ins, comments, pages, groups, events, etc.). The associations establish several kinds of connections among these objects. Both objects and associations have unique identifiers. The introduction of the Open Graph protocol in 2010 made Facebook's graph mechanism available to the entire web. This means that objects and associations outside of Facebook can be integrated into its platform. When someone likes or shares an external object, for example a site that provides a button for this purpose (a variety of "social plug-in"), pressing this button causes the object to become attached to the graph.

In a simplified illustration of how the graph works, suppose that user Alex checks in (one of the options offered on the form with the sentence "What's on your mind?") in Rio de Janeiro (which results in a publication announcing that he is in the city), his friend Eva writes a comment about it and Laura, Eva's friend, likes her comment. We have a graph with six objects, of which three correspond to people (Alex, Eva, Laura), one to a place (Rio de Janeiro) and two to contents (check-in, comment). These objects are held together by seven associations, two of which unite people with one another (Alex/Eva, Eva/

Laura), three unite people with contents (Alex/check-in, Eva/comment, Laura/comment), one unites content with place (check-in/Rio de Janeiro) and one unites contents with one another (comment/check-in). We must note that the actions of Alex (to check-in) and Eva (to comment) generate contents and from them associations, while Laura's action (to like) generates only an association. In this example, Alex appears split into independent relationships with Rio de Janeiro and Eva. In practice, each user is microscopically fractionated through the subsumption of his traits in an immense web of relationships, which can be scaled in several assemblages, or profiles, with some relationships taken advantage of and others discarded in each assemblage. In other words, an assemblage accommodates a sampling of the user's digital traces, abstracting from the rest. When a product is advertised on Facebook, a cluster of profiles, the ad's target audience, is cut out from an assembly bringing together a few selected traits that would indicate receptiveness to such a product. As a profile, the assembly falls short of the individual, as it gathers only some data extracted from him; as a cluster of profiles, the assembly goes beyond the individual, as it is shared by the entire target audience.

VECTORIAL DIMENSION

Many relationships that intertwine users' digital traces are not given in advance, they must be discovered. Such challenge is what data analytics, a key part of algorithmic governance, proposes to face. Its chief trump is the scope of Big Data, to which data analytics is coupled, in terms of volume, velocity and variability – the 3 Vs formula introduced by Laney (2001). "Big Data's vaunted prospect is to unearth and discover what has never been observed", argues Reigeluth (2014: 248), "by abandoning the rigid hypothetico-deductive methods of reasoning and embracing new inductive tools that rely on vast expanses of arable data."

In fact, induction is not the only thing at stake. When a colossal amount of data is swept by the agency of machines in many directions in the brute-force strategy employed to unravel codes by scanning all possibilities, certain patterns end up emerging. However, this strategy can engender false correlations – it is plausible that some of the patterns that emerge are mere coincidences. A book on "spurious correlations" (Vigen, 2015) amasses random congruences between graphs representing completely disparate facts, such as the total number of people that drowned in a pool and the number of films in which Nicholas Cage participated, or the divorce rate in Maine and the per capita consumption of margarine. Therefore, one must go beyond superficial findings. Peirce (1989)

imagines a scenario where an extraterrestrial visitor, analyzing the available statistics, foresees a possible connection between pluviometric indices and literacy rates in different regions of the United States. At that time, making assumptions about this connection would be necessary, which would require familiarity with the issues in question (although this may seem to be an accidental tie at first, one could, for instance, examine the link between rainfall precipitation and agricultural occupation, and between the latter and the level of qualification of the labor force). These assumptions fall into Peirce's (1998: 227) category of abductive reasoning: "It is the idea of putting together what we had never before dreamed of putting together which flashes the new suggestion before our contemplation." When working with Big Data, thanks to the conjectures, one can direct, and thence rationalize, the operations of data collection and processing. Ideally, the algorithm embeds self-correcting techniques, making inferences about the results obtained, ascertaining if they are generalizable and continuously improving itself through the feedback received. Self-correction is not a purely machinic activity though, as it also involves the human factor, depending on the decisive collaboration of users through their reactions to the algorithm.

It is worth wondering why algorithmic governance is about unearthing something that is not self-evident. Undoubtedly, the analysis of data lends itself to purely descriptive purposes in some cases, in the sense of understanding what happened once or is given, like the structure of a literary work. But the relationships that constitute the core of algorithmic governance itself are typically oriented, integrating a probabilistic dynamic. The goal is to draw from the elapsed moves presuppositions about future patterns, which are then projected on the present as its chart and guide. A precursor of Chicago School's neoliberalism (Emmett, 2011), Frank Knight (1921) makes a disjunction, henceforth canonical for economists, between uncertainty and risk: uncertainty becomes risk when it is susceptible to measurement. Here, we are close to information theory, or mathematical theory of communication, for which information is the measure of uncertainty (Shannon; Weaver, 1963). What is sought through algorithms is the preemption of uncertainty by means of measurability, which paves the way for risk management.

By considering future behavior predictable, able to be inferred from past behavior, algorithmic governance espouses an understanding of the individual as being guided in his choices by a mathematically translatable internal logic, which coincides with the neoliberal vision of the *homo œconomicus*. In this view, according to Foucault's (2004b: 273) description of the position of Gary Becker, exponent of the Chicago School, "rational conduct is any conduct which

is sensitive to modifications in the environment variables and which responds to this in a non-random way, in a systematic way."[9]

Regarding the management of the social sphere, we can draw a parallel between the intricacies of Big Data and those of the market, from the standpoint of Hayek, for whom the market is composed of multiple agents animated by discrepant motivations. Acting autonomously and interacting in a restricted circuit, none of these agents is given a comprehensive understanding of the whole. In this context, the notion that algorithmic governance transcends the aptitude of observation of isolated agents is tantamount to the defense of the price mechanism by Hayek (1948: 91), who considers "the unavoidable imperfection of man's knowledge and the consequent need for a process by which knowledge is constantly communicated and acquired." And, in achieving the identification of patterns, algorithmic governance reactualizes Émile de Girardin's maxim (1867: 273), "to govern is to predict."[10] In a more general political perspective, it coordinates with the post-politics inherent to neoliberalism, which, as Rancière (1995) contends, relies on polls, attributing to them a power of mirroring the popular will that obliterates the inherent contradictions of politics. The behavior of crowds, usually linked to disorder in a tradition dating back to the mass psychology of Le Bon (2010) and others, becomes a motivator of prognostic attempts based on elaborate mathematical models (Cordis, 2016). According to the head of the digital innovation section of the Central Intelligence Agency (CIA), opened in 2015, the American spy agency would have the capability of forecasting social unrest in other countries in advance of up to three to five days (Konkel, 2016). We can speculate, *en passant*, whether the eventual meddling of the CIA itself with the genesis of these disorders would not contribute to this precision. The simulation of pandemics also involves more sophisticated probabilistic analysis techniques, as Opitz (2017) explains: given that each pandemic develops in its own way and the variables of the model cannot be conclusive in advance, what can be done is to envision plausible scenarios. In the wake of algorithmic governance in this area and elsewhere, after the crisis of 2008, financial regulation started to incorporate theories of complex systems; if previously the focus was the equilibrium precept, now an element of chaos and unpredictability is computed as inevitable (Cooper, 2011).

Internet companies that emerge from the 1990s onward are indebted to the neoliberal ideal of entrepreneurship, which, as attested by Adam Curtis's (2011) BBC documentary *All watched over by machines of loving grace,* is quite popular in Silicon Valley, with its legendary narratives about successful start-ups deployed by garage geeks. Ordinarily, the stratagem of these companies is to garner a huge mass of users and seek to monetize its appeal in some way. The gap between

[9] In the original: "la conduite rationnelle, c'est toute conduite qui est sensible à des modifications dans les variables du milieu et qui y répond de façon non aléatoire, de façon donc systématique."

[10] In the original: "gouverner, c'est prévoir."

these two stages provides an indication of the entangled risks: sometimes they operate on a budget deficit for several years until they find a sustainable business model. Here, the predictive focus of data analytics consists in concentrating on providing users with information that, in theory, would have the broadest chance of satisfying their demands and attracting their attention.

To achieve superior web search results, Sergey Brin and Lawrence Page (1998), who founded Google as PhD students at Stanford, are inspired by the impact factor concept in force in academia:

> Academic citation literature has been applied to the web, largely by counting citations or backlinks to a given page. This gives some approximation of a page's importance or quality. PageRank extends this idea by not counting links from all pages equally, and by normalizing by the number of links on a page.

Over time, Google begins to inflect responses by considering the specific interests of each user, manifested in the information stored on him. This implies intensifying the predictive approach. "More and more searches are done on your behalf without you needing to type", says Eric Schmidt, then CEO of the company, interviewed by *The Wall Street Journal* (Jenkins Jr., 2010). "I actually think most people don't want Google to answer their questions. They want Google to tell them what they should be doing next." This is in keeping with Brin's aspiration for omniscience, which was summarized to the editor-in-chief of *MIT Technology Review* (Ferguson, 2005): "The perfect search engine would be like the mind of God."

E-commerce sites like Amazon invest in so-called collective intelligence to continually improve their attunement with the consumer. Considering not only a customer's purchases but also the items he examines or puts on his wish list, his profile is being compounded. Based on the patterns calculated from the activities of customers who have purchased similar products or expressed curiosity about them, the platform considers other goods that may attract thim. If the consumer responds to these suggestions, whether by ratifying or declining interest, whether by stating that he already has what he has been advised of, any of these responses helps to further refine his profile and the subsequent suggestions, in an endless cycle. Crowning this process, Amazon registered a patent with the title "Method and system for anticipatory package shipping" (Spiegel et al., 2013), which comprises an algorithmic procedure to predict purchases and initiate the shipment of goods before the consumer sends his order, with the final destination being determined while already in transit.

In social networks, the vectorial dimension of algorithmic governance emerges at the outset in the administration of the circle of contacts of each person. For these sites, a user should have maximum participation, and this is affected by the sum of his contacts and his proximity to them. Therefore, the expansion of this circle is encouraged. The moment when someone, upon registering, entrusts a site like Facebook with his e-mail address, the catalog of those with whom he corresponds at that address can be synchronized with the tally of users of the site to list the users among his acquaintances and suggest their addition. Someone who adds a newbie is prompted to indicate other *friends*, an epithet reserved for Facebook contacts, to him. New names to be added continue to be suggested even to veteran users. Thus, having friends in common with another user is a pretext for this user to be recommended as a possible friend. In addition, several instruments to keep these ties lubricated are made available, from likes to reminders about birthdays. This computer-aided programming of sociality is qualified by Bucher (2013) as "algorithmic friendship."

On Facebook, the axis of interactions is the news feed, released in 2006 (two years after its inception), which presents a hierarchical selection, defined via algorithm, of posts made by a user's friends for his viewing. Its desideratum is to provide the user with whatever has the maximum potential to attract his attention. We cannot have an exact idea of the criteria that guide this selection, since this is a commercial secret which is not openly disclosed even in the patent registry, a useful practice as a safeguard against competitors and to ward off manipulative attacks. However, one can deduce from a relatively recent patent (Gubin et al., 2014) that the algorithm is not simply an equation with a list of variables, but it is a dynamic device that adjusts to the user's behavior and that of his friends. Therefore, an item can gain greater or lesser prominence depending on the user's previous engagement with publications of the same author or motif, the reactions that this item aroused in others, etc. And even such a dynamic device is subject to continuous optimization. Some users are paid to test its effectiveness by assessing to what extent the hierarchy of posts in their custom feed accurately portrays their tastes (Luckerson, 2015). According to one report (Rogers, 2014), Zuckerberg himself orders a change in the algorithm immediately upon realizing that his feed emphasizes a Facebook employee's birthday more than the birth of a niece.

The flow of materials displayed to each user also features ads, whose insertion is scrupulously calculated. In truth, channeling certain messages to specific audiences is a traditional marketing concern. In mass media such as radio and television, polls allow the contours of the audience for specific programs to be defined. In certain cases, the vehicles themselves target a segmented

audience considering the subject, demographic profile, region, etc., as with specialized journals. Another possibility is to send consumers advertisements adapted to their postal code, which acts as a classification matrix. The locution "direct marketing", which designates highly targeted campaigns, was conceived by advertising executive Lester Wunderman as early as 1961. What is new is that the development of the web since the 1990s has given unprecedented opportunities for direction. In search engines like Google, it is easy to start an automatic connection between the advertisement and what is being avowedly searched for. In social networks such as Facebook, browsing habits are not, in principle, clearly subordinated to consumption, inasmuch as the user has a number of other motivations. In contrast, the abundance of information about each user allows the parameters of personalization to be calibrated to the nth degree. Facebook (2017) provides the alternative of reaching "core audiences" to advertisers, who demarcate their public based on demographic variables (age, gender, marital status, educational background, job titles), interests (hobbies, entertainments), behaviors (consumption habits, types of devices used), and location. Supplementary options serve to manage various types of resources to recognize "custom audiences" the advertiser's actual customers and contacts – among the users or to target "lookalike audiences" – which resemble those customers.

AGENTIAL DIMENSION

The vectorial dimension of algorithmic governance is not gratuitous and unfolds in an agential dimension, since foresight involves the intendment to influence attitudes. Algorithmic systems not only condition the modalities of actions at users' disposal, which are solely those coded in each system (e.g., to like, to share, to send messages), but also direct these actions. This direction is not given in advance, according to models defined *a priori*, but follows patterns unveiled *a posteriori*. As Agamben (2013) states: "Since governing the causes is difficult and expensive, it is more safe and useful to try to govern the effects." And, to the extent that the causes need to be known, while the effects can only be verified and controlled, it becomes necessary, he argues, "to extend and multiply controls".

At this point we can recall Picasso's famous utterance about his creation tactics, reported by his friend Graham Sutherland (1936: 10), an English painter: "I do not seek, I find." In comparison, the motto for those who are stuck in contemporary algorithmic governance would be: "I do not seek, they find for me." This entails a paradox: the user agency is outsourced, but

this outsourcing is mirrored in the patterns generated by him, as if he were ruled based on his previous actions. Even if we admit that it is perfectly feasible to gradually reconfigure these patterns through present operations added to the data set used to establish the patterns, each one, in any event, is doomed to carry this set. That is, the freedom to choose is transformed into imprisonment by dint of choices. Each choice, insofar as it is recorded, leaves its indelible mark on the statistical patterns that condition new choices. In this scenario, Marx's phrase (1960: 115) in *The Eighteenth Brumaire of Louis Bonaparte*, *mutatis mutandis*, takes on renewed significance: "Men make their own history, but not according to their free will; they do not make it under circumstances they choose, but under those existing already, inherited and transmitted from the past."[11] In the above-quoted interview, Google's Schmidt goes as far as to suggest that in the future, when teenagers reach adulthood they should be allowed to change their name to get rid of the burden of their youthful digital footprints. Notice that leaving no traces is hardly a matter of will: even in cases where artifices like clearing the navigation history and disabling cookies can be used, this will decrease the efficiency of online services. However, in many other cases, the only way to omit traces is to not use these services at all.

[11] In the original: "Die Menschen machen ihre eigene Geschichte, aber sie machen sie nicht aus freien Stücken, nicht unter selbstgewählten, sondern unter unmittelbar vorgefundenen, gegebenen und überlieferten Umständen."

Past patterns that are retrieved concern the user's affinities with interests and people. Reproducing these patterns and projecting them in the present implies leveraging these affinities. This favors something in the vein of a mimetic inclination, redoubling the nexus with certain interests and increasing convergence among people unified around these interests. These are snowball-like movements that burgeon like the inevitable fruits of deliberate programming, synthesized in exhortations of technology enthusiasts, like that made by Kevin Kelly (1998), founder of the *Wired* magazine: "Embrace the swarm." Therefore, the dismemberment of users into traits is counterbalanced by their agglutination into clusters of users with some common traits, although these agglutinations are precarious and transient due to their plurality and dynamicity.

This phenomenon brings to mind the routine in stock exchanges known as "program trading": automatic transactions driven by algorithms that react immediately to market oscillations are bent to exacerbate these oscillations. Another parallel can be drawn with derivatives, financial instruments that disseminate risks to the point that an event like the 2008 American mortgage market debacle triggers an international crisis. Pandemics spread similarly in geometric progression, which is why the provision of data and the use of mathematical tools help to prevent and cope with them.

Regarding crowd behavior, the algorithms are applied not only to try to nail its dynamics, as stated earlier, but also to investigate how this behavior can be influenced with minimal intrusion. The action of infiltrated agents, who adopt a resolute posture and end up acting as magnetic poles with the ability to attract others (Fornasier, 2016), can be highlighted in this regard. The lesson of Freud's mass psychology (1967) can be applied here: the identification with the leader is what sets the tone of a mob's behavior. At any rate, it is pertinent to issue a caveat, developed by me in a book chapter about political mobilization through contemporary networks (Castro, 2016a): networks are characterized by the plural and ephemeral condition of leadership, which supports their mobilizing capacity at the expense of limiting their efficacy as an instituting power.

On the internet, it is easy to see how the agential dimension of algorithmic governance presents itself in the experience of each user. As we have seen, the results of search engines are customized so that any two people get dissonant returns when doing the same query. Each query and each alternative clicked among the answers improves the customization. Even the maps Google shows to each person are made to fit his reality, overlooking the company's claim of objectiveness and universality, and thereby contributing to the dissolution of the public space (Morozov, 2013). In social networks, the insistence on formatting the contents displayed to each user pursuant to his previous choices instigates a hyperspecialization of interests. This results in a tendency for users to be separated into "filter bubbles" (Pariser, 2011).

On a collective scale, the agential dimension of algorithmic governance presides over the imbalances of distribution that are common in networks. If the connections of a random network make up a Gaussian design, which corresponds to a bell-shaped curve, the arrangement of the connections in the intricate networks of the internet is mathematically expressed by a power law, graphically symbolized by a decreasing curve, which stretches between the head and the long tail. On the web, some sites are extensively linked, whereas the vast majority receive few links (Barabási, 2002). Thus, the prominence of mainstream sites of the most renowned and resourceful institutions in health search results, for example, is not surprising (Seale, 2005). On sites such as Flickr and Wikipedia, the inequality of the contributions of different users is transposed into an analogous diagram (Shirky, 2008). The longer the network, the greater the mismatch between the head and the long tail. And the use of algorithms reinforces this disproportion: the emphasis on what stands out, as in Twitter Trending Topics, makes it yet more noticeable. This drives the diffusion of memes, a neologism proposed by evolutionary biologist

Richard Dawkins (2006). "Meme" refers to a unit of cultural transmission – an idea, catchphrase or attitude that propagates from one person to another – and is applied to stuff that disseminates with celerity on the internet. Not unlike the gene that inspires it, the meme embodies a Darwinist dynamic of competition (here, a competition for attention among diverse contents and also among those who promote these contents), the same dynamic that is present in neoliberalism in general. In addition, algorithms tend to prioritize hegemonic themes and views. Assessed from users' past activities, collective intelligence, far from threatening existing biases and prejudices, lends itself to strew and corroborate them. According to a study conducted by a Harvard professor (Sweeney, 2013), the chance that Google's results will be matched by ads about criminal records is 25 percent higher when the queried names are typical of black people than when they are typical of white people, and it seems this occurs because these ads are more clicked on by the users themselves in the first case. In one way or another, the long tail plays a relevant role in all those distribution imbalances. In online business models such as Amazon's, a large assortment of items with small demand each, taken together, rivals in importance a small variety of items in huge demand (Anderson, 2008). Analogously, myriads of underactive users and low-impact publications contribute cumulatively to build the critical mass that confers allure and profitability to social networks.

Peter Thiel, one of the PayPal founders and an investor in several technology start-ups, does not hide his enthusiasm for Girard's (1978) thinking, and particularly for the concept of "mimetic desire". In 2004, Thiel became first external investor in Facebook, which, spreading to a growing number of users, emerged as an illustration of the power of mimicry. In a research conducted by this website (Kramer; Guillory; Hancock, 2014), which aroused controversy due to the conditions under which it was managed (without users being warned and allowed to withdraw at their discretion), the occurrence of emotional contagion could be verified: those who were exposed to less positive content in their news feed produced fewer positive posts and more negative posts, whereas those who faced a reduced number of negative contents exhibited the reverse behavior. Nonetheless, Thiel's notion of entrepreneurship (2014) requires moving against imitation: he values "vertical progress", which consists in introducing novelties, or going from 0 to 1, to the detriment of "horizontal progress", which is equivalent to copying what is successful, or going from 1 to n. In other words, mimetic inclination and entrepreneurship seem to evolve in opposite directions. Similarly, Borch and Lange (2017) underscore a tension between the herd spirit and the *homo œconomicus* rationality in their

diagnosis of the performance of financial market participants. Nevertheless, this apparent contradiction must be nuanced. First, because within the framework of Freudian mass psychology, which explains the phenomena of imitation and contagion as processes of identifying followers with leaders, both of them (Thiel's imitators and the entrepreneurs, respectively) have different but complementary incumbencies. In addition, on a more general level, there is a mutuality between performance culture, as the government of self, and algorithmic governance, as the government of others. The injunctions that affect each one are ambiguous, articulating agency and external pressure. This articulation is related to control, as modulation, something that Deleuze (2003) discerns from discipline, as molding.

The current vogue for coagulation of the circulation of the internet in private spaces is chastised by the web's inventor, Tim Berners-Lee (2010), for whom a social network amounts to a "closed silo of content". The singularization of experience in these spaces corresponds to an additional level of balkanization, spawning echo chambers that inhibit debate and jeopardize attempts to simulate the public sphere. Recalling an excerpt from the person known as the "godfather of the modern algorithm" (Steiner, 2012: 57) is appropriate here:

> The only way to rectify our reasonings is to make them as tangible as those of the mathematicians, so that we can find our error at a glance, and when there are disputes among people we can simply say: let us calculate, without further ado, to see who is right[12] (LEIBNIZ, 1903: 176).

[12]In the original: "L'unique moyen de redresser nos raisonnements est de les rendre aussi sensibles que le sont ceux des mathematiciens, en sorte qu'on puisse trouver son erreur à veue d'oeil, et quand il y a des disputes entre les gens, on puisse dire seulement: contons, sans autre ceremonie, pour voir lequel a raison."

What is happening today in practice, however, is that algorithms in social networks do not help to settle differences but to keep whoever diverges at a distance.

For Mouffe (2005), the counterpart of the neoliberal imposition of consensus is the emergence of modalities of dissent in the form of the return of the repressed, in psychoanalytic parlance. Here we have a sample of this. Regardless of its link with neoliberalism, algorithmic governance contains ingredients with the potential to undermine its hegemony. On social networks, the concentration of interactions around interests and contacts with which the user has greater affinity tends to contribute to the radicalization of positions and to the polarization of society between extremes. Many commentators interpret Brexit's victory and Trump's election in 2016 in light of this scenario. Incidentally, both campaigns capitalized directly on political polarization through the medium of professional data analysis services, curiously under the auspices of the same company, Cambridge Analytica (Grassegger; Krogerus,

2016). Even Germany's conservative prime minister, Angela Merkel, warns: "Algorithms, when they are not transparent, can lead to a distortion of our perception, they can shrink our expanse of information" (Connolly, 2016). As the *we* becomes more homogeneous, the nonconformity with *them* is accentuated and can be accompanied by aggressive emotions and postures. Such nonconformity also functions as an engagement catalyst– a survey in the United States by the Pew Research Center (Hughes; Lam, 2017) reveals that more ideological parliamentarians garner more followers than the more moderate ones. Between us and them, a mutually reinforcing spiral of antagonism is established, in line with what Bateson (1936) calls "symmetrical schismogenesis", a prototype of warlike escalations (Richardson, 1956).

Therefore, the agential dimension in the networks not only assumes the form of mimicry, of stimulus to be even closer to the similar, but also of opposition to the different – these are the two sides of the same coin. Either an approximation of the similar or the opposition to the different are modes of activity and, as such, can be monetized. The networks may serve as instruments for offline mobilizations as well. Per contra, one can conjecture that, by simulating a participatory dynamism, they inhibit these same mobilizations.

From the standpoint of social network management, there are likewise ways of containing the difference. In the case of Facebook, they include, for example, the restriction of what is considered pornography; more recently, the precautions against what are alleged to be false news; and in some countries, as in China, alignment with censorship prescriptions issued by the state. This reflects the distinct guidelines of algorithmic governance in general: on one hand, it fosters adherence to certain standards, albeit customized, as in the world of consumption; on the other hand, it contributes to prevent certain phenomena such as terrorism, epidemics and natural catastrophes, and can be deployed against any threats to corporate and state interests. In an article introducing the concept of dataveillance, Clarke (1988: 498) states that "the computer has been accused of harboring a potential for increased surveillance of the citizen by the state, and the consumer by the corporation."

We must note that the guidelines of algorithmic governance are not isolated from one another. Everyone is a latent target of databases that record commercial and police information which communicate with each other, and from which emerges a "criminal-consumer double" (Passavant, 2005). The confluence between consumption and security is a telling hallmark of neoliberalism. Days after the September 11 attacks, while planning surveillance improvement and military revenge, then President George W. Bush preached to his fellow citizens

the return to normalcy of the American way of life, emphasizing the importance for them to "go shopping for their families" (Bush, 2001a) and urging them to: "Do your business around the country. Fly and enjoy America's great destination spots. Get down to Disney World in Florida. Take your families and enjoy life, the way we want it to be enjoyed" (Bush, 2001b).

FINAL CONSIDERATIONS

Algorithmic governance is not merely a way to manage an existing reality. To govern, here, means to structure a given reality from a scheme that, in its various dimensions, establishes what relationships will be computed, what kind of vectors will be verified in them and how they will be dealt with. And, at the same time that algorithmic governance manages fragmentation, risk, and segregating homogenization, it also instigates them, providing a justification for the heightening of this management. In the case of social networks, not only is their character defined by algorithmic governance, but their constitution itself is, in good measure, made feasible by it, in contrast to the more spontaneous aspect of offline interpersonal networks.

The peculiarity of algorithmic governance is to derive its normative power directly from those who submit to it, since their interests and activities revert back to them as patterns to be followed. Even when users distance themselves from these blueprints, their movement is recovered and reincorporated, creating corrected and re-adapted versions of the blueprints. Thus, each user is cloistered by the movement he embodies, hardly being able to escape a script drawn from his own steps.

This dynamic seems to function in social networks for users and groups of users, driven by the strength of algorithms to potentiate their interests and activities. However, when looking at the entire universe of users, frictions and conflicts can arise from the segregation and polarization bolstered by algorithms. Therefore, algorithmic governance is proven to be a double-edged sword, having its effectiveness undermined by the discomfort sown among friends and acquaintances, causing the user experience to be less pleasant; by making advertisers be more concerned about the things to which their products are tied, like in the boycott that affected YouTube in 2017 due to hate speech videos; by prompting external questioning about the functioning of networks, such as that suffered by Facebook after Trump's electoral triumph; or by eroding the technocratic consensus that underpins neoliberalism in general. M

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