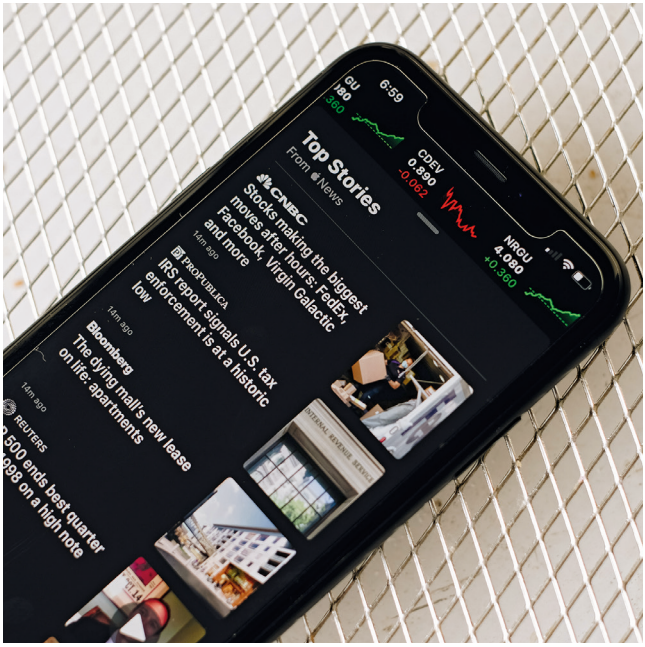
Materiali e documenti

New Journalism(s) in Theory and Practices Learning from Digital Transformations

edited by
Romana Andò



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Editorial Notes. About this Book and this Experience

Romana Andò

I would like to spend a few words introducing the aim of this edited collection of essays starting from its title *New Journalism(s) in Theory and Practices, Learning from Digital Transformations*. First of all we have decided to refer to the idea of journalism(s) to emphasize the plurality of aspects we have to take into account when talking about journalism. The plural here is devoted to telling the multiple transformations of journalism languages and content we have been faced with in the last decades, as well as the extraordinary and rapid innovations and challenges that have arisen within the new digital media eco-system. In order to address these challenges we need to confront theories and practices, enter the field of journalism and discover the inhabitants of this system and the way they are negotiating their positions and roles according to newcomers, new relations, and new environments.

As we perfectly know, as scholars in the field of media studies who are involved in the Erasmus+ PAgES Project, the challenges of this scenario constantly require new competences, new skills, and media literacies. On the one hand, the potentialities of digital media have redefined the very idea of writing and publishing in an unpredictable way. Nowadays, content creators, professionals or not, can count on a media system that is definitely characterized by low barriers of access wherein authors, publishers, and the audience of citizens/journalists are themselves engaged in producing content. Indeed, working in the field of journalism today is not the same as it was ten years ago.

On the other hand, the audiences and consumers of information are increasingly confronted with intrusive digital media and are developing (or have to do so) newer literacies and coping practices in order to deal with these intrusive media, namely the overflow of information,

the circulation of both official and unofficial content, the spreadability of fake news, the hidden power of algorithms and more.

Mirroring this complexity and these challenges, we have designed a learning journey made of training activities, both in person and online, and complementary content that are collected in this book as a result of the richness of diverse contributions we have had during the last four years, scripted and realized through different media channels and presented through multiple languages. The book is ideally divided into two parts: the first section focuses on the theoretical and epistemological *challenges* of contemporary journalism, while the second part deals with the *experiences* of journalism(s), evoking tools, technical skills, and practices that are required within the media industry.

In the first section we put into question the latest trend in journalism studies — the application of AI — with the help of two internationally credited scholars. Tiziana Catarci, from Sapienza University of Rome (*Artificial Intelligence: Myths and Prejudices*), provides a clear and disenchanted introduction to the science of Artificial Intelligence; whereas Charlie Beckett subsequently discusses the implementation of AI in news reporting based on the surveys carried out by the Polis Institute at the London School of Economics and Political Science (*Challenge of Artificial Intelligence for Journalism*). Anna Maria Lorusso (University of Bologna) and Bianca Terracciano (Sapienza University of Rome) analyze the foundations of the semiotic approach (*A Semiotic Perspective on Post-Truth Regime*), establishing a parallel between the main mythology of Western tradition — "truth as correspondence to reality and verification" — and the crisis of public debate triggered by the COVID-19 pandemic. From a similar starting point, Maria Romana Allegri and Christian Ruggiero (Sapienza University of Rome) reflect on the decreasing level of people's trust in media and news outlets as a result of both information overload and the effects of the pandemic, by insisting on the need of ethical standards and media accountability (*Journalism Ethics as a Tool to Survive Digital Transformation: An Overview*). By adopting a sociological framework, Isabella de Vivo (Sapienza University of Rome), in her essay on the *neo-intermediation* of journalism, discusses the twofold process of personalization and platformization (*Towards an Algorithmic Public Opinion?*).

The second part of the book is devoted to advanced models in news production and distribution. A bridge between the two sections is provided by Pedro Almeida and Luís Pedro, from the University of Aveiro,

who discuss a few cases of content co-creation and social media dissemination against the backdrop of such concepts as agency and engagement (*Participatory Strategies for Journalistic Content Production and Dissemination in a Trans/Cross-Media Perspective*). Luís Rodrigues, Vania Baldi, and Adelino Gala, from Aveiro University as well, focus on the field of mobile journalism, a new skill to which we dedicated a specific session of the PAgES training of trainers (*Mobile Journalism and New Skills in the Journalistic Field*). A very operational contribution is also provided by Alice Assunção de Melo, Adelino Gala, and Vania Baldi, who clarify the much-discussed issue of data-driven journalism (*Data-Driven Journalism: An Introductory Basis for the Practice of Journalism Guided by Data Analysis in Libya*). In her essay (*The Potential of Interactivity: Contributions of i-docs to Journalism*), Juliana Bez Kroeger (PhD candidate at Sapienza) explores the potentiality of interactive documentaries as a new model of interaction between content and audiences. The contribution also documents a specific part of the training conducted with Libyan students of journalism at Sapienza University and IULM in 2022.

Another relevant experience of cross-media information and communication is the one described by Javier Cantón Correa and Esteban Romero Frias, from the University of Granada, who propose some insights from the activity of the UGR MediaLab with a focus on the design of the ad-hoc tools from cross-media communication (*Cross-Media Communication in Social Labs: The Experience of Medialab UGR*).

Finally, Cristina Stefanelli who curated the online training within PAgES experience, explains the hybrid approach to online and on-site training for journalists, which has become ever more necessary in the years of COVID-related travel bans and restrictions (*Journalism Education: a High-Hybrid Approach to Online Training for Journalism Teachers*).

We did not initially have the ambition to produce a manual on journalism. Instead, this collection represents our attempt to spread the polyphony of the voices of this project among a plurality of audiences, from scholars to students to professionals, from people passionate about this content to engaged citizens… and to continue to nurture our dialogue.

Towards an Algorithmic Public Opinion?

Isabella de Vivo

1. Introduction

Problems relating to data processing and the "infodemic" that accompanied the health emergency[1], with the consequent worsening of polarization dynamics, the spread of misinformation and the media-manipulation, are all aspects that, due to their urgency, need to be investigated through a longitudinal and interdisciplinary study. Indeed, conscious and creative thinking capable of guiding governance operations is now paramount.

Even though the need for revisionist theories and founding concepts in the field of communication research has already been at the center of the scholarly debate due to the emergence of hyper-personalized forms of communication based on "datafication", the research about the detrimental effects of personalization is often inconsistent. However, there is no doubt that in the long run the algorithmic capacity to govern our lives in increasingly sophisticated ways will dramatically expand. During the digital metamorphosis process of the "structural power" of systemic constraints, the activation of communication processes and the attention to the forms of rationality of understanding can be antidotes to the sophistication of the center.

A close investigation of the new communication dynamics is, therefore, considered necessary to outline the real possibilities of the resistance of spaces "from below", as well as to measure the effectiveness of the regulatory strategies put in place by public actors to protect an

[1] See World Health Organization 2020.

"autonomous public sphere" which, according to Habermas[2], is able to communicatively exert a critical influence over the institutions of the center, while legitimizing their power.

The key role played by on-line platforms in the neo-intermediation of the public debate, together with the digital metamorphosis of the structural power of the new systemic constraints, require a fundamental review of the current tools for investigation and ask for a map of the information eco-system, highlighting the political nature of such analysis. As a matter of fact, these aspects of innovation are rebuilding the authority relations, are creating new political entities, and are establishing new interpretative frameworks. A cross-disciplinary approach is needed in order to develop adequate regulatory proposals and draw the researchers attention on the ethical challenges that underly the functioning of datafication, commodification, and selection algorithms. Indeed, the latter are analytical prisms that help us understand the way in which the ecosystem modifies power relations.

Online platforms and algorithms of personalization play a fundamental role in knowledge management. They limit information overload, reduce complexity, and satisfy users by acting in all respects as "neo-intermediaries" of information and knowledge on a global scale. The personalization of multimedia contents based on datafication as well as the engine of the current digital information economy, however, is not free from new risks and threats. Such threats are able to alter the delicate balance between the right to inform and to be informed and other fundamental rights protected by European constitutional traditions. In addition to the crucial problems related to the protection of privacy as an inviolable individual right, the use of "algorithmic reason" together with the so-called *microtargeting* also produce the amplification of perceptual distortions such as *filter bubbles*, *eco chambers,* and *groupthink*. All these phenomena can limit the exposure to diverse, balanced, and plural information and they are fundamental issues within the field of media law and ethics, which both seek to preserve autonomy of choice, diversity, and pluralism in democratic societies. Information empowerment can, in fact, be seriously compromised with the increase of pathological phenomena of polarization, public fragmentation, conspiratorial thinking and other forms of manipulation that can result in undermining individual and collective

[2] Habermas 2006.

decision-making autonomy, thus putting at risk the resilience of the democratic debate. It is about protecting what Eskens[3] calls the sphere of personal information and which resembles the broader concept of intellectual privacy: "a protection zone that guards our ability to decide freely"[4].

While the causes and dynamics of personalization have been extensively researched[5], there is a lack of empirical studies about the consequences of using personalization algorithms with respect to the quality of the information ecosystem. Researches on the social, political, and economic effects of personalization have not yet developed into a coherent frame of reference, but there is no doubt that in the long term the algorithmic capacity to shape individuals and societies in increasingly sophisticated ways will expand considerably. It is quite clear, then, that we need to review current tools of investigation of what we will term digital "neo-intermediation".

Indeed, we may start by discussing some key issues and formulating crucial questions to enlarge the scientific debate. What are the main values and parameters that inform or should inform designers in the algorithmic arbitration of information dissemination? What is the effective impact of personalization on misperception and what is the correlation between this and the circulation of disinformation? To what extent can information personalization be considered legitimate? What are or must be the theoretical presuppositions needed to think about a rebalancing of the information asymmetry between audiences and gatekeepers? To what extent are users of online platforms legally responsible for such practices and to what extent should they be?

Starting from these brief considerations, the need for a dynamic and interdisciplinary approach to the digital information ecosystem emerges. Such an approach should be able to closely map through new hermeneutical tools, the pliable and adaptive nature of the ecosystem that goes beyond stereotypes and simplifications.

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3 Eskens 2020.

4 Richards 2015.

5 Tucker et al. 2018.

2. Exploring the relationship between platforms, information dissemination and public opinion

Online platforms have established themselves thanks to their ability to self-represent as neutral intermediaries able to allow the storage, navigation, and delivery of digital content: this supposed invisibility has allowed them to establish a lasting position in economic and cultural domains, both in practice and at the imaginaries level[6]. Through rhetorical and celebrative descriptions, platform services are presented as universal: wherever in the world you are, it should potentially be possible to access the same content. This universality, however, is utopian. As we already know, platforms are intrinsically regional[7]: different techno-cultural visions and socio-economic influences and the pervasiveness of the platforms means that distinctive forms of social organization are created, where the redefinition of public spaces and values takes place. In digital information ecosystems (determined by economic regimes and by complex domestic attitudes regarding multiple aspects such as surveillance, freedom of expression, and rights), the mechanisms of platforms interact until they converge in the architecture of social institutions. Furthermore, they are driven by the need to obtain profits within a scale economy and they are characterized by *selection, datafication and commodification*[8]. Referring to the effective metaphor proposed by Gillespie, platforms are "the new guardians of the internet"[9]: they preside over the entire socio-technical horizon within which all the actors move. Moreover, they perform a "neo-intermediation" function which structures the information flow through an algorithmic logic — unnoticed on an experiential level and not transparent to all stakeholders — that supports users in their customized searches. In their desire to engage with content and disseminate it without intermediaries, users have entrusted themselves to additional intermediaries: the platforms themselves. The latter do not create the content but are able to shape it in their image and likeness. Moderation activities, therefore, model platforms as institutions, tools, and cultural phenomena: the technical and institutional tools that come into play

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6 Gillespie 2018.

7 Steinberg et al. 2017.

8 van Dijck et al. 2018.

9 Gillespie 2018.

when choices are made that affect the selection of content reveal the cultural power of the platforms[10].

To analyze the transition from digitization to platformization in the face of a general decline in research into information and international journalism, we have to evaluate the power of platforms in intermediation and the progressive personalization of information productions. In this way, we intend to integrate and clarify concepts typically associated with the public expression of political instances such as mediatization and digitization, adding a new frame, the platformization and exploring the processes of adapting forms of information to the structural constraints imposed by platforms.

It is precisely this analytical approach that opens up the possibility of advancing the cognitive link in which the issues in question are resolved. Indeed, there is no doubt that the analysis of the forms (and algorithmic dissemination strategies) of public discourse, which take place and are structured around the constraints imposed by the platforms, emphasizes the systematization of the findings regarding the responsibility of the platforms in addressing public values (and of the debate around them), precisely because it is endorsed by systematic comparison. Indeed, the negotiation of conflicting values will have a significant impact on global innovation policy, national security, freedom of expression, and social cohesion.

2.1. The platformization of the web

> «Taken together, the technological, economic and socio-legal elements of the architecture of a platform shape the dynamics of a platform-driven sociality"[11].

The term "platformization" has been widely theorized by various scholars. Anne Helmond defines platformization as the transformation of the web with interconnected application programming interfaces (APIs) to allow platforms to collect external online data[12]. Subsequent studies take the definition to a different conceptual level, interpreting the platformization as the transformation of an industry in which the operators of

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10 Ibid.

11 van Dijck et al. 2018.

12 Helmond 2015.

the connective platforms and their underlying logics are able to reshape social dispositions[13]. Infrastructure platforms are supranational entities, founded not on the ratification of a social contract, but on "terms and conditions of service", social media policies and technical design choices. Moreover, business models effectively serve as a form of privatized governance that directly promulgates rights and regulates the flow of online information and, in doing so, promotes or limits civil liberties[14].

The operating syntax of the platforms can be summarized as the processes of:

1. *Datafication*

"The transformation of social action into online quantified data, thus allowing for real-time tracking and predictive analysis"[15]. Platforms translate the data, characteristics, and aspects of reality. User behaviors and choices, which were not previously quantifiable or constituted informal or ephemeral activities are now the "bargaining chip" in the "attention market".

2. *Commodification*

The platforms transform data associated with content and emotions into commodities that can be traded inside and outside the platforms. To access the online platforms, users usually give up those data they generate in exchange for the "free" service. The core-business that generates profit is the sale of meta-data, a bargaining chip in the multi-sided market of platforms. In turn, the so-called prosumers act as secondary gatekeepers, producing unpaid content and generating economic value for the platforms through their "digital work"[16]. This is the status quo of the current data-driven society in which sociality is transformed into economic value.

3. *Selection and curation*

The platforms direct users to specific content and objects. The selection process guided by the traditional editorial logic is replaced by a data-directed selection process based on the logic of click-baiting and fed by

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13 van Dijck et al. 2018.

14 DeNardis et al. 2015.

15 Mayer-Schönberger et al. 2013.

16 Scholz 2012.

information flows — consciously or more often unconsciously — originating from users through feedback mechanisms.

Datafication, commodification, and selection are therefore the analytical prisms for understanding the way in which the ecosystem re-articulates power relations. Much of the economic and public value of datafication lies in the possibility of capturing information flows in real time: the individual behavior of groups is tracked, aggregated, and analyzed. Subsequently, the results are transmitted to other users in charge of marketing, advertising, public institutions, organizations, and companies. The circulation and extension of the platform economic policy online takes place through a process of *decentralization* and *re-centralization* of data.

The so-called Big Five, or GAFAM (Google, Apple, Facebook, Amazon, Microsoft), infrastructure platforms, control the circulation of data to and from the industry platforms, sites, apps, and the multitude of users. The devices people use to access platform services often incorporate software and apps that can automatically collect "platform ready" data. External online data become readable by the platforms and exploitable according to the logic of their own economic model. The policy of the platforms thus extends beyond them (e.g. the use of the Facebook "like" button on other web content). Through APIs, third parties can remix and transform the proprietary data of companies such as Google, Facebook, and Twitter into new applications and programs (e.g. Google maps) following the so-called double logic of platformization[17].

2.2. Centrality of data

The term "Big Data" refers, as a first approximation (in the absence of legally binding definitions), to the collection, analysis, and accumulation of large amounts of data which may include personal data and data from other sources[18].

The immense nature of the processing operations brings with it the need for such sets of information (both stored and streaming) to

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17 Helmond 2015.

18 In the sense provided by Art. 4 of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016, concerning the protection of individuals with regard to the processing of personal data, as well as the free circulation of such data and which repeals Directive 95/46/EC, hereinafter also "RGPD".

be subjected to automated processing, using algorithms and other advanced techniques, in order to identify correlations of a (mostly) probabilistic nature, trends and/or models. The creation of data is growing exponentially: in 2018 the total volume of data created in the world was 28 zettabytes (ZB), recording an increase of more than ten times compared to 2011. As shown in Figure 1, the total volume of data is expected to reach 163 ZB by 2025.

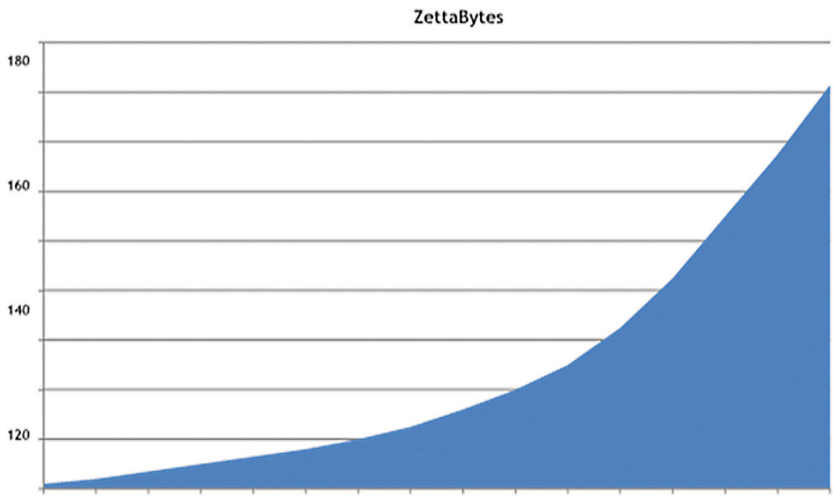

Fig. 1. Data Growth in ZettaBytes. Source: AGCM processing based on the data provided in the IDC technical report AGCOM AG joint fact-finding survey, AGCM 2018-2020.

In the physiognomy of the Big Data economy, therefore, the process of "knowledge extraction" is crucial and it could be possible to identify, on a logical level (with possible repercussions also on the legal level), three main orders of activity within it:

i. collection, which in turn is divided into generation, acquisition, and storage;
ii. processing, which involves extraction, integration, and analysis;
iii. interpretation (profiling) and use (See Figure 2).

2.3. Data driven customization

In the publishing sector, Big Data, the driving force of information "neo-intermediation", makes it possible to achieve a high level of personalization in the use of editorial content.

1. Raccolta
- Generazione
- Acquisizione
- Memorizzazione

2. Elaborazione
- Estrazione
- Integrazione
- Analisi

3. Interpretazione
- Interpretazione
- Decisione

Fig. 2. The Big Data Supply Chain. Source: AGCM processing, merged into the joint fact-finding survey conducted by AGCOM, AGCM, AG on Big Data (2020).

Algorithmic personalization, despite being at the basis of the new information filtering and ranking mechanisms, remains an ambiguous and little explored concept, without consensus on its essential characteristics and on the effects on the equilibrium of the digital information system.

Profiling is the basis of the personalization mechanisms. In art. 24, GDPR (679/2016) defines profiling as "any form of automated processing of personal data consisting in the use of such personal data to evaluate certain personal aspects relating to a natural person, in particular to analyze or predict aspects concerning professional performance, economic situation, health, personal preferences, the interests, reliability, behavior, location or travel of said natural person". It is therefore a processing of personal data for evaluative, predictive, manipulative purposes, intended to have repercussions on the user's legal sphere. Of course, profiling can take place in a variety of contexts and for a variety of purposes. In the case of news personalization, profiling makes or informs the decisions (presumed preferences) that personalize a user's media environment (for example the selection and ordering of contents). With large media providers no longer performing a gatekeeping function, the consumption of information is based on the more or less conscious delegation of selective choice to profiling algorithms.

Clearly, these complex predictive decision-driving and selection processes raise serious theoretical questions, offering limitless benign opportunities as well as dystopian realities.

2.4. The neo-intermediation phenomena

An in-depth analysis of both the online information system and the role played by the platforms is clearly needed. It has to highlight the characteristics of the information offer from the point of view of the quantity, quality and variety of the content generated, as well as to examine the methods of dissemination of news, allowing light to be shed on both the criticalities of the information offer and on the distinctive characteristics of the production of disinformation content. These are themes brought to the center of political and academic debate due to the "infodemic" that accompanied the health emergency with the consequent exasperation of the dynamics of polarization, misinformation, and media-manipulation[19].

The gatekeeping process is extensively studied by multiple disciplines, including media studies, sociology and management, in order to address traditional media bias, i.e. how certain events are deemed more newsworthy than others and how influential institutions or individuals determine what information they pass on to recipients, i.e. what are the values or moral perspective with which to select news. In the digital ecosystem, some important changes have occurred: a. the editorial role delegated to the algorithms; b. the growing role of audiences as secondary gatekeepers for which users co-determine what makes the news (popularity algorithm = relevance); and c. the change in the position of the journalist from gatekeeper to gate-watcher.

From the moment it is born to when it reaches the widest audience, information is modeled, filtered, and hidden within a dense mixture of elements that come together in the algorithmic infrastructure of social media and digital platforms[20]. From a theoretical point of view, the identification of the phenomenon of "neo-intermediation"[21] and the limits of the concept of disintermediation, lead us to pay attention to the distinctive characteristics of algorithmic publishing/platform press and to the metamorphosis of the processes of information content selection and dissemination, in order to analyze the impact on the balance and on the information system.

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19 See World Health Organization 2020.

20 Moeller et al. 2018.

21 Giacomini 2018b & 2020.

Within the scientific literature, the concept of "neo-intermediation" has appeared before under the name "re-intermediation"[22]. However, the term "re-intermediation" runs the risk of suggesting the occurrence of a reiteration of the old intermediation (through the prefix re-, which mostly expresses the repetition of an action in the same sense), while that of "neo-intermediation" suggests (through the prefix neo-, the first element of compound words in which it generally has the meaning of new, modern or recent) that it is a form of intermediation that presents itself through digital and not analogical forms, that is algorithmic and not heuristic and, therefore, not simply repeated, but unpublished.

With the concept of "neo-intermediation" we therefore intend to focus on the central role of recommendation and personalization of algorithms such as new gatekeeping infrastructures, together with the combined role — played by third-party mediators — also known as data brokers. From the interaction between all these elements, what has been defined as "algorithmic public opinion"[23] is inevitably influenced by the governance of online platforms and by the emergent possibilities that have emerged[24].

The power of neo-intermediation entrusted to the new "Custodians of the internet" is twofold:

Firstly we have to refer to the *filtering* process: the platforms act as filters or gatekeepers. Therefore, in the flow of information, they select news deemed relevant enough to reach users. In light of the current European governance models, they do not limit themselves to providing an apparently neutral publication space, but they assume the role of censors. Thus, on the basis of criteria hither to not legally defined and, therefore, acting in accordance with an "editorial and/or information line", they remove content viewed as "potentially harmful to the public interest" of users.

The second aspect to consider is the *ranking*: like traditional media, digital media indirectly determine the public agenda by placing news in a certain order (ranking) so that their consumption can be influenced.

Part of the impalpability of these moderation mechanisms is due to the procedural opacity of what surrounds them: the algorithms are flanked by a variable army of human fixers who often do not have the time, skills, and above all the democratic legitimacy in the operations of curatorship, control, and censorship of the flow of information.

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22 Jones 2002; Bentivegna 2015; Cepernich, 2017.

23 Airoldi 2020.

24 Friedman et al. 2006.

The randomness of the rules and the human component that intervenes in both the decision-making processes and the planning of the algorithms should contribute to questioning the generable potentiality of the platform services as well as their neutrality.

2.5. Anatomy of AI-based information filtering

Machine learning is a means to create artificial intelligence by discovering patterns in existing data. Machines can learn word associations from written texts and these associations mirror those learned by humans as measured by the Implicit Association Test (IAT). Of course, semantics derived automatically from language corpora contain human-like biases. The IAT has predictive value in uncovering the association between concepts such as pleasantness and flowers, or unpleasantness and insects. It can also tease out attitudes and beliefs. For example, it can uncover associations between female names and family, or male names and careers. Such biases may not be expressed explicitly, yet they can prove influential in behavior[25]. Any remedy for bias, therefore, must start with awareness that bias exists.

Consequently, using the criteria defined by the designers (input) and beyond: the algorithmic filtering of data takes place. Through inductive machine learning processes, the algorithms are circularly trained by user activities, in a sort of feedback loop[26], where feedback refers to "the property of being able to adjust future conduct with past performance"(Figure 3)[27].

Thus, in practice, artificial intelligence systems also learn from cultural "propensities"[28]; from data models extracted from online audiences, which reflect specific positions in the "social space"[29] as well as relative "prejudices" or biases, including implicit biases[30]. The results proposed by the algorithm will, therefore, reflect the practices of production and consumption of content of internet audiences as well as the relative implicit biases resulting from them.

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25 Caliskan et al. 2017.

26 Sumpter 2018; Airoldi 2021.

27 Wiener 1989, p. 33.

28 Mackenzie 2019.

29 Bourdieu 1989.

30 Baeza-Yates 2018.

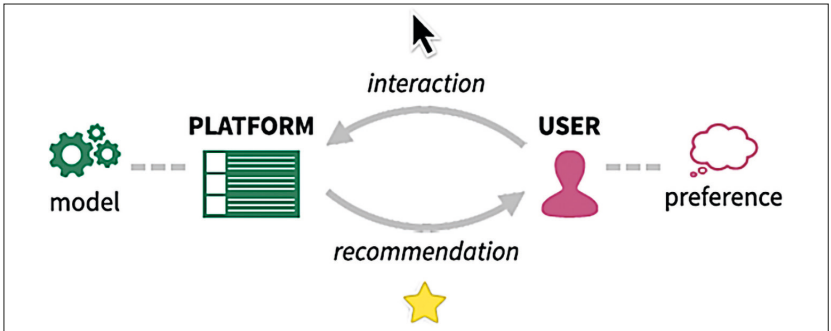

Figure 1: The feedback loop between user behavior and algorithmic recommendation systems. Confounding occurs when the model attempts to capture user preferences without accounting for recommendations. User preferences then influence both recommendations and interactions, obfuscating the casual impact of recommendations on behavior.

Fig. 3. The Feedback Loop. Source: Chaney-Lippold 2018.

As shown in Figure 3, if the outputs of a technical system are redirected as inputs, the system powers itself. Platform-based user interactions with machine learning systems produce feedback loops [31].

If on the one hand the mechanism allows each user to have easy access to the content of greatest interest, on the other hand, it intensifies phenomena of *self-confirmation bias*. Through the described circular causality mechanism (feedback loop) the user, through the choices they make, reveals the information that interests them and, in turn, the selection of information made by the algorithm influences the user's choices. The natural tendency to avoid cognitive dissonance is, therefore, amplified, with the effect of closing the user in an invisible bubble (filter bubble), thus confirming their own vision of the world[32].

The combined action of several cognitive distortions, in particular, the *confirmation bias* (see above), the *disconfirmation bias* that refutes information that contradicts preferences, and the *prior attitude effect* on the basis of which individuals attribute greater credibility to information more in line with their mentality[33], seem to be amplified by the algorithmic economy of the platforms. Such distortions, as demonstrated by the most recent empirical research[34], underpin strategies for the

31 Airoldi 2021.

32 Pariser 2011; Cheney-Lippold 2011.

33 Epley 2016.

34 See AGCOM 2020.

propagation of disinformation which are developed in order to exploit the cognitive biases and the functioning mechanisms of the mind by emphasizing the emotional reactions and automatic cognitive processes (but not only these)[35].

Individuals will also tend to remain within the contexts that enforce their acquired beliefs, amplified by the phenomena of eco-chambers[36], or message amplification (groupthink), which are capable, with varying degrees of success[37], of jeopardizing pluralism, transparency, and information diversity. Indeed, it is clear that the availability of a plurality of sources does not necessarily impact on the actual experience of users. Moreover, a specific content and/or editorial product will not (tendentially) be proposed outside a user group which, according to the profile to which they belong, can be considered *a priori* interested. The natural tendency for homophily and, therefore, the interaction between groups of homogeneous individuals tends to trigger a further effect: individuals are inclined to believe that what is claimed by groups of people is reliable (*bandwagon effect)* simply by virtue of it being repeated and thus more familiar to the mind (illusory truth effect). In addition to the impact of algorithms, some studies have observed how online interaction through social networks also creates a favorable environment for the spread of disinformation through mechanisms that are entirely similar to contagion phenomena thus favoring news viralization processes.

As for newspapers, the need to propose content that generates interactions often leads them to select information on the basis of the "virality principle" whereby what can be rewarded by algorithms is considered newsworthy. The massive transfer of journalistic material to social networks implies the adaptation of the language to the codes of the hosting platform. From this phenomenon also derives the simplification of journalistic content — according to the principles of gamification and "emotionalization"[38] which helps to further inflate the ideological bubbles of the network, aggravating the problem of incommunicability between highly polarized groups[39]. The content with the highest virality rate tends to be the most able in acting on the emotional sphere

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35 Pennycook 2019.

36 Sunstein 2007.

37 See Bruns 2019; Sumpter 2018.

38 Sorice 2019.

39 Mele et al. 2020.

and generating strong reactions such as anger, indignation, excitement, and enthusiasm, which then can be translated into interactions, clicks and shares. Therefore, it is a matter of content, which is already simplified, being made immediately understandable and emotionalized, thus reaching users in a personalized way and on the basis of the conformation of their social networks.

2.6. Personalization and individual autonomy

Personalization can be explicit or, as more often happens, implicit[40]. It can depend on user requests and/or user behavioral data (created unknowingly): digital traces or behavioral surplus that fuels surveillance capitalism[41] may include data on digital behavior and physical travel as well as sensitive health, banking, or professional information[42]. According to a recent study by eMarketer[43], online communication strategies are based on the possibility of capturing the unconscious motivation of individuals, till the point that 57% of the major marketing companies make use of "non-conscious market research" techniques. Such techniques include behavioral economics models, eye tracking, facial analysis, applied neuroscience models and biometric responses. An example comes from the smart recruiting sector: one of the leading artificial intelligence systems in the sector, developed by the American company HireVue, was able to analyze the data of up to 25,000 candidates, taking into account vocabulary, tone, cadence, facial expressions and posture. This at least until a complaint was presented to the federal trade commission by the research and public interest group "Electronic privacy information center", in 2021, following which HV decided to exclude facial expressions from the evaluation. Personalization can therefore be based on the autonomy of individual choice or on algorithmic delegation (essentially conscious) to the platform to deduce one's personal preferences.

The consequent asymmetry of information (and, therefore, of power) between companies/institutions and consumers/citizens as well as being considered a threat to individual privacy, especially in the case of facial

40 Thurman et al. 2013.

41 Zuboff 2019.

42 Cheney-Lippold 2018.

43 Biometric Marketing 2019.

recognition techniques and in poorly regulated regulatory contexts such as in China and the United States[44], is able to impact the very resilience of democratic institutions.

For example, the so-called psychographic profiling and "hypernudging" techniques (configuring the context of the user's information choice in a way intentionally designed to influence their decisions[45]) are believed to have been used by the Cambridge Analytica company to influence the 2016 US presidential election campaign, and in "Brexit", by taking an enormous amount of data from the Facebook profiles of completely unsuspecting users. Manipulation and deception become easier thanks to affective computing (or "emotional AI") captology — the study of computers as persuasive technologies[46] — and the emergence of psychographic techniques focused on demographic characteristics and "affect detection techniques", along with different types of data such as location-based tracking, real-time data, or keyboard use.

Recommendation systems (RS) represent the most important personalization engines. By RS we mean data-driven computer-based software tools and techniques that provide suggestions for elements that may be useful to a user[47]. These systems emerged in the early 1990s and in 2006 were made famous by the Netflix award for the enhancement of hybrid RS movie recommendations. The spread of social media and smartphones that provide much contextual information such as the time, place, emotion of people and groups has subsequently opened a new recommendation path known as contextual RS. "As in a self-fulfilling prophecy, real audiences replicate the behaviors prescribed by algorithmic audiences generated as output by Big Data and disguised as suggestions and recommendations"[48].

RS can be divided into three main types:

1. *content-based* (also called "semantic filtering");
2. *collaborative* (also called "social filtering");
3. *hybrid* (most RS)[49].

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44 Pasquale 2015.

45 See Yeung 2018.

46 Fogg et al. 2002.

47 Ricci et al. 2015.

48 Andò 2018, p. 135.

49 Ricci et al. 2015.

Content-based filtering (semantic filtering) refers to recommendations that are made by analyzing the associations between a user's past choices and the descriptions of the new objects.

Social filtering (collaborative filtering) automates the "word of mouth" recommendation process: articles are recommended to a user based on values assigned by other people with similar tastes. The system determines which users have similar tastes using standard formulas to calculate statistical correlations (a paradigmatic example is the collaborative RS of Facebook Edgerank). In this case, it is worth noting the concise definition given by Hildebrandt and Gutwirth in *Profiling the European Citizen*: "Profiling is a matter of pattern recognition, which is comparable to categorization, generalization and stereotyping"[50].

Finally, hybrid filtering is the most common form of RS today and uses a hybrid of recommendation techniques which combine characteristics of both systems and other elements such as demographics, communities, or editorial selections.

3. The contribution of cognitive sciences: the vicious circle between misperception and disinformation

As we have tried to underline so far, both the complexity and fluidity of the information environment require an innovative and cross-disciplinary approach to analysis. The aim is to identify tools to create a deterrent ecosystem to misperception (false perception), prevent the spread of disinformation and, therefore, limit the use of censor remedies. The most recent empirical research is aimed precisely at exploring the possible correlation between misperception phenomena and the propagation of disinformation.

In this regard, the cognitive mechanisms that govern the ability to recognize true and false news, as well as the problem of distinguishing between the two, represent a much-debated topic in even recent scientific research. Indeed, there is still no single answer or consolidation of theories. However, many empirical studies, even those of a multi and interdisciplinary nature, have focused on the investigation of these phenomena, focusing on the use of online information, its framing and sharing, induced polarization, and the role of algorithmic filters.

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[50] Hildebrandt 2008.

The results of the research into the cognitive origins of misperception, although not directly related to the world of information, can be usefully taken into consideration. Many of the psychological mechanisms that underlie misperception and many of the characteristics of the environment from which it emerges, in fact, are found in the online information system. It has been observed that not only are misperceptions able to exacerbate the impact of false information, but that they are themselves fueled by disinformation, the contents of which, stimulate emotional reactions. Examples include negative feelings towards ideologically opposed individuals or social groups; or situations that threaten the identity of individuals or their vision of the world; and even social pressure exerted by members of the same group.

"Misperception" can be defined as a belief that contradicts the available evidence concerning a particular phenomenon; individuals, in particular, can believe in something and feel that they are well informed on related issues. This trend has been the object of increasing study (see for example the Ipsos ones). In many countries, among them Italy, there has been a significant (and growing) gap between the perception of social and economic phenomena and the reality of the facts. Of particular interest is the study conducted in Italy by AGCOM in 2021. Here, as part of a project entitled "Digital platforms and information system", a fact-finding survey conducted on a sample of 1,358 individuals was carried out, aimed at studying public resistance to online disinformation. The report highlights how cognitive distortions and false perceptions can be used strategically to influence public debate and direct support or aversion to public policy alternatives. The novelty of the AGCOM report is precisely its use of the interpretative contribution of behavioral analysis and the experimental method to reconstruct the cognitive process underlying the decisions of users in the "attention markets".

To take into account the scientific debate on the issues mentioned before, the report adopts a non-traditional method of analysis which is based on a "survey-experiment". The originality lies in the administration of a questionnaire structured in a similar way to a typical cognitive psychology experiment which combines the main components of the surveys with real tests on the knowledge of phenomena and on the ability to discern the different quality of news. In this way, the advantages of the survey, linked to the size of the sample and the representativeness of the same, are combined with those of an experimental design with

which to try to retrace the individual decision-making processes in the consumption of information through a path with successive phases. In doing so, the report investigated the correlations and influences of two interpretations of the impact of disinformation on individuals[51]:

- Intuitive System (S1): the effectiveness of disinformation content in deceiving individuals are linked to fast, intuitive, "automatic" mental processes of an emotional nature, based on analog-associative mechanisms, on cognitive routines and, therefore, on the "laziness" of the mind in activating "controlled" processes. Also typical of system 1 is the *anchoring effect:* the order in which we receive information about a certain event influences our understanding of the event and acts as a filter and "resistance" to receiving further information that contradicts what we already know or read as a cognitive challenge.
- Analytical system (S2): believes that the propagation of disinformation is facilitated by a cognitive strategy, defined as "motivated directional reasoning". This consists in the activation of the described convergent analytical mental processes which, even when generated by an initial false perception, lead to the selection of only those elements that confirm the original perceptual biases. Rational motivation would be the basis of the system of protection from cognitive dissonance.

It emerged that both systems, amplified by the described algorithmic cognitive distortions, are involved in misconception phenomena. Therefore, it is not certain that distorting cognitive mechanisms (bias) occur only due to the activation of the cognitive mechanism of simplification and routine (*intuitive system or system 1*) or merely to the mechanisms of speculative study (*analytical system or system 2*). This means that it is not only the modalities of the information on the supply side (i.e. the fragmented-repetitive nature of the same) that generate the phenomena of false perception, but also the attitudes on the side of the algorithmically oriented demand.

The correlation and reciprocal influence between online misperception and disinformation have been evident and have a high impact: misconceptions make disinformation phenomena less recognizable. Furthermore, disinformation strategies can exploit the false perceptions of social and economic phenomena and address them, feeding them in a vicious circle. The choices and decisions, but also

[51] Kahneman 2017.

the learning process and the formation of opinions are, therefore, clearly influenced by the context thus defined.

The report, through a completely innovative investigation tool, empirically analyzes how the methods of information distribution through online platforms, including algorithmic personalization and framing, intervene in the perception of the reality of the world. Understanding these phenomena is also decisive for the evaluation of self-regulation and co-regulation processes in progress in relation to the information conveyed through online platforms.

In my opinion, AGCOM's research, in addition to the "European action plan against disinformation" is moving in the right direction. Indeed, I believe that the targeted study of media literacy interventions aimed at implementing skills is fundamental, even before "curative monitoring and control interventions such as fact checking, and debunking" and account closure. Encouraging a natural resistance of the public to online disinformation and *borderline content* guaranteeing decision-making autonomy is the first step for the resilience of democratic institutions.

4. Personalization and public communication

In many cases, as we have already seen, personalization is based on the comparability or even on the similarity (for some simplified categories) of the user with others (e.g. collaborative filtering). Thus, personalization paradoxically denies individual uniqueness through "intelligent" homogenization that negotiates the diversity of humankind. By constructing, manipulating, and strengthening these homogenizing categories, data-driven personalization, therefore, works on the premise of "divide and rule". In this case, the audience of the platforms, selected through algorithms whose control is not possible, pass from being networked individuals to calculated individuals, an aggregate whose boundaries are established and known only to the platform managers.

Taking up the well-known Habermasian hermeneutic paradigm[52], "data driven neo-intermediation" seems to add to the strategic and potentially manipulative action of peer to peer communication and thus the verticality of the dual communication emission/reception typical of traditional mass media. Indeed, the presentation of aspects of strong

[52] Habermas 1981.

verticality (think of the asymmetry of power between a neo-intermediary like Google and a single user) simultaneously allows forms of strategic (and therefore manipulative) actions that are no longer tempered by a universalistic validation constraint "imposed by heterogeneity and the unknowability of the mass audience"[53].

As highlighted above, it is clear, therefore, that it is not only privacy as an inviolable individual right that is put at risk, but the "sphere of personal information", or intellectual privacy, which constitutes the prerequisite of cognitive self-sovereignty[54]. Through the so-called psychographic data collection techniques, which allow platforms/institutions to act on the totality of information and not only on statistical samples, the actor has a targeted and profound knowledge of the "citizen-user". The latter discards the guise of an abstract and unknowable entity and is easily manipulated by targeted and sectoral communication no longer covered by the "claim to validity" and universalization of the political message imposed by the vastness of traditional public mass media[55]. The effect is the segmentation of audiences capable of breaking up the control traditionally exercised by the "autonomous public sphere" which, according to the Habermasian ideal, is able to communicate generating a critical power towards the institutions of the center while legitimizing their power. On the other hand, the ranking and personalization mechanisms, the absence of transparency in the targeting of information, and the logics of click-baiting constitute the environment that has allowed, or at least facilitated, the explosion of disinformation and polarization[56]. In the process of digital metamorphosis of the "structural power" of systemic constraints, however, the activation of communication processes and attention to the forms of rationality of understanding can be antidotes to the sophistication of the center. Therefore, a close investigation of the new communicative dynamics of the power nodes of the new subjects of the center is necessary to outline the real possibilities and resistance of spaces "from below" as well as the effectiveness of the regulatory strategies put in place by public actors to protect what, in Habermasian terms, we have defined the "autonomous public sphere", the only legitimizer of democratic institutions.

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53 Ibid.

54 Yeung 2016.

55 Privitera 2001, pp. 44-45; Giacomini 2018a; Giacomini 2020, pp. 31-50.

56 Del Vicario et al. 2016.

5. The contribution of sociology — Towards a sociology of algorithms?

As we have briefly tried to illustrate, with the global spread of digital platforms that make the accumulation and analysis of user-generated data their main business model, the canonical research objects of the social sciences are profoundly transformed. From power to identity, from everyday life to culture, from forms of sociality to memory, almost everything has become, at least in part, "algorithmic"[57].

The engineering and automation of social processes has characterized the recent transition to what has been defined an "algorithmic culture"[58]. This carries with it enormous social and cultural implications which require researchers to intensify their efforts to expand the existing understanding of algorithmic processes and the cultural conceptions that surround them without stopping at the "unknowability" of the black-boxed codes underlying economics.

A sociology of algorithms, in the true sense of the term, does not yet exist. Or rather, there are many research experiences which are mostly divided between the study of digital media, the economic-political critique of platforms, and the Science and Technology Studies approach to code. Few authors — including Beer, Bucher, and MacKenzie[59] — have tried to outline a social theory, centered on culturally and socially structured relationships between automatic systems and individuals[60].

However, despite the mainstream "dataist" discourse that tends to mythologize the positive consequences of artificial intelligence and predictive technologies for the economy and society[61], a large multidisciplinary critical literature has flourished in recent years, partly known as *critical algorithm studies*. The focus of this academic debate is the different components of algorithmic "Big Data assemblages", that is, the complex socio-technical systems of data production and processing embedded in digital technologies and platforms[62]. In critical algorithm studies it is the social and political consequences of the

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57 Airoldi 2020; Beer 2017; Cheney-Lippold 2018, Hallinan et al. 2016.

58 Hallinan et al. 2016.

59 Beer 2017; Bucher 2018; MacKenzie 2019.

60 Airoldi 2021.

61 Gambetta 2018.

62 Aragona et al. 2018.

output that are the subject of theoretical speculation and — more rarely — empirical research, starting from questions such as: How does the algorithmic circulation of content affect cultural consumption?[63], or what impact does it have on the polarization of public opinion?[64], and to what extent do racial and gender biases present in predictive systems contribute to reproducing social inequalities and forms of discrimination[65]?

The fallout resulting from the aforementioned Cambridge Analytica scandal, and the publication of a series of documentaries that presented an exposition of the inner workings of social media platforms in relation to data management, content moderation and ethics, has indeed given new space for the debate on reducing the opacity of algorithmic recommendation systems and improving their transparency. The latter is a crucial factor in distinguishing between the legitimate influence on public opinion and the coercion of opinions.

In the wake of the tradition of Science and Technology Studies[66], many authors have highlighted the need to open the "black box" of algorithmic models applied to the social world[67]. Above all, they have shed light on: 1. the not very visible but central role of human work in developing, calibrating, and training — even if only as simple, unsuspecting users — AI algorithms and systems[68]; and 2. the cultural assumptions, political-economic interests and biases inscribed in the design of algorithms and platforms that are only seemingly neutral[69].

Beyond the lack of public knowledge of the functioning of profiling algorithms underlying the filtering of information content (think only of Pagerank, the Google search algorithm), in order to understand their relevance in the processes of creating public opinion, there is a need to firstly recognize them as social and cultural objects. Therefore, to discuss the possible research directions of a sociology of algorithms, beyond the demystification of the code, it is necessary to: 1. contextualize the algorithm, starting from the study of the social worlds hidden

63 Beer 2017.

64 Bruns 2019.

65 O'Neil 2016.

66 Wajcman et al. 1999.

67 Pasquale 2015.

68 Casilli 2019; Crawford et al. 2018.

69 Pedreschi et al. 2018; Gillespie 2014.

behind the machine[70]; 2. historicize technology; and 3. investigate human-machine interaction.

"Society […] also includes all those objects to which purely human functions have been delegated. Human subjects are social beings, but also those "non-human" subjects who are objects, as well as, if not above all, those "hybrid" subjects, human and non-human together, born from more or less casual, more or less lasting encounters, between human and non-human actors"[71]. "Objects are not means but rather mediators, in the same way as all other actants; they do not faithfully transmit our strength — at least no more than we ourselves are the faithful messengers of theirs […] In order to finally be able to deal with the social body as a body it is necessary to consider things as social facts"[72].

Indeed, it is crucial to understand algorithms as "a socio-economic construct, that is, as technologies that are incorporated into organizations with their own objectives, values and fundamental freedoms, capable of modifying interactions with the human/economic/environment in which they operate. "The criteria that inform the algorithm as in the case of human publishing, necessarily express 'human values', that is, they wear what has been defined as a 'machine habitus'"[73].

As previously illustrated, even in practice artificial intelligence systems learn from the cultural "propensities"[74] of the data models extracted by users — secondary gatekeepers — reproducing and amplifying stereotypes, perceptual and cultural biases, and prejudices inherent in their choices. Machine learning systems must, therefore, be studied as "socialized" actors within human-generated data that bear the cultural imprint of specific social contexts[75]. When we consider the mechanisms of selection of a platform that involve algorithms, human editors, or a combination of both, we will znecessarily question the key values that inform these mechanisms, in other words the "habitus" they wear.

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70 Casilli 2019; Aragona et al. 2018.

71 Marrone 2002.

72 Latour 2002, p. 227.

73 Airoldi 2021.

74 Mackenzie 2018.

75 Mühlhoff 2020; Fourcade et al. 2020; Završnik 2019; Nobile 2018.

6. Datafication and dataism: "a new paradigm in science and society"

Just as relevant within this debate is the study of man-machine relations. The perceptions, opinions, and understandings of algorithmic interventions in the daily consumption of information and in the filtering of content for users count, in fact, as much as the knowledge of the code and mathematical formulations of these algorithms[76]. Indeed, it is in this direction that the most recent research in this field seems to be moving. It aims to investigate awareness and perception of the role of algorithms, investigating the possible reaction between acceptance, exit and coping strategies.

Users can ignore the profiling and personalization mechanisms underlying their news feed on the media[77] or, on the contrary, they can accept the phenomenon according to what the literature defines as the sociology of "digital resignation"[78]. In other words, despite growing awareness of surveillance, as well as unease concerning the implications of these systems, people may feel they lack the power to cope with the nature of data collection[79], hence the acceptance of massive data collection in their social life.

From the already mentioned 2018 survey conducted by AGCM in Italy concerning the degree of awareness of users of digital platforms in relation to the transfer and use of their personal data, it emerged that about 6 out of 10 users are not only aware of generating data with their online activities that can be used for profiling activities, but also appear informed of the high degree of pervasiveness of the collection systems (e.g. geolocation, access to functions such as address book, microphone and video camera) and the possibility of data exploitation by companies. It also emerged that 4 out of 10 users are aware of the close relationship between the granting of consent and a "free" service. On the one hand, therefore, there seems to be a limited sensitivity to the relevance of such data (36.1%); on the other, there is a perception of the complexity of technological tools (30.4%).

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76 Bucher 2017.

77 Eslami et al. 2015.

78 Draper et al. 2017.

79 Dencik et al. 2017.

The survey confirms the trend, already noted in the scientific literature, of accepting the collection of personal information as a pragmatic response in negotiations with digital infrastructures. There has been a normalization of the trade-off between metadata and the provision of free communication services and security, which has found its way into the comfort zone of many people. This has been driven, at least in part, by the ideology defined by Van Dijck as "dataism".

Research on public attitudes, starting with the revelations of Snowden[80] who pointed out that, despite there being a greater awareness of the problem of *datafication*, the justification for surveillance has been largely internalized, particularly when concerning security. Hence, there has been an acceptance of the massive collection of data in social life and the active marginalization of possible alternatives[81]. The so-called "Limited Government Regulation" model, inspired by "technological solutionism», and by current Western governance models, has in fact concentrated on trying to mitigate the excessive damage of *data* leading to the *discursive* depoliticization[82] of the problem of surveillance. This response has not been able to transform the social imagination into a force capable of tackling the so-called "realism of surveillance". This concept was developed in the context of communication research in reference to the "pervasive atmosphere" similar to that described by Fischer in relation to "capitalist realism"[83], which dominated the political and media debate in the post-Snowden era. This era was characterized by an atmosphere capable of both directing thought and action and normalizing the operation of surveillance infrastructures to the point of limiting the possibility of imagining possible alternatives[84]. The concept can, therefore, prove to be a useful hermeneutic paradigm for *social research* in the transversal study of policy interventions *and* their impact on the public. This will pave the way for the formulation of possible alternatives for the future of the communication and, ultimately, democracies themselves.

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80 Snowden 2013.

81 Dencik et al. 2017.

82 D'Albergo et al. 2020.

83 Fischer 2018, p. 26.

84 Dencik 2018.

7. Concluding remarks

In the new definition of the cascade activation model[85], government information fluctuates through hierarchical but not irreversible processes, from actors with official power to the public. It is necessary, therefore, to redefine the rigidity of framing processes in the face of platforms that on the one hand allow disintermediation, and on the other hand introduce a series of diversions that risk confirming and exacerbating ideological affiliations and partiality of information, which can be summarized in techno-infrastructural elements and socio-political variables. The cross-disciplinary study of the ways in which that we have defined neo-intermediation processes are structured, through the production of content and the dissemination of the same through the platforms, allows us to understand self-representation strategies, dominant and public frames perceived in order to develop regulatory perspectives and governance.

Despite the apparent inevitability of standard setting and ideological influence, the mutual shaping of platforms and society is neither irrevocable nor irreversible. Currently, the business platforms of the Big Five determine the basic technological infrastructure, the dominant economic models, and the ideological orientation of the entire system. In addition, they direct the interaction between industry platforms, social institutions, companies, and billions of users. In this context, the ability of governance to guarantee the citizen-user control of themselves in the network is to be evaluated as a meta-requisite to think about a rebalancing of the position of the user-producer (prosumer) and information mediators. In fact, it is believed that the degree of success/failure of governance models is proportional to the degree of awareness, control, and transparency of the profiling mechanisms.

In other words, the restitution of the domain to the private sphere is decisive — understood as control of "inbound" and "outbound" user information traffic[86] — as an indispensable condition for the protection of the principle of self-determination and cognitive self-sovereignty. Moreover, it is a condition of the very existence and resistance of an autonomous public sphere and, therefore, democratic debate.

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85 Entman 2018.

86 Rodotà 2014.

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