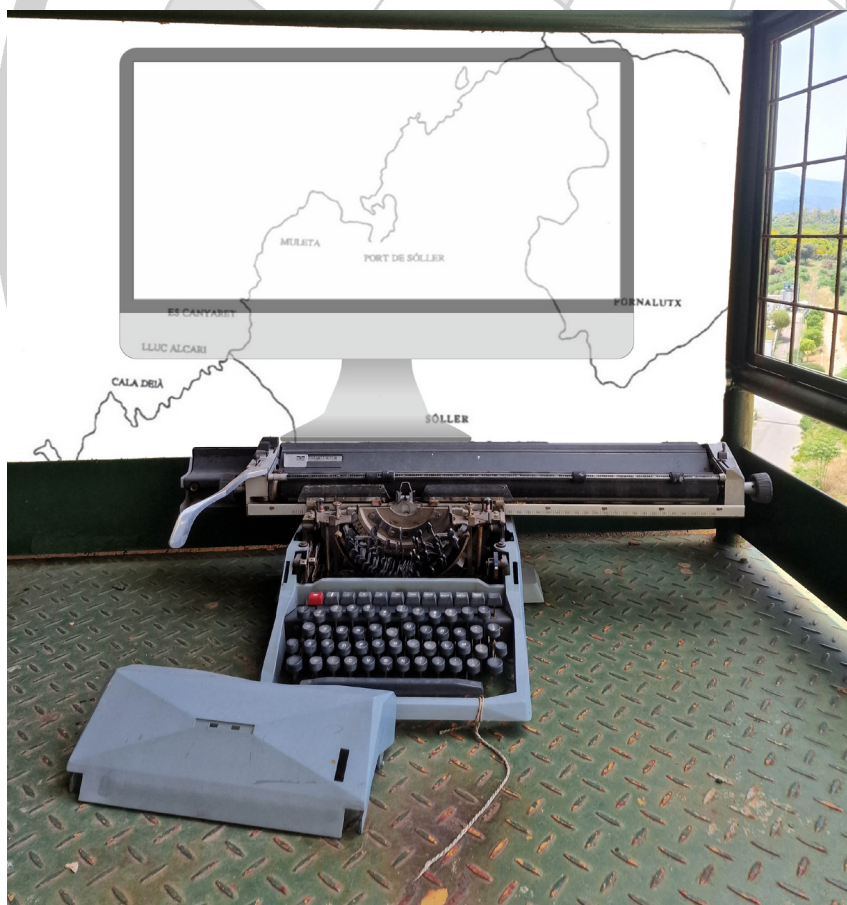


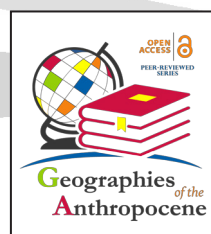
INFORMATION TECHNOLOGIES AND SOCIAL MEDIA: NEW SCIENTIFIC METHODS FOR THE ANTHROPOCENE

Gaetano Sabato, Joan Rosselló (Editors)



Preface by Javier Martín-Vide

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Information Technologies and Social Media: New Scientific Methods for the Anthropocene

Gaetano Sabato, Joan Rosselló

Editors



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Edizioni

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Anthropocene*

Gaetano Sabato, Joan Rosselló (Eds.)

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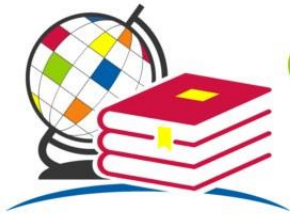
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CONTENTS

<i>Preface</i> Javier Martín-Vide	8
<i>Introduction</i> Gaetano Sabato, Joan Rosselló	12
Section I	
<i>Social Media and Research</i>	
1. Participation, geography and social media. Discussing method <i>Gaetano Sabato</i>	17
2. Mediated subjects and interconnected days. Facebook as fieldwork <i>Stefano Montes</i>	30
3. Scientific Discourse and Social Media. The Reliability of Information Sources and the Figure of the Expert in the Post-Truth Society <i>Marianna Boero</i>	58
Section II	
<i>Humanities and technology</i>	
4. New technologies and historical research of migrations. An example in the Sóller valley (Mallorca). <i>Antoni Quetglas Cifre</i>	72
5. ICT and the classroom, a difficult relationship? <i>Iris Morey, Marina Palou and Joan Rosselló</i>	85
Section III	
<i>Practical application of technology</i>	

6. Floodup, citizen science project to increase flood risk awareness and collective knowledge

Montserrat Llasat-Botija and Maria Carmen Llasat 106

7. Hydric Bath - Recent learnings and a new research methodology for the assessment of long-term flood risk using documentary evidence

Ioanna Stamataki, Thomas R. Kjeldsen 132

Section IV

Multidisciplinary research

8. Artificial Intelligence and Anthropocene

Francesco Mele, Antonio Sorgente and Paolo Vanacore 150

9. The making of space, music, and soundscapes through digital art tools

Gian Luigi Corinto 185

10. Technologies for communication and new models of thought. Culture, philosophy and social identities

Alfonso Di Prospero 200

3. Scientific Discourse and Social Media. The Reliability of Information Sources and the Figure of the Expert in the Post-Truth Society

*Marianna Boero*¹

Abstract

Social networks represent a more immediate way for researchers to communicate with the audience, dismantling the old epistemic hierarchies. In this sense, the ongoing social media revolution reconciles science and society. Alongside this advantage, however, the concrete use of social networks in scientific debates poses some critical issues, such as the increasing feeling of distrust for the expert knowledge, stimulated by the perceived wisdom of influencers on the Internet and social media. As various authors have argued, the gap between scientists and users' opinions on technical subjects, such as the climate change, the safety of vaccines, the safety of foods etc., is increasing. The possibility of debating of science on social networks highlights even more the difficulty of separating facts and opinions, reliable and false information, with the risk of spreading false news, intentionally or unintentionally. This process causes, moreover, a crisis of the figure of the expert, that is increasingly questioned by virtue of the spread of misinformation and disinformation, often amplified by social networks. The modern campaign against Covid-19 vaccines is a clear example. The aim of this contribution is to cross and deepen the described issues, as part of a broader reflection on the theme of fake news and post-truth. After an introductory section dedicated to the connection between social networks and scientific discourse, the paper will focus on the crisis of the figure of the expert at the time of social media, also analyzing the role and reliability of scientific sources in public debates and the contribute of the semiotic gaze in the description of the phenomenon.

Keywords: Semiotics, Post-truth, Fake news, Expert, Social networks

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1. Introduction

The advent of social media and new communication and information technologies has had a significant influence on scientific discourse in various fields. The research planning and development process is largely affected by the impact of the new dynamics of communication and interaction on social networks. The latter are used by scientists for professional reasons, to communicate with the public, to promote their research, or to create fruitful connections with physically distant people. Platforms such as *Academia*, *ResearchGate*, but also *LinkedIn*, seem to be essential to disseminate research products and initiatives; moreover, the use of social networks such as *Facebook*, *Twitter*, *Instagram* can have a key role in the spread and valorization of researchers' image and interests: then, the construction, sharing and promotion of the research products are modified by the participatory value of culture 2.0. The possibility of commenting on articles, posts, videos, initiatives is an example of such a process, unthinkable before the advent of social networks. Social networks also represent a more immediate way for researchers to communicate with the public, but also a space for discussion, a place for debate and dialogue between experts and citizens. In this way, science appears more accessible and closer to the audience.

Alongside these advantages, however, the concrete use of social networks in the scientific debate poses some critical issues. Indeed, the audience participation implies the possibility for social network users to comment and intervene even on technical and difficult topics, to question skills and data, favoring opinions, experiences, and personal feelings. Science on social networks highlights even more the difficulty of separating facts and opinions, reliable scientific information and false information, with the risk of spreading false news, intentionally or unintentionally. This process causes, moreover, a crisis of the figure of the expert, that is increasingly questioned precisely by virtue of the spread of misinformation and disinformation, often amplified by social networks. The case of vaccines in the period of the Covid-19 pandemic, but also the debates on climate change and other scientific topics, are clear examples of this process.

The relationship between social networks and scientific research is therefore controversial. How can a citizen check the veracity of data and statements, distinguishing between reliable sources and fake news? Likewise, how can a researcher exploit the advantages of communication on social media without penalizing the solidity of scientific studies and claims? Starting from these questions, the aim of this contribution is to cross and deepen the

described issues, as part of a broader reflection on the theme of fake news and post-truth. After an introductory section dedicated to the connection between social networks and scientific discourse, the paper will focus on the crisis of the figure of the expert at the time of social media, also analyzing the role and reliability of scientific sources in the public debate.

2. Scientific discourse and social media: a controversial relationship

According to historical evidence, the birth of the Internet is linked to purely scientific needs: at first, as a technological tool capable of connecting the scientific communities spread across the US and subsequently as a means of hypertextual sharing of digital texts at CERN in Geneva. The extraordinary impact of the Internet on science discourse reveals a profound change in the relationship between science and society, since the Internet allows unprecedented forms of collaboration and cultural co-production not only among scientists but, above all, between scientists and the general public (Cavallo & Spadoni, 2010). The most recent developments, such as blogs, tagging and social networking, collectively known as Web 2.0, have further expanded the number of available tools, so that today it is possible not only to consult the information already present on the net, but also to publish new information, to create (and manipulate) contents, making it necessary for journalism, marketing, politics and even science to adopt new ways of thinking and acting (Avveduto, 2015).

More and more researchers have begun to work using these tools, with positive repercussions both on contents update and in terms of widespread diffusion of the science itself. There are also advantages in terms of creativity and participation, with a positive impact on productivity. Scholars have always built their knowledge of the world starting from the work of other researchers, perfecting their own concepts and those of others through open debate. However, the potential offered by the web has made it possible to create collaboration networks between scientists and research communities, going beyond space-time frontiers. Through the Internet, every researcher does not address only to peers but to a potentially global audience, breaking down the barrier between “communication within the scientific community” and “communication with the outside”. Thus, a different idea of doing science emerges, more participatory and interactive, less hierarchical. Waldrop (2008) uses the expression “Science 2.0” to describe it, indicating that this web-based science 2.0 is not only more collaborative than traditional science, but also much more productive.

The world of science and Web 2.0 adopt very similar philosophies, with common traits that become more and more evident. It is not a coincidence that in this climate of interaction a new figure is born: the “prosumer” (Ritzer, Dean & Jurgenson, 2017). The name comes from the fusion of the terms “producer” and “consumer” and refers precisely to the way of participating in the scientific community. The purely vertical information structure disappears, having the possibility to interact with anyone within the network and to share contents without limits. Each researcher becomes at the same time producer and consumer of information, accelerating the development of knowledge through the exchange of experiences and opinions. The revolution through the world of the web has therefore led to the sharing of information, that is increasingly free to circulate and generate knowledge. This process has favored the birth of real communities of scientists in various research fields. Exchanges and meetings are the contact points between the various communities, and the web platforms are increasingly configured as a social space. All this has made it possible to further expand the boundaries of knowledge. Researchers can meet and network even if geographically located in different departments or nations, exploiting the many possibilities that Web 2.0 offers them (Fedeli, 2017).

However, alongside the described advantages, the relationship between scientific discourse and social media appears controversial. A first critical aspect concerns the possibility for the non-specialized public to access scientific information available on the web, with the risk of distortion, misunderstanding and hyper-simplification of the message. Through social networks, even the non-expert public can freely intervene on any topic of a scientific nature, even if such topics do not belong to their own field of expertise. In such a scenario, conspiracy theories spread, with the consequent distrust towards the experts’ opinions and the political decisions regarding public health, environment, science, and it is difficult for the public to check the reliability of a source. Contents, experiences and opinions shared on social networks by influencers and virtual contacts can be considered reliable as well as scientific reports. The number of likes and the type of reactions associated with a post or comment contribute to the authority and effectiveness of the communication. Consequently, users do not necessarily carry out further checks on the veracity of an information and believe that the information they have obtained through social networks is actual and appropriate. Social networks are in fact very often used as reliable sources, as documentation tools, and news spread primarily through this type of channel rather than through traditional media. Furthermore, information that do not correspond to the truth can become viral, appealing to emotions such as fear,

love, nostalgia, anger, etc. Personal opinions and objective facts are confused in the new communication context, distorted and manipulated contents spread through the web, creating a fertile ground for fake news diffusion.

Another critical aspect concerns the way in which researchers use social networks for professional and private purposes. Indeed, there are social networks that allow researchers to promote and disseminate the results of their research, to reach a potentially global audience, to create research networks, in a virtuous circle. *Academia* and *Research Gate* are examples of a professional use of social networks. Scholars can share their research interests and establish a synergistic collaboration with other scholars all over the world, with positive repercussions in terms of research opportunities. If through social networks like *Academia* or *Research Gate* the scholar turns to the peer network, through social networks like *Facebook* and *Instagram* the tone of communication changes since researchers interact with the wider public of non-scientific people. These social networks are virtual *arena* of public debate and offer a gaze on the private life of the user, through photographs, video and other shared contents. In this way, they can have an impact on the scholar's personal image. On one hand, public issues become private; on the other hand, moments and aspects of private life become public. There are numerous examples of this phenomenon. Among them, the use that virologists have recently made of social networks, on the one hand communicating scientific data on Covid-19 pandemic, on the other hand sharing their personal opinions on the most disparate social and cultural facts, not necessarily related to the health field. The insertion of private issues in researchers' public profile on social networks can have repercussions on their professional identity, thus requiring keeping under control the different images of themselves that are inscribed on the various social platforms.

Social media have therefore introduced new promotion and dissemination possibilities for scientific discourse, but at the same time they represent a place for questioning the same. The area of action of scientific discourse is thus eroded by other social discourses, such as journalism, but also advertising, television, tourism, politics, creating unprecedented spaces for interaction between the subjects involved (Boero, 2018). In the next paragraphs we will deepen these aspects, talking about the problem of the reliability of information sources and the "crisis of the expert".

3. Post-truth and fake news: the reliability of information sources

In the current communication context, social media are among the preferred information channels for users. Contents disseminated through social networks are considered simple, clear, reliable by users. However, the growing diffusion and importance of online and social media raises serious concerns over the quality, accuracy and credibility of circulated information and knowledge: countless contents published online are shared on social media without any control from a scientific point of view, and in a very short time can reach a high number of views. While certainly contributing to a greater pluralization of our information ecosystem, social networks stimulate the creation of “echo chambers” that amplify and reinforce existing views rather than support confrontation with dissenting perspectives (Lorusso, 2018), thus contributing to a faster and deeper polarization of opinions. This has been particular evident in the last two years. In the period of the Covid-19 pandemic, fake news and misinformation about diseases and medical treatments spread quickly and pervasively through the web. Controversial tweets, posts, comments contribute to strengthen the lack of trust in science and in the skills of experts. The phenomenon is not new. Conspiracy theories, “hoaxes” and fake news have always existed and circulated. Nowadays, what changes is the context of communication, in which relational and symbolic exchanges are increasingly outlined on social networks (Ferraris, 2009). On social media, the sphere of public opinion is fragmented into an archipelago of homogeneous communities, whose point of view, in the absence of a real exchange with those who think differently, tends to polarize. The individual is frequently exposed to incorrect information, without having the opportunity to access different contents that would represent a necessary counterpart for the formation of critical thinking.

While distrusting in journalism, readers are strongly influenced by the news that is shared on social media by virtual friends and close contacts, who often have the same point of view. Furthermore, the public internalize both the content and the emotions of those who propose it. The consequence is a general vindication of the opinion of the individual and of their autonomy from any rational and scientific consideration. Lorusso (2018) describes this phenomenon by analyzing the meaning of the word “post-truth”, highlighting how it is linked to an evolution of thought strongly conditioned by the change that television has experienced since the 1980s. The gap between entertainment and information has increasingly narrowed in favor of information that was also entertainment (infotainment) and gradually towards a TV increasingly interested in representing reality, but a reality that is

necessarily manipulated and constructed. Reality shows and talents have already weakened the idea of reality and, consequently, of truth. However, in the current communicative context, reality and fiction are intertwined and often confused in an even greater way, in a cultural logic that rewards emotions and identifications rather than skills. Daily life is exasperated, and intimacy becomes a parameter of truthfulness. In a horizon of this type, if private experience and emotions are placed before judgment, it becomes increasingly difficult to establish the truthfulness of a news (Ferraris, 2012). Truth as a criterion of absolute judgment has weakened more and more in favor of a plurality of truths that find infinite multiplications on the web.

This context creates the favorable ground for the spread of fake news. Fake news has been a relevant topic of public debate since at least 2016, together with the cultural and epistemological context in which it flourishes: post-truth (Riva, 2018). Fake news and post-truth are topics clearly related to communication: it is worthwhile to discuss them from the point of view of semiotics, to understand whether semiotics can study these topics and what tools it can offer. It is not possible here to give a complete account of the debate on fake news classification, but it is useful to outline the most recurrent categories. A first distinction is made between disinformation (“inaccurate or manipulated information/content that is spread intentionally”) and misinformation (“inadvertent or unintentional spread of inaccurate information without malicious intent”). The second step is to realize that fake news is only a part of a more general phenomenon, a new way of conceiving truth that has been indicated with the expression “post-truth” (Polidoro, 2018, p. 190).

According to the *Oxford Dictionaries* (2016), “post-truth” is an adjective “relating or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotions and personal belief”. This explanation clarifies that the prefix in post-truth has a meaning more like belonging to a time in which the specified concept has become unimportant or irrelevant.

There are two main aspects in this definition of post-truth. The first is that post-truth is characterized by the fact that in public debate our emotions, or what we already believe, prevail over rational argumentation. The second is that the consequence is a general disregard towards truth (Vattimo, 2009): truth is not considered central in the fixation of belief; it is more important that our initial point of view prevails. Fake news and post-truth weaken the role of rational or reasonable argumentation in public debates, substituting them with emotional and/or surreptitious arguments. They allow public argumentation to be based on false premises.

Fake news can be seen as a special species of disinformation. Fake news reports exhibit a lack of truth, but they need not be literally false. They may just be misleading in that they state something there is literally true but conveys something false. Not all false or misleading news reports are in turn fake news: in advert journalistic errors should clearly qualify not as fake news. What turns false or misleading statements into fake news is a lack of truthfulness: fake news goes along with the intention to deceive or bespeak a disregard for the truth, in which case they fall into the category of “bullshit” (non-sense, trash) (Polidoro, 2018, p. 191). Fake news is news that does mischief with the truth in that it exhibits both a lack of truth and a lack of truthfulness (Marrone, 2017). It exhibits a lack of truth in the sense that it is either false or misleading and exhibits a lack of truthfulness in the sense that it is propagated with the intention to deceive or in the manner of bullshit.

Traini (2018) describes some fake news discourse strategies: documentality, storytelling, visual exaggeration, no call for interpretation. Documentality deals with referencing, with the “exhibition of proof”. A photo, a witness, a document can be used as a guarantee of the veracity of what is being stated. The effects related to this strategy are indignation towards the status quo and call to action, for example the request to share a post on one’s own timeline². Storytelling deals with the narration of a story with omission of parts or with a manipulated chronology. Visual exaggeration deals with techniques such as the use of capital letters, of close-up photographs. The aim is to appeal to the emotions of the public and obtain indignation. The fourth strategy, no call for interpretation, deals with posts or articles that do not require efforts of interpretation by the reader nor critical abilities. All ambiguity is cancelled out and the tendency is to guide the story through predictable and unproblematic scenario. All these strategies contribute to the effectiveness and trustworthiness of fake news discourse.

The spread of fake news in the context of post-truth society has led experts to deal more with the world of social media than in the past. Not only with social networks dedicated to research, like *Academia* or *Research Gate*, but also with commonly used social networks like *Facebook*, *Instagram* *Twitter*, to control the disseminated contents and give themselves the opportunity to reply. The attempt has not always proved effective, given the difficulty of the experts to get in tune with the social media audience and the way of communicating that characterizes this medium. The risk is the polarization of different positions, with the consequent difficulty of communication and

² See Mangiapane (2018) for a comparative analysis of fake news strategies in the Italian context of communication.

comparison: a polarization that, as we will see in the next paragraph, is at the basis of the lack of trust in the figure of the expert.

4. The crisis of the expert

In a recent work, Marrone and Migliore (2021) describe and specify the role of semiotics in investigating the “expert competence”. The field in which the theory of signification has most worked on the theme of competence is that of narrativity. The starting point is the Chomskian notion of competence, understood as the ability of native speakers to produce an infinite number of syntactically well-formed sentences. According to Greimas and Courtés (1979), competence is not a thing in itself but a particular case of a broader phenomenon, which, under the generic denomination of competence, is part of the problematic of human action and establishes the subject as an actant, whatever the field in which he practices. Thus, any action, in order to be carried out, must presuppose its potential, a know-how; in technical terms, if the act is “making being”, competence is what makes being. The linguistic theory thus merges with the narratology of Proppian origin and in particular with the ethnosemiotic concept of qualifying proof, an action necessary for the hero to acquire the necessary means for the accomplishment of the decisive fight against the antagonist. It is retranslated in a semiotic sense in terms of a theory of modalities: competence, conceived in this way, is a modal competence, which can be described as a hierarchical organization of modalities (it will be founded, for example, on a wanting to do or having to do, that support a being able to do and a knowing how to do). The task of semiotics will therefore be to build models of modal competence, which, based on the analysis of narrative discourses, are applicable to non-linguistic semiotics of the natural world and serve as premises for a semiotics of action (Bertrand, 2021).

From a narrative point of view, competence should not be understood so much as a property of the “subject of doing”, but as a process within which it is acquired (or lost). As argued by Marrone (2021), the definition of the expert from the semiotic point of view is complex: considering the canonical narrative scheme, the expert is both the receiver and the subject, the initial receiver (the contractor) and the final receiver (who evaluates the execution of the contract and pronounces a verdict); he is gifted with competence and at the same time performs the performance. Faced with this syncretism, we understand the reason why these qualities of him make him desirable on the media scene perpetually seeking a stabilization, even momentary, of the rich

and elusive sense that regularly appears on his screens. However, these same qualities make the expert special, given that in the contemporary episteme “competence” tends to be considered a value. The expert designates a thematic role; its basic and almost exclusive modalization is knowledge. Almost exclusive modalization, given that it seems to exclude power, when the latter, to exercise itself, relies on that previous knowledge, giving it legitimacy. The ambiguity of this modal relationship is one of the first reasons for suspicion. Knowledge is actually the core of the particular authority recognized to the expert. This cognitive competence is valued according to the supposed complexity of the world to which it refers. The knowable, as the progress of the sciences goes on, is divided into progressively finer sections, in space and time and implies new strategies for observation, conceptualization and argumentation, whatever its domain of action (economics, biology, computer science, ecology). The credit recognized to the expert is based on the mastery that he exercises over one of these domains.

Nowadays, however, the figure of the expert is at the center of numerous debates and is characterized by an inedited crisis. The loss of representativeness by various public and private subjects; the direct access through the Internet to information and products of all kinds; the possibility of communicating immediately on a global level: these are some recent phenomena that seem to have undermined the functions of orientation, criticism, validation, and mediation that characterize the work of professional figures. The crisis of expertise coincides today with the role that political and scientific decisions have assumed in addressing and solving community problems of massive extent, from environmental pollution to immigration, from vaccines to pandemics. On one hand, there is a need for specialist skills, to cross and translate different kinds of knowledge. On the other hand, these knowledge and skills are questioned and opposed (Marrone, 2021).

The expert is a subject who, having developed knowledge, skills, and experience, is able to validate information, to provide the public with reliable data, to propose interpretations, paths and solutions. However, the trust in the experts is weakening. There are many areas in which this is happening: culture, medicine, psychology, journalism, environment, etc. The users can get any kind of news, information, service, product, directly and instantly from the Net and from technologies. For this reason, they no longer need intermediaries, mediators, and experts. Technical skills and knowledge are not considered more reliable and influential than an opinion or an information available on the web. There are various causes attributable to this crisis. Social dynamics, transformations in the field of communication, but also the traditional distance between intellectuals and the mass public. Another reason

for the crisis of the expert is the speed with which knowledge travels today in all fields of information, producing continuous relativism, overcoming consolidated paths with a continuous and rapid evolution.

Another cause can be found in the actual tendency to simplify / trivialize aspects, problems and discourses belonging to the most varied fields, without neither deepening the topics nor identifying the multiple connections among them. This approach favors simplification over complexity, reductionism to intertwining, unconditional adherence to critical thinking, elements functional to a fast, immediate, repetitive consumerism. Another phenomenon has contributed to creating the situation described above, a “rhetoric of participation”, emphasized as symbol of inclusion and access. Such a rhetoric spread in several areas, while participatory practices are often limited to proclamations, instrumental practices of sharing, that are far from real participatory processes. These actions have generated ambiguity and confusion, making it difficult to distinguish and differentiate roles and responsibilities.

Redefining relationships is a central point for the inversion of this process. Already Edgar Morin and Norberto Bobbio conceived the role of the expert not only as someone who possesses certainties, knowledge, solid, stable and permanent skills, rather as someone who identifies needs, asks questions and doubts. Someone who recognizes how immense and limitless knowledge is, and who admits the limits of his own knowledge. The phenomena in progress require a redefinition of the role of the expert in this sense, rethinking tools, methodologies, relationships. On the contrary, today’s risk is the tendency towards a hyper-specialization, which leads to the increasingly specific fragmentation of knowledge. From urban planning to anthropology, from medicine to culture, from biology to psychology, from economics to information, the ways to try to respond to these problems lie in the need to link separate, compartmentalized, dispersed knowledge. Indeed, only the connection of knowledge can consider the complexity of the problems and only the awareness of their interrelation can indicate effective solutions.

5. Conclusions: new trajectories of scientific discourse

The path undertaken allows us to reflect on the relationship between scientific language and social media from a social semiotic point of view. The debate on the reliability of the sources and on the competence of the experts can be inserted, in fact, within the changes that concern, more generally, the scientific discourse in contemporary society. Discourses “act” and “cause

action”. As stated by Landowski (1989, p. 9), discourses create social acts that transform intersubjective relationships: it is necessary to understand, consequently, the interactions that occur, thanks to discourses, between individual and collective subjects. In this way the discourse becomes a space for interaction and social semiotics should study the social effectiveness of their trajectories. Indeed, in the system of social discourse – using Lotman’s (1985) words, a “semiosphere” – the objects of meaning (the texts) travel trajectories that modify the system itself. According to Semprini (2003) in this continuous repositioning and in this continuous redefinition of discursive boundaries, it is important to pay attention to the conditions of manifestation of social discourses, as well as to their ability to create conflicts of powers and positions, beliefs and values: the social semiotic gaze thus becomes a real critical analysis of current society in all its discursive manifestations.

In the case of scientific discourse, the encounter-clash with other languages shows the attempt to redefine its areas of relevance to each discourse. Other discourses, such as journalism, politics, ethics, enter into relationship with scientific discourse and try to broaden their areas of action. This attempt, as we have seen, carries with it consequences, some of which are probably yet to manifest. Sensationalism, the mixture of facts and opinions, the lack of trust in skills are just some of the elements that emerged. At the same time, it is necessary to consider that scientific discourse also erodes, in a more or less intentional way, areas of relevance of other languages, such as advertising. An example is the video with which the Italian virologists decided to promote the vaccination campaign, with questionable results, as well as their entry into the world of mass media, primarily the television one. The elements of contamination among different discourses are therefore numerous and reflect the complexity of the social context in which we are immersed (Dominici, 2022). A context that can be described and understood only through a fluid gaze, oriented towards a continuous and synergic interdisciplinary dialogue.

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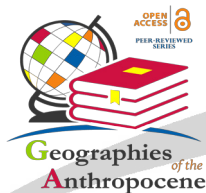
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The development of technology during the Anthropocene has affected science and the ways of “doing science”. Nowadays, new technologies help scientists of several disciplines by facilitating knowledge and how to manage it, but also allow for collaborative science, the so-called “Social Science”, where everyone can be a scientist and be involved in providing data and knowledge by using a computer or a smartphone without being a specialist. But is it really that simple? Actually, the daily and integrated use of different digital technologies and sharing platforms, such as social media, requires important reflections. Such reflections can lead to a rethinking of epistemologies and scientific paradigms, both in human geography and social sciences. This volume titled “Information Technologies and Social Media: New Scientific Methods for the Anthropocene” includes 10 chapters exploring some changes related to the way to do science with a multidisciplinary approach. From classroom experiences to the use of Citizen Science, from Artificial Intelligence use to how Social Media can help researchers, the book reflects on the ICT influence during the last few decades, exploring different cases, complementary perspectives and point of views.

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