"We will multiply the fires of resistance"

The catalysts of dissent against institutional science and their interplay with refused knowledge communities

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Introduction

Within the present debate over opposition to institutional science, a recent branch of studies has recognized a recurring set of beliefs framing a specific take on the affirmation of alternative epistemologies. These studies label science-related populism as an "antagonism between an (allegedly) virtuous ordinary people and an (allegedly) unvirtuous academic elite —an antagonism that is due to the elite illegitimately claiming and the people legitimately demanding science-related decision-making sovereignty and truth-speaking sovereignty" (Mede and Schafer, 2020: 12). This narrative, which closely follows other forms of populism (Moffitt, 2016), is largely associated with what Saurette and Gunster (2011: 199) call "epistemological populism": the belief that true knowledge should stem from the first-hand practical experience of common people.

This theoretical framework gained more importance during the pandemic, when it seemed to accurately describe the forms of resistance and contestation to scientific knowledge and to

the governance choices that the public decision-makers legitimize on their basis. In Italy, the context of this paper, this narrative has become an ideological glue for the birth of movements - and later also of political parties - which challenge the governance choices that rely on scientific authorities (e.g., by refusing vaccines). Although the object of criticism concerned heterogeneous areas (together with the vaccination campaign and the introduction of the EU Digital COVID Certificate, face masks requirement, the lockdown measures, and even the implementation of 5G technologies during the pandemic) and was characterized by different stances and radicality in contesting official scientific knowledge, the response from public institutions and the media was unambiguous. They set off a proper wave of moral panics (Cohen 1973; Chas 2006) about unwanted behaviors and contestations by citizenship. Public institutions explained these "misconducts" through exposure to misinformation on social media and typically reacting – as we will see- by systematically limiting or even closing some social media profiles that disseminate those kinds of contents. Labelling protesters as irrational, ignorant and dangerous conspiracists, that promote anti-science and disinformation, amplified the polarization between institutional science and existing protest movements.

Indeed, several authors have shown how the phenomenon of science-related populism is much more complex. For example, Ylä-Anttila complexified the concept by demonstrating how it is not always characterized by anti-intellectualism. On the contrary, it can also contest epistemic authorities by elaborating and disseminating "counter knowledge", which is "allegedly supported by alternative inquiry" (Ylä-Anttila, 2018: 2). This second strategy does not eschew "expertise altogether" but advocates "alternative knowledge authorities" (*Ibidem:* 3-4). According to this perspective, to label as "anti-scientific" the positions in contrast with institutional science is a form of reductionism.

Furthermore, even the so-called "institutional science" should be accountable of the polarization between the academic elite and the people. As authors such as Saltelli and Funtowitz (2017) have argued, the lack of trust in science and the consequent science crisis should be addressed with a renewed self-criticism in the scientific sector. In this regard, the weaknesses of governance practices and the lack of extended forms of inclusion of citizens and movements in science – e.g., in the formulation of scientific questions or quality control,

or in the construction of deliberative processes geographically distributed (Sarewitz 2015) - are among the many issues that should be urgently addressed within and together with scientific communities.

Other scholars have also pointed out how populist stances do not only characterize forms of anti-science or alternative expertise, but also some representatives of institutional science. For example, the concept of "scientific populism" has been adopted by French institutions to stigmatize the behaviours of mainstream scientists who bear "simplistic and reassuring solutions" to complex problems. It is for example the case of Doctor Didier Raoult, who has been accused of justifying and promoting his cures for the COVID-19 disease relying only on scientific authority, with the support of some political actors (Galland 2020).

In this complex scenario - that cannot be reduced solely to the problem of public confidence in institutional science (Smallman, 2016), to understand the phenomenon of science-related populism, it is in our view necessary to focus on the forms of production, circulation and use of populist contents addressing relevant scientific issues as the object of their critique. This means, on the one hand, to focus on the ecosystems and the actors that act as intermediaries between alternative expertise and lay people. As we will show, a new figure, that we have labelled "the catalyst of dissent", has been crucial for this purpose. On the other hand, it is necessary to overcome the reductive, and covertly normative, approach of the literature on how people accept or integrate populist contents in their activities. In line with the aforementioned wave of moral panic, this literature often recalls an outdated paradigm of "strong effects" of media which directly and deterministically matches the exposure to disinformation and behaviors (Tosoni 2021). To address this second gap in research, it is crucial to investigate not only how misinformation is framed and interpreted within specific groups (Prasad 2021), but also how information, including the one refused by the scientific community, is used by contesting groups for their own ends, including the construction of their narratives of contestation and of alternative epistemologies.

Therefore, we aim to contribute to the debate on emerging forms of science-related populism by analysing the interplay between an understudied figure spreading populist narratives – the "catalyst of dissent" (CoD) – and three Italian refused knowledge communities (RKCs) which have appropriated resources produced and shared by the CoDs online. We define RKCs as

communities that propose visions of science and medicine that are denied acceptance or even consideration by institutional science. As it will be shown in the empirical part, CoD is a key public figure that does not belong to the scientific community, who spreads science-related populist narratives. CoDs do so by using online media visibility and organisational capabilities within a constellation of grassroots ecosystem of resistance to institutional science. These actors differ from better-studied populist leaders who are engaged in external endorsement – and sometimes top-down promotion – of science-related populism.

Our analysis investigates the available RKCs can rely on for the production and circulation of their counter-narratives, with focus on those provided by CoDs. We thus borrow the concept of "appropriation" from media studies as a tool to inform our analysis. Within the ethnographic tradition of audience research this concept – originally introduced by Roger Silverstone's domestication theory (see Silverstone & Hirsch 1992) intends to emphasize the active role of users in their relationship with media contents and technologies; in particular, this role includes the selection and interpretation of chosen contents, and possibly their incorporation in broader systems of beliefs. Therefore, by focusing on the synergistic relationship between CoDs and RKCs as an appropriation process, we will respond to Mede and Schafer's (2020: 13) plea for empirical research on science-related populism in situated social and cultural contexts contributing therefore to the key topic of the legitimacy crisis of science.

This paper is organized in four sections. In the first section, we describe the case studies and the ethnographic research conducted on the online spaces of the RKCs under scrutiny. Then, we describe the role and features of the catalysts that emerged during our ethnographic observation. In the subsequent section we analyse the changes that occurred in each RKC after the interplay with the CoDs. Finally, we highlight the relevance of grassroots analyses of science-related populism in RKCs.

1. Exploring the ecosystem of dissent in Italy: choice of the case studies, methods and sources

This paper draws on the main findings of a 12-month online non-participant ethnographic observation (November 2019-October 2020) on the main digital spaces of three RKCs. Starting from March 2020, our fieldwork has been deeply influenced by the evolution of the public debate in Italy related to the Covid-19. Italy was in fact the first Western country to confront the pandemic crisis, therefore the pandemic influenced both the empirical activities and the agenda of the communities under scrutiny. For this research, we analysed three RKCs, which have been studied during a national research project involving four Italian universities and addressing the social and cultural processes affecting the acceptance of refused knowledge.

The first case study refers to the RKC coalesced under the claim "No-5G", a heterogeneous community engaged in contrasting the deployment of the fifth-generation wireless communication technologies (5G). Although the most important health institutions, such as the World Health Organisation (WHO, 2020) and the Italian National Institute of Health (Polichetti, 2019), have affirmed the safety of 5G, this RKC claims that exposure to its electromagnetic waves can weaken the immune system and cause several pathologies (e.g., cancer and electromagnetic hypersensitivity). The "Free-Vax" community has historically claimed the right to refuse vaccination as a precautionary public health policy: groups and associations carry out activities to promote information on the risks of vaccinations and support families who have had vaccine damage. The "Free-Vax" community is a scattered network that counts small local groups and some associations that stand among the others in the attempt to coordinate nationally their actions. Among the many, we focussed on three groups that best represent the current configurations of "Free-Vax" community: CORVELVA (Veneto Regional Coordination for Freedom of Vaccination), COMILVA (Coordination of the Italian Movement for Freedom of Vaccination), 3Vs movement (originally "Vaccines we want truth", currently 3V Vaccine, Truth, Freedom). CORVELVA and COMILVA were founded in 1993 and hegemonized the national debate on paediatric vaccination operating as privileged interlocutors with other European free vax associations. In 2019 3Vs movement emerged as a single-issue political party. The "Five Biological Laws" community refers to an alternative approach to health and medicine that has been rejected by health authorities in many Western countries. Born under the charismatic figure of the German doctor Ryke Geerd Hamer, the 5BL community promotes, through training programs and local associations, the uniqueness of each human being. The individual is in fact the only responsible of what is

wrongly referred as "disease", that is rather a fruitful and natural resolution of a personal trauma.

As we will see, our analysis indicates that the relationship between CoDs and these RKCs resulted in various outcomes: it boosted a populist turn in the "No-5G" scene; it caused an internal division in the "Free-Vax" scene; and it fostered a leading role and epistemic authority in the "Five Biological Laws" groups.

These communities were selected for several reasons. First, they represent three contemporary unsolved public health issues in the relationship between science and society such as vaccination, alternative healthcare, and the potential harmfulness of ICTs. Secondly, these cases demonstrate how the interaction between different groups and the same science-related-populist symbolic and discursive resources can lead to different outcomes in terms of RKCs' narratives, public visibility, organisational shape, and institutional role. Our analysis does not exhaust all possible outcomes, but the heterogeneity of the case studies illustrates how engagement with science-related-populist contents can be analysed as a non-deterministic process.

We performed a multi-sited (Marcus, 1995) and connective (Hine, 2004) virtual ethnographic field that mirrored the RKCs ecosystem. According to a criterion of typological variation, we initially looked for the main online spaces in which each community was involved within a vast array of media channels, including social media platforms, instant messaging services, websites, blogs, and YouTube channels. The field was recursively updated and reassembled by discarding less active interactive spaces in favour of more active ones. Following conversations, reposted contents, and public invitation links, we obtained a sample of 39 online spaces (see Table 1). The researchers used a shared template for the weekly formulation of the ethnographic notes, which allowed a constant comparison on media-related practices, on the actors involved, and on the widespread discourses circulating in the field. The coding of the material was carried out during and after fieldwork following the principles of constructivist grounded theory (Charmaz, 2014) which relies on an iterative and reflexive process of data analysis. Furthermore, to have a measure about CoD's relevance within the Italian public debate, we combined a quantitative analysis of mainstream Italian newspapers with the analysis of YouTube channels. To do so, we explored contents provided

by CoD's on recurring of YouTube channels we detected through our ethnography; we took advantage of digital tool YouTubeDataTools (Rieder 2015) that allowed us to collect data about visualizations of contents and to perform a network analysis between channels (see supplemental materials for more information). The analysis that follows reconstructs the contribution of CoDs for the communities under scrutiny following precisely those contents produced by them.

Table 1 – Digital spaces monitored during the ethnographic observation

2.The emergence of catalysts

Harsh political measures have been implemented globally to slow the spread of the SARS-CoV-2 virus. Italy was the first western country to impose a lockdown following the advice of experts and scientific committees. Among the different activities, the Italian government and some key members of the Italian scientific community intervened at both media and jurisdictional levels to contrast the spread of misinformation regarding SARS-CoV-2. The "*Transversal Pact for Science*", led by a group of Italian scientists, traced and publicly condemned the sources and actors who spread unreliable scientific information. In parallel, the *Italian Communications Regulatory Authority* (AGCOM) obscured science TV programmes and channels that promoted alternative cures and theories about COVID-19.

As a reaction, some RKCs called for active resistance against such interventions strengthening their relationship with CoDs to confront government and scientific authorities. The role played by CoDs in this relationship has not been studied in detail before. Since CoDs don't belong to any RKCs, in fact, they cannot be conceived as "liquid" or "choreographic" leaders for political populist protest groups described by Gerbaudo (2012). They also differ from more studied political leaders such as Trump or Bolsonaro, that promote scientific populism in the

agenda of mainstream and social media even across their respective national borders (Saurette and Gunster, 2011). Finally, they can't be conceived as alternative knowledge authorities, that is a role they do not claim for themselves in their relationship with CoDs. Rather, they present themselves as unbiased witnesses who mediate "the neglected voices" coming from alternative experts and communities which criticize the choices and methods adopted by scientific elites. In doing so, a CoD can address a variety of topics, not focusing on a specific issue or ideological battle. Like the "social catalysts" on Facebook described by Saveski et al. (2021), CoDs create "opportunities for people to interact (…) facilitating conversation between them", in our case around a plurality of populist contents.

Through our ethnography, we could distinguish two types of catalysts (see Table 2). The first type consists in political figures - with or without institutional responsibilities – such as Sara Cunial, the Member of the Italian Chamber of Deputies, or Diego Fusaro, the Founder of the sovereigntist party Vox Italia. During the pandemic, they publicly argued against scientific and governmental institutions - which allegedly violated constitutional rights by implementing measures to limit sociality and personal freedom. Cunial, for instance, used parliamentary interrogations as well as rallies to denounce the hidden powers leading a "health dictatorship" (Pellegatta, 2020).

The second type of catalyst includes content providers, bloggers, and influencers such as Mauro Scardovelli, Giulietto Chiesa's Pandora TV, Massimo Mazzucco's Contro TV, and Claudio Messora's Byoblu. For example, Byoblu, which claims to be "the TV of citizens, different from mainstream media," is powered by a YouTube account with more than 500,000 subscribers. During the pandemic, Byoblu broadcasted journalistic reports on the artificial origins of the coronavirus in China and secret plans behind vaccination programmes. Alongside covid-related issues, the agenda of these channels includes bank seigniorage system, climate change, corporate conspiracies, and counter-fact-checking of mainstream media and similar topics. It is also worth to note that the name of each TV, blog or radio mentioned above – even if they are aesthetically presented as traditional broadcasting organisations – is closely associated with the name of one specific catalyst, who act, at the same time, as owner, director, and "anchor-man" of his/her own medium.

The distinction between political and media catalyst, however, is not clear-cut. CoDs directly address their followers through their social media on a regular basis, while content producers promote and directly engage in political campaigns. Over time, catalysts formed a close-knit network of collaborations and cross-references that, as we will see, became institutionalized in the political movement R2020.

Table 2 – Main catalysts emerged during the ethnographic observation

3. The interplay between Catalysts of Dissent (CoDs) and Refused Knowledge Communities (RKCs)

The rising centrality of the catalysts has not been the only transformation that occurred in the network of grassroots resistance to institutional science during the pandemic crisis. Each RKC appropriated the narratives and used the resources provided by CoDs in different ways, following distinct trajectories of transformation of their epistemological assumptions, political goals and strategies, and internal organisational structures and norms. This section will describe the main forms of organisations and counter-narratives of each group before and after the pandemic crisis, and the role that was played by CoDs in their transformations.

3.1 The syncretic and populist turn of the No-5G scene

Italian RKCs gathered under the name "No-5G" share the conviction that the advent of the fifth-generation wireless communication technologies (5G) will dramatically escalate electromagnetic pollution, with severe repercussions on health and the environment. CoDs have always played a relevant role for these RKCs, even if this role radically changed as a result of the pandemic crisis. This change must be read in relation to a broader transformation that deeply reshaped the organisation, online presence, and activities of these RKGs, and the epistemology of the critical discourse they promoted. Our ethnographic observation showed that these two levels – socio-structural and socio-symbolic – have been tightly connected and must therefore be addressed in their mutual entanglement.

Table 3 Description, groups and main catalysts emerged in relation to the No-5G scene

Regarding the socio-structural level, before the pandemic crisis, the online presence of No-5G RKCs closely mirrored the organisational structures of the No-5G activist scene. A constellation of independent local groups, usually centred on a main city, organized their offline activities (leafleting, collecting signatures, and public debates with local institutions) through WhatsApp groups, and promoted their initiatives through Facebook groups and pages. These local groups found a loose form of coordination in trans-local Facebook groups like *Alleanza Italiana Stop 5G* and *Stop Sperimentazione 5G*, mainly used to keep in contact with other local groups. The main objectives pursued by activists were to enhance public awareness about electromagnetic pollution and to convince municipalities and the national government to stop the deployment of the 5G infrastructure.

Regarding the socio-symbolic level, the elaboration of a counter-narrative of 5G aimed to contrast its representation fostered by national and international reference institutions for health (WHO, 2020; Polichetti, 2019: 6) as a safe technology. Two key features characterized this counter-narrative. First, it strictly discussed electromagnetism and 5G, carefully avoiding inclusion of any issue related to other refused scientific knowledge (i.e., vaccines). Second, it aimed at being credited as strictly scientific. The linchpin of this counter-narrative was therefore represented by the work of several critical scientists chosen as "alternative knowledge authorities" by No-5G groups. These particularly included those linked to the National Toxicology Program (NTP) in the US and the Ramazzini Institute in Italy. These scientists provided proofs for correlation between exposure to radiofrequency radiation and the onset of certain types of cancer in mice and rats (i.e., Falcioni et al., 2018) although International scientific community doubted those claims (ICNIRP, 2018: 6; AIRC, 2018).

No-5G activists and their Italian alternative knowledge authorities, like Istituto Ramazzini, shared the same side in a "science war": a public disagreement differing "from a scientific controversy in so far as the arguers are mostly concerned to convince an outside audience rather than to convince their immediate scientific opponents" (Collins et al., 2020: 53). Under this point of view, hey mutually benefitted from a close collaboration: No-5G activists helped critical scientists to gain public visibility through invitations to public debates and through circulation of informative contents in their digital spaces. Critical scientists acted as consultants to help No-5G activists to keep their narratives within the borders of a scientific

epistemology, and to frame their contestation in scientifically acceptable terms, avoiding untenable positions.

The forms of online organisation of the No-5g scene helped to guard the borders of this narrative. Administrators and charismatic leaders played a key role in moderating conversations, sometimes even removing unwanted comments:

> REGULATION: (…)is it also forbidden to have arguments over politics, or over topics non pertinent to 5G, like vaccines, chemical trails, conspirations. Before publishing an article, please ascertain the recognised seriousness of its source. Scientific publications are welcomed. (…) We must be credible and knowledgeable.
>
> Posted by Admin in Stop Sperimentazione 5g Group on 2019, August 5

In this pre-pandemic phase, CoDs were already relevant to the No-5G RKC. The online content produced by CoDs (e.g., videos and articles from Messora's Byoblu, and from Sara Cunial's Facebook page) has always been systematically reposted as key resources for the No-5G counter-narrative. However, the eclectic contents produced by CoDs underwent a strict process of selection and appropriation that harmonized them with this counter-narrative's features. Contents were filtered based on pertinence (excluding anything not No-5G related) and their scientific plausibility. Notably, most of the shared contents featured No-5G "alternative knowledge authorities." In this way, 5G activists gave visibility and credibility to CoDs within their networks, while CoDs relaunched No-5G activists' instances at a national level, making them visible among their larger audiences and followers. What is more relevant here is that through this process of selection and appropriation, No-5G groups avoided taking on the scientific populist narrative that framed the eclectic media contents of CoDs.

CoDs were also relevant for the organisational resources they provided. Besides participating and supporting activists' campaigns (e.g., the collaboration between Fusaro's party VOX Italia and STOP 5G MILANO), they often provided information supporting activists from a legal and institutional point of view. Sara Cunial in particular organized press releases and international conferences at the Deputee Chamber (i.e., in February and June 2019), inviting No-5G's spokespersons and alternative knowledge authorities as Dr Belpoggi:

> Thanks to the extraordinary Sara Cunial for allowing us the press conference in the Chamber of Deputies (…). Thanks to the heroic Dr. Fiorella Belpoggi, scientific bastion of defence for public health. (..) We are moving consciences and opinions, the rubber wall begins to creak.
>
> Posted by Maurizio Martucci, national spokesperson for Alleanza Italiana Stop 5G, on 2019, February 26

She also translated activists' agendas into proper parliamentary motions (e.g., in October 2019). This synergy started to give more and more relevance in particular to the trans-local group Alleanza Italiana Stop 5G as an "informal committee" at a national level. However, just when local activist groups started discussing the desirability of this process, the pandemic crisis abruptly and radically reshaped this scenario, both from the organisational and epistemological point of view.

During the on-going pandemic crisis, social distancing forced activists to quit their outdoor activities. Consequently, local digital spaces have gradually lost their relevance in favour of trans-local and national ones. The latter quickly increased their number of users (partly thanks to administrators' recruitment campaigns). This triggered a shift in the mode of communication between online participants from a collective elaboration of a counter-narrative through posts and comments within small (local and trans-local) online groups. Communication moved instead to a dense and uninterrupted "flow" of juxtaposed and fragmentary contents (articles, videos, and claims), often posted several times, which challenged the administrators' moderation. Many of these posts asserted a causal relationship between 5G deployment and the pandemic crisis, either denying the existence of the virus and ascribing the disease to electromagnetic waves, or assuming a weakening effect of 5G waves on the immune system. Another relevant part of the content shared did not pertain to 5G at all, but regarded the artificial nature of the virus, vaccines, or other non-science-related speculation over a forthcoming global authoritarian surveillance regime. Drawing on this theme, a distinct narrative returned centrality to 5G, this time representing it as the core "infrastructure" of a trans-humanist project to come, involving AI, contagion tracking applications, robots, and face recognition technologies, in a syncretic narrative bringing together a plurality of RKC topics and sometimes also conspiracy theories.

Clearly, this content eludes the basic features of the No-5G RKC narrative elaborated in the previous phase, being not strictly related to 5G, coming from sources with weaker scientific credentials, and being closer to a populist framework. Indeed, at the beginning, administrators tried to enforce the old principles using public reminders, and several times even blocking users, deleting content, and suspending the ability to post. They justified censorship as a way to avoid the risk of being shut down connected to the new policies against fake news enforced by social media platforms. However, this activity of gate keeping soon proved to be impossible because the content posted by users was in large part pandemic-related. Between the end of February and mid-March of 2020, administrators started to re-launch this content themselves. These online resources and posts, in fact, deeply resonated with the personal concerns and frustration of the online groups' members undergoing a harsh lockdown. These concerns triggered a rising hostile attitude against scientific institutions and opened the doors to science-related populism:

> Virologists and scientists - without having certainties but rather quarrelling with each other - became the priests of the new religion at the time of the virus.

> Posted in WhatsApp group by G., commenting a public letter to the president of the republic signed by Messora and others, on 2020, May 5

Within this detournement, the No-5G knowledge authorities increasingly lost their central role in favour of CoDs. CoDs' contents were no longer filtered and selectively appropriated as in the previous phase, but rather taken as a whole, including the scientific populist framework that held them all together. For example, the "dogmatic" and "not people-oriented" nature of science is often criticized in the communications released by the R2020 movement led by Sara Cunial:

> For a science that is not dogma, independent research and medicine that is primarily prevention. For public health. For the free choice and self-determination of individuals. For a state that looks at health, people and the planet

Posted in WhatsApp group by M., commenting on a statement by R2020, on 2020, May 22

CoDs provided relevant resources (once filtered out) to back up the science-related populist turn of the No-5G scene. They also played a very relevant role in reshaping the organisational structures of No-5G RKCs, in a process that is still on going. Cunial launched in June 2020 the political movement R2020 describing it as "an open and inclusive democratic container that brings together all those who struggle to reaffirm their rights of freedom and self-determination". This convergence is being facilitated by the widespread diffusion of the aforementioned syncretic populist meta-narrative, through which the catalysts are fulfilling the function of a bridge between different worlds, like those of the other communities observed in the following paragraphs.

3.2 Deepening the cleavage across the Free-Vax community

Free-vax protests became harsher in 2017, after the Italian government imposed a series of vaccinations as mandatory for children in order to be enrolled in schools. However, the two most prominent associations, COMILVA and CORVELVA, refused a direct political engagement beyond the gathering of signatures for a law proposal regarding the free choice of paediatric vaccines.

Table 4 - Description, groups and main catalysts emerged in relation to Free-Vax community

(...) you should have already understood what COMILVA, CONDAV and the other associations are focusing on. Projects on individual territories, hearings at the regional council, information conferences on vaccines, this is where our resources are going. [...] We preferred to use our resources in this [kind of activities]. The [protest] events offer the advantage of making us feel all united but have not had results in making us listened (...). We are and will always be close to families. We do not prevent anyone from going but we have chosen another path.

Posted by COMILVA on 2019, April 14

By common agreement, the Freedom of Choice Committee reiterates that all the adhering groups remain non-partisan being interested, more than in active politics, in the common goal, that is to abolish the vaccination obligation.

Posted by CORVELVA on 2019, October 25

Therefore, rather than a proper political project, the main common element among these groups was the interest in abolishing the current compulsory vaccination policy, which they considered a health threat and an unacceptable interference in individual freedoms. These protests were not devoid of a shared "climate of suspicion" (Fairhead and Leach, 2012) and of claims of an alleged collusion between health authorities and "Big Pharma". It should be noted that this does not imply an anti-scientific stance. On the contrary, the Free-Vax community denounced the lack of availability of data about the trials and alleged that the health authorities did not share data about vaccination efficacy.

In this regard, before the pandemic crisis, we noted clearly that Free-Vax benefited from a continuous counter-information campaign through the contribution of Claudio Messora/Byoblu, a catalyst that played as the key vector in sharing counter-information. The blog and the connected YouTube Channel represented a lynchpin for Free-Vax content as alternative sources of information: the blog regularly casted alternative perspectives on vaccinations, analysis from alternative experts quoting research, and meta-analyses of vaccine efficacy as breaking news. Often, Messora/Byoblu joined forces with the Free-Vax community to create events together. In June 2019, it streamed an interview with Andrew Wakefield, the well-known former physician who connected autism to vaccinations.

The "contents for discontent" on YouTube have been often re-launched by COMILVA and CORVELVA associations, accusing the Italian government of collusion with the pharmaceutical industry. In this sense, Messora certainly played a key role as a catalyst. It contributed to maintaining public interest in studies by alternative experts and in reports showcasing the hidden powers that would rule the world. This content was closely followed by Free-Vax supporters, as proved by the high interaction rate on YouTube platforms (comments, views and likes) and by the continuous sharing on Telegram channels and Facebook groups.

Sara Cunial is another example of the relationship between CoD and the Free-Vax community, in particular for her brokering role. Since her election as Member of Parliament in 2018, she always tried to bring a proper Free-Vax stance to political debate, giving visibility – (e.g., press conferences at the Deputy Chamber) to alternative experts that raise doubts about the safety of the compounds used in vaccines, in line with COMILVA and CORVELVA activities of lobbying.

Both these CoDs then contributed to the promotion the visibility of the Free-Vax community and actively supported a robust populist narration of suspicion against institutional health and scientific authorities by alleging corruption and collusion with economic and political elites.

After the pandemic crisis exploded, the two CoDs promoted a new relationship with the Free-Vax community that goes beyond the reinforcement and the promotion of visibility of their narration and that accelerated a deep transformation. The pandemic crisis, in fact, was the background for the radicalisation of a tension between a moderate area, led by COMILVA and CORVELVA, and a more radical area that opted for direct political engagement: the 3Vs Movement.

The new single-issue party 3Vs Movement directly called for political action and gained a certain visibility through the action of the catalysts. The 3Vs movement, funded in early 2019, appealed directly to Sara Cunial for a political collaboration:

> Having acknowledged her commitment to freedom of choice in the vaccination field and the other important political battles, (…) we address to Sara Cunial the invitation to a meeting as quickly as possible, to define a possible collaboration with our movement, not excluding her possible adhesion to M3Vs for the continuation of the common battles.
>
> Official note by 3Vs movement, posted on 2019, April 22

This excerpt well exemplifies how a brand-new single-issue political party actively searches for the same process of visibility enhancement. In this case, the role of Cunial is not simply brokering the Free-Vax agenda, but directly promoting a form of political organisation,

catalysing (read: accelerating) the rift between the two groups within the Free-Vax community.

As described earlier, the process sped-up further in 2020 with Cunial increasing her media presence because of the connection she publicly hinted at between the pandemic, health policy (mainly the Italian and European vaccination plans), and economic interests in developing new forms of control and subjection (through 5G infrastructure and Big Pharma). The 3Vs movement followed the same narration, condemning the "aggression by government against individual freedom and freedom about therapeutic choice" (Speech by Paolo Girotto, a candidate for a regional election in Veneto). Synergies with the No-5G community and the new R2020 network bloomed in a political proposal where the Free-Vax stance hybridized with a more complex and syncretic turn against the alleged "elites of the health dictatorship".

Moreover, Messora provided this new political subject with the chance to expand its audience. Indeed, the Byoblu YouTube channel streamed multiple assemblies and rallies organized by the M3V during the election campaign.

This last element further showed the ambivalence of CoDs for the Free-Vax community. On the one hand they promoted visibility, spreading contents (a reinforced narration), and strengthening the leadership of the main association (organisation level). On the other hand, they promoted a significant change of the community itself, that led to an internal division.

3.3 Fostering a new medicine for and by "the people": the Five Biological Laws community

The community referring to the "Five Biological Laws" (5BL) follows an alternative approach to medicine and health, the so-called German New Medicine, conceptualized by Ryke Geerd Hamer, a controversial figure whose licence to practice medicine was revoked for malpractice in 1986. According to Hamer and his fellows, the 5BL link any symptom to a biographical and biological "shock", which is seen as the main cause of the activation of special biological programmes leading to a state of malaise. According to this perspective, the origins of any disease are traceable and verifiable, but the individual is the only person accountable for the good resolution of their past conflict. Until now, the 5BL have been largely rejected by official

medicine in Western countries: the application of this approach is in fact labelled and condemned as a dangerous and counter-productive practice, especially in relation to oncological cases (AIRC, 2018).

Table 5 - Description, groups and main catalysts emerged in relation to the 5BL community

Before the start of the pandemic, the 5LB community was already widespread in Italy, thanks to the organisation of training programs and courses, which addressed common citizens and health workers/practitioners such as nurses, osteopaths, and physiotherapists. Beside these formalized centres, experts and practitioners also rely on a conspicuous literature (mainly books by small publishers and non-peer-reviewed articles) and on online magazines, YouTube channels, and Facebook pages and groups moderated by experts. Unlike the former case studies, this community was not born as a single-issue movement. All these sources provide information both on the application of the 5BL and on mainstream scientific debates and controversies (including, at a later point, the analysis of the pandemic phenomenon.) The opposition to institutional science of the community is to some extent ambivalent, since the 5BL aims at not replacing but integrating with official medicine in order to improve the quality of diagnoses and medical therapies.

Before the pandemic, the catalysts did not appear in social media group discussions of the 5BL, which strictly referred to their own knowledge authorities. It was only when actors like Claudio Messora and Sara Cunial began their political and media struggle against the so-called "health dictatorship", that the first posts and comments quoting the catalysts appeared.

However, unlike other communities, when the pandemic began to spread, the 5BL community supported the actions and discourses of the catalysts, not to gain public visibility for their agendas, but to safeguard the work and the stability of their organisations in Italy. In particular, they were safeguarding their right to legitimately promote an alternative and holistic vision on healthcare and science-related issues. The 5BL community saw the attacks on the catalysts from scientific authorities as an upcoming direct threat to their own activities. Consequently, leaders of the community started to endorse CoDs by sharing their contents on personal profiles and private groups or even in restricted-access areas within their institutional online platforms. For example, on the website of the most important 5BL training school in Italy, the director posted a long series of links and comments against the violation

of constitutional rights and individual freedom perpetrated by the government and scientific elites. In this page, titled "news - the fundamental rights of citizens,'' the intervention of Cunial and the petition launched by Messora were both at the top. The school director claimed:

> We share with absolute firmness the intervention of the Hon. Sara Cunial at the 331 session of the Chamber of Deputies on 24 April 2020: 'We have been spied, subjugated and treated as criminals by a government that in only two months destroyed our fundamental, natural and constitutional rights'. Thanks Sara, we need true people in this time of generalized betrayal.
> Posted by SBLI Italia on 2019, April 25

Concurrently, other leaders of the 5LB community posted materials and contents in defence of the channel Byoblu on their personal profiles. In line with the populist claims by actors like Cunial and Messora, the 5BL community especially condemned those mainstream scientists who were replacing an "evidence-based medicine" with an "*eminence*-based medicine." The organisation that symbolizes this shift, the *Transversal Pact for Science*, should in fact be renamed "Transversal Pact for the Corruption of Science. When all is over, they will be the first to bring to trial." (posted by 5BL expert on 2020, October 16).

Such an anti-elitist stance is not surprising in the 5BL community. Since its founding in the 1990s in Northern Italy, the 5BL community has faced a long list of lawsuits and journalistic reports condemning the medical malpractice of 5BL experts, especially on oncological patients. Hence, the extended control of scientific elites on medical statements and practices during the pandemic represented a further threat to the epistemic authorities of this community. In this context, the catalysts acted as allies in the longstanding fight for preserving and spreading alternative scientific epistemologies. The right of politicians like Cunial and Messora to share and defend the people's "truth-speaking sovereignty" matched with the right of the 5BL experts to profess an individual and subjective-based approach to health and care, especially in relation to Covid-19.

When it comes to the catalysts' communication, unlike 5G and vaccines related issues, the 5BL community seems to be irrelevant. This is because rather than looking for public

notoriety, the 5BL experts established a more subtle and cooperative relationship with some catalysts. When Sara Cunial launched the first meeting of R2020 in Rome in late June, one of the most important 5BL associations sponsored the event, joining the ethical committee of the movement. The association promoted the event on social media invoking the end of the health dictatorship and claiming what van Zooned labelled "*I*-pistemology" (van Zoonen, 2012) for analytically capturing individual and truth-speaking sovereignty on health and care issues:

> *Resistance*: to the prescribed and false health need, to the constant recruitment that through terrorist disinformation campaigns transforms healthy people into sick people.

> *Re-birth*: as individuals, as human beings free from delegation, who allow the active participation in health problems in respect of a health based on self-determination and freedom of choice as the maximum values.
> Posted by 5BL association on 2020, June 29

Notably, this synergistic relationship between Cunial and 5BL went far beyond this sponsorship. A key feature of Cunial's event, entirely covered by Byoblu, was the organisation of "commissions" led by experts, in which the key issues of the R2020 would be discussed by all the fires of resistance. During the event, seven experts out of the ten listed as "moderators" for the commission of "medical *ars* and wellbeing" belonged to the 5BL world. Moreover, the main stage presenter was a famous Italian promoter of the 5BL.

During this later stage of the pandemic the synergy between the catalysts and the 5BL community emerged in a more subtle way compared to the other cases. The space of interaction and discussion between RKCs opened by catalysts was exploited by 5LB leaders to position themselves as references and experts in the field of health and medicine within a new political movement. This influence is also traceable in the catalysts' public discourses, although 5BL leaders are rarely directly quoted. For instance, the R2020 official FB page reiterates the argument that fear is the first enemy of public health, or that it is "well established that the general state of health (psycho-physical-intellectual) is maintained by the optimal presence of viruses" (Post on FB by Sara Cunial on 2020, November 17). These are

assumptions developed within the 5LBs framework. The official document released by the health commission of R2020 also testified the penetration of the 5BL community within this movement. For example, the commission suggests by-passing institutional medical care by means of horizontal forms of mutual help. It also promotes the freedom of choice of treatment and the centrality of the subject in managing and assessing illness experiences. It encourages the fight against "misinformation", specifically naming a book written by an Italian journalist against the 5BL community (D'Amato, 2017) as a key example of "fake news". Finally, the commission asks for the abolition of the medical order, a category that historically stopped and forbade the institutionalization of the 5BL within the healthcare system (R2020, 2020, p. 6-14). This last point is crucial, because at a later stage, starting from September 2020, a leading 5BL expert took part in the "Committee for Constitutional Freedom" (ComiCost), a group of lawyers and health workers drafting legal documents against the application of government measures (e.g., social distancing and curfew), and safeguarding the freedom of choice in healthcare issues. For example, ComiCost produced a revised version of the informed consent for Covid-19 vaccines for the R2020.

During this synergistic relationship with catalysts, the 5BL groups resisted the hybridization of their system of beliefs with other RKC's narratives. In some cases, this community even came into conflict with other groups. For example, in a YouTube video published by the main Italian online magazine on the 5BL, the chief editor denied and debunked any correlation between the 5G antennas in Italy and the spread of Covid-19, sparking a debate in the comment section with the No-5G. While narratives and conspiracy theories about vaccines were subtly shared by the 5BL, this community avoided any blurring with other RKC in order to maintain and protect its identity and the stability of its foundations from epistemic ambiguity. The 5BL communities continued instead to pursue institutional recognition as a scientific and reliable medical approach to be integrated within the old official and 'datafied' allopathic medicine. The R2020 movement and its leading catalysts acted thus as an elective channel to reach not only a wider basis of affiliates, but also to gain consensus within the legal and political sphere.

4) Conclusions

Our research emphasizes the relevance of the CoDs within a heterogeneous ecosystem of resistance to institutional science in Italy during the pandemic crisis. We have shown how synergistic relationships between catalysts and RKCs led the latter to grow, shift, and change in different ways. These synergic relationships relied on a mutual exchange of resources. On the one hand, the CoDs profited from the agendas, cognitive resources, and alternative forms of "expertise" provided by RKCs to produce their media assets. On the other hand, the RKCs in some cases embedded the populist narratives spread by the catalysts, while in other cases their relationship with the catalysts' helped them to formalize their organisational structure and to position themselves within the public debate.

As we have shown, the interplay with the catalysts led RKCs to follow different trajectories. In particular, the CoDs provided RKCs with resources that were adopted to accelerate heterogeneous processes and transformations regarding three main points: the eventual reformulation (and hybridization) of their narratives, the public visibility of their claims, and their organisational structure and sometimes institutional role.

Regarding the hybridization of their narratives, we have seen how the CoDs acted as bridges between different groups, promoting new spaces of interaction in which the narratives and claims of each RKC could conflate and occasionally conflict. From our observation, we can tentatively hypothesize that the more a group is pre-structured and institutionalized, like in the case of the 5BL, the more it tends to resist epistemological turns and the hybridization of its narratives with other communities. Conversely – at least in the time frame of our observation - the interplay with the CoDs led less structured RKC such as the No-5G to lose its focus on a single issue, and to loosen its attempt of remaining grounded to the scientific epistemology.

Regarding visibility, we have observed how catalysts enhanced the media exposure and the mainstreaming of the claims and concerns of two of the groups under scrutiny: the No-5G and the Free-Vax communities. Conversely, the 5BL community did not aim at getting a widespread visibility through the relationship with CoDs. However, at the moment, they are a relevant part of the catalysts-led R2020 network, although it may be too early to know if

their epistemology and narratives will play a marginal or hegemonic role within the movement. Another relevant aspect in terms of exposure is that - unlike well-known cases of populist leaders - the relationship between catalysts and RKCs is never unidirectional. From their side, RKCs can enhance the visibility of catalysts through their media practices and their offline activities.

Finally, regarding organisational structure and institutional roles, we observed that the interplay with catalysts can accelerate and enhance institutional actions and organisational changes within RKCs. Visibility and the critical mass gathered by the catalysts, especially by key actors such as Sara Cunial and Claudio Messora, provided the Free-Vax movement 3Vs with the strength to become an official political entity, running for the Italian regional elections. Concurrently, some key leaders of the 5BL community joined the R2020 movement to foster their role as experts in healthcare, also contributing to the legal actions against those "elites" that long denied the integration of the 5BL within the official care system. Regarding the No-5G activist scene, we observed that the interaction with catalysts contributed to the new centrality and relevance of national "informal coordination committees," and in particularly of Alleanza Italiana Stop 5G.

Overall, the interplay between the CoDs and RKCs shows how science-related populism can result from the negotiation of political, communicative, and organisational resources between political figures, influencers, and communities. We have also shown the complexity and the heterogeneity of actors, organisations, and movements involved in the circulation of refused or controversial knowledge. Under this point of view, the polarization against institutional science does not necessarily entail a homogenization of different RKCs, or the hybridization of their claims.

Therefore, to understand the grassroots resistance of the "people" against institutional science – and thus the potential starting points to weave a dialogue between the two – we need more in-depth analyses of this plurality of actors and of the ways in which they consumed, shared, and deploy populist discourses within their strategies of mobilization.

However, since most of the processes analysed in this work are still ongoing, future research is needed to investigate further developments of RKCs, especially with the end of the

pandemic crisis. Moreover, further research may unveil the presence and the role played by catalyst-like figures in other Western and non-Western countries.

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"We will multiply the fires of resistance"

The catalysts of dissent against institutional science and their interplay with refused knowledge communities

Supplemental material

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Table of contents

Introduction

The supplemental materials provided here give account of the key methodological choices we made in our empirical research, and further elaborate some of the main insights of the paper. In section 1, we discuss our digital ethnographical approach and describe more in details our ethnographic field. In section 2 we describe the ecosystem we referred to in our paper by showing some quantitative elaboration on the presence of CoDs on Youtube, and the limited presence of CoDs in traditional media.

1. Digital ethnography

From a methodological perspective, our main aim was to build a multi-sited (Marcus, 1995) and connective (Hine, 2004) virtual ethnographic field that mirrored the RKCs ecosystem. According to a criterion of typological variation, we initially looked for the main online spaces in which each community was involved within a vast array of social media platforms (such as Facebook, Instagram, Twitter), instant messaging services, websites, blogs, and YouTube channels. During the observation, the field was recursively updated and reassembled according to criteria of relevance emerging from the observation, i.e. by discarding less active interactive spaces (especially on platforms such as Instagram and Twitter) in favour of active spaces that were somehow connected (e.g. mentioned, or reposted) to the loci under observation. Following conversations, reposted contents, and public invitation links, we obtained a sample of 39 online spaces. Eventually, the ethnographic field included national and local Facebook pages and groups (22), YouTube channels (4), blogs and websites (6), Whatsapp and Telegram groups and channels (7) which we accessed via public links. Regarding ethical issues on accessing the field, as Zayed notes (2021, p.60), the practice of sharing the public link of a chat creates the expectation that anyone can join the conversation -including the researchers -: a perception that consolidates as members see others join without introducing themselves and leave with no explanation. This aligns with the British Psychological Society's statement that online observation should take place when and where users 'reasonably expect to be observed by strangers' (British Psychological Society 2009, p.13). We nevertheless specify that some of the instant messaging groups, although being of public access, were perceived as private by the participants. In some cases, when the members of these groups were notified of our first access to the chat, the administrators contacted us asking to introduce ourselves: once we identified with our name and qualified as researchers, we were accepted as members.

To avoid running any risk of the participants being recognized, we used the pseudonymization de-identification technique, which consists in replacing people's information into pseudonyms, while maintaining the possibility to analyse the data and to track the users in their activities among different publicly visible pages (Mancosu and Vegetti, 2020, p.5). The researchers used a shared template for the weekly formulation of the ethnographic notes, which allowed a constant comparison, for example, on media-related practices, on the actors involved, and on the widespread discourses circulating in the field. With regards to instant messaging services, data collection was occasionally operated through an in-built app feature that allows to export a whole chat history as text data. The coding of the empirical material was carried out during and after fieldwork following the principles of constructivist grounded theory (Charmaz, 2009) which relies on an iterative and reflexive process of data analysis. In the months before and after the Italian lockdown, we also attended offline events (4) that were organized or promoted within the online spaces. Beside one promotional event of a training school of the 5BL, the other offline events were mainly organized by larger association in the cities of Padua, Naples and Milan to protest against the "health

dictatorship". During these events several members of the selected communities, especially the Free-Vax and NO5g, spread their knowledge claims. Although not extensive, the data collected through ethnographic diaries were used to complement the research.

2. The configuration of an information ecosystem for RKCs

During our ethnographic observation, we detected a recurrent set of YouTube channels and content providers shared by RKCs across different platforms. Among them we considered 41 YouTube videos, selected according to the following criteria: i) most shared; ii) most seen; iii) science-related populism contents. Furthermore, in order to understand the relevance of CoDs within the Italian public debate, we combined a quantitative analysis of mainstream Italian newspapers with the analysis of YouTube channels. We explored YouTube channels through network analysis, using digital research tools such as YouTubeDataTools[1]. We selected the most reposted YouTube channels within RKCs: we considered them as starting points (seeds) for launching the crawl through YouTubeData Tools (Rieder 2015) and the Wayback Machine of Internet Archive (Rogers 2017)[2]. Therefore, we plotted the results of the scraping using Gephi[3], a freeware tool for network visualization. The results below indicate a specific configuration of such information ecosystem.

Outputs showed two distinct clusters of YouTube channels and four free-riders channels (Fig. 1). The two clusters are separated in terms of structured relationships: the first at the top left sees the Mazzucco channel at its centre; the second, much more important cluster, is hegemonized by Mauro Scardovelli and Byoblu. According to the Authority indicator, Byoblu is the most linked by relevant nodes of the same community. In assessing the presence of catalysts on Italian daily press, we queried their names on a media-monitoring platform (Giardullo and Lorenzet 2016; Crabu et al. 2021), checking the number of articles in which they are nominated at least once in the time span between 2016 and 2020 (5 years). The media-monitoring platform collects and indexes articles by 8 main Italian newspapers[4] on daily basis making them available for full-text researches. We took advantage of this to conduct queries on the number of articles published by those newspapers that contains at least once those names. For this exploration we considered articles as our unit of analysis and we compared the frequencies of articles that named at least once the full name of the catalyst.
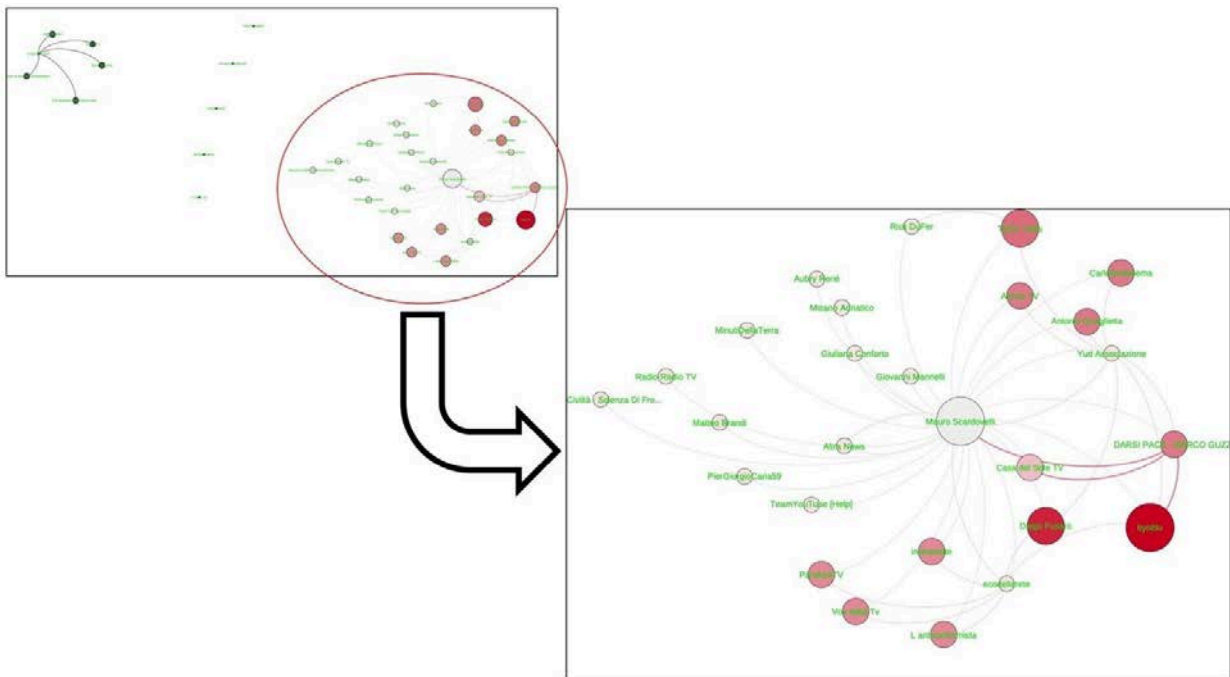
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[1] YouTubeDataTools is available at: https://tools.digitalmethods.net/netvizz/youtube/
[2] The Wayback Machine is Available at: https://web.archive.org
[3] Gephi is available at: https://gephi.org
[4] Corriere della Sera, La Stampa, La Repubblica, Il Sole 24 Ore, Il Messaggero, Il Mattino di Napoli, Avvenire, Il Giornale.

Fig. 1 - The ecosystem of scientific dissent on YouTube channels

The size of the nodes corresponds to In degree value (the number of connections each node receives from other ones). The colours show the Authority indicator as produced by the HITS (Hyperlink-Induced Topic Search, see Easley and Kleinberg, 2010) algorithm: black stands for a low value of the Authority indicator, white is an average value, and red is a high value. Source: our survey through YouTubeDataTools and graphic elaboration through Gephy.

Table 1 gives us two main indications: first and foremost, it certifies how Sara Cunial achieved her public visibility in 2020 during the pandemic crisis, since two out of three articles mentioning her had been published that year. Second, comparing Table 1 and Table 2, the role of media influencers appears to be reduced when catalysts are outside of their web ecosystem. Scardovelli and Fusaro, for example, increased their relevance on Youtube but are definitely marginal (the former) or did not become particularly visible during the pandemic (the latter) in mainstream media.

This confirms that the phenomenon of CoDs develops specifically on the web, featuring an online ecosystem that in turns has a limited permeability in the newspaper agenda. Taken as a whole, the two analyses combined allowed us to better ground our fieldwork, and to focus on the most relevant CoDs (Cunial and Messora mainly) for the analysis provided in the paper.

CoD's* YouTube Channel	2nd semester 2019	1st semester 2020	2nd semester 2020	% variation
Claudio Messora - ByoBlu	232.000	307.000	490.000	+211,21
Mauro Scardovelli - Unialeph	103.000	176.000	190.000	+184,47
Diego Fusaro	66.600	153.000	179.000	+268,77
Massimo Mazzucco - Luogocomune2	34.779	77.200	126.000	+362,29

Table 1 – Number of subscriptions to YouTube channels per semester.

 * Although Sara Cunial is present on many YouTube videos shared on the platform, she has not updated her personal channel since 2019.

Source: Queries on Internet Archive, Wayback Machine. The data points might not exactly correspond from one CoD to another, depending on the availability of screenshots on the Internet Archive.

CoD	2016	2017	2018	2019	2020
Sara Cunial	0	0	21	17	54
Diego Fusaro	3	12	20	17	25
Claudio Messora	1	2	4	4	6
Mauro Scardovelli	0	0	0	0	1
Massimo Mazzucco	0	0	0	1	0

Table 2 – Media presence of CoDs across Italian daily press from 2016 to 2020.

Source: Queries on Media Monitoring Platform

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