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Unpacking Linguistic Devices and Discursive Strategies in Online Social Movement Organizations: Evidence from Anti-Vaccine Online Communities

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Abstract. This study investigates linguistic devices and discursive strategies employed by online social movement organizations (SMOs) in attempts to deinstitutionalize long-standing, institutionalized behaviors. The research draws from an in-depth analysis of public discourse within anti-vaccine online communities in Italy and contributes to the social movement literature on framing and the theory of discursive institutionalization. It employs semi-automated text-analysis methods and interpretive analysis of textual data from seven anti-vaccine social media communities, before and subsequent to the 2017 regulatory intervention of the Italian government to increase vaccination rates. This intervention followed a phase of intense debate centered on the decrease in vaccination coverage and the spread of anti-vaccine ideas in social media as well as in the broader public discourse. The study analyzes the discursive strategies and linguistic devices of community leaders (moderators) and followers (members), and investigates shifts in micro-level online anti-vaccine discursive strategies that developed after the government regulation. The findings suggest that anti-vaccine online SMOs employ specific sets of linguistic devices, namely rhetorical fallacies, that support well-defined discursive strategies such as those aiming to delegitimize actors that endorse vaccines. Furthermore, the evidence shows that these linguistic devices and discursive strategies, after the government regulation, shift from an evidence-based stance towards values and emotions-based argumentations.

Keywords: social media; discourse analysis; discursive strategies; linguistic devices; anti-vaccine SMOs.

1. Introduction

Social movement organizations (SMO) increasingly employ social media as a platform for supporting their collective action and promoting social changes (Cardoso et al., 2019; Leong et al., 2020) as well as to oppose or support governmental and political decisions (Anduiza et al., 2014; George & Leidner, 2019). SMOs and digital activists can leverage social media to facilitate communication, coordination, and connectivity (Cardoso et al., 2019), to perform stronger forms of activism, such as diffusion of unauthorized information or hacking with political objectives (George & Leidner, 2019), but also to increase the perception of their movement's legitimacy (Cardoso et al., 2019) and to change or stabilize values of their supporters (Selander & Jarvenpaa, 2016).

A burgeoning literature has developed around social movements phenomena drawing from two main theoretical frameworks. The first one focuses on the social psychology perspective of social movements, while the second one is situated within resource mobilization theory (Morris & Herring, 1984). Recently, the scholarly debate on social movements has been rooted in the framing perspective (Benford & Snow, 2000; Carroll & Ratner, 1996; Snow et al., 1986). Built on Goffman (1986) conceptualization of frame, framing can be viewed as the individual "organization of experience" where "primary framework is one that is seen as rendering what would otherwise be a meaningless aspect of the scene into something that is meaningful" (pag. 21).

The framing perspective has been applied to online social movements in order to understand the emergence, diffusion, and convergence of collective frames to support mobilization of resources (Yetgin et al., 2012), and the emergence and structuring of the movement (Leong et al., 2020). In this sense, Leong et al. (2020) analyze how frames and action repertoires shift after a period of low intensity activity of the Global Bershis online movement. Similarly, Miranda et al. (2016) explore how different frames are employed by traditional and social media in the discourse surrounding the Stop Online Piracy Act (SOPA).

The "shared view" of issue or the "framing" ultimately emerges from the deployment of a discursive strategy—or the systematic strategy of language use—supported by purposefully employed linguistic devices (Kwon et al., 2014). Previous research has pointed out how online SMOs develop and successfully employ discursive strategies

to counterbalance the discursive power of traditional media sources (Hatakka, 2017), build resistance strategy against political censorship (Wu, 2018), or oppose the hegemonic discourse in repressive context (Gleiss, 2015). However, it is also noted that we know relatively little about the specific linguistic devices (Kwon et al., 2014) employed by online SMOs to build their discursive strategies. Second, most of the studies focus on the struggle between activists and political actors, but there is less clarity on the discursive strategies and linguistic devices employed by online SMOs to deinstitutionalize a long-standing "institutionalized behavior," or the "habitualized action which is accepted as typical by all members" (Cherlin, 1978, pag. 636). Third, only few studies (e.g., Hatakka, 2017) have moved away from a unitary understanding of online SMOs frames and discursive strategies and differentiated between the actions of SMOs leaders and followers. Lastly, the extant literature on SMOs framing processes in traditional media (such as television and newspaper) has suggested that external events can cause shifts in framing activities (e.g., Litrico & David, 2017). For example, it has been reported that the introduction of a new tax on Australian resource companies triggered counter-framing reactions from mining industry's actors (Murray and Nyberg, 2021), but there is a lack of studies addressing this issue in the online SMOs' context.

Thus, this study aims to contribute to the literature by specifically addressing two main research questions: *What linguistic devices and discursive strategies are employed by online SMOs leaders and followers to deinstitutionalize accepted social norms and institutionalized behaviors? How do these linguistic devices and discursive strategies change due to an external event aiming at hitting SMOs activities?* To do so, we first theoretically frame online SMOs in the "discursive model of institutionalization" (Phillips et al., 2004). This framework posits that the processes supporting institutionalization and deinstitutionalization of behaviors (Maguire & Hardy, 2009) are based on the actors' production of texts that shape the overall discourse. Drawing from this, social media can be considered as technologies that have "decentralized and democratized access to discursive power" (KhosraviNik, 2017, pag. 582), permitting all social media users to produce and distribute texts to a broad audience and, in doing so, potentially shaping the overall institutional discourse (Phillips et al., 2004). Lastly, social media provide "unprecedented opportunities to organize masses of people in democratic actions,"

and “foster new information and action repertoires that go beyond offline communities” (Young et al., 2019, pag. 1).

To address the formulated research questions, our study empirically investigates the online discursive activities in anti-vaccines social media communities before and after a government crackdown on vaccines regulation. Anti-vaccine social movements are a recurring, challenging presence in medical history (Blume, 2006). Since their first introduction, vaccines have faced various forms and degrees of opposition depending on the historical period and the disease they were targeting (Blume, 2006; Dubé et al., 2015). In Italy, the debate around the diffusion of anti-vaccine theories on social media grew rapidly in 2017 at both social and government levels (Bocci, 2017). In May 2017, the Italian government announced the introduction of a new law making twelve vaccines compulsory for all infants and establishing economic sanctions for parents in the case of non-compliance (Barone, 2017). This strong regulatory intervention was rooted in policymakers’ concerns emerging from a significant decrease in vaccination coverage amongst the Italian population (Pezzotti et al., 2018). It was also a reaction to the spread of anti-scientific ideas around disease prevention in social media (Mantovani & Santoni, 2018). The promulgation of the 2017 new law introducing a range of sanctions, including monetary, in the case of non-compliance can be conceptualized as an attempt of the Italian government to support the institutionalization of vaccine practices in Italian society and to challenge the deinstitutionalization of vaccine acceptance.

Employing semi-automated text-analysis methods and interpretive analysis of textual data, in particular posts and comments of seven public anti-vaccine communities on social media, we explore the linguistic devices (Kwon et al., 2014) and the discursive strategies (Carvalho, 2005) employed by SMOs leaders and followers prior to the announcement of the new law (pre-event), and how these have changed after it (post-event). The findings suggest that anti-vaccine online SMOs employ specific linguistic devices in their attempt to delegitimize the institutionalization of vaccine acceptance. Precisely, they use an identifiable set of linguistic devices, namely rhetorical fallacies (Walton, 2008), that support well-defined discursive strategies (Carvalho, 2005; Kwon et al., 2014) such as those aiming to delegitimize actors that endorse vaccines (i.e., pro-vaccine doctors). Furthermore,

the evidence shows that these linguistic devices and discursive strategies shift, due to the external event of law announcement, from an evidence-based stance towards values and emotions-based argumentations.

The rest of the paper has the following structure. First, Section 2 introduces the theoretical background; Section 3 frames the chosen empirical setting; Section 4 describes the methodological approach. Then, in Section 5, the results are presented, Section 6 addresses discussions and implications, and Section 7 draws conclusions in terms of contribution to theory and practice, limitations of the study and future research avenues.

2. Theoretical background

2.1. SMOs framing processes in the online context

SMOs have been traditionally investigated through two main theoretical lenses: the first one has mostly focused on what Morris and Herring (1984) labeled as social psychological factors such as ideology, strain, and deprivation, whilst the second one has concentrated primarily on structural factors such as resources mobilization and rational utilitarian logic. As we saw, theorizing around SMOs activities has in recent years relied on the framing perspective (Benford & Snow, 2000), where framing is conceptualized as "signifying work or meaning construction engaged in by movement adherents" (Snow, 2013, pag. 1).

Originally developed by Goffman (1986), the concepts of frame and framing have found several applications in the social movements literature as "meaning work—the struggle over the production of mobilizing and countermobilizing ideas and meanings" (Benford & Snow, 2000, pag. 613). Seminal studies on framing have already highlighted the conditions under which frames emerge (Gamson et al., 1982), align (Snow et al., 1986), change, and are retained (Marullo, 1996) by SMOs in non-online environments. Additionally, the literature on online SMOs has persuasively investigated how the peculiarities of social media, or other online channels, affect framing processes. For example, the framing perspective is employed to reveal how social media support frames convergence (Leong et al., 2020), whether varied support from different media (i.e., blogs, forums) produce

different outcomes (Pu & Scanlan, 2012), and how the analysis of frames allows to evaluate the level of conformity versus emancipation of social media for SMOs activities (Miranda et al., 2016).

Notwithstanding this increasing attention on the framing perspective in SMOs research, Benford and Snow have claimed that more research is needed to understand the discursive level of the framing process or frame articulation, which requires "access to and retrieval of the discourse that is part and parcel of the framing process" (2000, pag. 624). According to Snow (2013), more attention needs specifically to be devoted to systematically examine the discursive processes which have enabled the emergence, development and shift of frames.

2.2. Online SMOs and the discursive model of institutionalization

The study contextualizes digital activism and online SMOs within the theoretical "discursive model of institutionalization" proposed by Phillips, Lawrence, and Hardy (2004), which is based on the combination of *new institutionalism* as well as *discourse analysis*. The model of institutionalization posits that institutions are fundamentally constituted by texts production (Phillips et al., 2004), where texts are identified with "any kind of symbolic expression requiring a physical medium and permitting permanent storage" (Taylor & Van Every, 1993, pag. 109). Therefore, institutionalization—and deinstitutionalization (Maguire & Hardy, 2009)—is produced by discursive activities influencing actions instead of actions per se (Phillips et al., 2004). Actions per se do not have the necessary characteristics to be diffused and transmitted over time and across spaces by the actors involved in these actions; these functions are provided by texts – here produced online – which can leave traces and directly modify the overall discourse (Phillips et al., 2004).

In order to understand why digital activists and online SMOs matter in affecting an "institutionalized behavior," or the action perceived as "habitualized" by all its members (Cherlin, 1978), it is first necessary to contextualize the role of social media users' in influencing the processes of institutionalization and deinstitutionalization. Institutionalization can be viewed as the process through which "a reciprocal typification of habitualized action by types of actors" (Berger & Luckmann, 1966, pag. 54) occurs. This habitualized action is a set of behaviors expressed by actors to solve problems and worthy of being transmitted to other generations, a process that leads

to the taken-for-grantedness of those behaviors (Berger & Luckmann, 1966; Zilber, 2002). On the contrary, deinstitutionalization can be defined as "the process whereby previously institutionalized practices are abandoned" (Maguire & Hardy, 2009, pag. 150).

The discursive model of institutionalization claims that institutionalization processes, through which institutions and institutionalized practices and behaviors are produced and maintained (Phillips et al., 2004), and deinstitutionalization, through which they are disrupted (Maguire & Hardy, 2009), are both based on discourse. Discourse can be defined as "a system of statements that define an object" (Parker, 1992, pag. 5) and that offer the socially embedded and self-disciplining mechanisms that endorse institutions and structure individual behavior (Phillips et al., 2004). Institutionalization and deinstitutionalization are grounded in actors' discursive activities, or rather on actors engaging in "producing, distributing and consuming texts" (Maguire & Hardy, 2009, pag. 148). Those texts are the material form of the discourse that becomes accessible to others and influence the overall discourse about supporting (or disrupting) institutions (Phillips et al., 2004).

Nevertheless, the produced texts have to be purposefully structured with one or more specific aims, or rather they need one or more underpinning discursive strategies (Cillia et al., 1999; Vaara & Lyon, 2008). These latter are defined as "forms of (discursive) manipulation of 'reality' by social actors in order to achieve a certain goal" (Carvalho, 2005, pag. 3) or "a particular social, political, psychological, or linguistic outcome" (Kwon et al., 2014, pag. 269). This outcome can be reached by making different types of thinking and acting possible while rendering others impossible or costly (Phillips et al., 2004) through the production, dissemination, and consumption of texts. Furthermore, these strategies can be developed by employing different linguistics devices, in particular, rhetorical devices (Kwon et al., 2014; Wodak et al., 2011), as these have the potential to affect the formation of a shared view and structured common perspectives of strategic issues. Previous literature has meaningfully shown that discursive strategies, based on purposefully selected linguistic devices, can impact the discourse both at the micro (Kwon et al., 2014; Vaara & Lyon, 2008) and macro-level (Cillia et al., 1999). Through social media, different actors can produce and distribute texts to a vast audience, implementing their own discursive strategies, based on specific linguistic devices, in order to achieve "manipulation of 'reality'" (Carvalho, 2005, pag. 3).

3. The case study setting: anti-vaccine communities, actors, and discourses in Italy

To investigate our research questions, we first contextualized the chosen empirical setting of online anti-vaccine SMOs in the discursive model of institutionalization (Phillips et al., 2004). We defined the institutional actors involved in producing texts underlying the linguistic devices and discursive strategies focused on vaccines deinstitutionalization, and identified the external event that can cause a shift in the activities of these institutional actors. Since the introduction of the vaccine against smallpox at the end of the 18th century, every new vaccination campaign has generated some form of opposition based on fear and mistrust for the vaccine's potential side effects (Poland & Jacobson, 2010). This pattern has been confirmed by the events surrounding the COVID-19 pandemic. With the background of millions of deaths worldwide, the vaccination campaign has become the object of misinformation and fake news on social media that might have significantly decreased the vaccine intention of many individuals (Loomba et al., 2021).

In Italy, the first vaccine introduction dates to 1799 when doctor Luigi Sacco vaccinated five children (and himself) against smallpox. After these first successful experiments, the smallpox vaccine was made compulsory in 1888 and then abolished in 1981, when the infectious disease was completely eradicated. Several vaccines were subsequently made compulsory in the 20th century: the vaccine against diphtheria in 1939, polio in 1966, tetanus in 1968, and hepatitis in 1991. For a long period, vaccine acceptance was not an issue in Italy, and, as a consequence, vaccines coverage displayed a positive trend from 1900 to 2010 (Pezzotti et al., 2018). This was supported in particular by the fact that the Italian healthcare system had devised an effective vaccination plan at the national level, which was then applied entirely free-of-charge for target populations at the Regional level (Signorelli et al., 2017). Nevertheless, recent empirical studies have revealed a negative trend in terms of immunization coverage for several diseases since 2010 (Pezzotti et al., 2018; Signorelli et al., 2017), due to a range of factors such as anti-vaccine propaganda, lack of perception of the social value of vaccines, skepticism, and fake news on social media (Mantovani & Santoni, 2018). Owing to the spread of propaganda and mounting skepticism,

on May 19th, 2017, the Italian government promulgated a new law to make a total of twelve vaccines compulsory, including vaccines against meningitis, measles, mumps, rubella, and chickenpox. Our analysis focuses on the SMOs on social media participating to online production, distribution, and consumption of texts aiming at deinstitutionalize vaccines acceptance following the regulatory intervention.

4. Research Design and Methods

The methodology was developed following recommendations on how to employ social media data in Information Systems qualitative research (McKenna et al., 2017), namely: (1) we collected a large volume of texts from a social networking site (i.e., Facebook), (2) we analyzed them employing an unsupervised text mining tool (i.e., Leximancer) to extract the main concepts and relationships among them, (3) we performed an in-depth analysis of the resulting dataset, and (4) we subsequently developed a sound qualitative explanation to address our research questions.

4.1. Data collection and sources

The data collection was split into two periods: pre- and post-event, which is the announcement of the new law on compulsory vaccination made by the Italian government on May 19th, 2017. To better understand the dynamics and processes of discourse production, we focused on the linguistic devices and discursive strategies employed in anti-vaccine social media groups and pages, looking at changes in statuses and the creation of comments over the period investigated. After having analyzed several possible Web 2.0 (e.g., forum) and social media platforms (e.g., Facebook, Twitter, Instagram, and so forth), we decided to concentrate our analysis on one specific platform – Facebook – where most of the Italian anti-vaccine discourse took place on social media in 2017. The most influential public groups and pages in terms of the number of members (see Table 1) were identified after searching for vaccine-related keywords and only selecting groups (or pages) whose profile was completely public in terms of privacy settings regarding the information shared by members. All texts were publicly available documents at

the time of the data collection. The chosen communities accounted for nearly 90% of the total number of social media users active in anti-vaccine groups, corresponding to roughly 36,000 users. Cumulatively, we collected 1,968 statuses (408 created after the government announcement) and 18,345 comments (8,587 produced in the post-announcement period). In a subsequent stage of the data analysis, we also identified the different roles of pages and groups administrators, contents creators, or, more generally, the individuals performing the roles of community moderators (Young, 2013).

Table 1. Anti-vaccine online communities

Social Media Pages / Groups Name	**Number of Members**
Autismo e vaccini (*Autism and Vaccines* - page)	13,547
Vaccini basta (*Stop vaccines* - page)	11,911
Quanti sono in Italia i danneggiati dai vaccini, e nel mondo? (*How many people are damaged by vaccines in Italy and in the world?* - group)	6,718
Vaccini puliti. Rimozione dal commercio dei prodotti vaccinali contaminati (*Clean vaccines. Remove from the market contaminated vaccines* - group)	1,413
Vaccini informati per sopravvivere (*Well-informed vaccines for survival* - page)	1,397
Vaccini e malasanita', informati per tutelare meglio la tua famiglia (*Vaccines and health system mismanagement, seek information to protect your family* - group)	839
Vaccini: se sono sani...garanticeli!!! (*Vaccines: if they are safe… vouch for them* - group)	543

4.2. Data analysis

The understanding of the discursive strategies developed by different actors, needs "a systematic comparison of discourse at certain moments" (Carvalho, 2005, pag. 3) and shifts at "critical discourse moments" (p.6), when specific events challenge existing discursive positions over time (e.g. Cillia et al., 1999). Thus, our analysis at the level of texts, or talks, focuses on the linguistic devices and discursive strategies employed by anti-vaccine SMOs' on Facebook at different points in time and by different types of activists. Therefore, during the data collection and analysis we considered the diverse groups of social media activists in terms of their roles, interests, and efforts in producing texts on social media. As previous research suggests, at least two distinct groups of activists can be engaged in discursive strategies development: SMOs' leaders and followers. Applying these categories in the

context of anti-vaccine SMOs' groups and pages on Facebook, these are distinguished between community's moderators (leaders) and members (followers). Community moderators perform practices related to their role through a purposeful and continuous effort. Conversely, community members enact their agency through (usually occasional) pop-ups such as a comment or a "like" to a previous post. Given their higher interest and level of effort in producing a discourse to "achieve a certain goal" (Carvalho, 2005, pag. 3), i.e., to shape vaccines discourse, we analyzed separately the texts produced by these two types of social media actors in order to better compare and contrast the two distinct set of discursive strategies and linguistic devices.

The analytic schema is summarized in Figure 1, where the whole corpus of text is divided into four sub-samples: (1) texts produced by community moderators in the three months before the announcement, (2) texts produced by the same actors in the subsequent month, (3) texts produced by community members in the three months before the announcement, and (4) texts produced by these actors in the subsequent month.

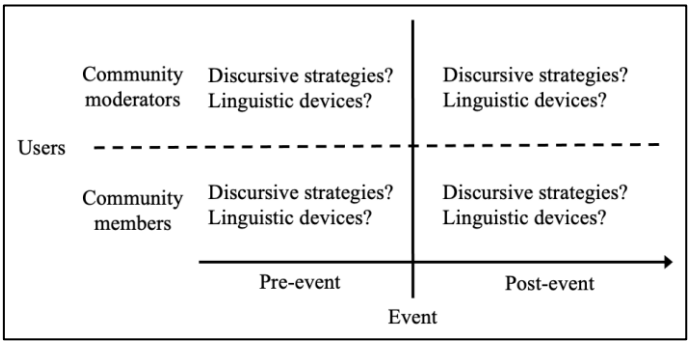

Figure 1. Analytic schema of pre- and post-event discursive strategies and linguistic devices

This choice of time intervals was motivated by the intention to analyze the relevant discursive productions in a relatively stable period before the event and in the most active period after the announcement. These four corpora of text are then separately uploaded and analyzed employing Leximancer. This automated coding tool applies a Bayesian machine learning algorithm to uncover main concepts (represented by the words in black in Figures 2 and 3 and written in bold italics in Section 5) and their respective relations (Wilden et al., 2016). In the first phase,

the system learns the attributes of linguistic entities through co-occurrence analysis; in the second phase, it delineates the relationships among entities and concepts in a reliable and reproducible way (Penn-Edwards, 2010; Smith & Humphreys, 2006). Once the concepts and their respective relationships are discovered, the machine learning algorithm proposes second-level themes (represented by the bubbles and words of the same color in Figures 2 and 3 and written in bold in Section 5). Each theme is a "semantic region" characterized by concept connectedness (Smith & Humphreys, 2006). In terms of settings, we employed all the standard choices proposed by the software in order to make more transparent the analytical process; specifically, we used: a stop-words exclusion list (Italian language standard), two sentences per block (standard choice), the break at the paragraph setting (standard choice), and displayed all concepts and themes (more details on standard settings can be found in the Leximancer User Guide (Leximancer Pty Ltd, 2017)). The Leximancer machine learning algorithm has been previously successfully tested for face validity, stability, and reproducibility (Smith, 2003; Smith & Humphreys, 2006; Yarowsky, 1995) with texts corpora between 7,538 instances (Yarowsky, 1995) and books of around 250,000 words (Smith & Humphreys, 2006). Our textual corpora are comparable in terms of words' number:

- Pre-event members' texts: 293,460 words
- Post-event members' texts: 232,441 words
- Pre-event community moderators' texts: 1,038,885 words
- Post-event community moderators' texts: 287,072 words

This analytical approach has been employed in several studies in the healthcare sector (Bell et al., 2015; Freeman et al., 2012), in the management field (Rooney et al., 2010; Wilden et al., 2016), in Information Systems (McKenna et al., 2017), and in discourse analysis (Bell et al., 2015; Purchase et al., 2016; Rooney, 2005; Rooney et al., 2010). Researchers in discourse analysis methodologies have supported the employment of Leximancer, or other automated coding tools, as valuable support for analyzing discourse structure (Angus et al., 2013; Hodge, 2012), given that it allows the researcher to analyze and read all the textual excerpts that produce the first-level concepts and to visualize how they are interconnected. Accordingly, Angus et al. (2013; p. 262) state that these tools "automatically generate textual relationships that are brought into focus for discussion through visual

representations". Consequently, the researchers will focus on making sense of the relationships generated instead of explaining them. This of course does not mean that the researcher should refrain from analyzing the text as to investigate the research problem. At the same time, the emergent concepts and themes are theoretically free from any author's subjectivities (Smith & Humphreys, 2006), as only in a subsequent phase the themes and underlying concepts are investigated in terms of their contents meaning via an in-depth reading.

The results of the Leximancer analysis are presented in Figure 2, with regard to the corpus of texts related to online community moderators' discourse, and Figure 3, in relation to online community members' comments. The two "focal points" in each figure (**PRE-EVENT** and **POST-EVENT**) represent the position, in terms of semantic distance, of the corpora of texts in the two-time phases with respect to all the different concepts and overall themes identified by Leximancer. To support the analysis and to ease the visualization of the empirical data, we also employed four further functionalities of Leximancer. First, the algorithm visualizes the importance of each theme in terms of frequency of words co-occurrence, creating a heat-map where the most important themes are colored with "hot" colors (red, orange, yellow…), and the less significant ones are colored with colder colors (green, blue, purple…). Second, the dimension of a theme (size of the bubble) visualizes the semantic region constituted by the concepts that underpin the higher-level theme. Third, Leximancer allows identifying and distinguishing the positions of different actors or points in time (i.e., pre-event and post-event announcement) in terms of semantic proximity to themes and concepts. Finally, the software enables to access and read the specific segments of texts that support a theme or a concept under analysis.

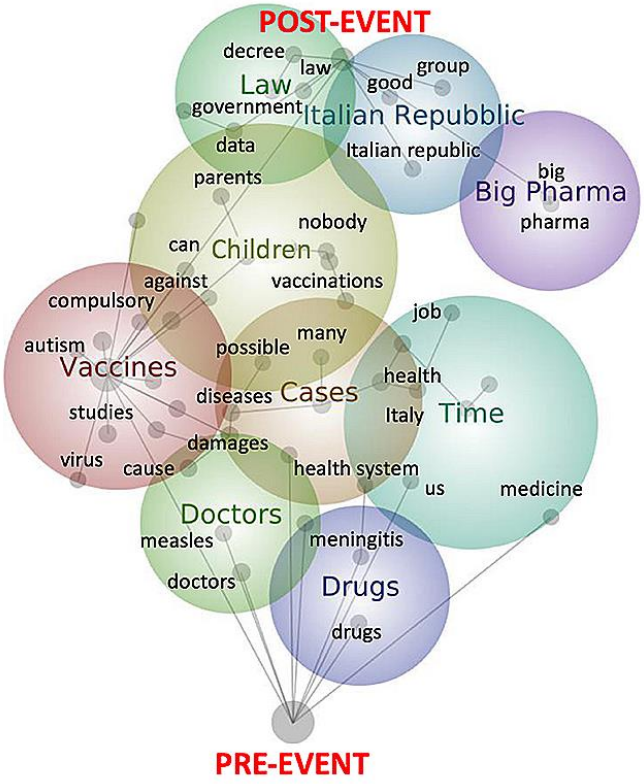

Figure 2. Online community moderators' map of concepts

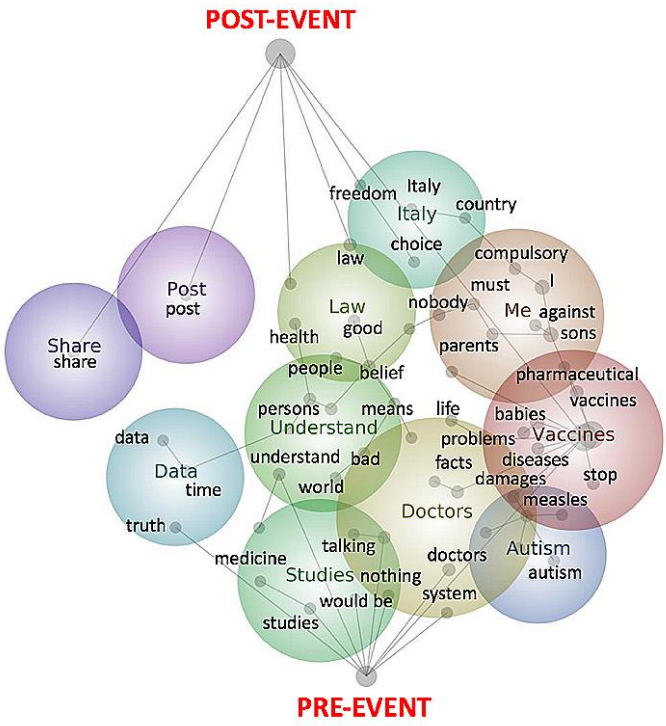

Figure 3. Online community members' map of concepts

The automated coding analysis generates concepts and highlights their relationships, identifies overall themes and maps the semantic position of actors. However, to uncover and explain the discursive strategies and linguistic devices employed by social media users and how they evolve after the government action, an in-depth analysis of texts excerpts and the development of a sound qualitative explanation are needed (e.g. Cillia et al., 1999; Kwon et al., 2014). The detection and analysis of linguistics devices and discursive strategies are usually performed by employing at the same time: (1) a theory-based approach that, starting from already existing categorizations of linguistic devices and discursive strategies, connects the empirical data to those already existing categories, and (2) an inductive-interpretative approach that allows the researcher to conceptualize emerging and novel discursive strategies directly from the texts (Carvalho, 2005; Cillia et al., 1999; Kwon et al., 2014). In this study, we have applied the same approach following two phases. In the first phase, we performed a theory-based analysis of the texts in order to identify the employment of previously conceptualized linguistic devices and discursive strategies;

for example, we identified an extensive use of rhetorical linguistic devices (Moore & Parker, 2009; Walton, 2008) and of well-known discursive strategies based on legitimation (Kim et al., 2016; Kwon et al., 2014) and delegitimization (Maguire & Hardy, 2009). In the second phase, we carried out an interpretative and inductive analysis of the texts to detect emergent linguist devices or discursive strategies not fully conceptualized in previous literature or specific to our empirical setting. In the following section, the linguistic devices and discursive strategies are presented in a narrative form; for a more general and synthetic overview, a table is provided in Appendix A.

5. Pre and post-event linguistic devices and discursive strategies in anti-vaccine online communities

5.1. Pre-event discursive production

In order to unpack the linguistic devices and discursive strategies employed in the pre-event phase, we first considered the commonalities, and then the differences, in the discursive activities of communities' moderators and members through an in-depth interpretative analysis of texts excerpts. In the pre-event semantic regions, constituted by the concepts and themes closer to the grey circle **PRE-EVENT** and linked to it by grey lines, there are two main overall themes that characterize both groups of actors' discourses. Both community moderators (in their statuses) and members of online communities (in their comments) refer to **Doctors** and **Vaccines**. This is, of course, expected given the nature of the selected online communities. However, it can be noticed that the two concepts are on the borders of the analyzed themes in both discourses: ***harm*** and ***cause***. Further exploring the texts' excerpts, we can observe that the central issue in both statuses and comments is that ***vaccines*** are believed to cause ***harm*** but an important part – seen, to an extent, as the root cause of this problem – is also played by ***doctors***: "*What is happening demonstrates that the medical establishment was sleeping…* [talking about the harmfulness of vaccines]" and "*A doctor should have as his only dictate the protection of the health of his patients* ... [being] *completely disconnected from economic and political interests*."

Nevertheless, the views on ***doctors*** in anti-vaccine communities are ambivalent, and, in some excerpts, support for doctors who manifest anti-vaccine opinions is expressed. For example, in relation to one anti-vaccine doctor, it is said that "*he has the courage to shout loudly that he is a doctor and not a puppet in the hands of powerful actors…*" or that society should demonstrate "*solidarity to a doctor that is coherent and competent* [against vaccines]." Conversely, criticism is directed towards doctors with pro-vaccine opinions, who are depicted as servants of ***pharmaceutical*** companies (see Figure 2) that encourage the diffusion of ***vaccines*** without concerns for the ***problems*** and ***harm*** they can cause. For example, it is said that "*doctors prefer to keep earning money inoculating people with useless vaccines instead of respecting the Hippocratic Oath*" and that "*the real composition of vaccines is known only at the very highest level of the system, but doctors close their eyes in relation to their riskiness*." Taking this view to an extreme, it is claimed that doctors are part of a ***sick*** system because "*all accept bribes and paid travels and attend fake congresses*."

As found in previous studies, one of the most employed types of discursive strategy leverages legitimation (Kim et al., 2016; Kwon et al., 2014) and delegitimization (Maguire & Hardy, 2009) processes. In this pre-event phase, both groups of users relied on delegitimization strategy of pro-vaccine actors (i.e., doctors). At the same time, some support to doctors emphasizing vaccines risk (anti-vaccine doctors in some sense) is present, but this support does not amount to a well-defined discursive strategy. On the contrary, the delegitimization of pro-vaccine doctors is strongly supported by the wide and recurrent employment of the *hasty generalization* rhetorical device (Walton, 2008). Both community moderators and members produce some logical arguments (economic interest beyond vaccine, presence of vaccine risks, relationships with pharmaceutical firms, and so forth) which are, then (hastily) used to conclude that pro-vaccine doctors are dishonest and they hide the real risks of vaccines for personal economic interests.

Further insights about linguistic devices and discursive strategies emerge from comparing the texts excerpts underpinning the concepts of community moderators and members. Starting from the members' sematic region, there are two main themes - **Data** and **Studies** - which relate to their discursive strategy (see Figure 3) of supporting anti-vaccine positions or, alternatively, discrediting pro-vaccine stances by relying on what is proposed as

evidence-based medicine: "*there are studies that prove that* [harmfulness of vaccines]" and "*I am not interested in fake studies you are proposing…* [talking about pro-vaccine studies]".

Similarly, **Data** supporting anti-vaccine positions are often associated with ***trust***, whereas other sources are dubitative and openly questioned on their trustworthiness: "*the official data such as in PubMed are always falsified or 'tamed*'." At the same time, it is highlighted that *"it is wrong to say that there is no data* [supporting the harmfulness of vaccines], *there is a lot of data if one wishes to search*." Moreover, some discrepancies can be seen in the texts about the **Studies** theme. As previously observed for ***doctors***, it can be noticed that ***studies*** supporting the views of anti-vaccine activists are considered as ***true***, while pro-vaccine studies are often associated with dubitative assertions. Therefore, the discourse framed by members in social media communities is focused on discovering scientific evidence of the potential side-effects of vaccines. This discursive strategy can be conceptualized as a fact-finding strategy based on the linguistic device of the *appeals to authority*, which relies on arguments against vaccines based on "the appeal to external or objective knowledge, which comes from scientific evidence" (Walton, 2008, pag. 210).

With reference to community moderators, the themes and concepts closer to the pre-event semantic region are framed according to a different discourse. First, these actors do not talk about **Data**, and ***studies*** are reframed as a small (less important) concept beyond the **Vaccines** theme. Employing in their texts the **Drugs** theme and other secondary concepts, community moderators formulate their pre-event discourse strategy as issues to discuss: "*also drugs, in general, are harmful and have negative consequences*" and they "*are often employed in a not correct way and when not necessary.*" We have also found several texts excerpts where an outbreak infection by bacterial ***meningitis*** in Italy is described as a social media bubble: "*The meningitis alarmism was only a media circus*," "*Italian relapse in it and believed in epidemics of meningitis and measles*" and "*in reality, the cases of meningitis compared to the last year are declined.*" By emphasizing the issue of excessive mediatic alarmism about meningitis in Italy, they introduced a *straw man* argument (Walton, 2008), in the sense that they help to increase a general skepticism towards medicine and doctors without needing to prove the risks and actual harmfulness of vaccines.

Another insight highlighting the strategy adopted in community moderators' discourse can be found in the **Cases** theme, where they often talk in an intentionally vague and superficial way about episodes of malpractice in the Italian ***health system***. This is another important and much-discussed issue in the Italian context, which is fundamentally unrelated to compulsory vaccination. Here, a *poisoning the well* linguistic device is employed (Walton, 2008), stating that malpractice is rife in the Italian healthcare system and so compulsory vaccination must have some dangerous connotations, essentially aiming to delegitimize the healthcare system with would appear as a plausible argument. As further evidence of differences in the respective discourse strategies, members seem to leverage a presumed scientifically proven correlation between vaccination and autism, whereas community moderators do not deem useful providing any sort of evidence of the side effects of vaccines. Thus, **Autism** represents a fairly common (hence important) theme in members' discourse (see Figure 2) but has a relatively minor role as a concept under the **Vaccines** theme in community moderators' discourse (see Figure 3).

Finally, another difference emerges from the text's excerpts underpinning the **Time** theme in the community moderators' discourse, where it is associated with two different arguments: one related to a general call for action ("*it is time to act*"), the other one related to ***medicine*** as a historical-rooted discipline. The interpretation of the latter suggests that vaccines are an issue linked with time because vaccines are not following established traditions in disease prevention, as "*in the past children were put in contact with other sick children to develop immunization…*". In linguistic terms, this is defined as *argumentum ad antiquitatem* (Risen & Gilovich, 2007) or *appeal to tradition*, where an established, long-standing practice is seen as legitimate because "*it has always been done that way*"; it is noted that the necessity, or not, to immunize with vaccines is naturally changing because, for example, "*poliomyelitis is disappearing on its own, as it has been the case for so many contagious diseases without vaccines*" It is also pointed out that a long ***time*** has gone by since ***medicine*** has provided evidence of the side effects of ***vaccines***: "*This study* [on the presence of possible contaminants in vaccines] *has been well known for a long time to public authorities but, with their silence, they are cooperating to a possible slaughter*."

To sum up the different linguistic devices and discursive strategies employed by the two groups of actors, we frame community moderators' pre-event discourse as made of two main discursive strategies: (1) a

delegitimization strategy of pro-vaccine doctors based on the *hasty generalization* rhetorical device, and (2) a red herring strategy, which employs linguistic devices that generates conclusions not related or irrelevant (Walton, 2008) for the main argumentation. In the latter, opposition to vaccines is associated with, first, criticism against the use of drugs and the exaggerated alarmism about the re-new spread of infectious diseases such as measles and meningitis (*straw man argument*); second, malpractice in the healthcare system (*poisoning the well*); and, lastly, the claim that long-standing medical practices are fundamentally (and intentionally) ignored in pro-vaccine discourse (*appeal to tradition*).

On the other hand, the pre-event discourse of community members partially follows the discourse of community moderators when they employ a delegitimization strategy of pro-vaccine doctors based on the *hasty generalization* rhetorical device. But, at the same time, they veer away by employing a fact-finding strategy, based on the *appeal to authority* rhetorical device, which, in their view, is supported by scientific knowledge built on concrete ***data***, medical ***studies*** or alleged side-effects (***autism***) of vaccination.

5.2. Post-event discursive production

As we did with the pre-event texts, in this section we present the results of the in-depth interpretative analysis of community moderators and members post-event discourse, first analyzing texts excerpts of the themes and concepts in common, and, subsequently, those in contrast.

Two main themes emerge in both discourses: **Italy** (in members' discourse) or **Italian Republic** (in moderators' discourse)**,** and **Law** (present in both). However, particularly interesting are the concepts underpinning those themes that were extracted by the algorithm. Community moderators frame **Italian Republic** and **Law** as closely related to the decision of the ***government*** to use its executive powers to impose a ***decree***. Furthermore, in the excerpts, the word ***group*** is related to a call for action to the collectivity to jointly oppose the new ***law***. Accordingly, people should "*act as a unified group demanding tests before and after vaccination*." "*Freedom* [to refuse vaccination] *and not an obligation*" are strongly advocated, and there is a vivid sentiment that a vigorous fight

against a law that is perceived as "*a liberticidal*" and "*anti-constitutional and dictatorial*" is needed: "*Their decree about vaccines is smelling of fascism*" and "*We have to act against this law altogether with legal recourses.*" At the same time, they associate the Italian government with **Big Pharma**. In the relevant excerpts, the regulatory intervention is framed as an act supported by **Big Pharma**: "*The Italian Constitution provides freedom of choice! Keep children far away from the dealings of Big Pharma!*". It is also claimed that the pharmaceutical industry enjoys a privileged communication channel with the Italian government: "*Big Pharma is knocking at the government door!*". This argumentation seems to follow the structure of the so-called *guilt by association* rhetorical device (Scriven, 1987), as the Health Ministry is criticized for working with the enemy or other interested parties (**Big Pharma**) which make money at the expense of people's health rather than being concerned with vaccination-associated risks.

On the other hand, the discourse framed by community members in relation to **Italy** is based on a different set of arguments. The main issue here appears to be of leveraging the individual ***freedom*** of ***choice*** in a ***country*** which has always been characterized by respect for individual choice: "*In a civil society there should be the freedom of choice of receiving or not vaccination!*", or "*Is Italy a country in which there is freedom of choice, isn't it?*". Some actors go as far as figuratively defining Italy as a dictatorship: "*I am against it* [compulsory vaccination]. *We are under a dictatorship, not in a democracy*". This can be conceptualized as a value-laden strategy that aims to leverage shared Italian democratic values in order to negatively frame the new law about vaccines. In this case, the relevant linguistic device is the *value appeal*, essentially an argumentation that achieves compliance by leveraging on "joint beliefs" and "important values" that "should guide what they [citizens] do" (Kellermann & Cole, 1994, pag. 12).

The other main theme characterizing the community moderators' discourse is **Children**. This is present in the anti-vaccine discourse pre and post-announcement of the new law, but it becomes more prominent in the post-event discourse. The main point focuses on the view that ***nobody*** can force ***parents*** to accept the vaccination of their ***children***, who have to be protected from the ***harm*** caused by ***vaccines***: "*They cannot oblige parents to choose a therapeutic treatment only for prevention without assuming any responsibility in case of adverse reaction*,"

"*everyone would be willing to pay to have their children left in peace unvaccinated and healthy" and "there is a persistent cover-up of the real harms of vaccines."* Here, the rhetorical device employed is *appeal to fear* (Walton, 2008), which leverages the fact that the potential of children being put in danger can generate negative emotions in parents.

Another interesting insight comes from the emergence of ***data*** under the **Law** theme. Specifically, community moderators produce texts where, on the one hand, ***data*** highlights the danger of ***vaccines*** and the need to oppose the new ***law***. On the other hand, the official ***data*** —in particular, if circulated by AIFA, the Italian Drugs Agency— are believed to be fake and manipulated: "*during the TV show he* [a doctor] *was asked about the falsity of the data presented by AIFA on adverse reactions to vaccines*." Additionally, it is claimed that parents need to be able to access more reliable databases "*that collect data and information about harm and deaths caused by vaccines*." Given the sequentiality of text production (pre and post-event), this point represents an insight of the adaptation of community moderators' discourse to community members' one. Indeed, in the pre-event discourse, the use of ***data*** to support anti-vaccine positions is part of the community members' discursive strategy, but in the post-event phase, this argument becomes part of the community moderators' discourse. Essentially, their discursive strategy seems to be based on embracing the arguments of whom they want to influence; we have labeled it as embracing strategy.

With reference to online community members, two distinct and emerging themes—**Share** and **Posts**—suggest a different and non-discursive strategy in order to have an impact on discourse. Both themes are related to the nature and functioning of social media. First, the **Share** theme has a 'technical' significance, as in online platforms, comments are frequently tagged and shared (typically multiple times) as they were originally posted. Leximancer algorithm, therefore, captures the words ***share*** considering them a content-relevant theme. Second, **Posts** is also a theme that is generated through repeated tagging and sharing. Community members have the tendency to refer to other members' ***post***, to call for making a ***post*** viral, to invite sharing a ***post***, to comment on somebody else ***post***, and so on. These two themes emerge with exponentially higher frequency in the post-event period, revealing a concerted effort to criticize and attack pro-vaccine legislation by sharing texts and citing other users' posts.

Essentially, it entails a call for action in the form of behavior capable of influencing the diffusion of texts on social media (see Figure 4). This latter cannot be conceptualized as a discursive strategy but more properly as a manifestation of *metavoicing* activities that include sharing, reposting, retweeting, and so forth (George & Leidner, 2019). Therefore, we noted it in Figure 4 in square brackets to point out that even if this evidence emerges from the analyses, it does not refer to a specific discursive strategy but to the intention to increase the diffusion effort of discursive activities.

To conceptualize the discursive strategies of community moderators and members, we first observe, as in the case of the pre-event phase, that online community moderators operate at a higher and broader level of discussion than members. They continue to employ a red herring strategy by discussing issues that are not logically linked with scientifically demonstrated risks from vaccination. First, they associate a well-known enemy in the anti-vaccine discourse, namely pharmaceutical **Big-Pharma** companies, and their profit-driven behavior, to the Italian government (*guilt by association*). Furthermore, they leverage anti-vaccine views by referring to **Children** protection against **Vaccines**, a traditional approach in the anti-vaccine discourse that plays into the emotional bonding of parents with their children (*appeal to fear*). Finally, to call for action against the new **Law**, community moderators adopt the concept ***data***, which, as we saw, was one of the most popular concepts in community members' discourse strategy in the pre-event phase. This suggests that community moderators employ an embracing strategy, adopting arguments from community members' discourse.

In the post-event phase, the discursive strategy of community members relaxes its somehow narrow focus and becomes less pragmatic. The evidence-driven arguments about the risks from vaccination are progressively abandoned, with a shift toward a value-laden strategy emphasizing values and beliefs embedded within Italian society, such as individual freedom of choice (*value appeal*). Finally, it would seem that in the post-event phase, community members have stepped up their opposition against the regulatory intervention by increasing their presence and activity (sharing) in social media (*metavoicing* activities).

6. Discussion

This study has investigated the linguistic devices and discursive strategies employed by online SMOs to deinstitutionalize an institutionalized behavior (i.e., vaccine acceptance) as summarized in Figure 4. First, it has shown that different sets of linguistic devices and discursive strategies are employed by online SMOs leaders (community moderators) and followers (members). Second, it has provided evidence on how these linguistic devices and discursive strategies change due to an external event aiming at hitting online SMOs' deinstitutionalization efforts, namely, the introduction of a new law in Italy making twelve vaccines compulsory and supported by economic sanctions for non-compliance.

We have conceptualized online SMOs' members in the discursive model of institutionalization (Phillips et al., 2004). This model allows us to conceptualize online SMOs' activists as actors carrying out deinstitutionalization processes through production, dissemination, and consumption of texts. Social media have additionally been theorized in the model, considering them as technological means that enhance texts production and diffusion. Social media have provided users with an unprecedented "discursive power" (KhosraviNik, 2017) and "new information and action repertoires that go beyond offline communities" (Young et al., 2019, pag. 1).

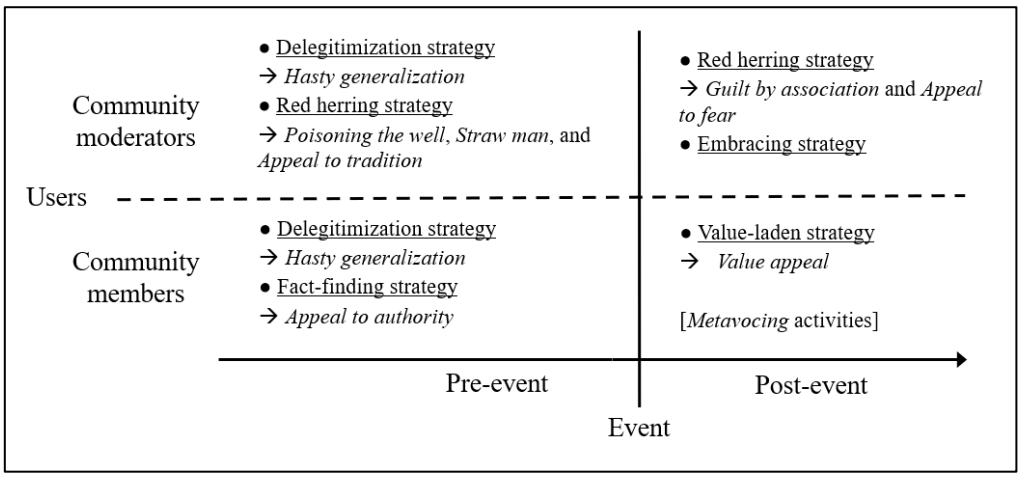

Figure 4. Pre- and post-event linguistic devices and discursive strategies

With reference to the first research question focusing on linguistic devices and discursive strategies employed by leaders and followers in online SMOs, our findings suggest that online SMOs different actors employed two well-defined sets of discursive strategies underpinned by specific linguistic devices, essentially what rhetorical studies label as argumentation or rhetorical fallacies (Walton, 2008). Although theoretically categorized as "fallacies," they seem to function effectively to obtain the desired effect in terms of deinstitutionalization. Previous epidemiological studies suggest that the Italian anti-vaccine SMOs have been successful in their actions considering that after 2010 there has been a significant increase of misinformation about vaccines in Italian social media platforms (Aquino et al., 2017), and vaccines coverage rates showed an increasing trend until 2010, followed by a progressive decrease (Pezzotti et al., 2018). For many commentators, the anti-vaccine online SMOs in Italy have significantly increased vaccine hesitancy, potentially creating serious issues for public health. To an extent, the findings can be of interest for online SMOs researchers and scholars given that they show a successful pattern of linguistic devices and discursive strategies that can be employed in other deinstitutionalization processes that have positive connotations for the collective welfare (e.g., deinstitutionalize social unfair behaviors).

Furthermore, our study contributes to the extant literature by unpacking the linguistic devices employed to deinstitutionalize a taken-for-granted behavior or practice. The findings reveal that a specific set of rhetorical fallacies is successfully employed by anti-vaccine Italian online SMOs—both for moderators and members—that based their delegitimization strategy on the ***hasty generalization*** rhetorical device.

Another contribution centers on the identification of two discursive strategies differently applied by online anti-vaccine online SMOs members and moderators, namely the fact-finding strategy and red herring strategy. The first strategy is used by members of online anti-vaccine SMOs to build their narrative against the institutionalized behavior (i.e., vaccine acceptance) through a search and display of data and evidence that should demonstrate the risks and the damages related to that behavior. It is reasonable to assume that they actuated this strategy by employing the ***appeal to authorities***, frequently referring to unspecified medical experts who have previously warned against vaccines' damages and risks. Conversely, online SMOs moderators have employed what can be

labeled as red herring strategy, which is based on rhetorical devices devoid of logical arguments to support the overarching narrative. The three rhetorical devices employed—*poisoning the well*, *straw man*, and *appeal to tradition*—rely on argumentations that are not logically related to the targeted institutionalized behavior.

With regard to the second research question, we have conceptualized and mapped the evolution of linguistic devices and discursive strategies in the pre-event phase and compared and contrasted them with the post-event ones (see Figure 4). In the pre-event phase, both community moderators and members shared the same delegitimization strategy, but with regard to their attitudes towards vaccines, they employed different discursive strategies and linguistic devices to build their narratives. Community moderators can be associated with a red herring strategy, unrelated to any type of evidence, fact, or data demonstrating vaccines harmfulness. Conversely, community members have built their narrative on a search and display of data and evidence via a fact-findings strategy. This evidence suggests that in the online communities under investigation, the discourse partially converges to a common understanding of the phenomenon among actors, and it is more pluralistic than suggested by the previous literature on online communities (Kane et al., 2014).

In the post-event phase, community moderators persisted in their red herring strategy, but they changed the underpinning linguistic devices toward more emotionally oriented texts (*appeal to fear*) or, more generally, toward devices that leverage on evocative arguments, such as *guilt by association* with regard to the relationship of Big Pharma with the Italian government. Community members also changed their discursive strategy and abandoned their pre-event fact-finding strategy for a value-laden strategy (see Figure 4). Furthermore, the discourse of community moderators seems to align with the members' pre-event discursive strategy by incorporating some aspects of their fact-finding strategy (i.e., ***data*** concept). Thus, the post-event phase is partially aligned with previous evidence from the extant literature on online communities, but, at the same time, it highlights some differences. The shift of community managers toward a more emotionally charged narrative is in line with previous research on online social movements suggesting that emotions can be employed by community moderators to create emotional contagion and strengthen community continuance (Young et al., 2013). Also, their decision to

embrace some aspects of the community members' pre-event fact-finding strategy can be understood within the existing literature.

Disruptive events (such as the new law announcement) are moments where online communities perceive the need to shift their production focus and altering the knowledge change-retain tension (Kane et al., 2014). In such situation, community moderators can decide to abandon the previously deployed strategies and leverage the variety of frames and voices generated inside the online community (Miranda et al., 2016). Accordingly, they will choose the most impactful frame and deploy it to shift their discursive strategies. The concomitant change of community members' strategies and devices can be justified by the mentioned disruptive event (Kane et al., 2014), but the focus on a value-laden strategy, which is consistently different from community managers post-event strategies, signals a departure from evidence reported in the extant literature. Young, Wigdor, and Kane (2020) found that core and peripheral activists in online communities struggle in a tug-of-war to control the focus of the online community which leads to a compromise. Our empirical findings suggest that both in the pre and post-event phase, community managers and members consistently maintain different focuses and rely on different linguistic devices and discursive strategies.

7. Conclusions

7.1. Contributions to theory

Our findings highlight some important implications for both online SMOs actors and researchers. On the one hand, the study identifies a set of relatively successful linguistic devices and discursive strategies employed to deinstitutionalize a longtime accepted and taken-for-granted behavior. The understanding of what are the devices and strategies that effectively lead to the deinstitutionalization of a behavior, or a practice, can be particularly relevant if they can be successfully repurposed to deinstitutionalize socially armful behaviors or practices.

On the other hand, the present study contributes to academic research on online SMOs in three ways. First, it focuses on a micro level of analysis that is seldom applied in the online SMOs literature. Several studies have

analyzed online SMOs' frames, but little research has concentrated on the level of linguistic devices. This study is built on a theoretical framework assuming theoretical links between linguistic devices, discursive strategies, and institutionalization/deinstitutionalization processes, previously not applied to online SMOs. Second, we propose a methodological approach that can be effectively employed to analyze other online SMOs and institutionalized behaviors. Online texts have a relatively long shelf life, and so it is possible to identify the role of different authors within SMOs, the timing of the texts, and to collect large amount of data produced by an online SMO. This approach is in line with the call to make use of big repertoires of social media data to better understand online SMOs (George & Leidner, 2019). Third, the findings suggest that online SMOs discourse can be less convergent when the texts produced by the different actors inside SMOs, namely leaders and followers, are separately analyzed. Future research should take into consideration this insight and disentangle the different narratives developed within an online SMO in the analysis of linguistic devices, discursive strategies, and frames.

7.2. Implications for policy and practice

The discourse of anti-vaccines online SMOs has become even more critical for public health purposes during the COVID-19 vaccination campaign. Social media can play a central role in questioning the effectiveness and safety of vaccines by sharing misinformation amongst online media users (Islam et al., 2020; Puri et al., 2020). Indeed, extant research suggests that exposure to social media misinformation about vaccines is significantly correlated to higher vaccine hesitancy and a lower vaccine intention (Bertin et al., 2020; Chan et al., 2020; Puri et al., 2020). Moreover, in the Italian context epidemiological research has revealed that misinformation spread by anti-vaccines online SMOs has markedly increased in the last years (Aquino et al., 2017) and it has had an impact on vaccines perception and hesitancy (Pezzotti et al., 2018). Therefore, our study provides useful information to policy makers and practitioners in understanding how online anti-vaccine SMOs build their discursive strategies and which linguistic devices they employ. This understanding could help them develop counter-discursive moves aiming at defeating anti-vaccine strategies and increasing vaccines acceptance, in particular accounting for the different ways online anti-vaccines SMOs' leaders and followers frame their opposition to vaccines.

7.3. Limitations and future research

Given that the present study is a first attempt to analyze a specific empirical event of regulative action with a micro-level approach to discursive strategies and employs a relatively novel analytical approach, it is also potentially affected by some limitations. First, this study uses an automated text analytics tool based on an unsupervised algorithm for discourse analysis. This could limit the depth of the analysis given that the extraction of concepts, and the related texts excerpts, is based on the words co-occurrence algorithm, which could have caused an underestimation of some texts inside the corpora. Conversely, this approach has the benefit of obtaining a non-subjective coding of the concepts and themes employed in the discourse, the semantic distances between actors and concepts, the representation of the themes' semantic regions, and their respective levels of importance in the overall textual corpus. Furthermore, the employment of Leximancer, or other automated coding tools, allows to automatically generate textual relationships and bring them into focus for discussion through visual representations, without preventing researchers from analyzing and reading all the textual excerpts that undergird the overall discourse.

Second, we limited our study to the specific context of anti-vaccine communities on social media but, in future research, it would be fruitful to widen the data collection and subsequent analysis by taking into consideration other types of actors and media platforms. Other examples of online SMOs acting to undermine an institutionalized behavior or practice can be analyzed to verify whether the set of linguistic device and discursive strategies identified in this paper is effective in other empirical settings. Lastly, the selected social media groups and pages do not represent the whole discursive production, given that some private groups with anti-vaccines focus exist but cannot be investigated due to restrictions set by the social media platform (Facebook). Further research should address these limitations considering wider set of actors involved in deinstitutionalization activities, for example keeping both the online SMOs activities but also discourse production inside more traditional media such as newspapers and TV channels.

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APPENDIX A

TIME	ACTOR	QUOTATION	LINGUISTIC DEVICES	DISCURSIVE STRATEGIES
Pre-event	Community members	"*What is happening demonstrates that the medical establishment was sleeping…* [talking about the harmfulness of vaccines]" "[commenting about an anti-vaccine doctor] *solidarity to a doctor that is coherent and competent* [against vaccines]."	*Hasty generalization*	Delegitimization strategy
	Community moderators	*"A doctor should have as his only dictate the protection of the health of his patients...* [being] *completely disconnected from economic and political interests."* *"*[writing about an anti-vaccine doctor] *he has the courage to shout loudly that he is a doctor and not a puppet in the hands of powerful actors…"*	*Hasty generalization*	Delegitimization strategy
	Community members	"[…] *there are studies that prove that* [harmfulness of vaccines]" *"*[…] *it is wrong to say that there is no data* [supporting the harmfulness of vaccines], *there is a lot of data if one wishes to search*." *"There are dozens of doctors, true luminaires, that have warned about vaccines' harmfulness but no one seems to listen them…"*	*Appeal to authority*	Fact-finding strategy
	Community moderators	*"This is how Italy works* […] *in Italy we have thousands of cases of medical malpractices…"*	*Poisoning the well*	Red herring strategy
		"*The meningitis alarmism was only a media circus*" "*Italian relapse in it and believed in epidemics of meningitis and measles*" "[…] *in reality, the cases of meningitis compared to the last year are declined.*"	*Straw man*	
		"[…] *in the past children were put in contact with other sick children to develop immunization…*" "[…] *poliomyelitis is disappearing on its own, as it has been the case for so many contagious diseases without vaccines*"	*Appeal to tradition*	
Post-event	Community members	*"In a civil society there should be the freedom of choice of receiving or not vaccination!"* *"Is Italy a country in which there is freedom of choice, isn't it?"* *"I am against it* [compulsory vaccination]. *We are under a dictatorship, not in a democracy".*	*Value appeal*	Value-laden strategy
	Community moderators	*"*[…] *we are plenty of data showing that vaccines damages people!"*	*N.D.*	Embracing strategy
		"The Italian Constitution provides freedom of choice! Keep children far away from the dealings of Big Pharma!" *"Big Pharma is knocking at the government door!"*	*Guilt by association*	Red herring strategy
		"They cannot oblige parents to choose a therapeutic treatment only for prevention without assuming any responsibility in case of adverse reaction" *"*[…] *everyone would be willing to pay to have their children left in peace unvaccinated and healthy"* *"*[…] *there is a persistent cover-up of the real harms of vaccines."*	*Appeal to fear*	