



Communication Technologies and Aid Practices: Superbergamo, Group Chats, and the COVID-19 Pandemic

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This article examines “Superbergamo”, a collective which emerged in response to the needs of vulnerable citizens during the first wave of the COVID-19 pandemic in Bergamo (Italy). The analysis reveals the central role of social media and group chat systems in facilitating the spontaneous creation of the group, and the subsequent development of coordinated voluntary emergency activities that brought aid to thousands of local people. Inspired by Actor-Network theory, the analysis traces of the group’s emergence, showing how human and non-human actors—including social media and group chat apps—played a crucial role in shaping the aid practice. In so doing, we contribute to the literature on emergency responses from the public and social media. More significantly, we show how the critical contribution of technology to the development and sustenance of aid practices can be mapped, by providing evidence of how groups, practices and sociomaterial networks are necessarily entangled.

Keywords: Actor-Network Theory (ANT), social media, group chats, WhatsApp®, COVID-19, aid practices, groups

INTRODUCTION

The COVID-19 pandemic disrupted ordinary life, creating an uncanny sense of social isolation. The closure of borders and accompanying lockdowns, saw several welfare agencies (private and public) downscaling their social and health support services in order to limit the spread of the virus. In response, scholars have noted how members of the public self-organized to offer relief to the most vulnerable members of the community (Andersen et al., 2020; Koos and Bertogg, 2020; Woodman, 2020; Carlsen et al., 2021). According to Fernandes-Jesus et al. (2021), mutual aid groups constituted an indispensable element of the public response to the pandemic, offering many forms of support, in particular grocery shopping. Similarly, Mao et al. (2021) noted how local communities were able to mobilize and organize into multiple and diverse forms of community action and support. Moreover, some existing groups changed their focus to support their local neighborhoods, with many people becoming active in *inter alia*: providing information about COVID-19; helping with shopping, packing and delivering food; fundraising and making donations; collecting prescriptions; dog walking, and offering emotional support through telephone helplines (Mao et al., 2021).

Social media played a crucial role in the self-organizing nature of social movements (Swann and Ghelfi, 2019), work (McGregor et al., 2019), and public responses to the crisis (Starbird and Palen, 2010, 2011; Cheng et al., 2020). Moreover, social media constituted a useful technology to mobilize people in times

of emergency and crisis (Carlsen et al., 2021), and this applied for both pre-existing organizations, and new aid groups that emerged during the pandemic.

Despite the evidence showing the relevance of social media for crisis intervention (Palen and Hughes, 2018), scholarly consideration of the role played by social media in self-organized support services during the COVID-19 pandemic, has been conspicuous by its absence. We fill this gap by analyzing the case of Superbergamo, a self-organized group that had hitherto coalesced around a pre-existing cultural association. During the very first peak of the pandemic this group performed extensive aid activities in Bergamo; the city hit hardest by the first wave of COVID-19.

We contribute to the scholarship on public self-organization under crisis conditions, and the use of social media in generating mutual help within communities, in particular, the role of WhatsApp (both the client itself as well as the nature and form of chats) in spontaneous aid¹ activities during the pandemic. While showing how social media and group chats enabled, supported, and permitted aid activities across the city (and its province), we also suggest ways in which mutually entanglement of groups, technologies, and aid practices are best understood. We aim to contribute to this research topic with an analysis that shows how the intricacy of human and non-human relationships can be traced in the emergence and development of a new (sociomaterial) practice of aid, in ways that eschew positivist epistemologies.

The article gives a rich description of the spontaneous appearance of “superbergamo”, highlighting how the group itself, and the aid practice that emerged, was shaped by encounters within and between human and non-human actors. Following practice theory (Reckwitz, 2007; Nicolini and Monteiro, 2017), we consider practice to always be a sociomaterial phenomenon and the group as the social entity behind a practice. Thus, our analysis—Inspired by Actor-Network Theory—stresses the network of human and non-human actors that gave rise to the new aid practices, where the practice of aid and the group itself is conceptualized as a result of the network of relations between several human and non-human actors. Consequently, we are less attentive to the elements of Superbergamo as a pre-existing group and instead focus on the use of social media and group chats by following the actors and mapping the connections that gave rise to the extraordinary manifestation of aid practices that took place in Bergamo in 2020.

Contributing to debates surrounding the nature of crisis and social media, as well as the scholarship concerned to articulate the study of groups underscored by a non-positivistic epistemology, the article is organized as follows. First, we briefly consider the use of social media environments, communication technology and group chat apps in the context of a crisis. Secondly, we develop an approach that enables the study of technology in practice by utilizing elements of Actor-Network Theory for the rich analysis/description of the entanglements that enabled the

aid practice. Thirdly, the case is explored through the empirical research and the qualitative methods used. Fourthly, we illustrate and discuss excerpts coming from Facebook and the original WhatsApp chats used by the group, to show Superbergamo as an emergent group, the actual practice of aid, and how the group’s coordination and impact on the population emerge from the sociomaterial entanglements. We conclude with the argument that analyses of the role played by social media in supporting and shaping aid practices, makes a meaningful contribution to the literature about crisis responses. Moreover, the article highlights the importance of enriching the extant scholarship about groups by emphasizing the emergence of social entities behind spontaneous sociomaterial practices.

SOCIAL MEDIA USES DURING THE CRISIS

Researchers of crisis informatics (see Palen and Hughes, 2018 for an overview) explore the nature of social phenomena in mass emergencies mediated by communication technology and social media environments (Schneider and Foot, 2004; Foot et al., 2005; Shklovski et al., 2008). As Palen and Hughes (2018) argue, risk informatics was initially characterized by placing attention on social media and other web applications that shared information on crises. For example, Torrey et al. (2007) noted that several citizens used online means to coordinate disaster relief, such as clothes, toys, and other items. Other authors have highlighted cases where citizens have used social media to help find missing persons and locate housing for crisis victims (Palen and Liu, 2007; Macias et al., 2009). These early studies demonstrated that through social media, citizens could obtain information, offer help relating to the crisis (Palen and Liu, 2007) and participate in the management of disasters remotely, far from physical emergency sites (Hughes et al., 2008; Heverin and Zach, 2010; Vieweg et al., 2010; Qu et al., 2011).

More recently, in the wake of Hurricane Katrina, attention has been paid to the potential of peer-to-peer communication in response to crisis events (Palen and Hughes, 2018). The focus has thus been on the use of social media to share information, assess the impact of an event and find out who was affected by it (Vieweg et al., 2008; Palen et al., 2009). Social media can also work as a “backchannel” allowing members of the public to obtain, provide, and seek informal information that it adds to the formal emergency response channels (Sutton et al., 2008). For example, Vieweg et al., show how microblogging—including Twitter—can improve situational awareness during emergency events (Vieweg et al., 2010). According to the authors, “situational update” information that people communicate through microblogging in mass emergency situations is one source that contributes to situational awareness, defined as an understanding “the big picture” during critical situations. Despite the great emphasis on the public’s provision of information during crisis, research on social media and disaster is not limited to this area of research.

As Palen and Hughes (2018) highlight, social media, chat apps and other communication tools, are also used to support populations affected by crisis events. For example, Twitter collected and donated funds to those affected by the earthquake

¹We refer to spontaneous form of aid practices as self-organized aid, mutual aid, aid from the public, aid from the community, public response to crisis and similar terms used by different branches of the literature.

in Haiti (Starbird and Palen, 2011). Similarly, Debnath et al., point out how textual intra-group conversations within disaster management organizations can be considered as underutilized information (Debnath et al., 2016). In particular, they argue that WhatsApp groups and chats ought to be considered more reliable places to understand the post-disaster work of volunteer organizations, compared to applications such as Facebook and Twitter, whose material is significantly affected by non-relevance and inaccuracy. According to them, group chats as WhatsApp can provide a detailed overview of a disaster situation, relevant movement patterns, as well as keeping accurate data on requirements and problems.

The term digital volunteerism is also used related to citizens' effort to develop applications or provide services to meet humanitarian needs. Liu and Palen (2010), Shanley et al. (2013) all refer to a pre-existing community, OpenStreetMap (OSM), that volunteered to create a map for Haiti's capital city that contributed to the humanitarian action after the earthquake in 2010. Defined in this way, digital volunteerism is related to the spontaneous citizens' effort that develops applications or provides services to meet humanitarian needs (Palen and Hughes, 2018).

STUDYING TECHNOLOGY IN PRACTICE

In a comprehensive sense, social media are tools that can be utilized in multiple public practices during a crisis. However, the contribution of social media in the definition of new practices during their emergence is somewhat less clear. A deeper analysis of the role social media plays in emerging practices in the context of a crisis, requires accounting for human and non-human elements of aid practices. A post-humanist approach to practice can be particularly helpful in taking account of non-human elements that participate in practice (Gherardi, 2019; Parolin, 2021). This approach can be defined as “post-humanist” because it tries to decentre the human subject (Cetina, 1997) and focus on relationships. As Gherardi maintains:

While theories of action assume a linear model of explanation that privilege the intentionality of actors, from which derives meaningful action, theories of praxis assume an ecological model in which agency is distributed among humans and non-humans and in which the relationality between the social world and materiality reconfigure agency as a capacity realized through the associations of humans and materiality (Gherardi, 2010, p. 504).

Within management and organization studies, practice theory² is represented in some of the most pertinent traditions that articulate situated analyses of collective work practices (see Nicolini, 2012 for an overview). This approach encompasses a range of models that have been concerned to show how knowing in practice (Gherardi and Nicolini, 2000; Gherardi, 2008,

2019; Nicolini, 2012; Nicolini and Monteiro, 2017) generates knowledge within situated work practices, *inter alia*: social learning approaches that promote the concept of a community of practice (Lave, 1988; Lave and Wenger, 1991; Gherardi et al., 1998; Wenger, 1998); ethnomethodological studies of work (Garfinkel, 1967; Lynch, 1993), workplace studies (Engeström and Middleton, 1996; Heath and Luff, 2000; Luff et al., 2000), situated cognition (Hutchins, 1995, 2020); as well as technology as social practice and variant streams of research that have promoted a deeper consideration of sociomateriality in work and organization (see Orlikowski, 2007).

These scholars consider technologies (and technologies of communication) as elements in situated ecologies, which means they are shaped by the repertoires and situated modes of action within a community of users. For example, the concept of technology-in-practice (Orlikowski, 2000) indicates an interest in considering how its users have learned the interaction between humans and non-humans, giving rise to a specific practice. In this respect, Orlikowski (2007) considers technology not only as the means by which participants share the same perception of environmental indicators, but also as a constitutive element of the practice. Indeed, every social practice—including work practices and help practices during crisis—is made by a network of human and non-human actors.

A focus on practice emphasizes a relational ontology based on interdependencies between human and non-human, subject and object, person and material world, networks and society (Orlikowski, 2007). These elements, including technologies, are not considered as possessing essential characteristics as their properties can only be developed in relation to other subjects, social groups, or networks (Østerlund and Carlile, 2005; Mattozzi and Parolin, 2021). This approach rejects the ontology of separateness that regards technology and humans as essentially differentiated and separate realities, embodying instead a relational ontology (Barad, 2003; Law, 2004). Such an approach privileges neither humans nor technologies; rather, it focuses instead on the constitutive entanglements enacted in situated practices (Suchman, 1987; Cetina, 1997; Barad, 2003; Latour, 2005; Pickering, 2010).

Orlikowski's approach resonates with the theoretical and methodological tools offered by Actor-Network Theory to analyze³ how human and non-human actors participate in collective action—or using a practice vocabulary—a sociomaterial practice. In Actor-Network Theory, human and non-human actors both play a role in the course of action, each having the potential to modify a state of affairs by making a difference to the practice. Human and non-human participants share distributed, variegated, multiple, and dislocated agencies, which Suchman (1987), Lave (1988), and Hutchins (1995) explain in critical interrogations of “situated” and “distributed” cognition.

²As Andreas Reckwitz maintains, practice theory “refers to a group of approaches in late twentieth-century social and cultural theory which highlights the routinized and performative character of action, its dependence on tacit knowledge and implicit understanding. Besides, these approaches emphasize the “material” character of action and culture as anchored in embodiment and networks of artifacts” (Reckwitz, 2007, p. 1).

³According to Latour, there is no difference between description and analysis (Justesen, 2020) as a description of relations should be considered an analysis (Mattozzi, 2019; Mattozzi and Parolin, 2021). To avoid misunderstandings, we propose to use the term “rich analysis”, a term that we deem embodies ANT's descriptive-analytical approach.

It is crucial to note that in highlighting non-human participation in practice, does not mean that an action is determined only by the objects. For example, baskets do not *cause* the fetching of provisions, nor do hammers “impose” the striking of a nail. Non-human participation in the action means that whilst they have agency and influence the course of human actions, they are not in themselves determinants (see Mattozzi and Parolin, 2021). In ANT the continuity of any course of action consists of in chains of human and non-human connections, as Latour maintains: “things might authorize, allow, afford, encourage, permit, suggest, influence, block, render possible, forbid, and so on” (Latour, 2005, p. 72).⁴

Grasping the role of objects or technologies in the flow or chain of the connections, however, is no simple matter. Indeed, it is possible to track their actions only through the traces that they leave on the path. As Latour puts it again:

To be accounted for, objects have to enter into accounts. If no trace is produced, they offer no information to the observer and will have no visible effect on other agents. They remain silent and are no longer actors: they remain, literally, unaccountable (Latour 2005, p. 79).

Moreover, once traces have been collected, understanding how to interpret them is a matter of methodology (see text footnote 3), which ANT usefully provides two clarifications for.

First, the concept of “actor” in Actor-Network Theory is not conceived as a rational thing that are abstracted from any given context and in full possession of their agency. Rather, they are conceptualized as someone (human), or something (non-human), whose acts are deeply and critically influenced by the entities around them. Specifically, in ANT, “... an ‘actor’ in the hyphenated expression actor-network is not the source of an action but the moving target of a vast array of entities swarming toward it. It is crucial to retrieve its multiplicity” (Latour 2005, p. 46). In this sense then, an actor is something that is made to act by many others, it comes into being with others and has little singular essence. Latour uses the metaphor of a theater to explain the controversy related to who, and what, is acting when “we” act. Put simply, on stage, an actor never acts alone, and when we watch an actor act, we always wonder if what we see is reality or fiction or who really determines the action. In a theater play, the question of agency opens up and is not attributed uncritically to whom we see acting. Similarly, in ANT, it is crucial to reconstruct how, and by whom, a human and non-human actor was influenced in making the action. It can only be done by collecting clues and trails left by the actors. As a consequence, uncertainty about the origin of action has to be resolved as a matter of enquiry rather than assumption.

While mapping the human and non-human contributions to the emergence of action, clarification of how actors qualitatively participate in the collective action takes place. This is the point that the second and fundamental ANT clarification arises: not

all human and non-human actors play the same role in the emergence of action; some are more important than others, a hierarchy of relevance which depends on whether they are intermediaries or mediators.

According to Latour, an intermediary is an entity that transports a meaning or a force without any transformation. Describing the inputs of an intermediary is enough to understand its outputs: “For intermediaries, there is no mystery since inputs predict outputs fairly well: nothing will be present in the effect that has not been in the cause” (Latour 2005, p. 58). In understanding the emergence of collective action, it can be seen if an actor works as an intermediary when it does not add anything, other than carrying the action effect forward. If an actor acts as a mediator, the consequences are completely different. A mediator transforms, translates, distorts, and modifies the meanings or the elements they are supposed to carry (Latour, 2005). Therefore, if we have chain of mediations in a network, many new and variable situations will succeed. These mediators make things do other things, in ways that cannot be foreseen.

It is crucial to note, an actor is not an intermediary or a mediator *per se*, but the expression of their potentialities depending on the positioning that they have in the network. Latour uses the example of a computer and a conversation:

A properly functioning computer could be taken as a good case of a complicated intermediary while a banal conversation may become a terribly complex chain of mediators where passions, opinions, and attitudes bifurcate at every turn. But if it breaks down, a computer may turn into a horrendously complex mediator while a highly sophisticated panel during an academic conference may become a perfectly predictable and uneventful intermediary in rubber stamping a decision made elsewhere (Latour 2005, p. 39).

An intermediary, then, can be significantly complicated but also non-relevant for the action to take place. A mediator can be very simple, but it may lead in multiple directions, changing all the contradictory accounts attributed to its role.

Following ANT, it cannot be asserted in advance what kind of actor a particular technology is, and which type of agency it has, and what is its contributions might be to the action. To be clear, it is not possible to say if a technology is an intermediary or a mediator without reading the network in which it is inscribed. The complex networks of human and non-human actors have to be followed in order to comprehend how a technology’s potential contributes to the action.

THE CASE AND THE RESEARCH METHODS

To excavate a deeper understanding of the dynamic relations between technology, people and spaces in aid practices, we looked at the emergence of an organization in response to the COVID-19 pandemic. The group named Superbergamo (Supporto Unitario Popolare e Resiliente or Unified Popular and Resilient Support in English), promoted a food and medicine service during spring

⁴On a similar matter James Gibson coined the famous concept of affordance (Gibson, 1986), while Suchman (1987) and Goodwin and Goodwin (1996) explore the assortment of modes of action of technologies.

2020 in Bergamo; the Italian city most affected by COVID-19. During the pandemic's peak (March–June 2020), this group, comprised of local people active in Bergamo's cultural and social associations, generated a social project designed to sustain people in need. Starting before the official lockdown Superbergamo, rapidly became a crucial player in meeting the community's needs as the depth of the crisis emerged and took shape.

During the most dramatic peak of the pandemic, Superbergamo was able to make 2,672 interventions. These included delivering groceries, drugs, oximeters and oxygen from pharmacies, medical prescriptions from GPs, small services at the post office, collecting medical reports, preparing and distributing free grocery packages for those without money, and other similar services. Focusing on the emergence of the collective actor who provided the aid practice, we focus on both human and non-human components and their relationships. It will become clear that Superbergamo as a collective actor, and the aid practice itself, was the result of the chain of relationships we are mapping. By describing the relationships between human and non-human elements, we can provide a more nuanced understanding of the contribution of social media and group chats to the constitution and execution of spontaneous emergency responses by the public.

Bergamo Outbreak and Collective Action

Bergamo was the epicenter of the COVID-19 outbreak in the Lombardy region and for a period of time Europe as a whole. With at least 6,000 COVID-19 related deaths, it remains one of the worst affected cities in Italy (Senni, 2020) and the world (Bernucci et al., 2020). The Guardian described the experience of Bergamo as being in a “lazzaretto of pain”, where hospital staff faced the horror of selecting which patients to treat on the basis of who had the greater chance of overcoming the infection. The city's cemeteries were so full that they were forced to ask neighboring provinces to remove their corpses for burial (Bonalume, 2020).

Superbergamo emerged from an idea expressed on the day 6th of March 2020 in the group chat of a local cultural association called Maite, and its service starts the same day. After a local newspaper article about the initiative (on the 7th of March), the service receives tons of requests for groceries and medicine (Scardi, 2020). On the 12th of March, a Facebook post from Maite provides some initial data: “70 volunteers active in the Bergamo area and Province. 4 switchboard operators who alternate with a hot telephone. About 100 phone calls arrived between Monday 9th and Wednesday 11th of March and 64 interventions carried out in Bergamo and the Province”. Prior to, and during the first weeks of the lockdown⁵, local and regional institutions provided no services for the most vulnerable sections of the population, save for advising them not to leave their houses (Pellegrinelli and Parolin, 2021). Thus, when Superbergamo's service started noting was put in place by the municipality to intervene and support the vulnerable population.

⁵Bergamo was affected by local and regional lockdowns that started on the 8th of March 2020, while the national lockdown took place some days after (11th of March 2020).

The Municipality of Bergamo also set up and coordinated a service made by volunteers, named “BergamoXBergamo”, to provide help to the citizens during the pandemic. However, the service was only implemented some weeks later the start of the activity of Superbergamo and it learns from it. An article in the local newspaper (*Eco di Bergamo*, 2020; 24th March 2020) titled “Volunteers to help citizens ‘BergamoXBergamo’ is born” (our translation) was dedicated to the initiative promoted by the Municipality quoting the municipal councilor. As the article states: “After a first phase focused on assistance to the elderly population, mainly addressed to emergencies, based on the availability that numerous volunteers reported to the Municipality of Bergamo and thanks to the spontaneous self-organized groups, ‘BergamoXBergamo’ the intervention plan of volunteers and volunteers organized by the Municipality of Bergamo takes shape” (our translation). The self-organized groups here referred to are those activated by Maite that will compose Superbergamo. Moreover, despite its activity in the whole province Superbergamo also participated in the Municipality initiative (that was limited to the Municipality area) as an independent group. Superbergamo, extemporaneously born from a local cultural and social association, gathered volunteers (over 300) and quickly established a solidarity network for the delivery of necessities (especially food and medicines). The complex and stratified Superbergamo project can be divided into three phases (Pellegrinelli and Parolin, 2021). The first phase (between the end of February and the first half of March 2020), runs from the establishment and initial deployment of a self-organized delivery service of groceries, up to the construction of a more complex network, including various local groups and associations. The second phase (from mid-March until the beginning of April 2020) saw the re-organization of the service in response to the overwhelming needs of the community. Finally, the third phase responded to the growing need for financial support from a significant proportion of the community. On the one hand, this phase took the form of fundraising initiatives; whilst on the other, of distributing solidarity grocery parcels for people in economic difficulty.

Research Methods

This case is based on qualitative research we carried out between March 2020 and July 2021, studying the emergence of the group and the development of its activities. The research includes:

- Several online and offline interviews (more than 60).
- Online participant observations.
- The analysis of different texts and inscriptions (in particular from social media and the group messaging app).

Given that the activity of Superbergamo coincided with the strictest lockdown Italy has ever known, most of the group's practices were carried out and coordinated exclusively online. Therefore, to account for the aid practices provided by Superbergamo, we focused on the network of inscriptions (Latour, 1999) involved in its socio-technical assemblage (including numerous WhatsApp chats). According to Jérôme Denis and David Pontille, mapping socio-technical networks in ANT (Actor-Network-Theory) entails the following of “small traces of paperwork, marks on sheets of paper, specific words

in documents (e.g., authors names and citations), files, minutes, reports, etc.” (Denis and Pontille 2020, p. 2). Consequently, our data comes from several sources: interviews, observants participation, and materials we gathered from the Superbergamo initiative, like Facebook posts, WhatsApp chats, emails, text and handwritten messages, minutes of meetings, excel documents, regulations, online self-regulation documents and newspaper articles. Indeed, we collected an enormous amount of written material, including several WhatsApp group chats where aid initiatives were conceived, discussed and implemented. However, following Latour, we decided to concentrate our attention on specific inscriptions that allowed us to understand how the mobilization of new resources is accomplished:

we do not find all explanations in terms of inscription equally convincing, but only those that help us to understand how the mobilization and mustering of new resources is achieved (Latour, 1986, p. 6).

In this sense, it was crucial to follow Facebook posts and messages in WhatsApp group chats in the context that they were written, to reconstruct the emergence of the group itself and the subsequent aid practices.

WhatsApp chat is an instant messaging App launched in 2009 and subsequently acquired by Facebook in 2014. According to Seufert et al. (2015): “WhatsApp is the most popular MIM application in the world having around 700 million monthly active users” (Seufert et al., 2015, p. 225). WhatsApp chat is based on Mobile Instant Messaging (MIM), an online service that overcomes the traditional Short Message Service (SMS). The benefit over conventional SMS is that MIM services are primarily free and can share media like videos, images, and audio messages. One of the most prevalent characteristics of MIM applications is group chatting.

According with Ling and Lai (2016) group chatting has consequences in the micro-coordination of social life. Prior to group chatting apps, micro-coordination usually assumed a dyadic form of interaction (using either SMS or mobile voice calls), mobile messaging apps have allowed multisided interactions that facilitate task-based chat groups (Ling and Lai, 2016). As with other mobile group messaging services, WhatsApp chats play a key role in gathering groups and micro-coordinating their activities.

To describe-analyze the emergence of Superbergamo, and the aid practices promoted by the group, we followed the messages in several chats, Facebook posts and other coordination tools related to the project. Superbergamo activity relied on several WhatsApp groups and subgroups (see e.g., the “Attack” group below), to facilitate the operational management of the service directed to the population. The multiplication of these spontaneous WhatsApp groups under the umbrella of Superbergamo, mostly with many to many structures, were intimately connected with the character of its project development. In Superbergamo, chats emerged spontaneously within a collective yet simultaneously fragmented process, surrounding the project’s operational needs and evolution. Moreover, these virtual subgroups became indispensable for coordinating activities and developing strategic reflection. In this respect, communication technologies and their

inscriptions, were embedded within, and part of, participatory processes: gathering the group; moving a complex machine that worked primarily remotely; and simultaneously imagining and managing its evolution. Therefore, analyzing these chats will elicit a deep and rich understanding of how both the group and the practice emerged.

THE DISCUSSION

Using Group Chats to Set Up a Collective Action of Help

As anticipated Superbergamo’s story began on the March 6th, 2020, 2 days before the lockdown in the Lombardy region began (lockdown was nationwide by the 11th March), and in a context where initiatives from public institutions were conspicuous by their absence. Nonetheless, information about the outbreak spread and so did the concern among the vulnerable population. Amongst other local cultural associations who had already canceled activities, *Maite the Bergamo Alta Social Club* located in Bergamo’s upper town and home to various cultural and artistic associations, had already alerted many about the pandemic’s risks thanks to a doctor involved in the team (Pellegrinelli and Parolin, 2021).

At 9.00 a.m. on the March 6th, 2020, in the WhatsApp group “Info Maite”—which includes about thirty of the most active associates—Piter, the president of Maite association, wrote a message: “I have a practical idea to support over seventy in the district. Like taking your groceries home or just ordering them online. Any volunteers available?”. What follows are enthusiastic messages about the idea. As another activist said, [The idea was] “to extend to the neighborhood what we had already begun to do for our parents and our elderly neighbors.” (Interview with a volunteer).⁶

Later in the day, after some rounds of enthusiastic appreciation and practical considerations within the chat “Info Maite”, a Facebook post appears at 14.47 on the page of Maite with the following text:

Excerpt 1

In the days after the closure of the MAITE—Bergamo Social Club, many of us are at home being cultural and school workers, we have decided to make ourselves available to those who, even more than us, suffer from forced loneliness due to a personal or health issue.

Those who need it (over 70 or people with difficulties linked to health issues will have priority), can call us at +39*****.

We can bring you the groceries, run small errands, go to the post office... in short, give support.

We have masks, sanitisers, delegation documents and other authorizations...

Moreover, copies of the announcement were printed and posted around (in the local groceries, pharmacies and bars) in the upper town district of Bergamo where Maite is based. The mobile

⁶All the participants have been anonymized with generic Italian names. However, we chose to keep the real name of the associations and groups involved, the name of the chats the punctuation and the emoticon used in them.

number in the announcement was the one used at Maite for booking the events. The chat “Info Maite” was also used for discussing how to set up the service proposed.

Excerpt 2

[...]

06/03/20, 10:46 - Piter: Is someone available to be the contact to call for support requests?


06/03/20, 10:46 - Roberto: But you say that we do not ourselves act as an intermediary for the infection to the older people?

06/03/20, 10:47 - Piter: obviously, intelligent measures must be taken

[...]

06/03/20, 12:08 - Valentina : I can be the one who answers the phone

06/03/20, 12:09 - Luca: Yes, perhaps better to check if the phone is still working. After that, it is a good initiative, but if they call you have to go. If one calls and is answered twice spades... are we sure we can be there?


06/03/20, 12:10 - Valentina : It depends how many volunteers are there

06/03/20, 12:10 - Valentina : Availability?

06/03/20, 12:13 - Piter: Simone e Davide have given their availability

06/03/20, 12:27 - Luca: In principle, I am available

[...]

06/03/20, 12:41 - Valentina : You have to recover hands sanitisers and face masks when you go to the elderly you put on and don't touch yourself

06/03/20, 12:43 - Piter: today I'm going to get everything we need

06/03/20, 12:44 - Michela: Pharmacies have run out of face masks 

[...]

06/03/20, 14:10 - Piter: Fausto do whatever you need and want

06/03/20, 14:10 - Piter: Cinzia can you deal with Facebook and various groups?

06/03/20, 14:10 - Piter: I have 20 printed copies, Marco, Manuela, Chiara, Annalisa, and others from the upper town, can you hang copies around?





(Extract from Info Maite WhatsApp chat).


The same day of the Piter's first message, the conversation on the Info Maite chat helps to define and set up the aid service. In a short period of time, some roles have been roughly defined: the one answering the phone (Valentina), the one responsible for putting the ad on Facebook (Cinzia), the one who will provide masks and sanitisers (Piter), and the ones called to post copies around the upper town (Marco, Manuela, Chiara, Annalisa and the others). The excerpt also shows how a shared orientation to the situation is negotiated within the exchanges. Roberto asks if volunteers risk becoming vehicles for the contagion, sparks a conversation about the importance of face masks and hands sanitiser, and a further chat dwells on practical matters such as checking that mobile phones are still working. What begins to emerge is a shared orientation toward creating a service addressed to the local elderly population,


based upon a mobile phone message and volunteers coming forward from a local association, and instigated by a group chat previously used to coordinate Maite's activities. This shared orientation to the situation marks the emergence of what Suchman calls a “situational territory” (Suchman, 1996), a complex territory that incorporates technologies, discourse and practice. The emerging “situational territory” is neither defined nor fixed, rather it is in the process of being shaped by the exchanges taking place. The division of labor, tasks and positioning of the volunteers within the collective action are emerging elements from the group exchanges taking place within the chat. Nevertheless, a “common state of readiness” to take care of the emerging needs of the vulnerable elderly was being suggested and negotiated, giving rise to the future practice of help.


A few hours after Piter's initial message (sent at 9.00), a Facebook post was published (14.47), the phone used for receiving the calls is turned on (14.54) and a new WhatsApp chat, called “Attack”, is set up (15.10) by Valentina—the activist of Maite who volunteered for managing the phone—to gather the volunteers that will provide the service. The new chat allows to include those who wrote to Maite after seeing the initiative on Facebook and are willing to volunteer to join it. The chat group “Attack” became the virtual place from where people interested in joining were addressed, creating both the group of the volunteers and a crucial infrastructure of the aid practice. The entire group of Info Maite was added to the new chat to populate “Attack” which immediately became the backbone of Superbergamo.


Excerpt 2


06/03/20, 15:19 - Valentina  created the group “
Attack  



06/03/20, 15:19 - Valentina  has added the participants at Info Maite chat

06/03/20, 15:20 - Roberto: How beautiful are the spontaneous initiatives 

06/03/20, 15:20 - Valentina : Hello! We have made an announcement in the social media and activate the number. Let's see who is calling! After that, we will coordinate ourselves. Go, go with mask and hands sanitiser

06/03/20, 15:21 - Valentina : Let's see if there are others willing [to join us]


06/03/20, 15:21 - Maddalena: 

06/03/20, 15:21 - Chiara:  

06/03/20, 15:21 - Piter: I'm going to get things today

06/03/20, 15:22 - Piter: make us administrators

06/03/20, 15:22 - Valentina : Piter if you bring me the SIM card I have the mobile phone for the calls

06/03/20, 15:23 - Valentina : We'll act as a control center like Power Rangers: “There is an elderly woman in the street X who needs you! She needs to pick up the Voltaren at the pharmacy!!!! Go go goo”

(Extract from Attack chat).

The new WhatsApp chat “Attack” gathered together the volunteers orientated toward a common goal, and also contributed to the generation of a shared sense of identity and imagination. As the excerpt shows, Valentina is promoting the idea of activating a control center to remotely coordinate the action of several volunteers willing to intervene. A coordination center able to organize the intervention of several superheroes (like power rangers) distributed across the neighborhood and the city willing to help people in need. The name attributed to the chat “Attack” invokes the motto of a group of superheroes who attack the monsters who are threatening the fragile population. The image of “superheroes” helps to create a shared cognitive comprehension of the situation and elicit an affective state, a sense of mission that framed and gave fuel to the collective action. Moreover, the new chat was the channel where communications about the groceries ran from, and through which the aid practice’s practical details were further negotiated.

The initial idea of the service configuration appeared quite simple: Valentina would collect every request by phone and ask by “Attack” chat the availability of a volunteer for each delivery. However, the group soon realized that adjustments were required to manage the flow of the conversations within the group. Nevertheless, in this phase, the Attack chat played a crucial role in the creation of the group. Before “Attack” the people willing to set up and play an active role in the service was only a small group. However, during the same afternoon, the chat generated further traction with volunteers who did not know the association Maite but wanted to participate in the initiative having seen the communication on Facebook. At this point, the Superbergamo group—although this name emerged only later—surfaced. As can be seen from Piter’s next comment, the chat Info Maite, running in parallel with the rhythm of interactions in Facebook, increased the interest from volunteers willing to join the initiative in impressive numbers, which surprised Maite’s management team.

Excerpt 3

[...]

06/03/20, 15:24 - Piter: let’s get it started and then let’s figure out how to do it

06/03/20, 15:24 - Gioacchino: let’s see, come on

06/03/20, 15:25 - Piter: Frankly, I wasn’t expecting 200 interactions in 30 minutes

06/03/20, 15:25 - Gioacchino: like a Facebook gang bang

(Extract from Info Maite chat)

In just a few hours the Maite team had discussed the initiative’s practicalities, opened a WhatsApp chat “Attack”, and generated a common course of action toward helping as many people as possible in the city of Bergamo and the wider province. Indeed, the interesting element was the initiative’s rapid impact. Initially conceived as an extension to the help that neighbors and acquaintances in a locality might give to each other, the initial message posted on Facebook prompted the generation of a help service that was very different. While the physical announcements posted on the walls on in the upper town attracted many calls from the public living in that area, the post on Facebook

(reposted around eight hundred times) reached a significantly greater audience.

While the paper announcements were posted within the local area, the Facebook post made the announcement visible to thousands of people living within and outside the city of Bergamo. In a Latourian sense, it is clear that in contrast to the paper announcements, Facebook post acted as a mediator, changing the very nature of the initiative and influencing the group. People commented on the initiative, and also asked to join it. It is possible to see this particular shift manifesting itself when the new chat “Attack” becomes (at 15.39) conceptualized as an initiative not limited to the upper town.

Excerpt 4

[...]

06/03/20, 15:37 - Valentina : The group has just been born, members are being added as soon as we are, we give

information on what to do 

06/03/20, 15:39 - Piter: we take into account the fact that we have decided NOT to indicate a specific territory. Mainly upper town. But we understand as requests arrive.

06/03/20, 15:40 - Piter: Because it is true that many are from the upper city and the Maite as well, but if someone is from other areas, they can also take care of it... like Giorgio down city center, Maddalena area Moterosso, Roberto Loreto neighborhood, etc. etc.

06/03/20, 15:40 - Piter: we’ll understand it little by little.

06/03/20, 15:41 - Valentina  : In the meantime, thanks to everyone for the availability!!! 

(Extract from Attack chat, emphasis in the original.)





The excerpts show how the Maite team gained the confidence that they could rely on several volunteers from the public. This created the space to imagine a more ambitious enterprise for the entire city and potentially something greater than that. Thus, the constitution and distributional capacity of the group, generated by Facebook and supported by the WhatsApp chat Attack, become crucial to the ability of the group to cover a significantly more expansive area of the city.

When we say that Facebook and WhatsApp played a role in shaping the practice, we are not making a deterministic claim. Rather, we are accounting for how social media—like all the other human and non-human actors—encourages, allows, permits, renders possible, blocks, prevents, or forbids action that might constitute the practice of help. In addition, we are interested in showing the chain of mediators (including Facebook and WhatsApp group chats) that make things, do other things, than what could have been foreseen (Latour, 2005). The example of how the scope of the area served by the group was widened, is informative in this respect, illustrating how Facebook played a significant role.

The capacity to keep the definition of the new practice open (by whom, from whom, and where), while the service was in its initial stages, was one of the key constructive features of Superbergamo. This characteristic emerged from the interaction

with Facebook and some of the features of the WhatsApp chat facility. As people joining the Attack chat were located in a different part of the city and province, the new entity (Superbergamo) remained open, fluctuant and unfixed, as did the aid practice. This was also apparent in the distribution of roles, and that way, “who does what” was defined and redefined as the activity progressed. As the following excerpt illustrates, the distribution of the areas of intervention was initially negotiated in the chat:

Excerpt 5

[...] 06/03/20, 15:50 - Valentina  has added Eleonora
 06/03/20, 15:53 - Claudio: I honestly have difficulties for Città Alta
 06/03/20, 15:53 - Claudio: I'm from Borgo Palazzo, I make myself available for this area + city center
 06/03/20, 15:54 - Gioacchino: welcome to Sofia and Emma!! we see that phone calls arrive. In case it helps, I can also cover Santa Caterina and Redona neighborhoods as I go through them.
 06/03/20, 15:54 - Valentina : We are from different areas, based on where you are more comfortable you make yourself available. Thanks!
 06/03/20, 15:55 - Piter: If you want, print and stick in your area that you know you can cover
 06/03/20, 15:55 - Valentina  has added Luca
 06/03/20, 15:57 - Claudio: Perfect. Thanks for the clarification Piter!
 06/03/20, 15:58 - Piter: particular news for a particular situation. If you have ways of making those who can serve them turn around, go ahead and do it. Here is the text [image of the text of the announcement (see excerpt 1)]
 06/03/20, 15:58 - Valentina : It will work like this: based on the call, we will write here who needs, what and where, and the first available person, with mask and hands sanitiser, goes.
 (Extract from Attack chat)


The first thing to note here, is how the group emerged and coalesced around the idea of future action. The collective action is thus both a result of the group, and simultaneously the driving force that created the group itself. The creation of the group, within the WhatsApp chat “Attack” and the design of the aid practice are two elements (or rather two perspectives) of the same entanglement that emerged from the inscriptions used by the Maite team to launch the idea of the service: Info Maite chat, Facebook posts, and Attack group chat. It is the technological infrastructure (the chats info Maite and Attack, and Facebook posts) which sustains the group’s initial communication and goes on to shape both the practice and the group of volunteers willing to participate. This is what allows the service to acquire the particular form that it did.

Using Group Chats to Coordinate Activities a Distance

Superbergamo involved almost 300 volunteers all of whom were coordinated only by a few tools and rules. When the

activity began on 6th of March, a single phone number received requests from the population and allocated—using Attack chat—deliveries to dozens (later hundreds) of volunteer riders. Riders worked autonomously, picking up groceries based on the information received by Valentina (and others who took a turn on the phone) and delivering them to the elderly.

Excerpt 6

[...] 10/03/20, 09:27 - Call center: * Tomorrow morning * who can go to get a prescription from a doctor and take medicine at the pharmacy for an elderly lady in Saint Bernardino street?
 10/03/20, 09:29 - Nicola: Me
 10/03/20, 09:30 - Valentina : I'll give you info in private
 (Extract from Attack chat)

During the initial days, the coordination of the delivery worked as previously announced in the WhatsApp chat “Attack”. After each phone call was received, Valentina sent a message to the chat “Attack” with basic information about the service and the area of the delivery (using the phone number of the call center). It followed a dyadic WhatsApp interaction with the specific details of the delivery by Valentina with the first rider who volunteered for the delivery. After receiving the precise details, the rider-volunteer then carried out the task and messaged Valentina when the pick-up was accomplished communicating the expense. Using the call center phone, Valentina would then call back the user, usually an older adult, communicating the name of the rider and the money she/he needs to prepare.

The phases of the task, characterized by the confirmation of the pickup, the communication of the rider’s name, and the amount of money the caller has to prepare allowed the delivery, which was all undertaken with the overarching remit to reduce the physical exchanges with the elderly to the minimum. The aid practice was based on one phone number, a call center receptionist (Valentina), some volunteers, a group WhatsApp chat (Attack), a dyadic channel of interaction (using WhatsApp), sanitisers, masks, and permissions to circulate during the lockdown provided by the local authorities. The only additional permission required was the appropriate documentation to authorize proxy collection of medical prescriptions by volunteers.

However, this simple organization quickly faced several problems. On the 7th and the 10th of March, two of the local newspapers wrote about the initiative and published the phone number for the service. As a result, requests for help dramatically increased, and so did the volunteers who joined the chat Attack. Thus, in a very short time, the service grew exponentially. As Valentina said in an interview: “As soon as the news of the service got around, we got to a point where the phone never stopped ringing. Literally from when it turned on in the morning to when it turned off in the evening”.

With the continuous arrival of new members, the Attack chat became challenging to manage, and the coordination of the volunteers available for the deliveries became especially critical. In addition, the messages in the chat were so many that it was difficult to allocate and manage the deliveries. In an attempt to limit the confusion, the WhatsApp chat became more structured, incorporating different levels of use. With a few changes in the

TABLE 1 | Examples of the details in the Excel file. The call center operator fills the pink area while the logistics operator fills the green. All the names, addresses, and numbers are fictional.

CALL CENTER OPERATOR						LOGISTICS OPERATOR		
Telephone	Source	Name	Town	Address	Service	Rider	Date	Amount
+39 *** *****	Phone call	Rossi Maria	Bergamo	Via Quarenghi 66	Groceries	Luca	1/4/2020	28,71 €
+39 *** *****	Phone call	Bianchi Giacomo	Bergamo	Via Donizzetti 84	Pharmacy	Serena	1/4/2020	105,99 €
+39 *** *****	WhatsApp	Verdi Giovanni	Bergamo	Piazza Sant'Anna 57	Groceries	Marco	1/4/2020	47,65 €

settings, the “Attack” group chat shifted from a many-to-many group chat model, to one where replies became specific rather than general responses to everyone.

Excerpt 7

[...] 10/03/20, 20:15 - Piter: Hi. As a matter of practical management of the group, we only set messages from administrators. We are more than 50 and we risk losing the important things. Therefore [the practice will run as follow]:

- 1- @call center phone number asks for availability
 - 2- privately answer @ call center [offering your availability]
 - 3- Any questions * not related to the service * ask me privately.
- Let's try this. Having many groups is a problem for the call center.

[Extract from Attack chat]

The new settings worked well for a few days. All human and non-human actors were aligned in a stabilized network that provided the practice of delivering groceries and other needs for the elderly. Nevertheless, the increased calls constituted a considerable amount of work for the volunteer operator at the call center. Indeed, despite the new rules and chat settings, the call center (promptly organized in daily shifts) was overwhelmed by requests and the consequent activities required to coordinate the practice of aid. The network produced a stable practice, but the centralization of coordination tasks in the hand of a single volunteer who was required to physically manage a single, publicly available phone, began to show significant limitations.

After a few days of serious difficulties, a new configuration was developed to distribute the workloads of the call center more effectively. The old, stabilized practice was reconfigured to further distribute the coordination activity. To this end, other actors join the network. A new phone number was activated, and a new role for another volunteer was created. Thanks to an Excel document shared in Google Drive, the coordination center was divided into two sections: the original call center operator received the calls from the public, while a new telephone (with the corresponding role of “logistics operator”) began to manage all dyadic communications with the volunteers (Table 1).

With the new configuration, the call center operator received the request, and instead of writing it in the Attack chat, she/he puts the details in a shared excel file (pink cells).

Another volunteer, the logistics operator, read the requests in Excel and communicated with the volunteers. Thus, the

logistics operator inputs a few details in Attack chat including the area of delivery. The first availability received by a volunteer is then published in the Attack chat to show the allocation of the shipping.

Excerpt 9

[...] 01/04/20, 08:39 – Logistics call center: grocery Serassi street?

01/04/20, 08:47 – Logistics call center: Silvia

01/04/20, 09:01 – Logistics call center: grocery Malpensata neighbor?

01/04/20, 09:08 – Logistics call center: Luciano

01/04/20, 09:43 – Logistics call center: grocery Broseta street area?

01/04/20, 09:44 – Logistics call center: Rachele

01/04/20, 09:46 – Logistics call center: grocery Montegrappa street?

01/04/20, 09:49 – Logistics call center: Matteo

01/04/20, 09:53 – Logistics call center: pharmacy near Borgo Santa Caterina? [Extract from Attack chat].

After allocating the shipping, the logistic operator activated a dyadic communication with the volunteer with the necessary details. Subsequently to the pickup, the logistics operator filled the purple part of the spreadsheet, allowing the call center operator to communicate to the user that the shipping is on its way, the name of the volunteer involved, and the invoice amount.

The new, and more complex, network that involved additional human and non-human actors sustained a new aid practice by being able to respond to unforeseen pressures and continue to provide an essential service. With the reorganization of the call center, a new coordination tool in the form of a shared Excel file, allowed the call center to be split into specialized tasks so as to manage the different flow of interactions (external by the call center operator and internal by the logistics operator) more effectively and permit the service to grow.

A new network of actors made by two phone numbers, two human operators, the Excel file, the real time-sharing document service, the “Attack” WhatsApp chat, the WhatsApp for the dyadic interactions and the 300 volunteers who participated in the shipping, gave rise to a new sociomaterial practice that was able to manage the high numbers of calls without “wearing out” the human actor.

CONCLUSIONS

The case of Superbergamo shows the importance of social media and group chat apps in spontaneous practices of aid organized by volunteers during a crisis. The events that unfolded will reverberate with various streams of literature that focus on social media, and other communication technologies, in considering public responses to emergency situations (see Palen and Hughes, 2018). In addition, our reflection about the case may also be relevant for scholars interested in the role of group chat apps in coordinating actions in crisis response. Furthermore, using ANT, our analysis suggests a more nuanced level of complexity concerning the role of technology in aid practices. Our analysis shows how social media and other communication technologies do not always play a fixed role within an aid practice. Instead, they are part of a heterogeneous network that enables and/or supports the aid action, commonly by changing their role in relation to other network's modifications. This means that group chat apps and social media do not have specific fixed roles, rather they embody potentialities that can allow, encourage, prevent, afford, influence or change a course of action.

The analysis of Superbergamo illustrates how the different roles played by group chats and social media change and realign themselves to the unpredictable variations of other elements in the network. For example, we highlighted the specific configurations of relationships between human and non-human actors that combined to facilitate the emergence of the group. The Facebook post worked to attract the volunteers, but only the features of "Attack" as a group chat provided the infrastructure for the group to gather and begin to act. Moreover, the chat "Attack" worked well in allowing the initial gathering but revealed the logistical problems in supporting the allocation of the deliveries. When growing, the group chat needed a different setting (from the initial many to many message structures). Thus, in this case, different settings of the same group chat app changed the way the technology participated in the network, preventing or allowing different uses, thus producing a refinement of the different roles in the practice. Splitting how the flux of interactions were managed into two different roles (call center and logistic operator) meant the inclusion of new actors (a new phone and phone number, a new volunteer role, an excel file, a platform for sharing the updates of the sheet—Google drive), which changed the aid practice. In this respect, every human and non-human actor within the network allows, renders possible, permits, sustains, influences and significantly, can change over time, depending on modifications that occur in the network. For example, "Attack"

REFERENCES

- Andersen, D., Kirkegaard, S., Toubøl, J., and Carlsen, H. B. (2020). Co-production of care during COVID-19. *Contexts* 19, 14–17. doi: 10.1177/1536504220977928
- Barad, K. (2003). Posthumanist performativity: toward an understanding of how matter comes to matter. *Signs J. Women Cult. Soc.* 28, 801–831. doi: 10.1086/345321
- Bernucci, C., Brembilla, C., and Veiceschi, P. (2020). Effects of the COVID-19 outbreak in Northern Italy: perspectives from the Bergamo Neurosurgery

as many to many group-chat was highly efficient with just a few participants but struggled to cope with a population of more than fifty volunteers.

We also noted how the same inscription—the initial announcement—when posted around the city and the local neighborhood elicited a very different type of response when the same inscription was posted on Facebook. The consequence of this was the necessity for a change to the scope of the service. Following Latour (1999, 2005) and Hennion (2003), we can enrich the discussion about the role technology plays in crisis response, by introducing the concept of mediation. Mediators are not mere carriers of work; they enrich, transform, and create it. For example, a musical instrument mediates as well as constitutes music. The activity is continuously transformed and re-created through each passage of mediation. Hence, the importance of mapping the chain of the mediations behind a practice, in this case an aid practice, in respect of which we have highlighted how the aid practice, and the group itself, were the emerging products of a particular configuration of a network of human and non-human actors and their relationships.

Our consideration of this case shows the importance of using a situated analysis for the study of groups. We believe that the theoretical and methodological tools offered by Actor-Network Theory offer the opportunity to study groups in situations to better explain each actor's role in the practice. Conceiving the organization of collective action as that which emerges *in situ* demands a reconstruction of the dynamics of interactions to see what each actor brings to the process, and how the practice changes according to the modification of the network.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because of privacy reasons.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

Both authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Department. *World Neurosurg.* 137, 465–468. doi: 10.1016/j.wneu.2020.03.179

Bonalume, A. (2020). Devastated by coronavirus, did Bergamo's work ethic count against it? *The Guardian*. Available online at: <https://www.theguardian.com/world/commentisfree/2020/apr/06/coronavirus-bergamo-work-ethic-lockdown> (accessed May 18, 2022).

Carlsen, H. B., Toubøl, J., and Brincker, B. (2021). On solidarity and volunteering during the COVID-19 crisis in Denmark: the impact of social networks and social media groups on the distribution of

- support. *Eur. Societ.* 23, S122–S140. doi: 10.1080/14616696.2020.1818270
- Cetina, K. K. (1997). Sociality with objects: social relations in postsocial knowledge societies. *Theory Cult. Soci.* 14, 1–30. doi: 10.1177/026327697014004001
- Cheng, P., Xia, G., Pang, P., Wu, B., Jiang, W., Li, Y.-T., et al. (2020). COVID-19 epidemic peer support and crisis intervention via social media. *Commun. Mental Health J.* 56, 786–792. doi: 10.1007/s10597-020-00624-5
- Debnath, P., Haque, S., Bandyopadhyay, S., and Roy, S. (2016). *Post-Disaster Situational Analysis from WhatsApp Group Chats of Emergency Response Providers*. Rio de Janeiro: ISCRAM.
- Denis, J., and Pontille, D. (2020). Maintenance et attention à la fragilité. *Sociologie*. doi: 10.4000/sociologies.13936. Available online at: <http://journals.openedition.org/sociologies/13936> (accessed May 18, 2022).
- Eco di Bergamo. (2020). *Volontari per aiutare i cittadini Nasce "BergamoXBergamo"*. Available online at: https://www.ecodibergamo.it/stories/bergamo-citta/volontari-per-aiutare-i-cittadininasce-bergamoxbergamo_1346408_11/ (accessed May 18, 2022).
- Engeström, Y., and Middleton, D. (Eds.) (1996). *Cognition and Communication at Work*. Cambridge: Cambridge University Press.
- Fernandes-Jesus, M., Mao, G., Ntontis, E., Cocking, C., McTague, M., Schwarz, A., et al. (2021). More than a COVID-19 response: sustaining mutual aid groups during and beyond the pandemic. *Frontiers in psychology* 4809. doi: 10.3389/fpsyg.2021.716202
- Foot, K., Warnick, B., and Schneider, S. M. (2005). Web-based memorializing after September 11: toward a conceptual framework. *J. Comput. Mediat. Commun.* 11, 72–96. doi: 10.1111/j.1083-6101.2006.tb00304.x
- Garfinkel, H. (1967). *Studies in Ethnomethodology*. Princeton, NJ: Prentice Hall.
- Gherardi, S. (2008). "Situated knowledge and situated action: what do practice-based studies promise," in *SAGE Handbook of New Approaches in Management and Organization*, 516–525.
- Gherardi, S. (2010). Telemedicine: A practice-based approach to technology. *Hum. Relat.* 63, 501–524. doi: 10.1177/0018726709339096
- Gherardi, S. (2019). *How to Conduct a Practice-Based Study: Problems and Methods*. Cheltenham: Edward Elgar Publishing.
- Gherardi, S., and Nicolini, D. (2000). The organizational learning of safety in communities of practice. *J. Manag. Inquiry* 9, 7–18. doi: 10.1177/105649260091002
- Gherardi, S., Nicolini, D., and Odella, F. (1998). Toward a social understanding of how people learn in organizations: the notion of situated curriculum. *Manag. Learn.* 29, 273–297. doi: 10.1177/1350507698293002
- Gibson, J. J. (1986). *The Ecological Approach to Visual Perception*. London: Lawrence Erlbaum Associates.
- Goodwin, C., and Goodwin, M. H. (1996). Seeing as a situated activity: formulating planes. *Cogn. Commun. Work* 61, 95. doi: 10.1017/CBO9781139174077.004
- Heath, C., and Luff, P. (2000). *Technology in Action*. Cambridge: Cambridge University Press.
- Hennion, A. (2003). "Music and Mediation: Toward a New Sociology of Music." In *The Cultural Study of Music: A Critical Introduction*, eds M. Clayton, T. Herbert, and R. Middleton (London: Routledge), 80–91.
- Heverin, T., and Zach, L. (2010). *Microblogging for Crisis Communication: Examination of Twitter Use in Response to a 2009 Violent Crisis in the Seattle-Tacoma*. Washington, DC: ISCRAM.
- Hughes, A. L., Palen, L., Sutton, J., Liu, S. B., and Vieweg, S. (2008). Site-seeing in disaster: an examination of on-line social convergence. Washington, DC: ISCRAM.
- Hutchins, E. (1995). *Cognition in the Wild*. Cambridge, MA: MIT Press.
- Hutchins, E. (2020). "The distributed cognition perspective on human interaction," in *Roots of Human Sociality* (New York, NY: Routledge), 375–398.
- Justesen, L. (2020). "Actor-network theory as analytical approach," in *Qualitative Analysis: Eight Approaches for the Social Sciences* (Thousand Oaks, CA: SAGE), 327–344.
- Koos, S., and Bertogg, A. (2020). *Lokale Solidarität während der Corona-Krise: Wer gibt und wer erhält informelle Hilfe in Deutschland?*. Konstanzer Online-Publikations-System (KOPS). Available online at: <http://nbn-resolving.de/urn:nbn:de:bsz:352-2-15cxzw16uv9e7> (accessed May 18, 2020).
- Latour, B. (1986). Visualization and cognition. *Know. Soc.* 6, 1–40.
- Latour, B. (1999). *Pandora's Hope: Essays on the Reality of Science Studies*. Harvard, MA: Harvard University Press.
- Latour, B. (2005). Reassembling the social. *Política y Sociedad* 43, 127–130.
- Lave, J. (1988). *Cognition in Practice: Mind, Mathematics and Culture in Everyday Life*. Cambridge: Cambridge University Press.
- Lave, J., and Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge: Cambridge University Press.
- Law, J. (2004). *After method: Mess in social science research*. New York, NY: Routledge.
- Ling, R., and Lai, C. H. (2016). Microcoordination 2.0: Social coordination in the age of smartphones and messaging apps. *J. Commun.* 66, 834–856. doi: 10.1111/jcom.12251
- Liu, S. B., and Palen, L. (2010). The new cartographers: Crisis map mashups and the emergence of neogeographic practice. *Cartograph. Geograph. Infm. Sci.* 37, 69–90. doi: 10.1559/152304010790588098
- Luff, P., Hindmarsh, J., and Heath, C. (2000). *Workplace Studies: Recovering Work Practice and Informing System Design*. Cambridge University Press.
- Lynch, M. (1993). *Scientific Practice and Ordinary Action*. Cambridge: Cambridge University Press.
- Macias, W., Hilyard, K., and Freimuth, V. (2009). Blog functions as risk and crisis communication during Hurricane Katrina. *J. Comput. Mediat. Commun.* 15, 1–31. doi: 10.1111/j.1083-6101.2009.01490.x
- Mao, G., Fernandes-Jesus, M., Ntontis, E., and Drury, J. (2021). What have we learned about COVID-19 volunteering in the UK? A rapid review of the literature. *BMC Public Health* 21, 1–15. doi: 10.1186/s12889-021-11390-8
- Mattozzi, A. (2019). Cycles of dispositions—unfoldings. A retro-ANT view of practices. *Sociologica* 13, 87–105. doi: 10.4324/9781315111667-11
- Mattozzi, A., and Parolin, L. L. (2021). Bodies translating bodies: methodological reflections on how to tackle aesthetic practices from an ANT point of view. *J. Sci. Technol.* 34, 2–29. doi: 10.23987/sts.79694
- McGregor, M., Bidwell, N. J., Sarangapani, V., Appavoo, J., and O'Neill, J. (2019). "Talking about chat at work in the global South: an ethnographic study of chat use in India and Kenya," in *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* Glasgow.
- Nicolini, D. (2012). *Practice Theory, Work, and Organization: An introduction to Actor-Network Theory*. Oxford: Oxford University Press.
- Nicolini, D., and Monteiro, P. (2017). "The practice approach: for a praxeology of organisational and management studies," in *The Sage Handbook of Process Organization Studies* (London), 110–126.
- Orlikowski, W. J. (2000). Using technology and constituting structures: A practice lens for studying technology in organizations. *Organ. Sci.* 11, 404–428. doi: 10.1287/orsc.11.4.404.14600
- Orlikowski, W. J. (2007). Sociomaterial practices: Exploring technology at work. *Organ. Stud.* 28, 1435–1448. doi: 10.1177/0170840607081138
- Østerlund, C., and Carlile, P. (2005). Relations in practice: sorting through practice theories on knowledge sharing in complex organizations. *Inform. Soc.* 21, 91–107. doi: 10.1080/01972240590925294
- Palen, L., and Hughes, A. L. (2018). "Social media in disaster communication," in *Handbook of Disaster Research. Handbooks of Sociology and Social Research*, eds H. Rodriguez, W. Donner, and J. Trainor (Cham: Springer). doi: 10.1007/978-3-319-63254-4_24
- Palen, L., and Liu, S. B. (2007). "Citizen communications in crisis: Anticipating a future of ICT-supported public participation," in *Proceedings of the 2007 Conference on Human Factors in Computing Systems* (New York, NY: ACM Press), 727–736.
- Palen, L., Vieweg, S., Liu, S. B., and Hughes, A. L. (2009). Crisis in a networked world. *Soc. Sci. Comput.* 27, 467–480. doi: 10.1177/0894439309332302
- Parolin L. L. (2021). *A posthumanist approach to practice and knowledge*. Available online at: <http://www.ephemerajournal.org/contribution/posthumanist-approach-practice-and-knowledge-second-edition-%E2%80%98how-conduct-practice-study> (accessed May 18, 2022).
- Pellegrinelli, C., and Parolin, L. L. (2021). *Bergamo resiste: Storia di Superbergamo, solidarietà e attivismo al tempo del covid 19*. Busto Arsizio: People.
- Pickering, A. (2010). *The Mangle of Practice*. Chicago, IL: University of Chicago Press.

- Qu, Y., Huang, C., Zhang, P., and Zhang, J. (2011). "Microblogging after a major disaster in China: A case study of the 2010 Yushu Earthquake," in *Proceedings of the 2011 Conference on Computer Supported Cooperative Work* (New York, NY: ACM Press), 25–34.
- Reckwitz, A. (2007). Practice theory. *Blackwell Encycl. Sociol.* 1–3. doi: 10.1002/9781405165518.wbeosp125
- Scardi, R. (2020). Coronavirus a Bergamo, l'associazione Maite: 'Facciamo la spesa per anziani e malati. *Corriere della Sera Bergamo*. Available online at: https://bergamo.corriere.it/notizie/cronaca/20_marzo_07/coronavirus-bergamo-l-associazione-maite-facciamo-spesa-anziani-malati-89c9d5e2-6057-11ea-8d61-438e0a276fc4.shtml (accessed May 18, 2022).
- Schneider, S., and Foot, K. (2004). "Crisis communication and new media," in *Society Online: The Internet in Context*. Eds. P. N. Howard, S. and Jones (London: SAGE), 137–153. doi: 10.4135/9781452229560.n9in
- Senni, M. (2020). COVID-19 experience in Bergamo, Italy. *Eur. Heart J.* 41, 1783–1784. doi: 10.1093/eurheartj/eha a279
- Seufert, M., Schwind, A., Hofffeld, T., and Tran-Gia, P. (2015). "Analysis of group-based communication in WhatsApp," in *International Conference on Mobile Networks and Management* (Cham: Springer), 225–238.
- Shanley, L., Burns, R., Bastian, Z., and Robson, E. (2013). Tweeting up a storm: the promise and perils of crisis mapping. *PE&RS.* 79, 865–879. doi: 10.2139/ssrn.2464599
- Shklovski, I., Palen, L., and Sutton, J. (2008). "Finding community through information and communication technology in disaster response," in *Proceedings of the 2008 ACM Conference on Computer Supported Cooperative Work* (New York, NY: ACM Press), 127–136.
- Starbird, K., and Palen, L. (2010). "Pass it on?: Retweeting in mass emergency," in *Proceedings of the Information Systems for Crisis Response and Management Conference* (Seattle, WA).
- Starbird, K., and Palen, L. (2011). "Voluntweeters" self-organizing by digital volunteers in times of crisis," in *Proceedings of the 2011 Conference on Human Factors in Computing Systems* (New York, NY: ACM Press), 1071–1080.
- Suchman, L. (1996). Constituting shared workspaces. *Cogn. Commun. Work.* 35–60. doi: 10.1017/CBO9781139174077.003
- Suchman, L. A. (1987). *Plans and Situated Actions: The Problem of Human-Machine Communication*. Cambridge: Cambridge University Press.
- Sutton, J. N., Palen, L., and Shklovski, I. (2008). "Backchannels on the front lines: Emergency uses of social media in the 2007 southern california wildfires," in *Proceedings of the Information Systems for Crisis Response and Management Conference* (Washington, DC).
- Swann, T., and Ghelfi, A. (2019). Pink organising: notes on communication, self-organisation, noise and radical social movements. *Organization* 26, 696–715. doi: 10.1177/1350508419855711
- Torrey, C., Burke, M., Lee, M., Dey, A., Fussell, S., and Kiesler, S. (2007). "Connected giving: ordinary people coordinating disaster relief on the Internet," in *Proceedings of the 40th Annual Hawaii International Conference on System Sciences* (Washington, DC: IEEE Computer Society), 179a.
- Vieweg, S., Hughes, A. L., Starbird, K., and Palen, L. (2010). "Microblogging during two natural hazards events: what twitter may contribute to situational awareness," in *Proceedings of the ACM 2010 Conference on Computer Human Interaction* (New York, NY: ACM Press), 1079–1088.
- Vieweg, S., Palen, L., Liu, S. B., Hughes, A. L., and Sutton, J. (2008). "Collective intelligence in disaster: Examination of the phenomenon in the aftermath of the 2007 virginia tech shooting," in *Proceedings of the Information Systems for Crisis Response and Management Conference* (Washington, DC).
- Wenger, E. (1998). Communities of practice: learning as a social system. *Systems Thinker* 9, 2–3.
- Woodman, S. (2020). *Was a Mobilized Society Key to China's Coronavirus Response?* Discover Society. Available online at: <https://discoversociety.org/2020/05/02/was-a-mobilized-society-key-to-chinas-coronavirus-response/> (accessed May 18, 2022).

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