An STS Perspective on Pandemic

Assunta Viteritti
Sapienza Università di Roma

Abstract: What can STS say about the pandemic? What kind of scientific models do we need to question our time? In this reflection I envision three issues which seem to me of particular importance: (1) the 'social' as a result of sociomaterial associations; 2) science as an open-air laboratory; 3) the new forms of alliances between science and politics. I conclude focusing on the theme of interdisciplinarity, the major challenge that the pandemic poses to science.

Keywords: pandemic; associations; sociomateriality; interdisciplinarity; politics.

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Corresponding author: Assunta Viteritti, DiSSE – Dipartimento di Scienze Economiche e Sociali, University of Rome, Via Salaria, 113, 00198 Rome, Italy. Email: assunta.viteritti@uniroma1.it

What can STS say about the pandemic? What kind of scientific models do we need to question our time?

My impression is that the pandemic we are witnessing points to three major issues: 1) the 'social' as a result of sociomaterial associations; 2) science as an open-air laboratory; 3) the new forms of alliances between science and politics.

I will now try to sketch them in some details.

1. Sociomaterial associations: or, the allies in the virus' journey

We are part of fragile, multilayer ecosystems. They are stratified archaeologies that come together in a shaky, non-inclusive, non-linear, non-stable way.

STS provided a shift away from any essentialist tendency, highlighting how every scientific idea, every technical artifact, every social fact, every event of the living are the product of entangled networks of relations in which human and non-human interact. To see closely the associations between human and material we can look at two of the social spheres most involved in the pandemic: education and healthcare.

Some images from China (figure 1)[2] – the first country that translated the rules of physical distancing within the material spaces of classrooms – show how protective and safety objects have been added to the traditional 'frontal' organization of classroom space (the 'one to many' learning model). The dividers separate students from each other, suggesting a relationality inspired by control, vigilance, surveillance, but also by safety, protection, and prevention. Dividers, benches, bulkheads, and protective devices (gloves and masks) worn by young girls and boys reconfigure the school space in terms of protection, inscribing morality and values, as well as new environmental and relational constraints.

Figure 1. School space post-covid in China

Looking at the medical field, the second image[3] shows a micro-environment of bio-protection in which different elements (gloves, bed, plastic-coated walls) are assembled so to allow healthcare workers to operate safely, protecting the patient at the same time.

Figure 2. Micro-environment of bio-protection

The image shows associations, entanglements and inscriptions between norms, ethics and knowledges that enact emergency and routine practices in bio-medical settings.

The other photo (figure 3) shows new risks and missing alliances. Technical objects, such as protective masks and gloves, placed into the chains of daily practices, do not find other connections after their use, but are placed in other types of connections and associations that feed the already serious environmental issues. These objects activate relational effects that can be described in other words: environmental risk, pollution, non-disposal, danger.

Figure 3. Mask and plastic gloves (photo taken by the author).

In this case, similar objects – arranged in different ways and seen in their relational effects – show new alliances or rather deficit of alliances and risks: similar objects and opposite effects.

According to Latour[4], the virus is only one node within a network. The virus highlights the interconnection between two crises, the health and environmental one, showing that the classic definition of society as something made exclusively of human entities no longer makes sense. The so-called 'society' depends on associations between many and heterogeneous actors, most of which do not have human form. This applies to microbes (Latour, 1993) but also to the Internet, the law, the welfare State, as well as to the climate change.

Viruses, animals, markets, men, women, sick people, elders, children, States, money, airplanes, cells, air, antibodies, politicians, hospitals, masks, swabs, gowns, food, drugs, vaccines, scientists (virologists, anesthetists, infectious disease specialists, veterinarians, pharmacologists, pneumatologists, epidemiologists, economists, sociologists, statisticians), nurses, doctors, protocols, decrees, rules, apps, data, big data, databases, standards, procedures, numbers, corpses, breaths, lungs. With all these elements we have built a new familiarity over the last ten months. They might seem arbitrary, yet we have learned to grasp them as part of an inextricable and vulnerable sociomaterial network on a global scale, in search of stable connections. Only if we look at how these elements associate with each other can we capture the multiplicity of associations in which we are immersed.

As Donna Haraway argued[5], just by understanding the chains of associations as *natureculture* – as elements that are not separated from each other – we can shift away from the centrality of the human being. The emphasis on these associations can be caught in the journey of the virus that triggered the pandemic. We have heard that it would be a product of evolution and certainly not a "artificial construction" in the laboratory. But what is actually "natural" if we are dealing with an event that has been facilitated, activated, amplified by actions that involve the human animal as well? In what sense can the natural be separated from the human in this story? What is there of non-human in this "natural" that would belong to the virus only?

Through the narration of the many scientists, science journalists, experts who have intervened in the public media space on a global level we have learned that there was not a single trigger event, or a cause, or a singular culprit. Rather, a chain of events occurred that have become both causes and effects.

Like many viruses, the SARS-COV-2 (commonly known as "Coronavirus") travelled around the world and among living species (humans, animals) and other material elements. David Quammen's book *Spillover* (2012) offers various examples of such a process. *Spillover* brings attention to all the times that humans have violated spaces, appropriated

resources, invaded ecosystems and brought events such as forced deforestation, urbanization and global warming that caused the release of viruses from animals – whose ecosystems have been violated – to other species and humans.

The first case we encounter concerns the measles of horses that broke out in September 1994 in a suburb of the north of Brisbane, Australia, called Hendra (the name that will take the virus). Hendra is a quiet old town, full of racetracks, horse lovers, wooden houses converted into stables, newsstands that sold sheets specialized in horse betting and coffee. But what triggered the virus? In his reconstruction, the author follows the associations between humans, nature and animals:

> After our first conversation, at a café in Hendra, Peter Reid drove me several miles southeast, across the Brisbane River, to the site where Drama Series took sick. It was in an area called Cannon Hill, formerly pastoral land surrounded by city, now a booming suburb just off the M1 motorway. Tract houses on prim lanes had been built over the original paddock. Not much of the old landscape remained. But toward the end of one street was a circle, called Calliope Circuit, in the middle of which stood a single mature tree, a Moreton Bay fig, beneath which the mare would have found shelter from eastern Australia's fierce subtropical sun. "That's it," Reid said. "That's the bloody tree." That's where the bats gathered, he meant. (ivi, 14)

The "bloody tree" was left alone where once there was "pastoral land surrounded by city" in which many other trees probably grew. Now it was the only one under which horses could shelter from the heat, and the only one for bats to take refuge.

We have found similar traces in the narration performed by several scientists in recent months. The international virologist Ilaria Capua (2020) spoke of the Coronavirus as a product of our world, of a violated forest, of a market where animals belonging to different ecosystems are locked alive in captivity in the same cages. Imprisoned by humans, the bat and the pangolin exchange viral agents, so that the latter could have become the involuntary "intermediate host" of the new Coronavirus, the bridge for the leap of species of the virus from bat to man. Pangolins seem to lack defense systems against viral infections but they tolerate them, thus becoming reservoirs of microbes while protecting themselves from their effects.

The beginning of the virus journey suddenly produced new associations: planes, trips, airports, ships, sick people, hospitals, dead people, quarantine. Time and space have entered into a powerful short-circuit: the SARS-COV-2 walked with our fast feet and planes, and moved immediately on a global scale from East to West (at first it was called "the virus of the rich", the virus in a suit and tie). The virus associated very well with the main feature of the contemporary and its mobile lives (Elliott and

Urry 2013): a mobility that made it travel, using humans as a vehicle – first to the Western routes and then to the rest of the world[6].

2. A global open-air laboratory

Scientific research invites us to follow new processes in order to produce a sort of domestication of the virus. Both in the public and professional (health) spheres, new technical objects come into play with their attempts to contain, manage or mediate the action of the virus, while contributing to redefining the concept of public health and individual well-being. Masks, soap, disinfectants, gowns, gloves, buffers, bulkheads and tools to promote physical distancing, and then reagents, respirators, serums, and so on have entered the scene incorporating, in different ways, imperatives for individual and collective behavior. We learn to live with these objects in order to live with the virus.

Scientists in recent months have found themselves under enormous exposure in the social space. Politicians and public opinion struggle to understand the uncertainty with which scientists are confronted in their work. Politicians and citizens want "ready-made" science and resist looking at the unstable, in-action construction of scientific knowledge. Yet, scientific research in the laboratory lives on uncertainties, doubts, approximations, data to analyze and interpretations of phenomena that scientists try to tame. No science is ready-made in the laboratory. Science is always in its making, more or less stabilized. In this phase, science in all of its components is indeed in a process of construction, in progress. The construction of science is an uncertain process in search of evidence to build forms of stability that are never permanent: the instability of scientific knowledge is one of its foundations.

Science laboratories all over the world are entering the public arena and – as in the Pouilly-Le-Fort farm, where Pasteur publicly prepared his experiments – are looking for practical solutions capable of taming the virus. Scientific practice seeks means, compares hypotheses and sets experiments to find recurrent trends and build more stable knowledge. In the occasion of the SARS-COV-2, one more element has marked the communication and representation of the virus: the metaphors that are escorting its journey. As suggested by Susan Sontag (2001), metaphorical images are a powerful social construction to relate to adverse events such as diseases and contagions. The most common and immediate one that has spread was that of war, of combat, of confrontation in a ring: a metaphor that invoked the virus as an enemy to fight. Then, slowly – and thanks to the language of some scientists – we moved from the war metaphor to that of living together with the virus. This less martial vision was introduced when we began to familiarize ourselves with the circulation of the virus.
A third image used is that of the adaptation to the host:

> Of course, more scientific evidence of a mutation is needed but it can be said that as the virus tends to adapt to the host. A new virus is always very aggressive in the early stages, then it learns to live with the host. This is an opportunistic attitude which allows it to survive[7].

Coexistence, dance, adaptation: this is the new perimeter of relations to dwell with. Verbal and material domestication practices embedded within sociomaterial networks of containment make our relationships with the virus more visible, less dangerous and more liveable. The American materialist philosopher Timothy Morton (2013) has coined the concept of *hyperobject* for interpreting entities of large spatial and temporal dimensions that produce effects on the local and global level: the pandemic looks like this.

3. Science and politics

In these times, the apparently unbridgeable gap that has often separated science and politics (at least at the public level) seems to disappear. We are witnessing three processes: science and politics talk to each other and share common tables publicly; many scientific knowledges are put into action in a polyphony of expert voices that enter the public space; pathogenic agents and material objects become central actors of political attention.

Contrary to what Robert Merton said, the immunity of science is deeply questioned: politics and science join their forces and hybridize their spaces, while research laboratories move their field of action and communication in the public arena. Hospitals, research centers, experts, scientists, politicians, patients are in a common arena and look for common embankments, they imagine solutions and forecast scenarios. Science and politics sit side by side in ministerial teams, on television talk shows, in regional political arenas, and we see a profound redefinition of the role of scientific and political activity. Scientists find themselves acting as public actors and policy agents for the sole fact that they speak publicly about measures, numbers, comparisons, data. Technical objects of daily use (masks, gowns, gloves, reagents) become central in everyone's life, and new sociomaterial alliances are established for building stable networks capable of facing the emergency.

Politics asks for ready-made, reassuring, univocal answers, but science and scientists, all over the world, bring partial, in the making, not reassuring, and unstable results. Experts speak in public about ongoing experiments, present slides of infected cells in television programs, show trends and provide partial interpretations and analyses of the current (and future) situation.

Politics asks science for answers and science presents itself with open questions. In this tension, politics and science appear more vulnerable, and in need of a new relationship, as for the task forces of experts and scientists created in various Countries testify. Many alliances (and task forces) are acting internationally, nationally, and regionally. They bring together scientists and experts from different technical and political fields, an unprecedented and important collaboration. Science and scientists (virologists, epidemiologists, clinicians, and so on), have been "gathered" for an event that affects all latitudes. The composition of the task forces – often shamelessly populated mainly or only by men – highlights the separation of expert knowledge between natural and social life. This separation uncovers the difficulty in framing the entanglement of the effects brought by the virus and which say: the natural sphere cannot be separated from the social one!

Another relevant associative process is the one impressed on the relationship between research laboratories and clinics. Research must now be translated into drugs, therapies, vaccine studies, and clinical trials of all kinds have already started throughout the world. This is an accelerating movement that has already been in place for decades: after the Human Genome Project, translational research has aimed to speed up the discovery of new treatments and diagnostic tools to transfer scientific knowledge from bench to bedside (Cambrosio et. al. 2006; Neresini and Viteritti 2014). Serological tests, new drugs and vaccines go in this direction. The question that arises is how to build common platforms between scientists from different countries and disciplinary fields to favor the analysis of large and complex databases, as well as how to ensure the interoperability between large data systems.

For the moment being, the alliances-in-the-making between science and politics translate in new public and private practices: diagnostic practices such as swabs and serological tests, practices of physical distancing assisted by the use of protective objects; the safe arrangement of public spaces (commercial, institutional and mundane); practices of tracking (via apps and information systems) and of personal hygiene (such as wash your hands often). Each of these practices, outline necessary as problematic alliances and associations between humans and non-humans, as well as between politics and science.

4. Final thoughts

Although it is not a novelty for STS, scientists from various fields have recently pointed to the centrality of interdisciplinary research as the only horizon for understanding the complexity of the living in all its natural-social-cultural-material-technological forms[8]. STS as a plural and non-anthropocentric scientific field, in dialogue with other bodies of

knowledges and experiences (such as technoscientific feminism), can then contribute in describing connections that would be invisible to a monocular knowledge perspective. With the pandemic we have witnessed the impact of the butterfly effect, and, as researchers, we are required to develop more skills in reading effects that are not given, not linear and not sequential. We are learning practically the consequences of taking seriously the idea that we are immersed in a reality where, as humans, we are not protagonists and architects, but the result of processes of intra-action (Barad 2007).

As individuals, we strongly contribute to troubling local and global ecosystems by creating harmful chains that favor the triggering of "viral" phenomena, which quickly move across time and space. As Donna Haraway (2016) suggests, we must equip ourselves theoretically, culturally, and materially to live an infected planet, seeking non-anthropocentric adaptations and alternative visions centred on the coexistence of humans and non-humans.

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[1] An extended and more academically attuned version of this contribution was recently published in "Sociologia Italiana", 2020/16, pp. 237-255.

[2] Photos circulated in April 2020, made by photojournalist Sam Yeh.

[3] The figure shows the image of a frame exported from a video available here: https://www.adnkronos.com/salute/2020/05/27/nuovo-coronavirus-sta-diventando-piu-buono-risposta-che-divide-medici-scienziati_mUy2usyMuJWarqznQbEL4H.html.

[4] Le Monde, March 25, 2020 https://www.lemonde.fr/signataires/bruno-latour/.

[5] Video-interview "How to survive on an infected planet". Turin Book Festival "SALTO Extra" on May 15, 2020 https://www.youtube.com/watch?v=-CaRdmalZHok

[6] Ilaria Capua talked about one of the first viruses that passed from animals to man with the birth of breeding and agriculture: measles. It still lives with us causing contagion and death. In 2015 alone, the World Health Organization estimated 134,200 deaths caused by measles, which in its debut "walked with the feet of humans" and took a long time to spread (as did HIV and other viruses).

[7] Massimo Clemente, Virologist at the San Raffaele Hospital in Milan, expressed this opinion in a interview.

[8] Two examples of scholars who underline the urgency of an interdisciplinary approach. The first one is scientist Ilaria Capua, who, in her texts and in the public discussions during the quarantine, invites sciences (from physics to information technology) to join forces and knowledges to look at the complexity of the health of the living beings and the planet. The second example is represented by Deborah Lupton, who has been involved for years in studies on digitization processes that also affect public health. On March 29th, 2020 she launched a working group entitled Social Research for a Covid and Post-Covid World: An Initial Agenda, which contains topics that can only be addressed through the integration of different disciplines.