Received: 19 June 2020 | Revised: 14 May 2021 | Accepted: 14 May 2021

DOI: 10.1002/sres.2803

RESEARCH NOTE

SYSTEMS and BEHAVIORAL RESEARCH SCIENCE WILEY

What a pandemic can say about human–environment relationship

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Abstract

In 2020, the new coronavirus disease has seen many countries adopt mitigation activities to interrupt human-to-human transmission, radically changing daily life habits with secondary effects on the environment. The aim of this article is to comment on these events from a systemic point of view, referring to systems theories and the non-linear causal relation between human behaviour and the environment. As Bateson stated, linear thinking has led human beings to exploit the environment, causing an ecological crisis and disequilibrium within the system, because the mutual interrelationship and homeostasis mechanisms between humans and their environment were ignored. Taking into account the pandemic and its effects, the new coronavirus provides an opportunity to see otherwise invisible or obscured relational phenomena, such as the mutual relationship between humans and their environment.

KEYWORDS

behaviour, COVID-19, environment, pandemic, systems

1 | INTRODUCTION

In the beginning of 2020, an outbreak of a novel coronavirus strain, now known as COVID-19, was identified in Wuhan, China. Its fast worldwide spread led the World Health Organization to declare a global pandemic (World Health Organization [WHO], 2020).

COVID-19 caused three major clinical scenarios: mild illness with upper respiratory tract presenting symptoms, non-life-threatening pneumonia and severe pneumonia with acute respiratory distress syndrome. The case fatality ratio is however still difficult to estimate (Heymann & Shindo, 2020): As a matter of fact, the reported case fatality rates across countries are very heterogeneous (Lazzerini & Putoto, 2020). This coronavirus spreads rapidly from person to person. In order to detect and contain the novel coronavirus, China adopted intensive control methods with a combination of public health measures and mitigation activities, such as the suspension of public gathering, closure of schools and universities, remote working, social distancing, home isolation and closure of non-essential commercial activities. The health monitoring of symptomatic individuals was supported by telephone or online health consultations to avoid any gathering in hospitals or in medical offices. This outbreak placed China under mass quarantine, a strategy that has then been followed by the all countries around the world affected by the virus, with Italy being among the first.

These mitigation activities designed to interrupt human-to-human transmission have radically changed daily life by imposing strict restrictions to individual's social and working life. These measures seemed to have had a positive side effect in terms of CO_2 reductions as a result of the decreased road traffic (mostly in Italy) and reduced industrial production, which registered a decrease of between 15% and 40% in emissions across key industrial sectors in China. This is likely to have wiped out a quarter or more of the country's CO_2 emissions (Carbon Brief Homepage, 2020).

The non-linear and non-causal relation between the pandemic and the reduced pollution spontaneously stimulated people's attention to debate on the subject in order to attribute a meaning to the phenomenon.

Here, we aim to analyse and comment on recent events concerning the COVID-19 pandemic from an environmental systemic approach. We will focus on Gregory Bateson's hypothesis, according to which 'the minimum unit of survival is a flexible organism-in-its-environment'. From this perspective, the key to an organism's survival is the close circular relationship between the organisms and the environment, where the organism affects the environment and the environment affects the organism.

In the 'Steps to an Ecology of Mind', Bateson highlighted the epistemological error in Darwin's evolution theory. As a matter of fact, he criticizes natural selection and evolution theory as it considers the family line or the species/subspecies as the minimum unit of survival (Bateson, 1972).

The epistemological error recognized in evolution theory sees the survival of human beings as linked to the species. In this perspective, the human being is an agent capable of using the supposed supremacy vis-à-vis environment as a power to exert and act upon it, instead of considering him as a part of a larger system. Darwin's epistemology is based on the idea of 'self', where human beings see themselves connected with the environment in a 'human versus environment' dichotomy only.

This idea is confirmed by the tendency to consider the humans as being provided with a purposive or linear consciousness (in terms of an organ of purposive agency) that gives the illusion of acting on the environment according to linear cause-and-effect relationships. In doing so, humans ignore the broader relationships that connect them and their actions with the environment, preventing them from grasping the characteristics of unity and inseparability of the biological world (Guddemi, 2011). They are probably able to see the consequences of their original actions, but they are most likely unable to anticipate and see that such consequences have other predictable consequences that require coherent, often corrective, actions in an iterative circular process (Mazzocco et al., 2013). This often leads people to the illusion of control over their behaviours and consequences and to underestimate the personal risk of adverse events impeding the adoption of preventive behaviours (Masiero et al., 2018). '... if an organism or aggregate of organisms sets to work with a focus on its own survival and thinks that is the way to select its adaptive moves, its "progress" ends up with a destroyed environment. If the organism ends up destroying its environment, it has in fact destroyed itself. And we may very easily see this process carried to its ultimate reduction ad absurdum in the next twenty years. The unit of survival is not the breeding organism, or the family line, or the society. And today a further correction of the unit is necessary. The flexible environment must also be included along with the flexible organism because, as I have already said, the organism which destroys its environment destroys itself. The unit of survival is a flexible organism-in-its-environment.' (Bateson, 1972, pp. 457–458). Such a process, observed in the human-environment relationship, can also be used to observe the virus in its environment. In other words, the phenomenon is clearly visible if we consider human beings as the environment that allows viruses to survive. The more lethal the virus is, the faster it will become extinct. To survive, it must mutate to be more contagious but less deadly. It consistently evolves to evade the host immune system with synonymous mutations that are the so-called positive selection (Kim et al., 2020). In this way, the virus needs to preserve its environment (the hosting organism) in order to survive, defining in such a way a unit of survival.

What Bateson proposed is an epistemology that considers the units of evolution, from protoplasmic aggregates to family structures, as a part of a system instead of a portion against the surrounding environment. This idea deals with the need of changing the focus from parts to wholes and from seeing things to seeing patterns. All the biological and evolving systems (from viruses to individual organisms, animals, human societies and ecosystems) are made up of multiple interconnected relationships, consisting of complex cybernetic networks, and characterized by specific formal characteristics (Bateson, 1972). These characteristics include a set of positive and negative feedback loops: The positive feedback happens when a message activates responses that amplify the movement of a system in the same direction. The negative feedback refers to self-maintaining or self-regulating chains of events. Bateson used the term 'homeostatic' as a synonym of this kind of negative feedback. The whole world-system therefore behaves like a self-correcting system, with a structural tendency to achieve the maintenance of a balance.

Already by the 1970s, Bateson considered many catastrophic dangers, from insecticides to pollution, atomic fallout and the melting of glaciers, as consequences of this epistemological error. The same dangers will cause more serious consequences in the next twenty years, threatening man and his ecological systems.

How can Bateson's ideas have resonance today while we are dealing with COVID-19? The effects of the current pandemic, that is putting at risk human survival, global economic systems and the public health systems, could

be an opportunity to stop and try to understand the meaning of 'survival': 'when we stop talking about the survival of something bounded by the skin and start to think of the survival of the system of ideas in a circuit' (Bateson, 1972).

In this perspective, we need to consider both the environment and human being as parts of a larger system. As the general theory of systems states, a system is as an 'integrated whole whose essential properties arise from the relationships between its parts', which are in mutual interrelation with each other (Capra, 1996). Thus, any change in one of these parts causes a change to all parts and in the whole system that, consequently, acts in order to restore a balance. This self-regulating process reflects the circular causality, a property of the complex systems that seems to be neglected by the majority. As argued above, the human being sometimes behaves according to linear cause-and-effect relationships, under the influence of conscious purpose (Bateson, 1972). This attitude has probably stressed the environment causing an ecological crisis or, in other terms, causing a disequilibrium in the system. One example is represented by global pollution, one of the world's largest health and environmental problems, which is strictly linked to human activities.

The current pandemic and the related lockdown have had multiple effects on the environment. For example, the reduction of the CO_2 emissions in all the affected countries; wild animals that were previously hiding from the civil world, now decided to come out and walk undisturbed in the lockdown 'abandoned' streets. Likewise, the environment has different effects on the virus' diffusion. Research has shown that certain geographic contexts offer opportunities for viruses, like coronaviruses, to spill over (e.g., modes of livestock rearing, forest encroachment and urban growth). Multiple features of the urban world are relevant to sustain the contagious transmission that can produce wide-reaching diffusion. For instance, many cities are densely populated, providing multiple human hosts susceptible to a novel pathogen and the airborne pollution probably act as a carrier of COVID-19 (Vanwambeke et al., 2020). On the other hand, social distancing recommendations lead people to prefer private transportation, with an increase in pollution that in turn may contribute to contagion. Taking into account these connections, the new coronavirus has provided us with chance to see otherwise invisible or obscured relational phenomena. Within this perspective, the strict relationship between humans and the environment becomes more clear if we look at the human–virus relationship as fractal of human–environmental relationship, in which the human is both the 'environment' and the 'host'. One might consider the virus as a part of a particular systemic stress acting on the larger human and environment system. This kind of stress relies on the ability of the system to work towards the mutual adjustment and continued flexibility of the interacting organisms engaged in it (Bateson, 1979).

Certainly, the consequences of humans' actions were evident and tangible to everybody now that such actions have stopped. The provocative question could be whether such knowledge would be maintained after the COVID-19 emergency ends, and if it would produce more awareness on the cascading effects of the human–environment interaction.

Human history seems to provide a negative response to such a question. Also, the current evolution of the pandemic in its several waves, the spread of the virus' mutations, and the humans' reactions to such evolution are suggesting that the horizon of our learning and knowledge is very short. Maybe more effort should be made to train individuals in learning iterative-like reasoning (Mazzocco et al., 2013), in order to eventually improve their ability to anticipate and integrate the consequences of their own actions in the problem representation built before the very first action.

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How to cite this article: Pettini, G., & Mazzocco, K. (2021). What a pandemic can say about human–environment relationship. *Systems Research and Behavioral Science*, 1–4. https://doi.org/10.1002/sres.2803