

# Applying Complexity Theory to the Coronavirus Crisis

Written by Faies Jafar

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FAIES JAFAR, APR 18 2020

In 1963, Edward Lorenz introduced his butterfly hypothesis. He stated, "a butterfly flaps its wing and sets molecules of air in motion, which would move other molecules of air, in turn moving more molecules of air eventually capable of starting a hurricane on the other side of the planet." Replacing the butterfly flaps with the transmission of COVID-19, scholars and intellectuals can then understand coronavirus/COVID-19's incredible diffusion worldwide in a particular way. Complexity theory has a specific place for the butterfly phenomenon. The theory explains that the world ontology is characterized by a system or a set of known and unknown numbers of systems and other components. These systems constantly evolve and are very sensitive to the initial conditions which are themselves subjected to persistent shifting. The butterfly effect takes different turns and changes its quantitative impact and the quality of the system behavior which moves from one level into others.

The study of complexity theory necessitates the engagement of many disciplines, and in certain cases, other theories such as chaos theory. Chaos Theory explains the system that is on the verge of entering a disorder status. The chaotic complex system is dynamic and behaves nonlinearly. What makes it different from non-dynamic nonlinear systems is that the initial conditions themselves keep changing when one cycle of feedback loops ends and a new one emerges. This simply means that prediction in such system, and not to mention modelling, is very difficult, if not impossible.

The international political system is qualified to be another complex one. It consists of many known and unknown influencing factors with formal and informal institutions constantly emerging, and with many political domains. For example, Globalization, a multifaceted phenomenon, adds to the world system complexity by narrowing the paths of communications and compressing many political spheres. In such a realm, local (at state level) problems become global since their impact is not limited to a particular state boundary. The butterfly effects, and based on empirical evidence, add a new epistemology and ontology whereby the impact does not (only) transfer from one place into others but also emerges and evolves into new forms and into unprecedented levels. Some of these forms may be of less importance at a particular time; some may be beyond the human awareness and others may generate noticeable levels of discourses and actions. Among those actions: politics among nations.

The diffusion and impact of the COVID-19 crisis materializes this point and provides a clear example as how to apply complexity theory in International relations (IR). The virus emerged in Wuhan, (initial condition) capital city of the Hubei province and was traced to a seafood market (another initial condition). The next initial condition can be the subjective choice of a particular animal (for eating purpose) by individuals: this is a micro-level behavior. Such a choice caused, in isolation of the consciousness of individuals, the transfer of the virus from animal to human.

The extensive spread of the virus worldwide then became a fact; it respected no borders. Figures published by the Chinese government in January and February 2020 of the scale of new cases of infections and deaths put the world mainly in a 'stay tuned' position until governments initiated action when cases arrived on their doorstep. Weeks later, the virus that is suspected to have emerged in China, evolved into a worldwide crisis that countries such as Italy, Spain and then the USA recorded non-comparable figures of casualties to those announced by Chinese authorities. This is (again) a materialization of the butterfly effect.

Worldwide, countries began sharing information about the upcoming tsunami of the Covid-19 virus. Political analysis

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and politicians asked many questions and received less answers. Discourses then took another turn by the heated exchange and accusations of the source, cause and the spread of the virus. For instance, American intelligence community concluded that Beijing obscured the “extent of the coronavirus outbreak in its country,” while China framed its disagreement with such allegations by clarifying that their country was “open and transparent.”

These are new initial conditions setting a new equilibrium. Figures of rapid spread of the virus in western countries brought the world on the edge of chaos. This is evident by frequent announcements by many state leaders exploring the possibilities of the diffusion and the losses beyond their states’ abilities, announcements of shortage in medical supplies, slowing in the economic cycle and shut down of airports among many other actions.

Approaching the verge of the chaos generated waves of new international relations. China engaged in health diplomacy by sending medical supplies and staff to many countries. The World Health Organization became the compass of the mainstream and the social media. News of potential vaccines/ treatments are received in a hopeful manner. Even protocols of hand shaking among leaders took on different forms. Unique tensions among countries emerged. Germany accused the US of “seizing thousands of protective face masks that Berlin authorities have already paid for,” and a similar war for masks erupted between France and Turkey.

To bring the world crisis under control, complexity theory introduces a unique concept: self-organization. A complex system is characterized by its ability of self-restoring when the system approaches a chaotic status. The content of this self-organizing phenomenon is not very well defined by scholars. As such, it opens the way for criticism on the basis of non-scientific interpretations. Self-organizing can be defined as set of mechanisms developed subjectively (actions taken by individuals, institutions, governments, known and unknown agencies, states etc.) and objectively (environmental feedback, informal actions, coincident, group effects of known and unknown agencies, unknown historical reasons etc.). Complex interdependence and interactions among the system’s parts develops into a spontaneous emergence of order which plays the main role in bringing the status into an orderly fashion. The latter will have new characteristics that make it distinct from the previous orderly phase: this is new equilibrium.

Scholars are more concerned about subjected factors in restoring the semi-chaotic status. This is because it might be possible to measure impacts of measures taken by powerful agencies, for instance, policy responses and the ability of studying qualitative changes – such as public opinion. Therefore, subjective factors influencing self-organizing mechanisms evolve into politics. There is no guarantee that particular actions taken by one state will not be in conflict with the interest of other states. In some cases, actions may require the cooperation as one state (alone) may not be able to implement their policy. Both possibilities fall in the heart of IR studies.

Although complexity theory consists of other concepts not covered in this short piece, what was explored suggests that it can enrich the IR literature. The analysis suggests that the theory is compatible and is qualified to become a theoretical framework to explain, in this case, the diffusion and political impact of COVID-19 worldwide. However, due to the uniqueness of the term to IR, much more work within IR and beyond is needed in this area.

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## About the author:

**Faies Jafar** obtained his Ph.D. at the Institute of International Relations at the University of the West Indies, Trinidad and Tobago. His areas of interest are international relations theory, small states behavior, political psychology, chaos and complexity science, foreign policy analysis and Middle East politics. He is currently a Senior Instructor at the University of Trinidad and Tobago, Project Management and Civil Infrastructure Systems Group.