The Return to Multi-Causality

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Abstract

Causality is a concept, which needs to be considered carefully as the way we comprehend it has significant practical implications for the sciences as well as in business, and naturally to the way we understand and try to influence the emergence of the future. This article argues that although there might be some events that would usually be considered loose and separate with no "causal nexus" it is not necessary to give up the notion of causality as such. However, we do need to rehabilitate the conventional linear understanding of causality. For this rehabilitation, three perspectives – sensitiveness to initial conditions, circular causality and the emergence of final cause – provide a base for the theory.[1]

Keywords: cause and effect, emergence, future

A Brief History of Causality

In Western culture, one of the earliest and perhaps still the most influential analyses of causality was made by Aristotle, when he described four causes or four different aspects of cause as material (see the quote (1) below), efficient (2), formal (3) and final (4). Aristotle's analyses offer us a simple but robust metrics to reflect on the qualitative changes in Western thinking about causality over the centuries. The point of departure is presented in *Physics II 3* and is also found in the dictionary of concepts in the *Metaphysics (V 2)*:

> " 'Cause' means (1) that from which a thing comes into being, e.g. the bronze of the statue and the silver of the saucer, and the classes which include these. (2) The form or pattern, i.e. the formula or the essence, and the classes which include this and the parts of the formula. (3) That from which the change or the freedom from change first begins, e.g. the adviser is a cause of the action, and the father a cause of the child, and in general the maker a cause of the thing

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[1] This article summarizes the leading proposition of *The Third Lens. Multi-ontology Sense-making and Strategic Decision-making.* Further information at www.ashgate.com.

made and the change-producing of the changing. (4) The end, i.e. that for the sake of which a thing is, e.g. health is the cause of walking. ... all these are for the sake of the end, though they differ from one another in that some are instruments and others are actions. ... These then are practically all the senses in which causes are spoken of, and as they are spoken of in several senses it follows that there are several causes of the same thing..." (Ross, 1955, pp. 56-57).

It is important as LSE Professor Eve Mitleton-Kelly (2007) states to stress this last point; what is referred to as 'causes' is strictly speaking *four senses* in which we speak of cause, and the formal unity of these distinct meanings is established through the question 'why?'

During the seventeenth century efficient cause gained predominance, as Newtonian mechanics did not allow 'either objects in the external world or anticipated end-states to serve as intentional objects of desire and goals of action' (Juarrero, 2002, p. 21). This meant that both the future and the path to the future were comprehended as known for rational and competent actors who were capable of discovering the underlying cause and effect relationships and designing interventions to achieve goals. This approach is depicted in figure 1 with the visible layer.

Although Aristotle stresses the interdependence of causes, his approach was made redundant. More recently it has been pointed out that this interpretation was mistaken. Although an important element in his science, efficient cause was not the universal and supreme principle of Aristotle's physics. (Wieland, 1975).
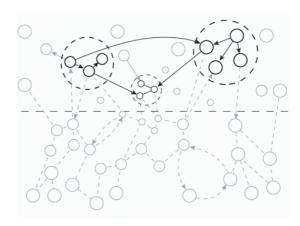

Figure 1. The two layers – the hidden (below) and the visible (above)

We propose that Western causality thinking has evolved from understanding causality in a true Aristotelian sense as multi-causality to the present situation where causality is most often understood in a Newtonian way as a single causality. However, we would like to suggest a return to multi-causality, based on the fact that many scholars and practitioners have begun to re-examine the notion of causality. In the natural and social sciences, complexity theory has become the source of a fresh perspective.

This article will explore that perspective and will attempt to link the concept of causality to current discussions on causality in complexity theory, particularly on sensitiveness to initial conditions, circular causality and the revitalization of final cause.

A Response to the Call

Even if the dominance of efficient cause has been growing in Western thinking since the 17th century, another very influential and useful position to reflect on causality was developed by David Hume. He argued that events are loose and separate, that there is no 'causal nexus' which ties cause and effect together. In other words we cannot track the causal chain from cause to effect because we cannot identify the mechanism by which the one is transformed into the other. We cannot track a direct chain between cause and effect in a complex system because there are too many non-linear interactions involved.

Professor Paul Cilliers (2007) from Stellenbosch University reminds us that events do not happen at random just because we cannot totally understand or predict them and this lack of understanding should not result in the dismissal of all forms of causality.

In this article we aim at creating a theoretically solid explanatory basis for the emergent properties of the system that are 'caused' by activity on the micro-level, and that micro-activities can be causally affected by macro-phenomena. In figure 1 these cause and effect linkages are depicted by the two layers.

The insights from sensitiveness to initial conditions, circular causality and the revitalization of final cause provide us with a promising way to make sense of the causal chains from cause and effects. They also provide new ways to describe how the future arises, evolves and is influenced:

1. In non-linear systems, and most of our every-day life systems are non-linear, a small change in one variable can spark changes in others. In non-linear systems, small changes or inputs of resources at strategic influence points can, if the system is sensitive to the change, propagate in space and time to bring about significant shifts in the overall system. (Lorenz, 1963; Nicolis & Prigogine, 1989).

2. A good point of departure to try to understand causality would be to think of a system as a rich network of interactions with many loops and feedback routes. Causality is at work in all the minute little interactions on the micro-level in the system. "The butterfly flapping its wings is not causing the hurricane, but it could be causing the butterfly to fly from flower A to flower B. This could result in flower B being pollinated, not flower A, given that a whole array of other causal and contingent relationships are also enacted." In a way, one could say that there is nothing which determines the behaviour of a complex system other than lots of small causes interacting all the time. Causality does not work in a linear way but in loops and circles. (Cilliers, 2007).

3. Alicia Juarrero (2002) makes sense of the idea of final cause as the object of desire. She describes how a gazelle becomes a final cause when it is perceived by a lion as food and hence as an object of desire. The point made by Juarrero

is that 'Awareness (intentionally characterized) and the goal-directedness it supports are the hinges connecting the inside and the outside. ... By positing something outside the organism as final cause or object of desire of voluntary behaviour, Aristotle effectively embeds the organism in the environment. An organism's internal state is dependent on something outside it.'
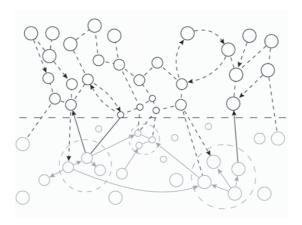

Figure 2. The two layers – the hidden (above) and the visible (below)

It has been stated on several occasions (e.g. Krems, 1995; Turkle, 1997; Lundberg, 2000) that a rich mental toolbox with varying levels of abstraction is a major source of organizational flexibility and effectiveness. We argue that more emphasis may be placed on making sense of the emergent processes that are not clear and visible, and trying to make clear connections between the visible and hidden layers.

We suggest that the ability to reflect on causality and to gain an understanding of how things emerge may provide the most significant source of flexibility and effectiveness that actually guides and influences the emergent properties of the strategic landscape, i.e. it lies in fact above the visible layer, not below it, see figure 2.

Since the emergent properties of the system are 'caused' by activity on the micro-level, and such micro-activities can be causally affected by macro-phenomena, the notion of level is only suggestive and should be used with care.

Concluding Perspectives

The recent legacy of efficient cause being the primary focus of science and economics can be considered here as erroneous and misleading. Its dominance of our thinking is also one of the reasons why many real-world problems appear intractable and are difficult to resolve. The difficulty arises when only single causes are sought, even though, such problems arise from the interaction of multiple, underlying, and inter-related causes. (Kaminska-Labbe et al., 2006; Mitleton-Kelly, 2007).

Despite our inability to track down causality completely this does not imply that we cannot look for causal patterns, even if these are difficult to conceptualise. We can still attempt to search for patterns if we acknowledge some role for causality in the basic scheme of things. This means that some of the causal patterns may be quite persistent and thus something which can be both modeled and understood, albeit in a limited way.

In this article we suggest that sensitiveness to initial conditions could be the theory-constitutive metaphor that would permit us to rethink the underlying logic of change and to reconceptualise cause. More than imagining and presenting the future as an extrapolation of the present, we should be looking for approaches that allow us to see and influence the future by responding to and influencing what is emerging. The challenge, as well as potential source of inspiration, for sense-making and strategic decision-making is how to identify and influence our systems' initial conditions as they are emerging. Preparing ourselves for coming changes by identifying them; and shaping the future to our advantage by influencing them is foresight. (Aaltonen & Sanders, 2006).

In addition circular causality can be used to model causal patterns. Activities on the micro-level give rise to behaviour we can identify on a larger scale or macro-level. The general term used for this phenomenon is 'emergence'. Consciousness is an emergent property of the brain (and the rest of the body), inflation is an emergent property of an economic system, and meaning is an emergent property of language. Emergent properties are not, however, merely effects, there is multi-way communication. Phenomena on the macro-level can affect activity on the micro-level. Causality does not simply work from micro-causes to macro-effects. There is also a top-down process at work which means that causality in complex systems is circular.

And finally the positing something outside the organism as a final cause or the object of desire of voluntary behaviour embeds the organism in the environment and revitalizes the final cause. This means that people's goal-seeking activities become sensitive to final conditions. Small variations in the occurrence and type of response received from larger environments can and should dramatically influence how and which contingencies are reframed as the context of this response in the agglomerate. (Barth, 1992). This way final cause becomes a target formed from continuous reflection.

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