

# Causality: Contemporary Approaches

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From the dawn of philosophy, with pre-Socratic thinkers, to the present day, the concept of causality continues to captivate and divide philosophers in all areas. On the one hand, causality is captivating as it is a fundamental concept for understanding the world and its dynamism. On the other hand, it is a source of discord, since it is a misconception and therefore can be understood and thought of in different ways, which leads to contradictory visions about reality. Because of these two facets, the contemporary philosophical debate about the nature of causality is fragmented into a large number of positions, each of which implies a different worldview. This fragmentation and this variety can be seen in three distinct facets: its basic conception, its ontological status, and the impact of science on causal understanding.

The first strand concerns the divergence that exists around the basic conception of causality. In the Aristotelian-Thomist tradition, causality was understood by what we today call ontological dependence, that is, the idea that there is a general sense in which one thing is dependent on another, or that one entity depends metaphysically on another to be what it is and how it is. This dependence was read in two distinct ways: the extrinsic (final cause and efficient cause) and the intrinsic (material cause and formal cause).

Currently, in the wake of Galileo and David Hume, causality tends to be seen as a strict relationship of conjugation of events, where the event-cause is temporally prior to the event-effect. In this sense, D. Hume described causality as exemplifying an explicit set of mere regularities. More recently, this model was renewed by J. L. Mackie and D. Davidson who no longer describe regularities as explicit instances (such as Hume), but rather as implicit relations – between "compatible" properties.

In an opposite sense, Armstrong, while agreeing with Mackie and Davidson that the nature of the causal relationship must be implicit, refuses to describe causality as an example of contingent regularities. Armstrong prefers to describe causality as "necessary" because of the permanent character of "repeatability" that causal relationships seem to exhibit under equal conditions. Because of this, this author suggests that causality should be understood as a manifestation of implicit laws existing in the relationship between objects and their properties.

More recently, D. Lewis proposed an alternative way to bridge the gap between Armstrong's "necessary" vision and the neo-human "contingent" vision. Based on his ontology of the plurality of worlds, Lewis described causality in terms of counterfactual dependence. Thus, on the one hand, there is causal need when a cause-effect event necessarily occurs in all possible worlds and, on the other hand, there is causal contingency when a cause-effect event can occur in a possible world, but not in all possible worlds.

The second aspect of the fragmentation of causality concerns the ontological status attributed to it. Some of the authors – the defenders of regularities – think that causality is a not primitive characteristic of the World, a category that should be understood in terms of other more fundamental properties. In another sense, M. Tooley and G. E. Anscombe consider that causality is not only the "cement" of the Universe, but is the very foundation of reality,

in such a way that the most fundamental level of the real cannot be thought of without the recourse to primitive causality.

Others, like S. Mumford, prefer to categorize ontologically causality according to "powers", and the dispositions of reality can solve the old dichotomies introduced by the Humean regularities. The models of regularities describe the World as a set of autonomous entities, in which regularities would be the "cement" that would unite entities through external and contingent relations. In the opposite sense, the metaphysics of powers extends the domain of causality, and causal relations can be described as internal relations of Nature and necessary for the dynamism of the Cosmos. Therefore, while Hume's followers conceptualized causal relations as asymmetric relations, ordered by temporal priority, the defenders of dispositionalism can support causal symmetry – typical of the Aristotelian-Tomist tradition – without needing temporal priority to order and categorize the internal relations of the World.

The third aspect of the fragmentation of causality concerns the impact that advances in science have brought to the understanding and description of causality. For example, Newtonian mechanics postulates an instantaneous action at a distance, while the theory of relativity rejects this postulate. In another sense, a certain Laplace view suggests that the foundations of causality are materially deterministic, while certain interpretations of quantum mechanics seem to suggest that the fundamental processes of the physical world are indeterministic in their essence. Also, the contribution of mathematics in this field, namely through the study of probabilities and statistics, has brought new perspectives to the debate on causality. The advances in science have also brought to the center of the debate the classic problems of mereology. On the one hand, supporters of physicalism and naturalism argue that causality should be understood according to a reductionist model, that is, a model in which the causes acting on the "whole" are simply the sum of the effects of its "parts". On the other hand, opponents of causal reductionism argue that the "whole" is greater than the sum of its "parts". Among the opponents of reductionism are the defenders of emergentism, for whom new properties and causal relationships emerge at the higher levels, even though they do not interact with them at the lower levels. This idea is known as "top-down causality".

In short, although there is a great fragmentation in the philosophical debate about the nature of causality, the interest about this concept and the will to create bridges remains a constant. In this sense, and with the aim of stimulating the debate on causality and thus advancing our understanding of the World and its dynamism, we encourage the submission of original articles, namely around the following points:

- Different Conceptions of Causality.
- The Relationship between Metaphysics and Causality.
- The Relationship between Science and Causality.
- The Relationship between Philosophical Disciplines and Causality.
- Specific applications of causality (Problem of Freedom, Problem of Symmetry/Asymmetry, Problem of Causal Priority, Problem of Causal Direction, Problem of Causal Mechanisms, Problem of Causal Models).
- Emergentism and top-down causality
- Metaphysical Grounding
- Dispositionalism and causal powers

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