

Constitutive counterfactuals and explanation

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All explanations are not causal. There are also explanations that Wesley Salmon calls constitutive explanations. Constitutive explanations explain properties of the system by appealing to the properties of its parts and their organization. Unfortunately, both philosophy of science and cognitive psychology have mostly neglected these explanations despite their importance, for example in the neurosciences. Causation and constitution are different sorts of metaphysical relations. Causation deals with processes and events, whereas constitution deals with properties and objects. Causal processes take time, but the relations of constitution are synchronic. Despite these differences causation and constitution are closely related: typically the *explananda* of constitutive explanations are causal capacities of the whole.

Recent theories of causal explanation have emphasized the importance of counterfactual information. Counterfactual considerations play a crucial role in the determination of explanatory relevance. Following James Woodward, explanation-seeking questions of causal inquiry can be characterized as *what-if-things-had-been-different* –questions: we are interested in factors that made the difference for the outcome. The idea of counterfactual relevance goes nicely with the idea that causal explanation is contrastive: we explain why *a* happened rather than *b*. In this paper I will consider whether similar ideas could be applied to the case of constitutive explanation.

I will start by comparing causal and constitutive counterfactuals and by arguing that theories of explanation based on counterfactuals face similar challenges in both cases. In the case of causal counterfactuals the challenges are posed by alternative causes, overdetermination, negative causes, and preventions. Analogical challenges are faced by constitutive counterfactuals: multiple realization, systemic redundancy, missing parts or organization, and blocking. We want to have asymmetry of dependence in both cases: backtracking counterfactuals are something to be ruled out. Furthermore, analogical distinction between contribution and overall contribution can be made both cases. These similarities suggest that we can use the same ideas about explanation to make sense of both kinds of explanations despite the metaphysical difference.

However, there is one crucial difference: manipulation. In the case of causation the idea of intervention can be used to characterize the asymmetry of the causal relation and to justify the direction of explanation. Similar idea does not apply in the case of constitution. Intervention on parts of the system does change the properties of the system, but this intervention is also an intervention on the properties of the system. This is due to the metaphysical difference between causation and constitution: the system is made of its parts, so they cannot be treated as distinct existences as in the case of causation. In his recent book *Explaining the Brain* (2007) Carl Craver suggests that constitutive explanatory relevance is determined by the mutual manipulability. I will argue that his account will not work. Craver's idea of symmetrical relevance makes it impossible to see why we explain the properties of the system by properties of its parts rather than other way around. I argue that the asymmetry of explanation is based on asymmetry of existence: the parts can exist independently of the system, but the system cannot exist independently of its parts. Furthermore, the explanatory relevance follows the explanatory asymmetry, so this does not make it different from causal explanatory relevance.

In the end I argue that constitutive explanation is an important topic for cognitive psychologists interested in explanatory reasoning and counterfactuals and that the results of these studies could help in developing a philosophical account of constitutive explanation.