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# Causalidad

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<https://arxiv.org/abs/1612.09592>

How Nature Solves Problems Through Computation, Jessica Flack

## Problemas conceptuales

“Lack of clarity about underlying philosophical commitments leads to lack of clarity at other levels of analysis. Here I show that the literature on so-called 'causal mechanisms' is rife with conceptual problems, stemming from insufficient rigor with respect to the metaphysics of causation”.

— [Causal Mechanisms and the Philosophy of Causation](#), Ruth Groff

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## Explicación y Causalidad

“Michael Strevens offers an account of causal explanation according to which explanatory practice is shaped by counterbalanced commitments to representing causal influence and abstracting away from overly specific details. In this paper, I challenge a key feature of that account. I argue that what Strevens calls explanatory frameworks figure prominently in explanatory practice because they actually improve explanations. This suggestion is simple but has far-reaching implications. It affects the status of explanations that cite multiply realizable properties; changes the explanatory role of causal factors with small effect; and undermines Strevens' titular explanatory virtue, depth. This results in greater coherence with explanatory practice and accords with the emphasis that Strevens places on explanatory patterns. Ultimately, my suggestion preserves a tight connection between

explanation and the creation of understanding by taking into account explanations' role in communication".

— Explanation and Understanding, <https://link.springer.com/article/10.1007/s13194-010-0002-6>

## Causalidad y leyes naturales

"dificultades lógicas siempre que intentamos definir el concepto de causalidad como un enunciado que afirma que existen leyes naturales" (Schlick 2002, p. 69).

- En el libro (comprado en eBook) *From Matter to Life: Information and Causality*, se busca explicar la emergencia de complejidad sin apelar a leyes naturales, mediante la **constructor theory** (ver más adelante)
- En sentido contrario piensa Richard Swinburne, editor de [Space, Time and Causality](#), que sugiere que la existencia de leyes naturales y el hecho de que de la aplicación de tales leyes surja la evolución hasta los seres humanos y la aparición de la consciencia, hace posible considerar la existencia de Dios como probable.

## Teoría del Constructor (Constructor Theory)

Constructor Theory of Life. <https://arxiv.org/abs/1407.0681v2>

*"Constructor theory (Deutsch, 2013) is a new mode of explanation in fundamental physics, intended to improve on the currently most fundamental theories of physics and explain more of physical reality. Its central idea is to formulate all laws of physics as statements about what transformations are possible, what are impossible, and why. This is a sharp departure from what I call the prevailing conception of fundamental physics, which formulates its statements exclusively in terms of predictions given the initial conditions and the laws of motion. For instance, the prevailing conception of fundamental physics aims at predicting where a comet goes, given its initial conditions and the laws of motion of the universe; instead, in constructor theory the fundamental statements are about where the comet could be made to go, with given resources, under the dynamical laws."*

*"This constructor-theoretic, task-based formulation of science makes new conceptual tools available in fundamental physics, which resort to counterfactual statements (i.e., about possible and impossible tasks). This has the potential to incorporate exactly into fundamental physics notions that have so far been considered as highly approximate and emergent – such as information and life".*

*"The constructor theory of information (Deutsch and Marletto, 2015) has accommodated the notion of (classical) information within fundamental physics and has unified it exactly with what currently goes under the name of 'quantum information' – the kind of information that is deemed to be instantiated in quantum systems. This theory provides the conceptual basis for the constructor theory of life (Marletto, 2015a). Here constructor theory is applied to produce the explanation of how certain physical transformations that are fundamental to the theory of evolution by natural selection – such as accurate replication and self-reproduction – are compatible with laws of physics that do not contain the design of biological adaptation. It also shows what features such laws must have for this to be possible: in short, they must allow the existence of information media, as rigorously defined in the constructor theory of information".*

*"Before going into the details of these theories, one has to introduce the foundations of constructor*

theory. Constructor theory consists of ‘laws about laws’: its laws are principles – conjectured laws of nature, such as the principle of conservation of energy”.

— [From Matter to Life](#)

Más información:

- <http://mathrising.com/?p=1062>
- [https://www.ted.com/talks/david\\_deutsch\\_a\\_new\\_way\\_to\\_explain\\_explanation](https://www.ted.com/talks/david_deutsch_a_new_way_to_explain_explanation)
- [https://www.edge.org/conversation/david\\_deutsch-constructor-theory](https://www.edge.org/conversation/david_deutsch-constructor-theory)
- <https://www.edge.org/conversation/constructor-theory>
- <https://www.edge.org/conversation/formulating-science-in-terms-of-possible-and-impossible-tasks>
- [https://www.edge.org/conversation/chiara\\_marletto-chiara-marletto-on-extinction](https://www.edge.org/conversation/chiara_marletto-chiara-marletto-on-extinction)

## constructor theory of information

*“We present a theory of information expressed solely in terms of which transformations of physical systems are possible and which are impossible - i.e. in constructor-theoretic terms. Although it includes conjectured laws of physics that are directly about information, independently of the details of particular physical instantiations, it does not regard information as an a priori mathematical or logical concept, but as something whose nature and properties are determined by the laws of physics alone. It does not suffer from the circularity at the foundations of existing information theory (namely that information and distinguishability are each defined in terms of the other). It explains the relationship between classical and quantum information, and reveals the single, constructor-theoretic property underlying the most distinctive phenomena associated with the latter, including the lack of in-principle distinguishability of some states, the impossibility of cloning, the existence of pairs of variables that cannot simultaneously have sharp values, the fact that measurement processes can be both deterministic and unpredictable, the irreducible perturbation caused by measurement, and entanglement (locally inaccessible information)”.*

— Constructor Theory of Information (PDF Download Available). Available from: [https://www.researchgate.net/publication/262988240\\_Constructor\\_Theory\\_of\\_Information](https://www.researchgate.net/publication/262988240_Constructor_Theory_of_Information) [accessed Jul 6, 2017].

— <http://rspa.royalsocietypublishing.org/content/471/2174/20140540>

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