Structural Realism and Causation: An Unhappy Marriage?

It has recently been objected that structural realism, in its various guises, is unable to adequately account for causal phenomena (see, for example, Psillos 2006). In this talk, I consider whether structural realism has the resources to address this objection.

One influential approach to structural realism conceives of relations in a purely extensional manner. That is, an *n*-place relation is simply identified by a set of ordered *n*-tuples. Does this conception of relations allow its user to distinguish between causal and non-causal relations? Suppose we want to find out whether *a* causes *b* or is merely correlated with it. If we endorse the manipulability account of causation (see, for example, Woodward 2003) we say something like this: *a* causes *b* just in case a direct manipulation of *a* consistently brings about changes in *b*. Among other things, this eliminates the case of a distinct common cause *c* for both *a* and *b* (so long as there is no over-determination of *a* by both our direct manipulation and *c*). For if *c* is the common cause of *a* and *b*, and indeed the *sole* reason why *a* and *b* are correlated, then directly manipulating *a* will not consistently bring about changes in *b*. To cite a well-worn example, manipulating a barometer does not consistently initiate or terminate a storm. Rather there is a common cause, namely atmospheric pressure, which brings about changes both in the barometer and in the weather.

An extensionally construed structural realism seems unable to tackle the differences between such phenomena. How could it, if it cashes out '*a* causes *b*' and '*a* is merely correlated with *b*' in terms of the same ordered pairs? One answer is with more extension, i.e. more relations. In the example above the case of a mere correlation is explained in terms of common cause *c*. Thus to express the relation '*a* is merely correlated with *b*' requires appeal to the relation '*c* causes *a* and *b*' (and the clause that nothing else causes *b*). But then how is this relation differentiated from '*c* is merely correlated with *a* and *b*'? We seem to be forced into a regress. Suppose we keep on adding extension until we include the entire network of relations in the universe. Have we thereby escaped the problem? It seems not, for the question still remains: how could we differentiate such a network of relations from an otherwise identical network where the relations are mere regularities?

I will consider three additional replies to the general problem of distinguishing between causal and non-causal relations. The first attempts to do so via the logico-mathematical properties of relations, e.g. '*a* causes *b*' is asymmetrical whereas '*a* is merely correlated with *b*' is symmetrical. The second 'reply' is more radical and involves abandoning the idea of there being causal relations. The third reply, recently mooted by Ladyman et al. (2008), opts for a shift to an intensional understanding of relations.

References:

Ladyman, J. et al. (2008) *Every Thing Must Go*: *Metaphysics Naturalised*, Oxford: Oxford University Press.

Psillos, S. (2006) 'The Structure, the Whole Structure and Nothing but the Structure?', *Philosophy of Science*, vol. 73(5): 560–570.

Woodward, J. (2003) *Making Things Happen*: *A Theory of Causal Explanation*. Oxford: Oxford University Press.