Causation in Biology: Stability, Specificity, and the Choice of Levels of Explanation

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Abstract

This paper attempts to elucidate three characteristics of causal relationships that are significant in biological contexts. Stability has to do with whether a causal relationship continues to hold under changes in background conditions. Proportionality has to do with whether changes in the state of the cause “line up” in the right way with changes in the state of the effect and with whether the cause and effect are characterized in a way that contains irrelevant detail. Specificity is connected both to David Lewis’ notion of “influence” and also with the extent to which a causal relation approximates to the ideal of one cause-one effect. Interrelations among these notions and their possible biological significance are also discussed.

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