

Representing Causation

Wolff, Phillip (2007) Representing Causation. In *[2007] Workshop: Causality, Mechanisms, and Psychology* (Pittsburgh, PA; 24 February, 2007).

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Abstract

The dynamics model, which is based on Talmy's (1988) theory of force dynamics, characterizes causation as a pattern of forces and a position vector. In contrast to counterfactual and probabilistic models, the dynamics model naturally distinguishes between different cause-related concepts and explains the induction of causal relationships from single observations. Support for the model is provided in experiments in which participants categorized 3D animations of realistically rendered objects with trajectories that were wholly determined by the force vectors entered into a physics simulator. Experiments 1-3 showed that causal judgments are based on several forces, not just one. Experiment 4 demonstrated that people compute the resultant of forces using a qualitative decision rule. Experiments 5 and 6 showed that a dynamics approach extends to the representation of social causation. Implications for the relationship between causation and time are discussed.

Keywords: causation, causal models, causal learning, knowledge structures, lexical semantics

Subjects: [General Issues: Causation](#)

Conferences and Volumes: [\[2007\] Workshop: Causality, Mechanisms, and Psychology \(Pittsburgh, PA; 24 February, 2007\)](#)

ID Code: 3126

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Deposited On: 05 January 2007

Additional Information: Causal Representation (in press). *Journal of Experimental Psychology: General*. To appear February 2007.