

# Causal perception is constrained by principles of Newtonian mechanics

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**Abstract:** Humans irresistibly perceive certain events as causal. We show, for the first time, that there is not one monolithic representation of causality in perception. Rather, there are multiple categories of causal events in perception, one of which is constrained by an approximation of a Newtonian mechanical principle: in an elastic collision, a struck object cannot move at more than double the speed of the object striking it. We show that adults are sensitive to causal (but not non-causal) events that violate this principle in a visual search task (Experiment 1), that this sensitivity is due to a categorical boundary and not the salience of this event (Experiment 2), and that the threshold for detecting these events approximates this Newtonian limit (Experiment 3). Finally, we argue that categorical boundaries are a core feature of causal perception, as they are present around the age at which causal perception first emerges (Experiment 4).