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May the Force be against you: Better sensitivity to speed changes opposite to gravity

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Abstract

Beyond seemingly lower-level features such as color and motion, visual perception also recovers properties that are more commonly associated with higher-level thought — as when an upwardly accelerating object is seen as self-propelled, and resisting the force of gravity. Past work has explored how speed changes drive the perception of physical forces, but might the reverse also be true? Does seeing a speed change as resisting the force of gravity make us more likely to notice it in the first place? In four experiments, observers were more sensitive to objects' accelerations when they moved upward (i.e. when those accelerations were opposite to gravity), and they were more sensitive to objects' decelerations when they moved downward (i.e. when those decelerations appeared as 'braking' against gravity). We conclude that the perception of physical forces is not merely an outcome of visual processing, but also determines the perception of other, seemingly lower-level, features of how objects move.