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Inferring the social meaning of objects with intuitive physics and Theory of Mind

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Abstract

Humans primarily communicate through words and gestures. In some cases, however, humans also communicate indirectly through objects, such as trafc cones or stanchion ropes. How does the human mind generate and interpret the social meaning of objects? Here we show that a computational model that uses commonsense physics and Theory of Mind spontaneously gives rise to the ability to communicate through objects. As predicted by our model, we show that people can infer the communicative meaning of novel objects by reasoning about the costs they impose, even in the absence of a pre-existing convention. Moreover, we show that people store the meaning of an object after a single exposure and recognize it in subsequent encounters. Our model sheds light on how humans bootstrap cognitive capacities that we share with other animals to give rise to uniquely-human cognition.