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Empirical Support for a Rate-Distortion Account of Pragmatic Reasoning

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Abstract

Iterated models of pragmatic reasoning, such as the Rational Speech Act model (RSA; Frank & Goodman, 2012), aim to explain how meaning is understood in context. We propose an optimal experiment design approach for teasing apart such models, in which contexts are optimized for differentiating model predictions in reference games. We use this approach to compare RSA with RD-RSA (Zaslavsky et al., 2020), a recent variant of RSA grounded in Rate-Distortion theory. First, we show that our optimal experiment design approach finds cases in which the two models yield qualitatively different predictions, in contrast to previous experimental settings for which these models generate similar predictions. Next, we test the models on newly collected experimental data using our optimal design. Our results show that in this experimental setting RD-RSA robustly outperforms the standard RSA model. This finding supports the idea that Rate-Distortion theory may characterize human pragmatic reasoning.