Modeling Judgment Errors in Naturalistic Numerical Estimation
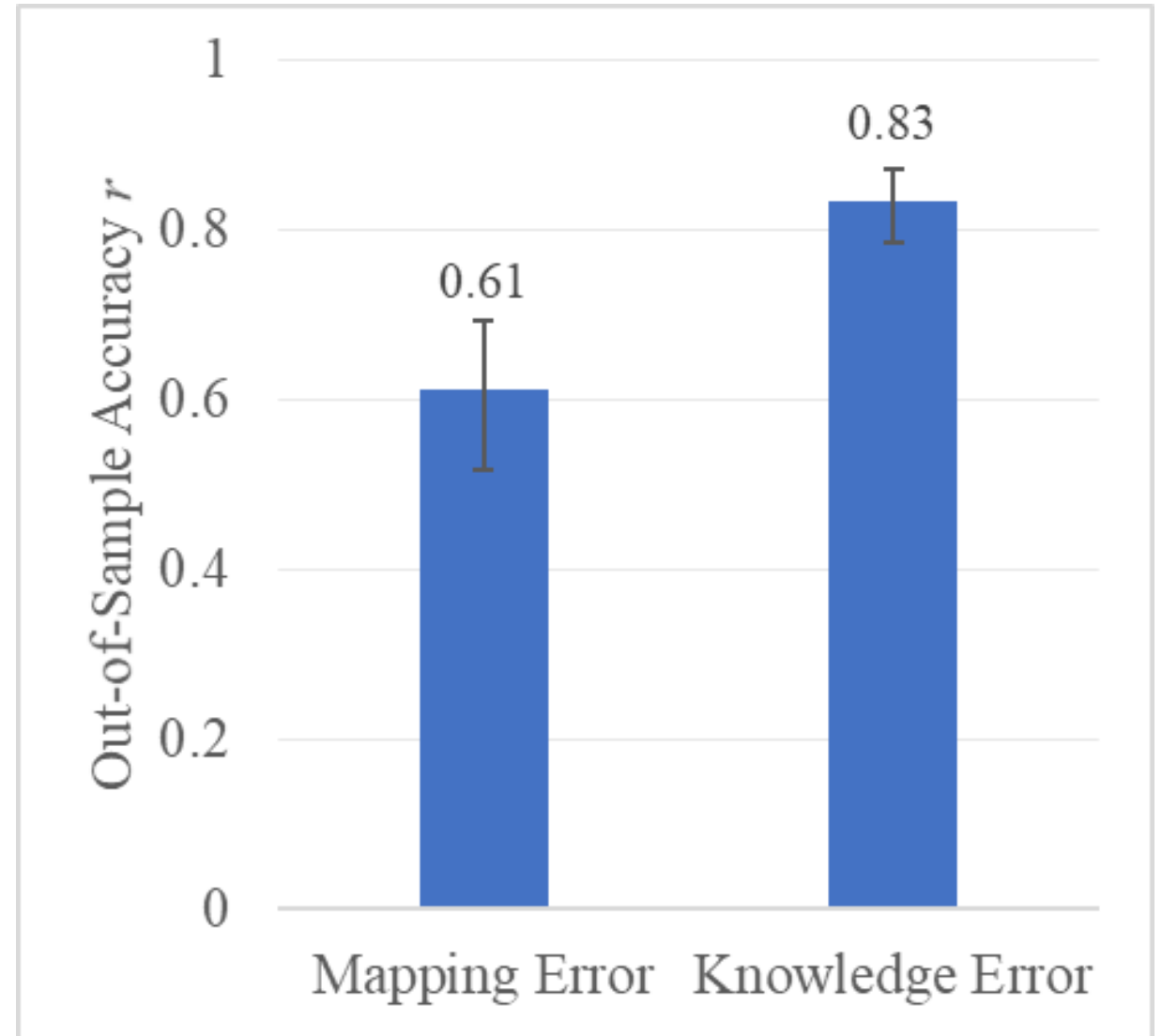
Wanling Zou, Sudeep Bhatia

Department of Psychology, University of Pennsylvania, PA, USA

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How many calories are in granola bars?

- Mapping error
  - Nonlinear mapping from true (z) to estimated values (y)
  - $y = a + bz + cz^2 + dz^3$

- Knowledge error
  - Incorrect weights ($\boldsymbol{w}$) on knowledge cues ($\boldsymbol{x}$)
  - $y = \boldsymbol{x} \cdot \boldsymbol{w}$
  - Knowledge cues: 300d word2vec vectors trained on word co-occurrence statistics in news articles

Concepts associated with high-calorie food

Concepts associated with low-calorie food

- All results were replicated with estimation of infant mortality rates

- Knowledge error model predicts participant estimates better than mapping error model and also identify associations that bias numerical estimation

- Text-based word vectors can serve as knowledge representations of naturalistic judgment targets

Thank you!

Full paper available
Email: wanlingz@sas.upenn.edu