Seeing it differently: The AmbigObj stimulus-set depicting ambiguous drawings of small-large and animate-inanimate object pairs

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Introduction

- Bottom-up models of the ventral stream are dominating the field of vision (e.g. Bashivan, Kar & DiCarlo, 2019)
- Top-down effects are understudied for traits such as animacy and real world size (Long, Yu & Konkle, 2018)
- Ambiguous drawings have the potential to isolate effects of image recognition from features → AmbigObj stimulus set

Methods

Stimuli:

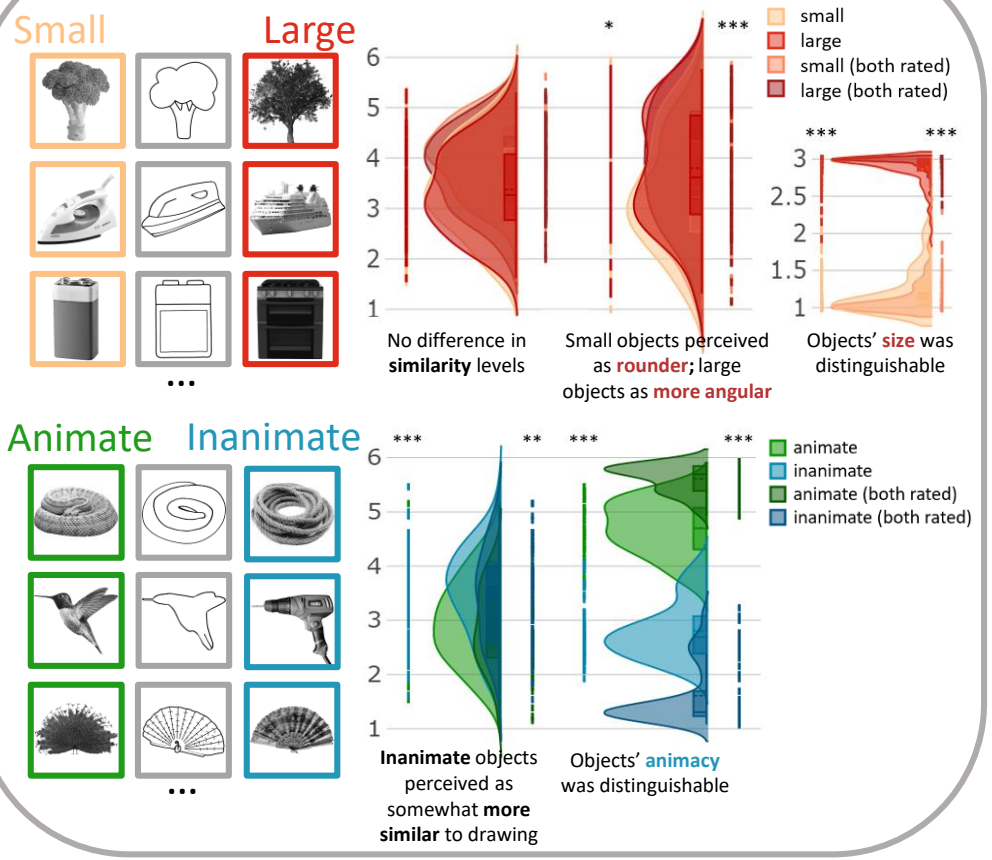
- 88 and 74 photographs of shape-matched object pairs with different real-world size and animacy
- Each pair is complemented by a customized ambiguous drawing, compatible with either categorical 'high'-level interpretation (e.g., either a broccoli or a tree)

Ratings:

- Participants rated the ambiguous drawings paired only with their respective small (n = 13) or large (n = 13) or animate (n = 13) or inanimate (n = 13) interpretation,
  or both interpretations at the same time (n = 13, respectively for size and animacy pairs).

- Dimensions:
  Perceived similarity of photograph and drawing (size and animacy pairs):
  1 = lowest; 6 = highest similarity level
  Perceived shape: 1 = round; 6 = angular
  Real-world size: 1 = smaller than a table lamp;
  3 = larger than a chair
  Animacy: 1 = not animate at all; 6 = very animate

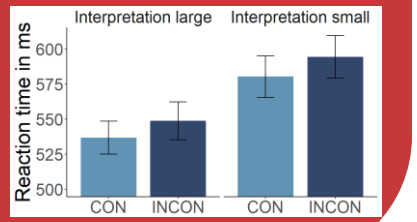
Stimuli & Ratings



Follow-up: Effect of learned interpretations on behavior

Two groups of observers completed an online **training** to interpret 36 drawings as either small (n = 28) or large objects (n = 30). We tested biases in an online **familiar-size Stroop task** ("indicate the smaller one of two images on the screen"; cf. Konkle and Oliva, 2012)

Observers were slower in incongruent trials, signifying opposite Stroop effects for identical drawings based on the learned interpretation, $F(1, 56) = 10.11$, $p = 0.002$.



Conclusion

- AmbigObj is well-controlled & can isolate recognition effects
- Ambiguity was more balanced for size compared to animacy stimuli
- Perceptual interpretation may be able to drive the familiar-size Stroop effect
- Future plans: lab-based replication study and fMRI to probe mapping onto ventral stream

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