Reality vs. Simplicity: The Effects of Real-World Objects on Attentional Selection

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Introduction

- To date, most object-based attention research has been conducted with simple geometric shapes, showing that objects guide attentional selection1,2.
- Simple rectangles are weak representations for the objects we encounter on a daily basis, possibly putting less pressure onto the attentional system as compared to real-world objects3,4.

Question

- Do objects with more complex features which contain high-level (semantic) information constrain attentional allocation?

Methods & Results

**Experiment 1**
Canonical Orientation: Same
- Complex real-world objects are grouped, reducing object contribution to attentional allocation4.

**Experiment 2**
Non-canonical Orientation: Same
- Real-world objects are grouped regardless of canonical orientation

**Experiment 3**
Canonical Orientation: Different
- Different images are not grouped, leading the attentional system to rely on objects3.

**Experiment 4**
Meaningful Relatedness
- High-level semantic relationships modulate object contribution to attention allocation

Summary

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<tr>
<th>Exp 1, Canonical Orientation, Same Objects:</th>
<th>Exp 2, Non-canonical Orientation, Same Objects:</th>
<th>Exp 3 &amp; 4, Canonical Orientation, Different Objects:</th>
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<td>Space-Based Effects</td>
<td>No Object-Based Effects</td>
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<td>Object-Based Effects for Unrelated Pairs</td>
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Discussion

- When using complex real-world objects, perceptual grouping4 can reduce reliance on object contribution to attentional allocation.
- Grouping is not restricted to perceptual similarity, and is extended to semantic relatedness; demonstrating that high-level information (semantics) constrains attentional allocation.
- When objects are perceptually and semantically dissimilar, the attentional system relies on object-based selection.

References: