

Disentangling shift direction, object orientation, and object selection yields a large, reliable metric of object-based attention

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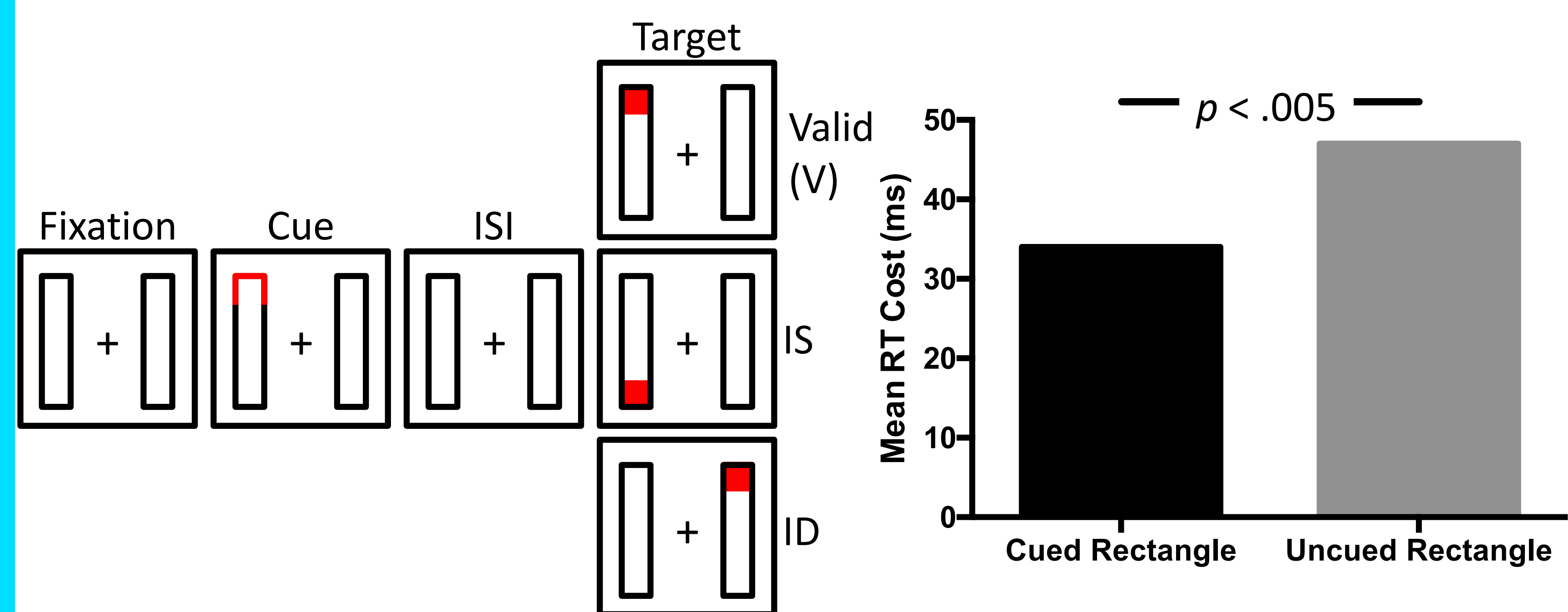
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Introduction

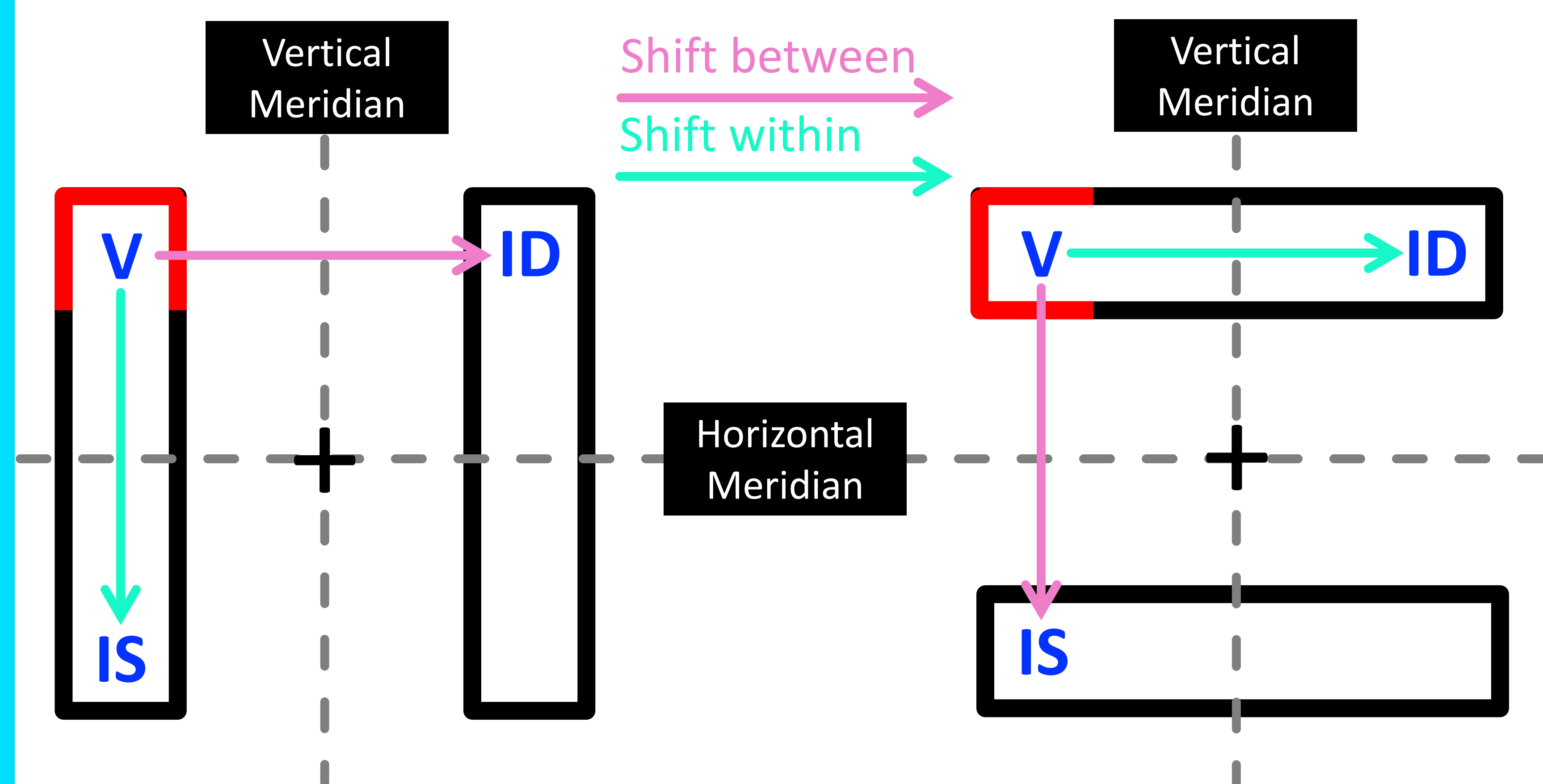
- Object-based attention (OBA) preferentially enhances visual information within boundaries of attended vs. unattended objects¹
- Double-rectangle cueing paradigm developed by Egly et al. (1994) exhibits enhanced performance at invalid-same (IS) vs. invalid-different (ID) location (approx. 13 ms), known as the **same-object advantage**¹



- Same-object advantage is small, inconsistent, and unreliable: studies have failed to show an effect^{2,3} or have found a **same-object cost**⁴⁻⁶
- Larger object-based effects (OBEs; i.e., same-object advantage) for horizontal objects vs. vertical objects, driven by few participants (15%)⁶

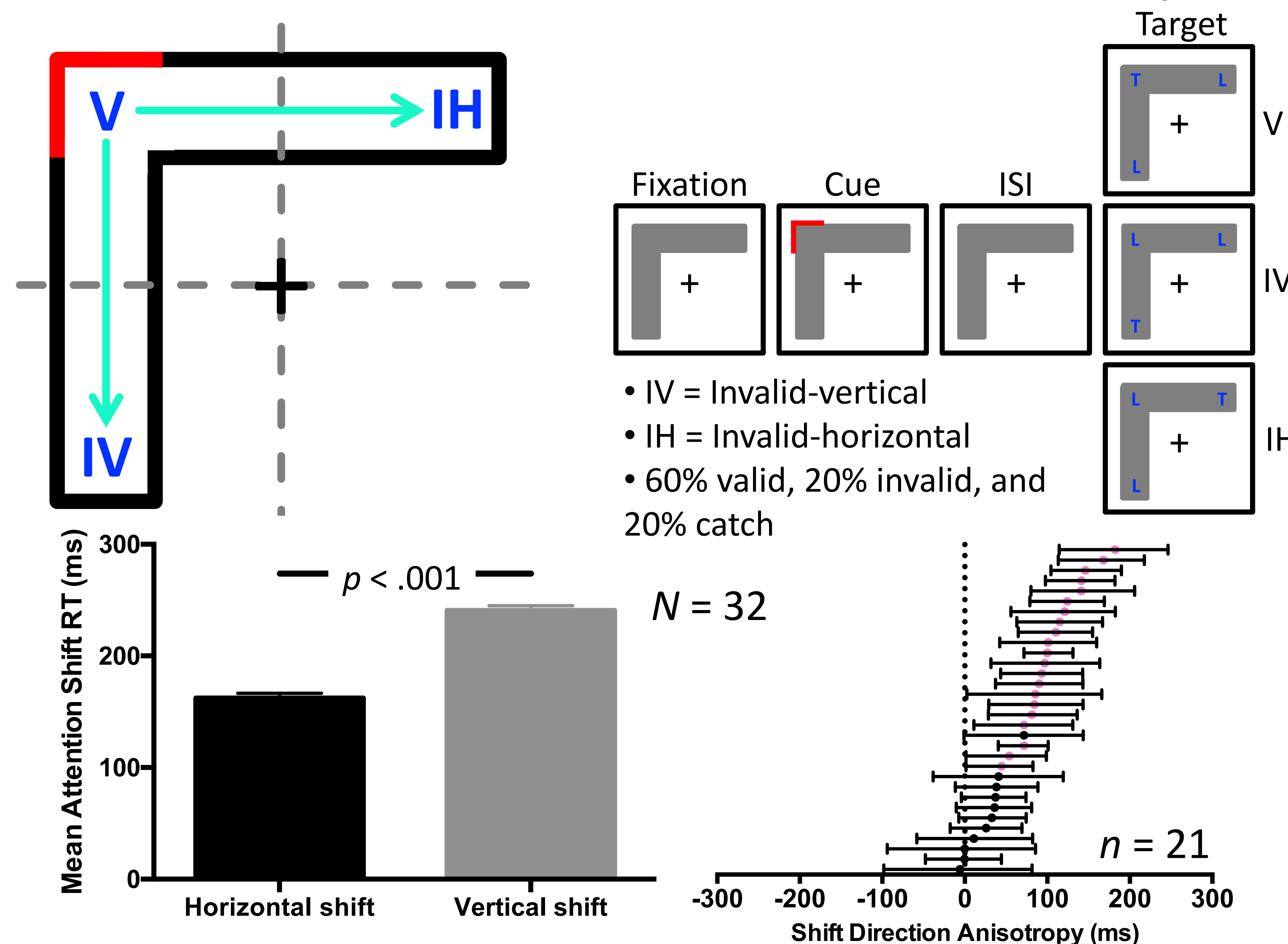
These notoriously mixed findings ultimately encourage questions regarding the legitimacy of OBA

What are the sources of inconsistent OBEs?



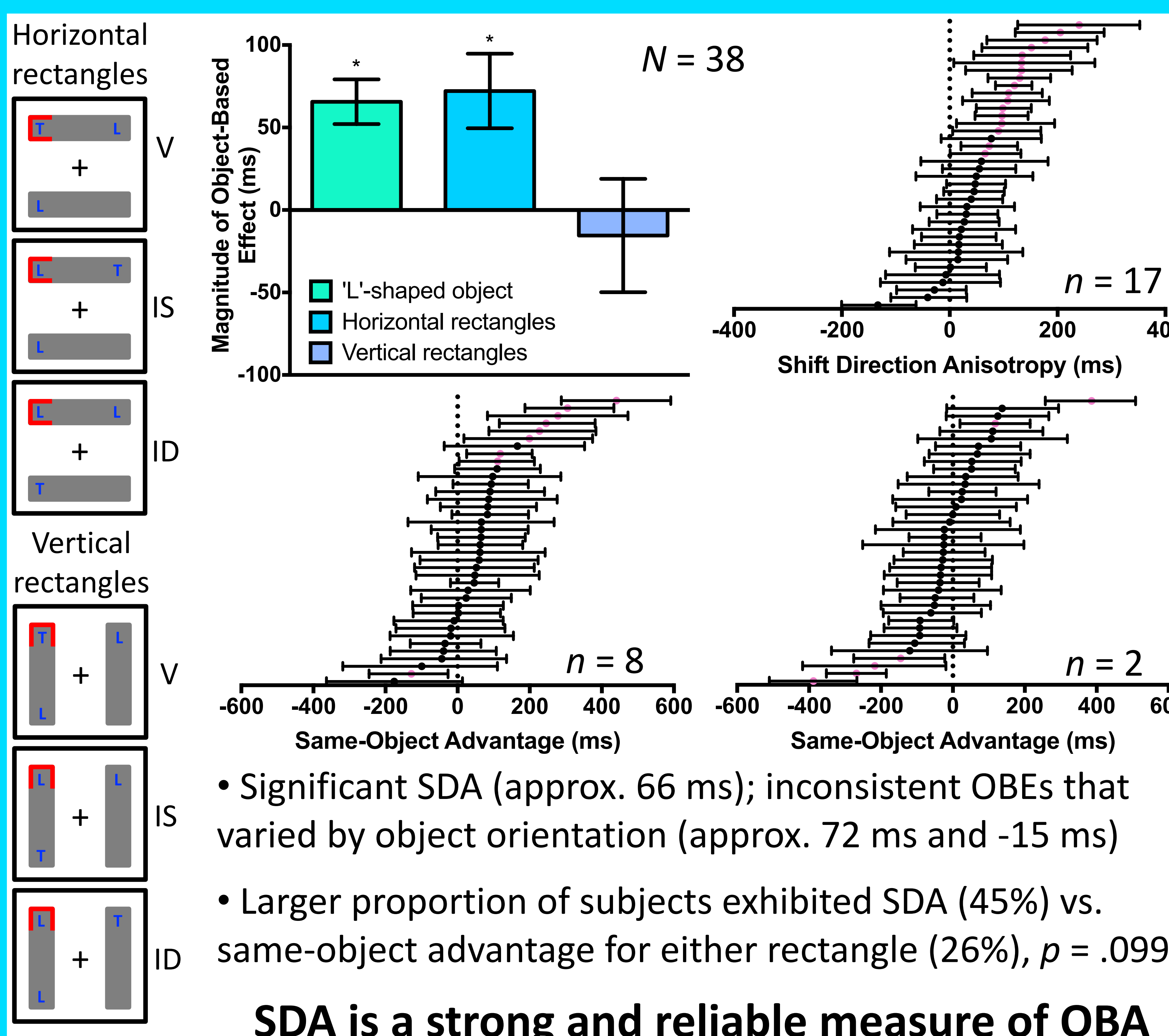
Exp. 1 – Eliminating Confound

Paradigm eliminates confounds by restricting attention shifts across visual field meridians within one object

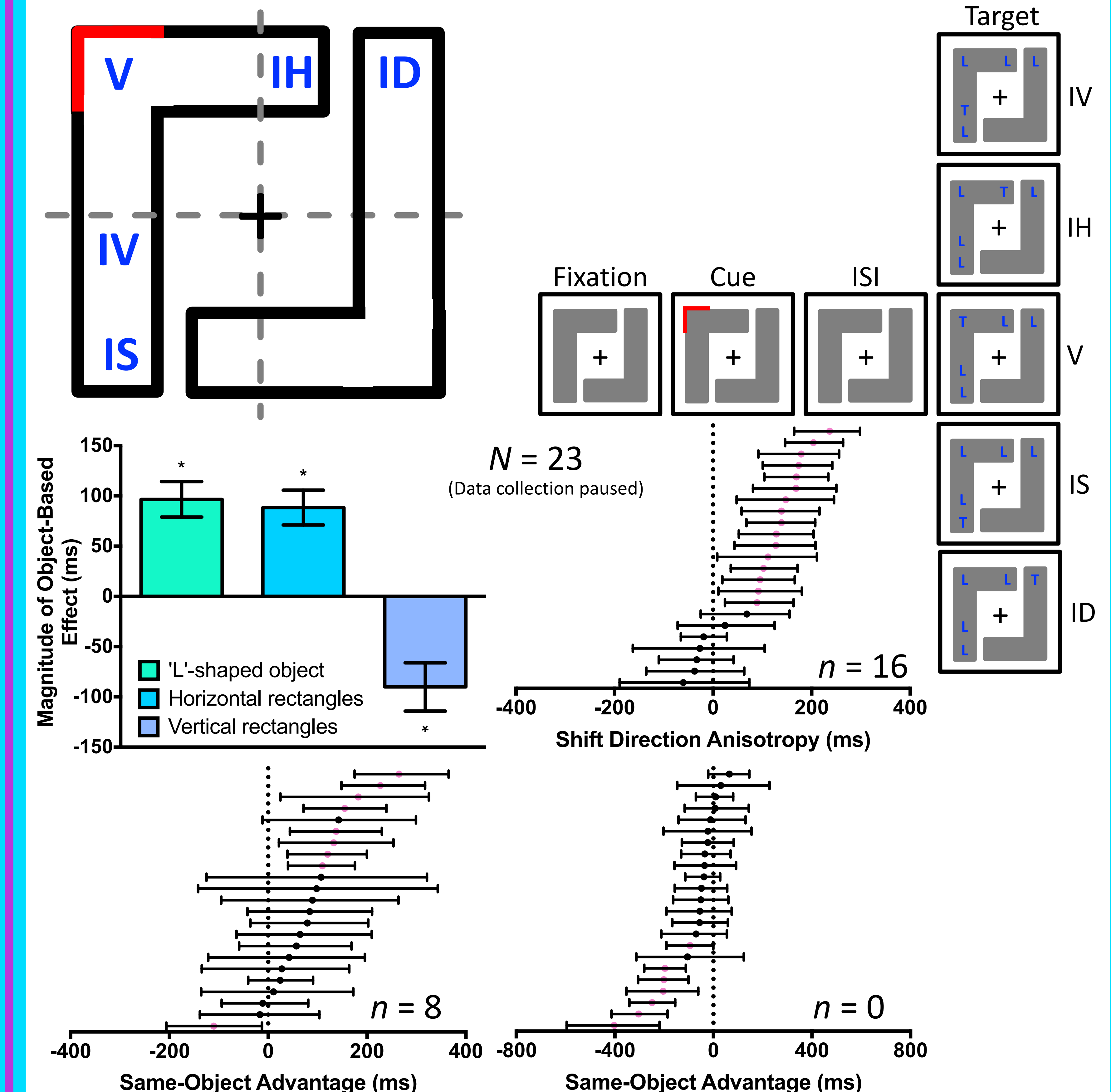


- Faster RTs to invalid-horizontal vs. invalid-vertical location (approx. 78 ms), referred to as the **shift direction anisotropy (SDA)**^{7,8}
- 65% of subjects exhibited SDA; significantly larger proportion relative to same-object advantage reported by Pilz et al. (2012), $p < 0.001$

Exp. 2 – Comparing Paradigms



Exp. 3 – Measuring Effects Simultaneously



Discussion and Conclusion

Confound between shift direction, object orientation, and object selection might have caused past inconsistent and unreliable OBA effects

- The SDA is larger and more prevalent than the same-object advantage, suggesting that **the SDA may be a more reliable and sensitive measure of object-based attention** than the traditional same-object advantage
- Stable and large magnitude effects of object-based attentional selection do exist when examined from a perspective that ameliorates significantly confounding factors
- These observations may lead to studies on the influence of individual characteristics on object-based attentional selection

Acknowledgments

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