

## Introduction

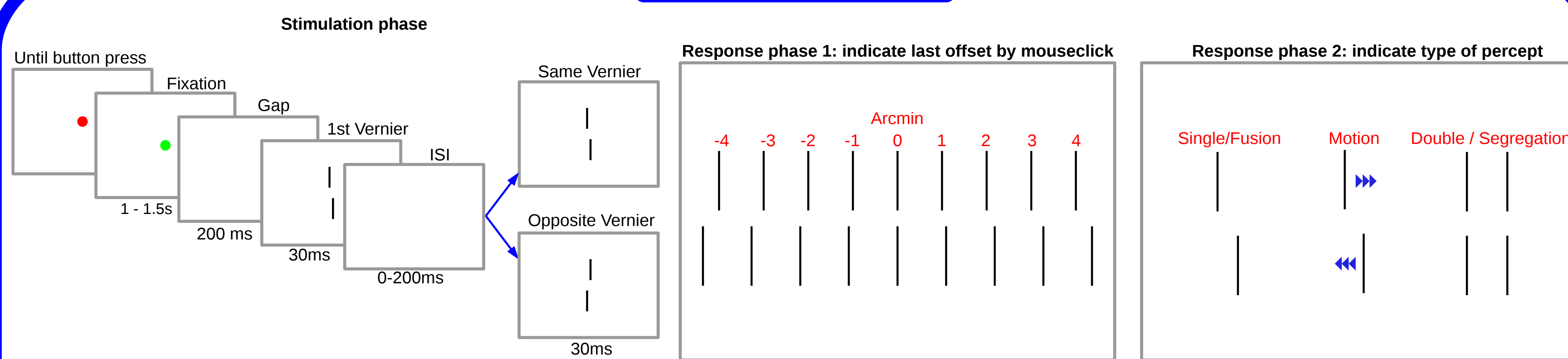
The visual system constructs a percept of the world across multiple spatial and temporal scales. We investigated this using **Vernier Fusion**, a phenomenon in which the features of **two Vernier stimuli** presented in close spatio-temporal proximity are **fused into a single percept**. With increasing spatial offset, perception changes dramatically from a **single** percept into apparent **motion** and later, at larger offsets, into **two separately** perceived stimuli (Scharnowski et al., 2007). Previous studies exclusively used binary choice to investigate this phenomenon.

What is the time course and magnitude of the perceived (fused) Vernier offset?

Is the perceived magnitude related to the perceived presentation type?

Are spatial and temporal fusion governed by the same mechanism?

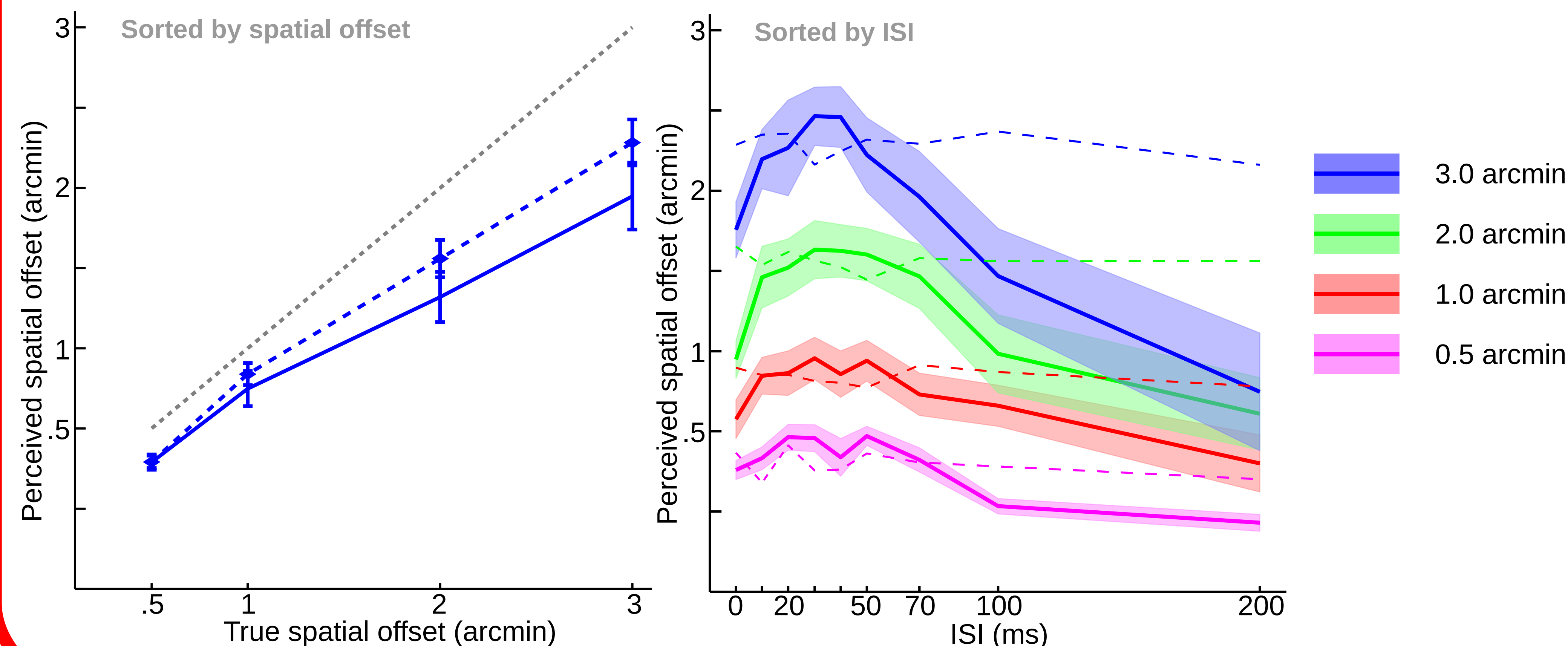
## Methods



## Results

Subjects systematically underestimate the spatial offset, even in same-offset trials. However, in opposite-offset trials, underestimation is significantly stronger. When sorted by ISI, a time course emerges, with a peak around 30-40ms.

### Perceived Magnitude of the Spatial Offset

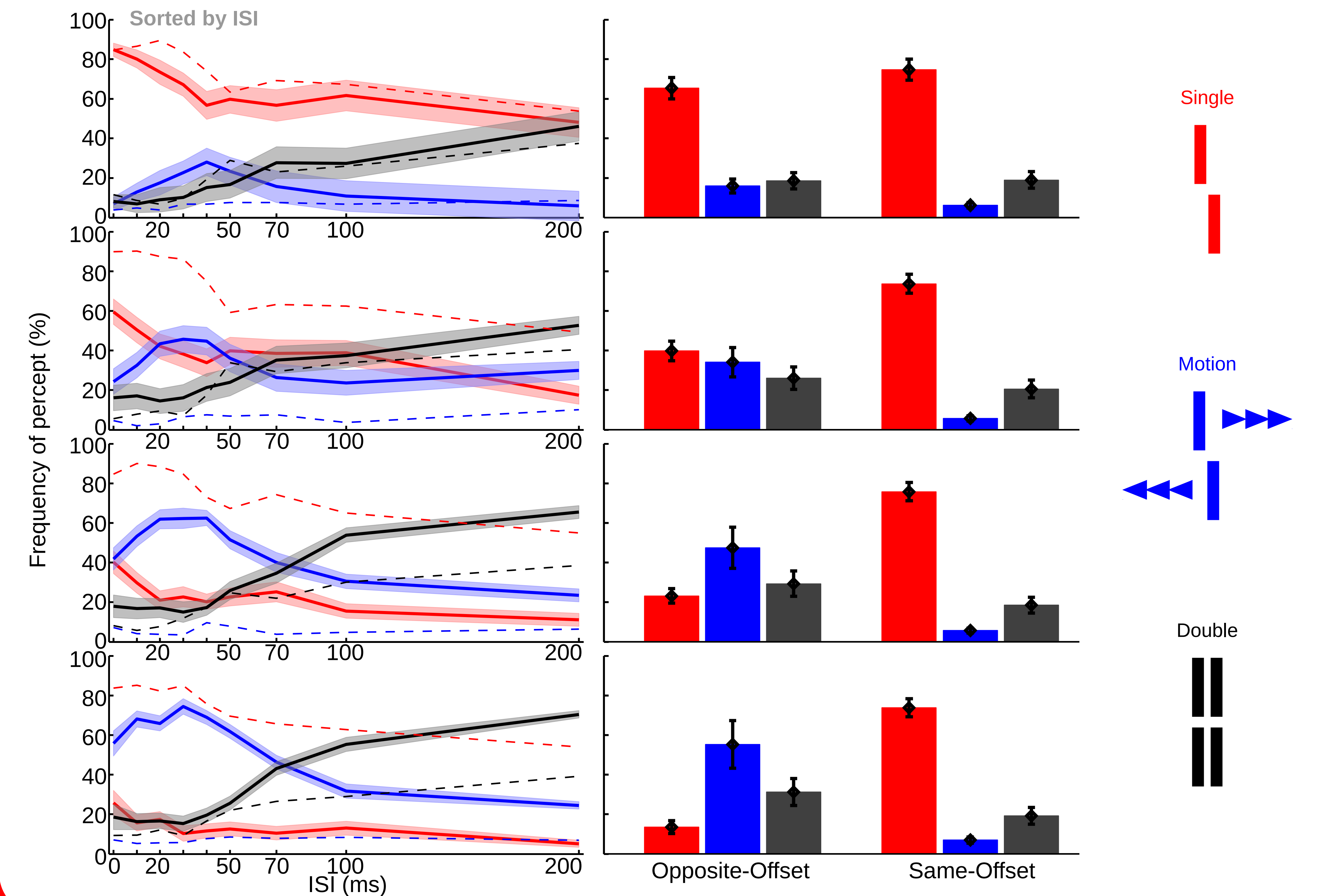


## Conclusions

- ◆ The time course of the perceived magnitude of the (fused) Vernier offset follows a non-monotonous curve and peaks at around 30-40ms ISI.
- ◆ The perceived event type is strongly related to the perceived magnitude of the Vernier offset: when motion is perceived, offset estimation is enhanced, whereas offsets are strongly underestimated when stimuli are perceived as single or double.
- ◆ The mechanisms governing spatial and temporal integration during Vernier Fusion are not the same: spatial fusion occurs even when stimuli are temporally segregated.

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Across ISIs, the frequency of the perceived events depends on the spatial offset. For a given spatial offset, the frequency of the perceived events depends strongly on the ISI. At **small ISIs** and spatial offsets, the **single** percept dominates. At **long ISIs** and large offsets, the **double** percept dominates. At **intermediate** conditions, **motion** dominates.



### Perceived Magnitude of the Spatial Offset, Sorted by Type of Percept

