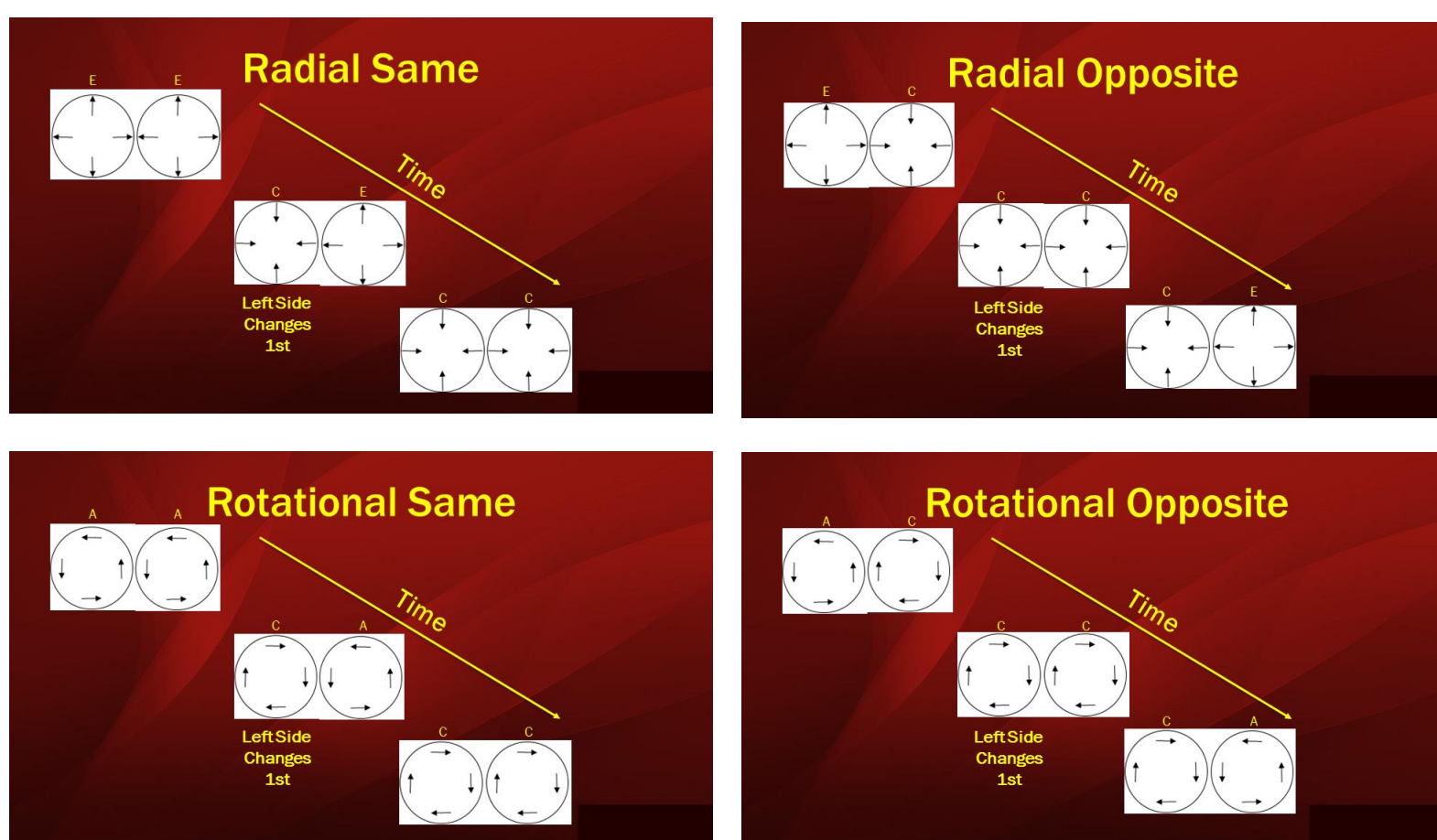


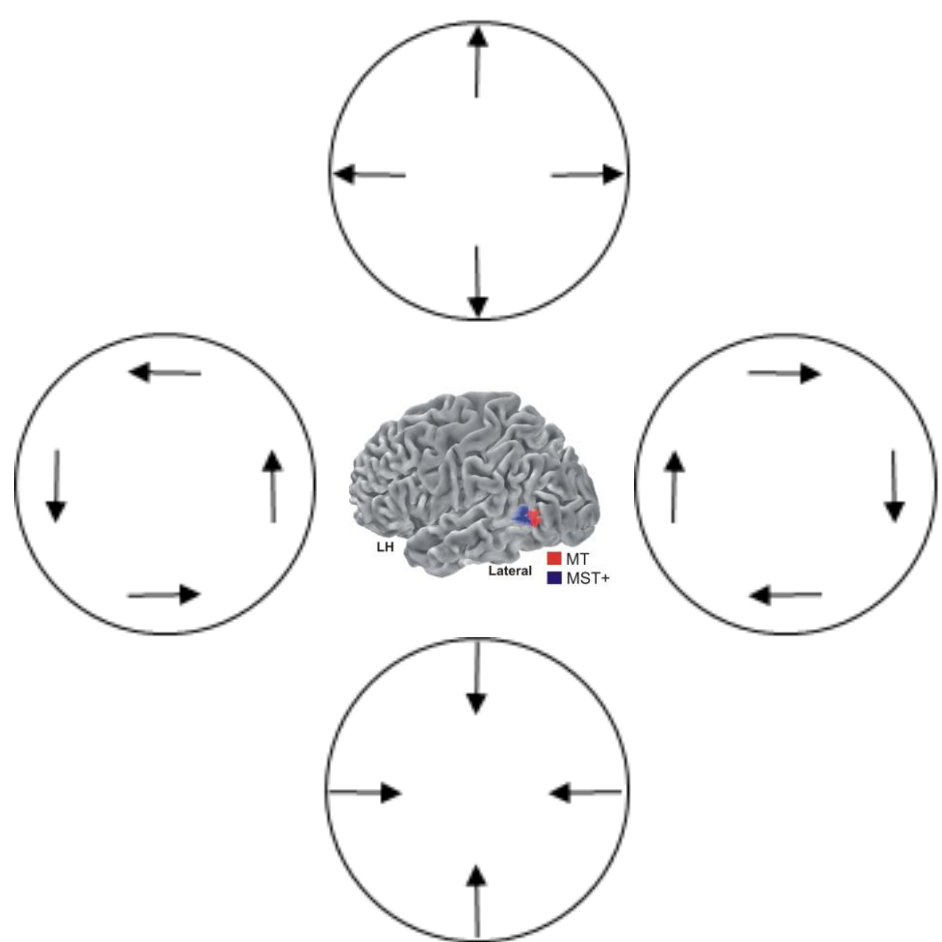


Introduction

- Temporal Order Judgments (TOJs) reflect the visual system's timing sensitivity.



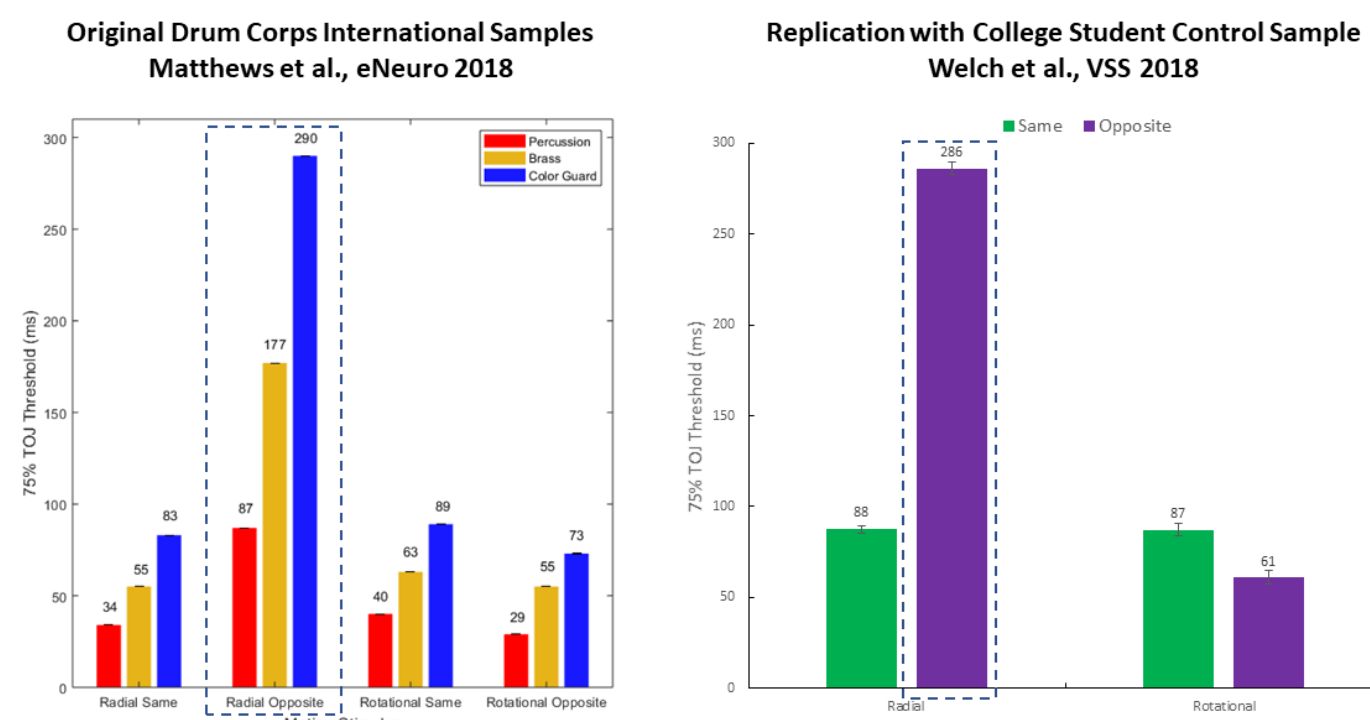
- In principle, TOJs for radial and rotational motion could depend on how precisely the visual system registers local linear motion cues [1,2].



Hypotheses & Predictions

- Contrary to the local linear motion cue hypothesis, prior experiments reveal ~3-fold TOJ threshold variations that depends on motion type (radial vs rotational) and direction (same vs opposite) [2,3].

TOJ Thresholds Elevated for Initially Opposite Radial Directions

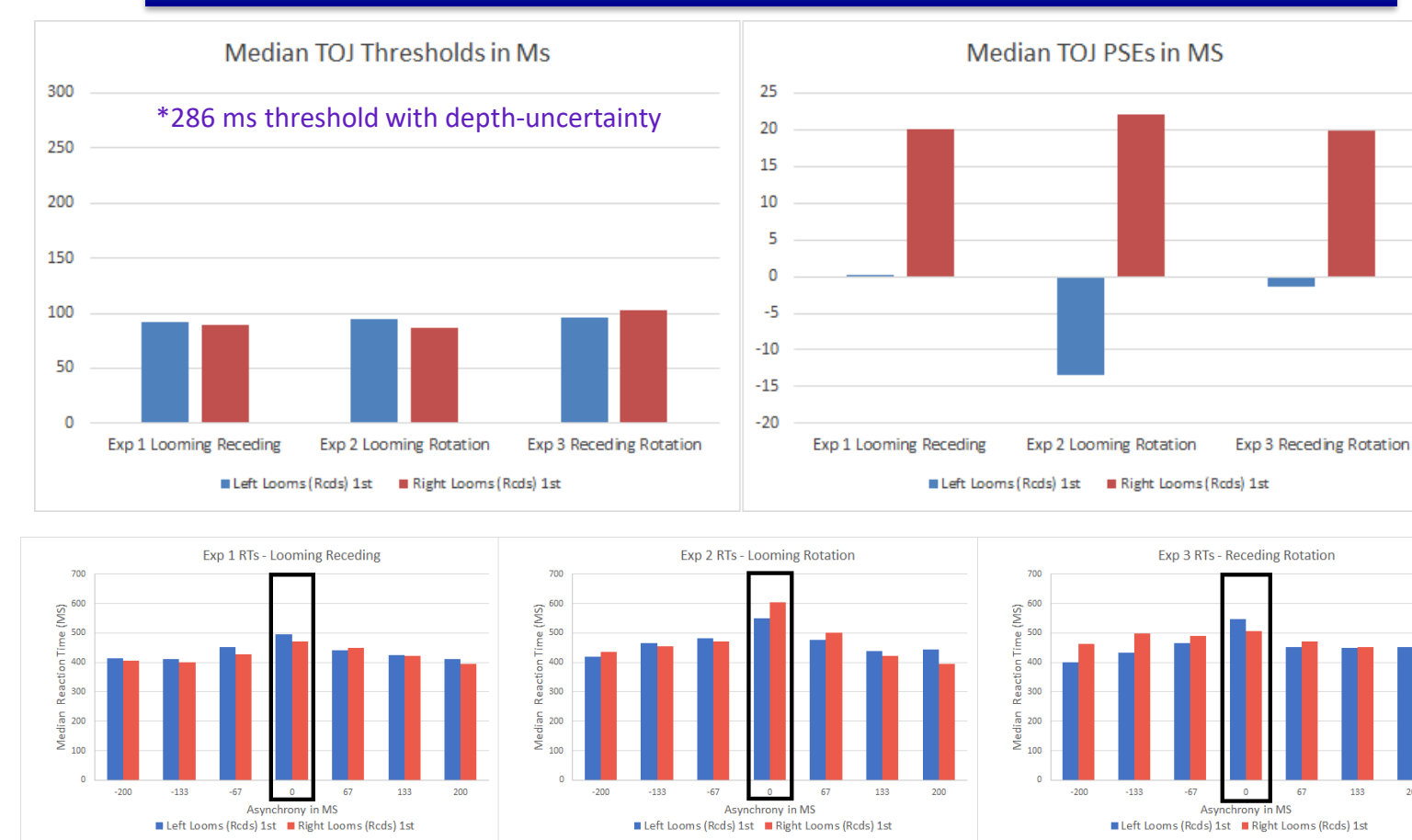


- Here we tested three additional hypotheses.
- The **Attentional Prior Entry (APE)** hypothesis predicts elevated TOJ thresholds, large (>100 ms) TOJ psychometric-function biases (PSE shifts), and peak-reaction-times (peak-RTs) skewed toward initially looming stimuli [4].
- The **Perceptual Grouping (PG)** hypothesis predicts elevated TOJ thresholds when motion stimuli fail to provide common-fate motion cues.
- The **Depth Uncertainty (DU)** hypothesis predicts reductions in TOJ thresholds after reducing depth-from-motion uncertainty.

Participants, Stimuli & Task

- **76 college students** completed 21,280 TOJ trials.
- **Stimuli:** Bilaterally presented plaids rotated or radiated before changing direction.
- **Task:** Which side changed direction first (L or R)?
- **Exp 1** (n=26), one stimulus initially loomed while the other initially receded.
- **Exp 2** (n=22), one stimulus initially loomed then receded; the other stimulus rotated.
- **Exp 3** (n=28), one stimulus initially receded then loomed; the other stimulus rotated.
- **All experiments** had looming stimuli to test **APE**, eliminated common-fate motion cues to test **PG**, and eliminated depth-cue uncertainty to test **DU**.

Results



References

1. Pitzalis et al., (2013). PLoS One.
2. Matthews, Welch & Festa (2018). eNeuro.
3. Welch, Matthews, Festa & Schafer (2018). VSS Poster.
4. Franconeri & Simons (2003). Perception & Psychophysics.
5. Matthews, Welch, Achtman, Fenton & FitzGerald (2016). PLoS One.

Stimuli & data available on the Open Science Framework: <https://osf.io/knvxj/>

Poster: <http://personal.denison.edu/~matthewsn/vss2019matthewsetal.html>