**Hemifield asymmetries in attention-based motion discrimination**

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**Introduction**: Previous research has shown performance asymmetries between right and left hemifields on attention-based tasks with a disadvantage for right visual field (RVF). For example, Battelli et al. (2007) reviewed evidence for worse performance in RVF on high-level motion tasks. Which aspects of spatiotemporal processing could be responsible for the performance difference?

**Method**: Twenty-one Denison University undergraduates viewed pairs of Gabor targets within the same hemifield. Targets changed orientation either simultaneously or at various asynchronies. Temporal order judgments (TOJ) and simultaneity judgments occurred in separate blocks with the order counterbalanced across participants. A second group of twenty-three students viewed Gabor target pairs where one or two Gabors changed orientation, and their task was to indicate how many changed (1 vs 2 task). A third group of eighteen students viewed Gabor target pairs that flickered in counterphase, and they judged which Gabor flickered faster (TF discrimination).

**Results**: TF discrimination and counting the number of orientation changes (1 or 2) thresholds were the same for RVF and LVF targets. However, TOJ and simultaneity thresholds both showed worse performance for RVF targets compared with LVF targets.

**Conclusions**: No hemifield difference in TF discrimination thresholds argues against coarser temporal sampling in RVF, suggesting no difference in quality of the front-end detectors. No difference in the 1 vs 2 task argues against hemifield differences in counting transients, suggesting simple comparisons are equivalent. Both simultaneity and TOJ require more information than the other tasks about when and where transients occurred, implicating a motion-attention stage.