

## **[MEETING ABSTRACT]**

### **Can Speed Be Judged Independent of Direction?**

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The ability to judge speed is a fundamental aspect of visual motion processing which is thought to involve motion sensitive, directionally selective neurons in areas such as visual cortex and middle temporal. It might be expected that speed comparisons would be most accurate when they use information within a common set of directionally tuned neurons. Yet, to our knowledge, it has not been tested how well people can compare speeds that move in different directions. We tested speed discrimination judgments between pairs of random-dot stimuli presented side-by-side: a reference stimulus moving vertically upwards or downwards at  $6^\circ/\text{s}$ , and a comparison stimulus moving in the same direction as the reference or in a different direction ( $+180^\circ$ ,  $\pm 45^\circ$ , or  $\pm 90^\circ$ ). The point of subjective equality (bias) and the slope of the psychometric function (sensitivity) were estimated from psychometric functions fitted for each condition for 12 participants. There were no systematic differences in sensitivity across different directional combinations. However, when the comparison stimulus moved orthogonally ( $\pm 90^\circ$ ) to the reference stimulus, but not in other combinations, it was judged to move faster than the reference stimulus. We conclude that while there are directional biases in speed information, it can be efficiently compared across direction channels. These results inform our understanding of how speed and direction are represented and will guide methods for testing motion processing in typical and atypical development.