Contrary to a shared-mechanism account, Exp 1 revealed distinct temporal order judgment (TOJ) patterns for radial and rotational motion. Reversing the initial directions impaired radial TOJs, but improved rotational TOJs.

Contrary to a shared-mechanism account, Exp 2 revealed distinct temporal order judgment (TOJ) vulnerabilities for radial and rotational motion. Phase noise generated larger impairments on rotational TOJs than on radial TOJs.

Exp 3 & 4 confirmed and extended Exp 1 & 2’s TOJ results to simultaneity judgments (SJs).

Conclusion – The findings suggest a double dissociation between the neural events that limit how precisely we judge asynchronies defined by these two types of MST-mediated motion.

Motion Physics – The figure above shows that radial motion can be converted to rotational motion (and vice versa) by rotating local linear motion vectors 90 degrees.

Motion Physiology – Radial and rotational motion register in the Medial Superior Temporal (MST) region of the primate visual system, according to prior neurophysiological research [1-7].

Do shared or distinct neural events limit how precisely we judge asynchronies defined by these two types of MST-mediated motion?

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