CONFIDENCE AMPLIFIES SERIAL DEPENDENCE IN PERCEPTUAL DECISIONS

Jason Samaha¹, Missy Switzky¹, & Bradley R. Postle¹,²
¹Department of Psychology, ²Department of Psychiatry, University of Wisconsin-Madison

WHY COMPUTE CONFIDENCE?

- Sensory uncertainty
- Subjective confidence
- Optimization of learning
- Information-seeking

Try to compute confidence?

Model 1: Sensory uncertainty
- Future decisions
- Subjective confidence
- Optimization of learning
- Information-seeking

Model 2: Subjective confidence
- Future processing
- Future decisions
- Optimization of learning
- Information-seeking

NEURAL MODEL OF CONFIDENCE

SENSORY DECODING

- Vertical, I'm pretty sure

SENSORY ENCODING

- Probabilistic population code

STIMULUS

- Signal
- Noise
- Signal + noise
- Stimulus
- High PE
- Low PE
- Number of spikes

TASK

- Confidence (until resp.)
- Probe (until resp.)
- Blank (variable)
- Target (33 ms)
- Warning (300 ms)
- ITI (300-500 ms)

DISASSOCIATING PERFORMANCE FROM CONFIDENCE

- Confidence-error relationship
- Error by PE
- Confidence by PE

CONFIDENCE-MEDIATED SERIAL DEPENDENCE

- "Correct" trials
- Previous trial confidence
- Previous trial PE

Samaha et al, Frontiers, 2016

Meyniel et al., Neuron, 2015

Ma et al., Nat Neuro, 2006