Context transitions modulate perceptual serial dependence

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Summary: visual recognition is biased toward recent stimulus features, but this bias is dampened after shifting to a new perceptual context

Background

Perceptual choices show serial dependence

 Incoming stimuli look more like recently-attended stimuli than they really are^{1,2}









 But that smoothing could be maladaptive when previous information is no longer relevant to current goals³

Event boundaries modulate memory

- Continuous streams of activity are parsed into meaningful segments of time that have a beginning and end (i.e., events)
- A mental model of the current episode is maintained in working memory, and contents of memory are updated at points of perceptual and conceptual change (i.e., event boundaries)⁴
- Memory is better within (A-C) vs. across (B-D) events⁵



Predictions for adaptive serial dependence

- A context shift (i.e., event boundary crossing) should indicate that upcoming information is distinct from what came before
- Mental model should get updated, memory for last episode flushed and its impact on current processing curtailed
- Serial dependence should subside when environmental changes cue a new visual episode

References

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Methods

- Continuously test orientation judgments for randomly rotated Gabors (1° steps)
- Periodically change background color (every 4 trials)
- Examine serial dependence (response bias toward previous trial angle) as a

Participants (n = 8) completed 2–4

Results

Super subject



Pull of previous after context shift

bootstrapped distribution (10,000 DoG fits)

Individual subjects











