Temporal expansion, more information: The role of subjectively distorted time in information accrual

Background and motivation

Subjective time expands (TE):
- Intense experiences [1,2]
- Oddball paradigm with standards of around 1 s [3,4]
- Saccadic chronostasis [5]

Subjective time contracts (TC):
- Oddball paradigm with brief standards of around 100 ms [3]
- Peri-saccadic time compression [6]

Potential explanations:
- Attention/arousal effects on pacemaker [1,3]
- Amount of information processing [3]
- Saliency/magnitude decision (see Sengupta et al., VSS poster #56.312)
- Habituation [2, poster #56.312]

Methods: three experiments

Response 1: enumerate oddball
Response 2: oddball longer/shorter

5-15 stimulus displays (1 oddball, position 4-14)

Hypothesis 1: Replicate temporal distortions (TE, TC)
Hypothesis 2: Greater information processing for longer perceived time

Temporal distortions reflect a real change in visual information processing: they are not epiphenomenal

Results

EXPT 1: Perceived expansion
 EXPT 2: Perceived compression

Enumeration performance depends on temporal distortions

Summary

- Replication of temporal expansion (TE) and contraction (TC)
- TE: Better enumeration for intermediate numerosities
- TC: Worse enumeration for intermediate numerosities
- No effect of TE/TC for enumeration within the subitizing range

Implications

- Tight link between subjective impression of passing time and the amount of information processed
- May reflect variations/plasticity in information processing [7]

References