Perceiving multiple scene events

Thomas Sanocki & Noah Sulman, University of South Florida, Vision Sciences 2011, Poster 56.444



Question

How does perceptual efficiency vary with the attentional set for task (event type) and object orientation? Our scenes consisted of 4 concurrent events each lasting seconds.

Method

Observers monitored the dynamic scene, detecting a target event amidst distractors.



The event tasks (animations)

Targets and distractors start out alike (< leftmost frame) but targets diverge in time (frames 3 - 7). Critical feature is color (brighter colors) or action ("clap").

Frames are presented for 500 ms each, so events had a lifetime of 3.5 sec. Observers were (quickly) trained at start of session, with one event at a time, to 100% accuracy.

actions by Steve Fiske



Event tokens occurred in 4 of 16 possible locations; tokens were of either a single event type (one task / one orientation) or multiple event types: Two tasks (same orientation)

- Two orientations (same task)
- Two tasks x two orientations •

Main finding: Multi-event perception is more costly when both task and orientation (5.9 and 4.5%). Both task and orientation define attentional set (and determine perceptual efficiency).

vary (12.9%) than when only one varies



Results

Hit rates for targets

Experiment 1: Multi- is 2 tasks	
Single-task 74.6 %	
Multi-task <u>68.1%</u>	
Cost 5.9 % (<i>p</i> < .001)

Experiment 2: Multi- is 2 orientations \rightarrow Single-task 75.5 % Multi-task <u>71.0 %</u> 4.5 % (*p* < .01) Cost

Experiment 3: Multi- is 2 tasks + 2 orients \rightarrow Single-task 78.7 % Multi-task <u>65.8 %</u> 12.9 % (p < .001) Cost



single-task

multi- task







at the grand time scale of seconds

Discussion

Perception is most efficient when a single attentional set can be used. Efficiency is reduced when the set must be changed for varying stimuli and tasks within a scene. The present studies indicate that attentional set is important with somewhat complex scenes (4) events), and that set involves specifics of task and space (orientation). When either change, set cannot be optimized and perceptual efficiency is reduced. When both change, the cost is especially high.

The results further illustrate the fruitfulness of studying event perception within scenes. In particular, we studied events defined over seconds, which people are likely to be especially good at perceiving (especially when set).

