Perceiving multiple scene events

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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.

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).

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

Results
Hit rates for targets

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

Experiment 2: Multi- is 2 orientations
  Single-task 75.5 %
  Multi-task 71.0 %
  Cost 4.5 % (p < .01)

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

Main finding: Multi-event perception is more costly when both task and orientation vary (12.9%) than when only one varies (5.9 and 4.5%). Both task and orientation define attentional set (and determine perceptual efficiency).