Multi-Event Scene Perception *at an ecologically representative time scale*

NEW PARADIGM for scene perception, reveals new roles of PERCEPTUAL SET

KEYS: - measure perception of events
- complex "scenes"
- use event time scale optimal for humans (~ 4 seconds per event)

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Method

4 tasks / event types

(schematic figure)

2 dorsal (motion, location)

2 ventral (shape, color)

each "token" changes over time, starting out as a distractor; a few change enough to be a target
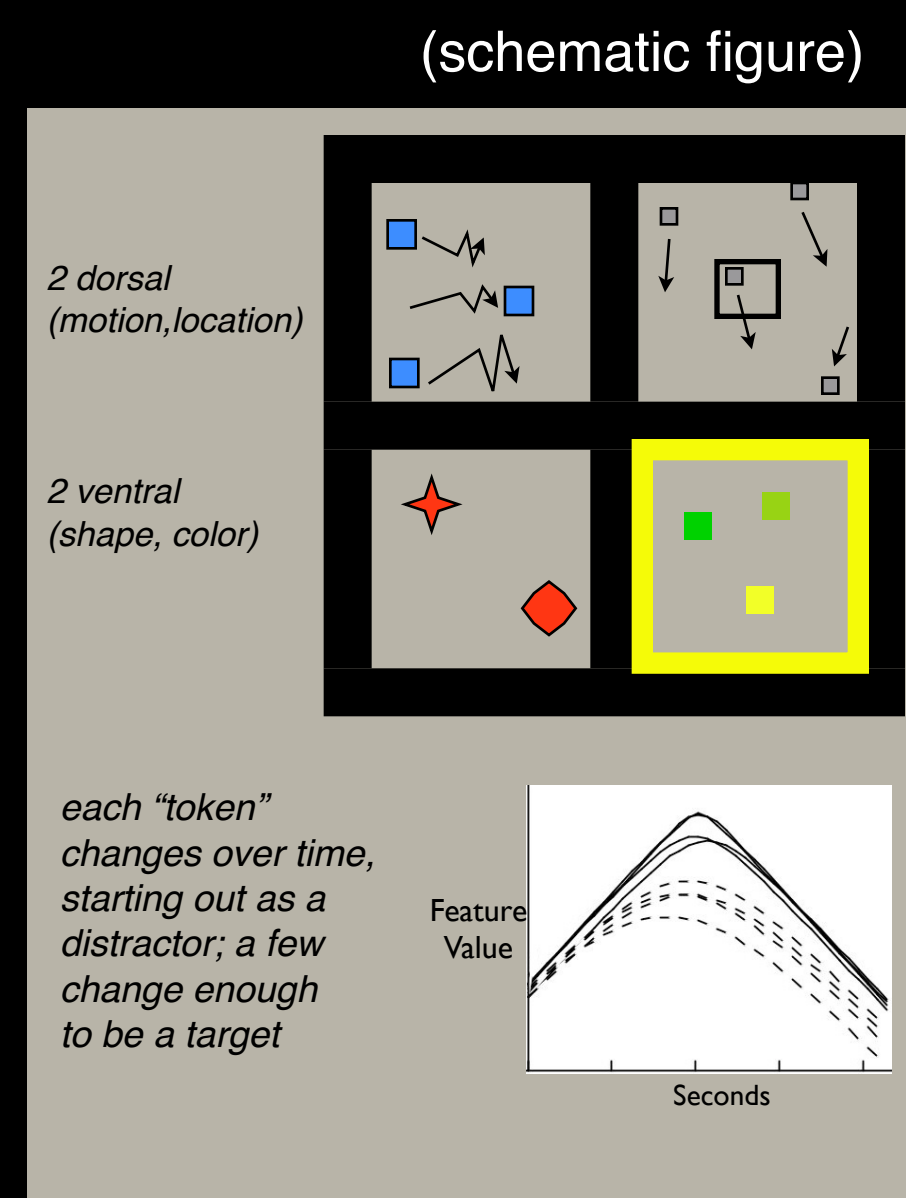
Feature Value

Seconds

single-tasking

vs

multi-tasking

Spatially organized (Experiment 1)
or
Disorganized (Experiment 2)

Single vs. multi- is blocked.

Trials involve a 60 sec stream of events in the 4 cells. Eight targets appear amidst 128 distractors (each trial). The items are either all the same task/event, or a mixture of 4 tasks/events (multi-tasking).

Sessions begin with training (for each task) followed by conditions in balanced order:

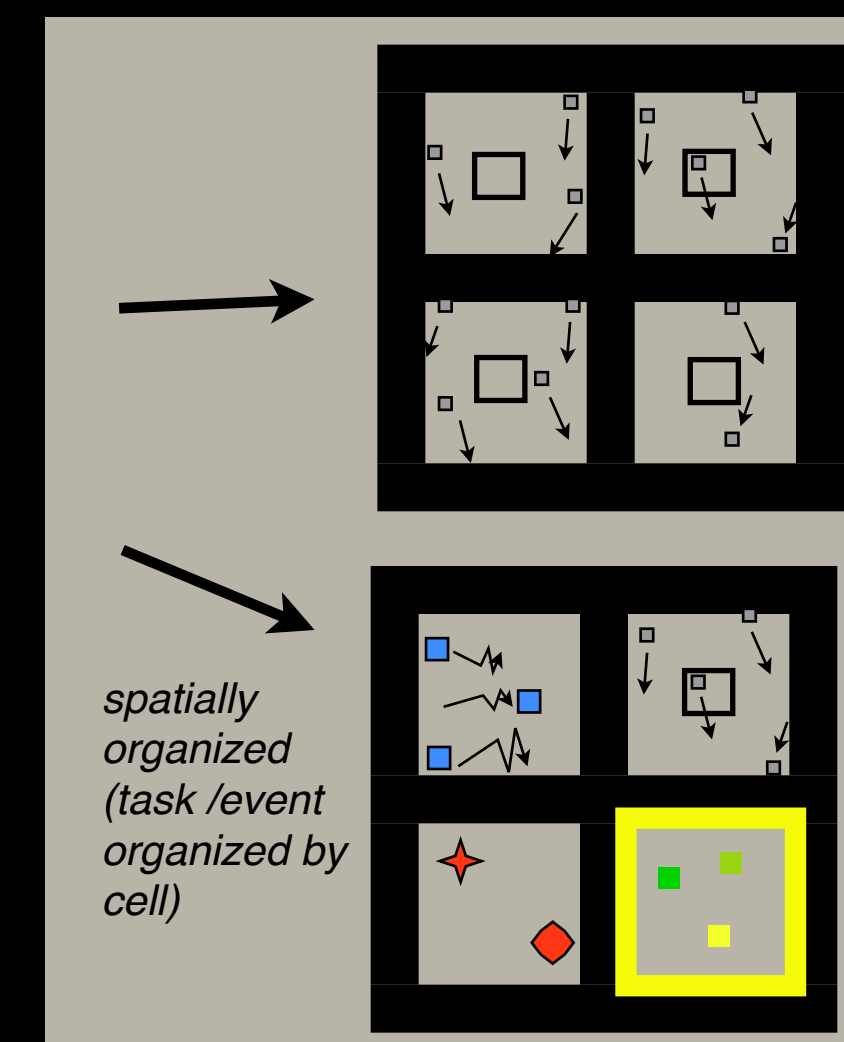| TIME ——> (~ 60 min total)			
Training (one cell)	Experiment (four display cells)		
	(a)	(b)	(c)
Learn-Test for Task: 1, 2, 3, then 4	Single task, 4 cell: 1, 2, 3, then 4	Multi-task, 4 cell: 1 - 4 one per cell	Single task, 4 cell: 1, 2, 3, then 4

Results

(Hit rates for main conditions*)

Experiment 1

78.4% Single
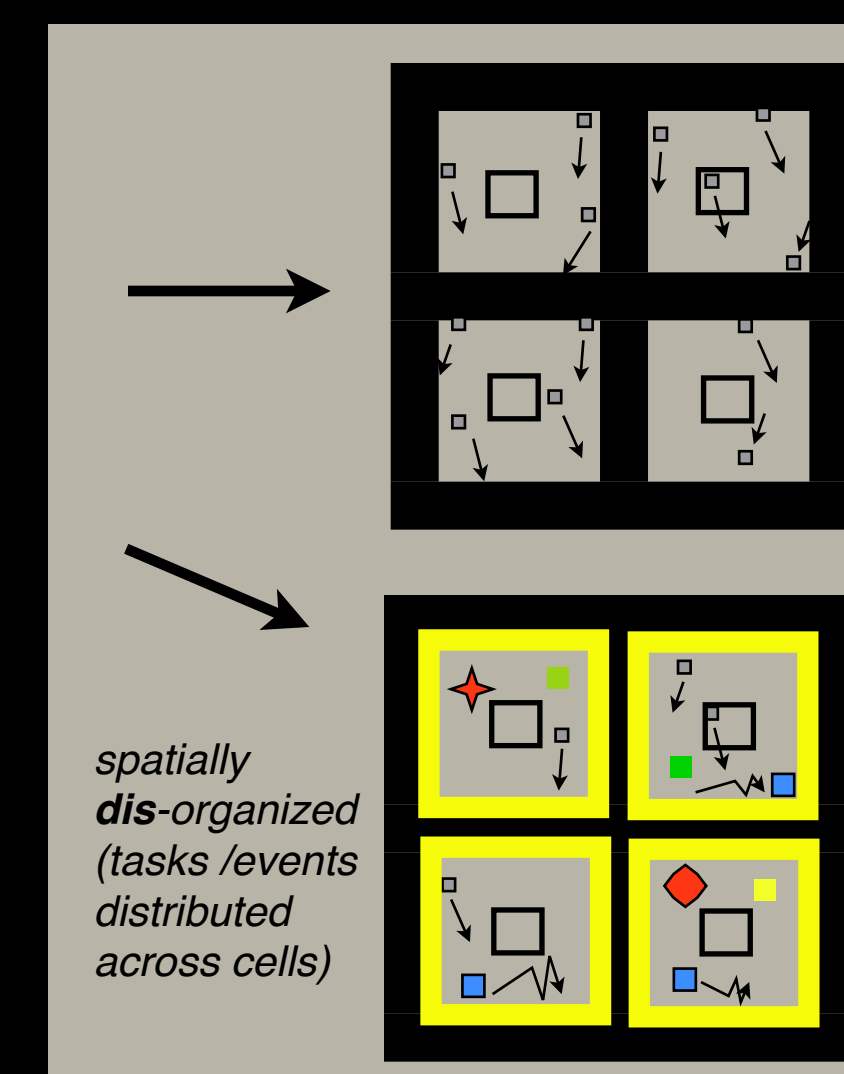
64.3% Multi

14.1% cost

(*Standard error = 3%*)

spatially organized (task /event organized by cell)

Experiment 2

79.3% Single

45.2% Multi

34.1% cost

(*Standard error = 2%*)

spatially **dis**-organized (tasks /events distributed across cells)

Experiment 3

Replicated both costs within observer (20% & 32%, respectively).

New Finding

Multi-event perception (*MEP*) can be fairly efficient, *if* the tasks are spatially organized.

* results were generally consistent across task; task data and sensitivites posted to right >>

Discussion

We created complex, dynamic scenes, because complexity can make perceptual set** especially important. We found the expected cost of switching tasks (set) in Experiment 1. However, the 14% cost was modest, especially if a single set is critical for perception.

We found stronger evidence of a set for multiple event perception (*MEP set*), in Experiment 2. MEP set supports fairly efficient MEP, and depends on spatial organization of the tasks. When that organization was disrupted, MEP was inefficient (the cost of MEP reached 34%).

There is much to be learned about the determinants of efficient perception within complex scenes. The large effects with our global measure suggest that further research along these lines will be fruitful.

** Here, *perceptual set* is likely to mean construction and application of a dynamic search template for each event type.