

The Role of Attention in the Processing of Biological Motion



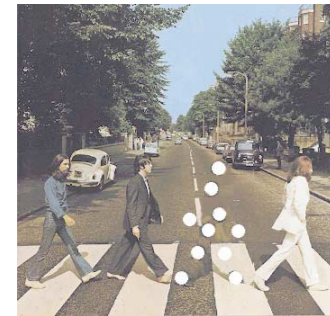
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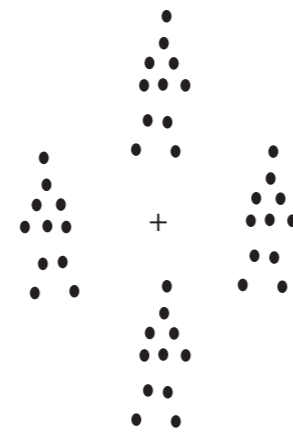
Introduction



Johansson's point-light walkers remain one of the most powerful demonstrations of the way that motion can influence the perception of form

Here, we explore the role that attention might be playing in the perception of these stimuli using a variety of different tasks

Visual Search



To further assess the role of attention we used a standard visual search task

Observers searched for a target walker (left or right facing) among 0, 1, 2, or 3 distractor walkers

Flanker Task

Congruent



Incongruent



Here we used a flanker task to assess whether biological motion is mandatory.

Do we process the direction of ignored walkers?

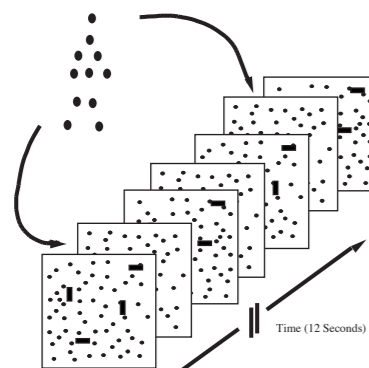
Conclusions

Dual-task results may reflect very efficient processing of biological motion during short "switches" of attention

Visual search results support the notion that attention is required to process direction of walking, but there is very little cost over and above an initial shift of focus

Flanker data suggest that dynamic cues to direction are computed automatically, that is, biological motion processing may be mandatory

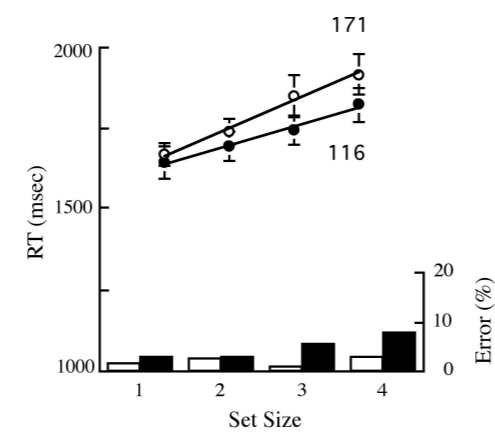
Method



Previously, we used a dual-task methodology to explore the nature of biological motion processing

Observers were required to monitor a set of rectangles to detect a changing item, and at the same time discriminate the direction of a masked walking figure

Results



Results from 10 observers. Target present responses shown as filled symbols.

All observers completed two blocks, one with left, one with right facing targets

Walkers were non-masked and subtended 4° and were equally spaced at random positions around a 4° viewing circle

Design

| | | Target Motion | |
|----------------|--------|---------------|--------|
| | | Moving | Static |
| Flanker Motion | Moving | p < .01 | n.s. |
| | Static | p < .05 | n.s. |

Ten observers completed a 2 (congruency) x 4 (motion) x 2 (direction) design.

The task was to report the direction of the center, target, walker ignoring the flankers

The two flankers either faced the same (congruent) or the opposite (incongruent) direction as the target

And Next...

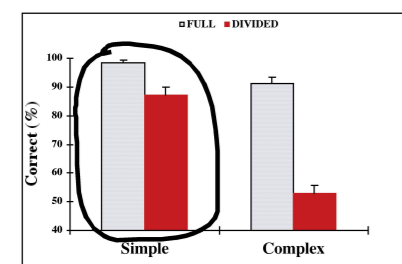


In collaboration with Niko Troje (Ruhr-Universität, Bochum) and Douglas Cunningham (MPI, Tübingen), we are now exploring search for gait using more real motion in virtual worlds

3D walking models are created via a motion capture system from Oxford Metrics (Vicon) and are then placed within a complex virtual model of Tübingen

Results from these visual search studies will be presented later this year...see you in Florida!!!

Results



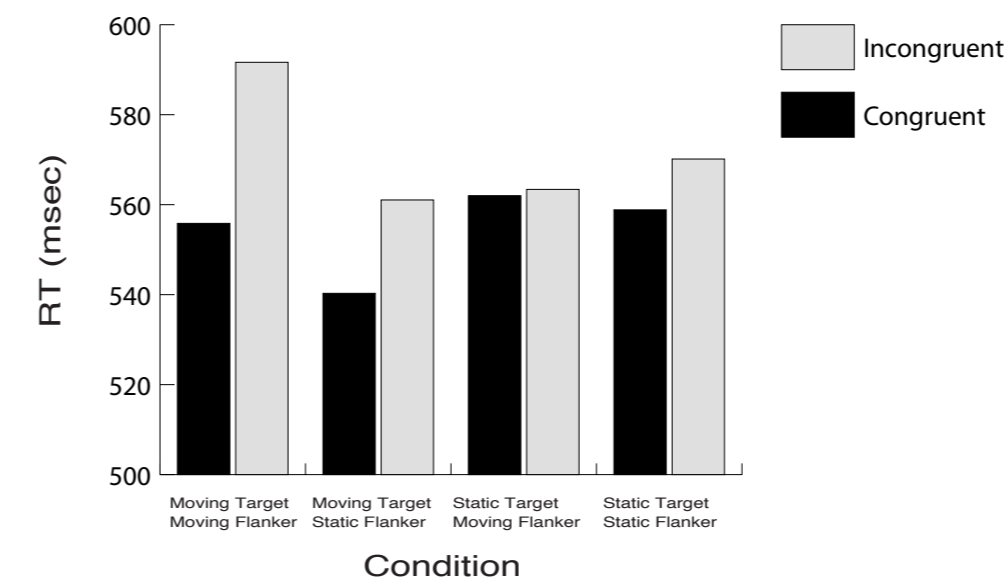
Results showed that with simple, random motion masks, biological motion could be detected very effectively, even when attention was allocated to another task

Does this mean that biological motion processing does not require attention?

Summary

- Search was serial
- However, items were processed very efficiently, taking into account estimates of attentional dwell time (Duncan, 1984)
- This is consistent with the notion that attention is required, but only to activate special purpose dynamic visual routines (e.g.,..., attentional sprites)

Results



References

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