Even though the motion of all targets is identical and in principle information might be accumulated over all targets, the sensitivity to envelope motion with 4 targets is the same as sensitivity with 2 targets.'

'

This region may be identified with the resolution of spatial attention, the critical distance of crowding, or some under characteristic size associated with higher-order motion detection.

In other words, the model assumes that even though the subjects were asked to report the direction of motion of the entire stimulus, when performing this task there is no increase in sensitivity due to pooling.

When targets are packed closely together, these estimates of position become less reliable, or in other words "spread out" over a larger area; but at the same time neighboring targets are more available. If the visual system is comparing successive estimates of position, then, there is the possibility of "misbinding," or associating one target's previous position with a flanker's current position. How can the visual system cope with cluttered environments while tracking objects, then? It appears that when position estimates are less reliable the estimate of position change is augmented by first-order motion signals. When targets are uncrowded, the perception appears to be dominated by the higher-order motion; as clutter increases, the visual system will be proportionately more influenced by the local motion.

At a less prosaic and more mechanistic level, several lines of evidence suggest that flankers exert an influence over targets that is like "obligatory summation" clockwise tilted flankers bias orientation judgements clockwise, and so on. cites?

We might identify this process with optic flow mechanisms, with the idea that coherent large-scale motion over the entire visual scene is most likely to arise from motions of the observer rather than motions of objects in the scene. When judging the motion of a selected target, it would usually be prudent to discount the background motion.

0.0.1 Crowding, a mini-review

Crowding is a phenomenon wherein identification or discrimination of an object presented in the visual periphery is impaired by the presence of nearby, but non-overlapping flanking objects. A finding characteristic of crowding is that critical spacing (usually a measure of the distance between target and flanker which achieves a particular elevation of threshold for recognition) scales linearly with retinal eccentricity [**?**, **?**]. Although most studies of crowding focus on its effect of impairing the recognition of shapes (e.g. letters) in parafoveal vision, it has become apparent that crowding is a more general phenomenon, extending to many different types of visual features (e.g. ([**?**]; for review, see [**?**].) It is thought that crowding is characteristic of some cortical mechanism that integrates signals from low-level feature detectors, a so-called "integration field" [**?**]. Because the scaling of critical distance with spacing mirrors the variation of cortical magnification with eccentricity, the integration field is thought to be a process that subsumes a constant distance on the cortical surface [**?**].

The next couple of paragraphs refer to a construction of my experiment I'm not doing any more...

[?] proposed that the crucial diagnostic test for crowding as opposed to masking or other forms of spatial interference is that the critical spacing scales with eccentricity and is relatively unaffected by signal size. Accordingly, we set out to determine which target spacing and motion parameters are necessary to drive the reversal of apparent motion as various eccentricities. In \autoref{sec:constant} below, we determine the relationship between critical spacing and target spacing, which satisfies Bouma's law. In \autoref{sec:occlusion} we show that the critical spacing is unaffected by the presence of an occluder which covers 2/3 of the visible circle, meaning that it is the spacing which is relevant and not the number of visible targets. In \autoref{sec:grid} we show that the critical distance and scaling property is robust to the size of the stimuli. We also test its robustness to variations in temporal frequency, step size, and step interval.

While most studies of crowding involve stationary stimuli, motion stimuli add a temporal component. In Experiments 1 through 3 we consistently find that for stimuli near the crowding distance, the trials for which the subject took longer in responding were more likely to correctly reflect the global direction of motion. In Experiment 4 we use an auditory cue to vary the subjects' response time to investigate this effect in more detail.

Our results reinforce the idea that global motion processing is the result of an integration of the output of low-level feature detectors, and that in fact the process subserving detection of global motion might be identical to the processes underlying object recognition and target selection. We discuss the implications for possible mechanisms of higher order motion perception and speculate on their possible physiological implementations.