Does saccadic space compression mean size shrinking?

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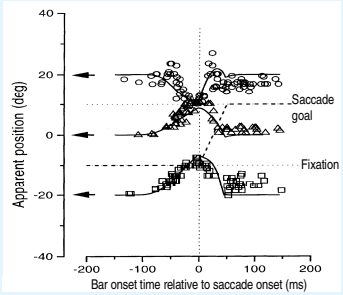
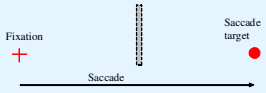
Outline

- Stimuli flashed around saccade onset time are perceived to shift towards the saccade target. The mislocalization pattern is interpreted as saccadic "space compression".
- Does perceived size really shrink during the "space compression"?
- We flashed horizontal bars and asked subjects to point to the endpoints.
- The bar location shifted as "space compression" predicted, but the bar length did not change as predicted.

Peri-saccadic space compression



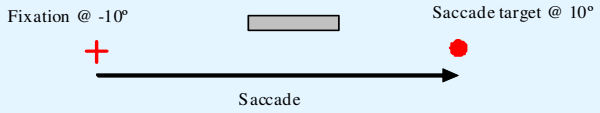


Vertical bars flashed around the time of saccades may be mislocalized, shifting towards the saccade target.

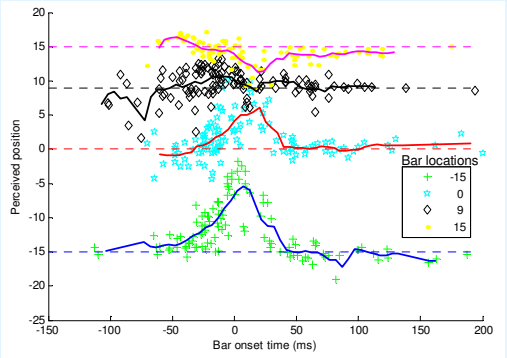
Data from (Ross, Morrone, Burr, Nature 1997).

So, would objects be perceived smaller along the direction of saccades?

Flashed bar: 1, 5, or 10° long;
center @ -15, 9, 0, or +15°

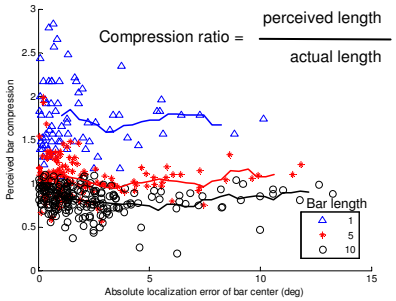


Mislocalization pattern of horizontal bar center

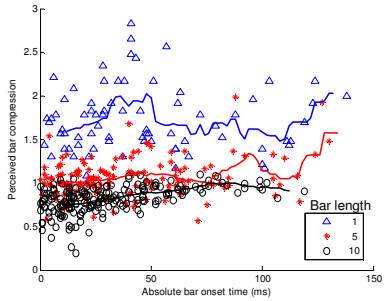


The mislocalization is as same as that of vertical bars.

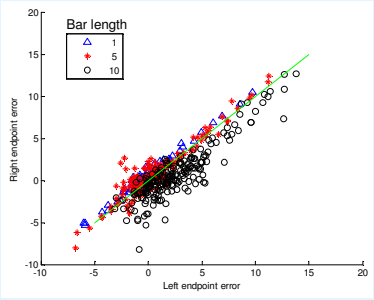
Perceived length vs. Localization error – not correlated



Perceived length vs. bar onset time – not correlated



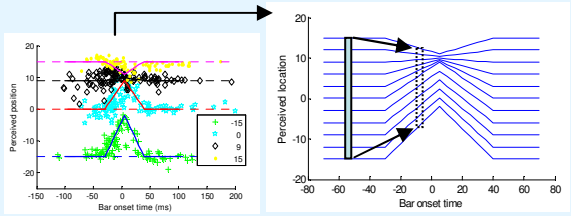
Localization error of two end points



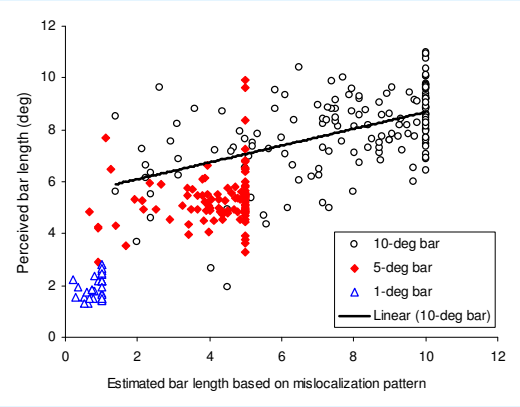
Slope of green line: 1
For 10º bars, left endpoints were mislocalized more than right endpoints. (Does it mean shorter or under-estimated?)

Predict bar length based on mislocalization pattern

Establish a linear interpolation model according to the mislocalization data of bar center.



Prediction vs. perception



For 1º and 5º bars, perception and estimation not correlated ($r<0.12$, $p>0.36$).
Weak correlation for 10º bars ($r=0.39$, $p<0.001$), and they shrank only 27% of the predicted amount.

Discussion

Objects might be perceived a little smaller in certain conditions. However, it seems that mislocalization of points do not imply a corresponding change in perceived object size