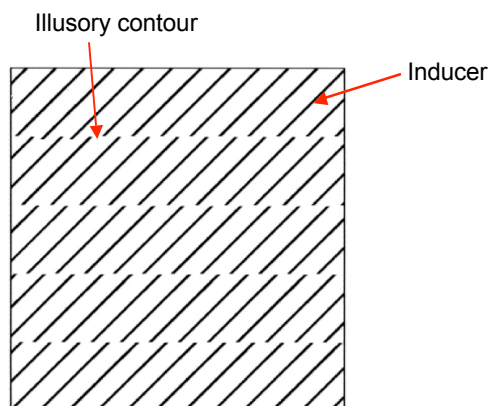


Orientation-selective adaptation to illusory contours in human visual cortex

Leila Montaser Kouhsari
New York University

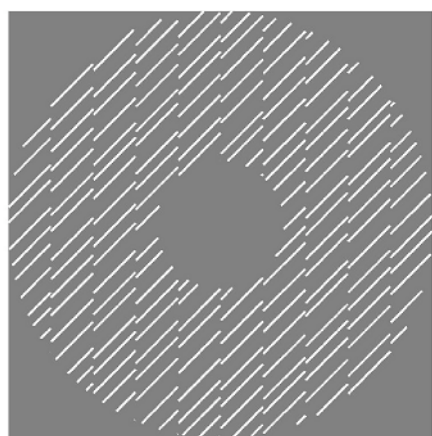
Illusory Contours



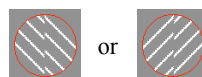
Background

- ❖ Single-unit recording: orientation-selective responses to illusory contours in V1 & V2.
- ❖ fMRI studies: responses throughout the visual pathway, but stronger in higher visual areas.
- ❖ But, fMRI studies in humans have not assessed orientation-selective responses to illusory contours.

Stimuli

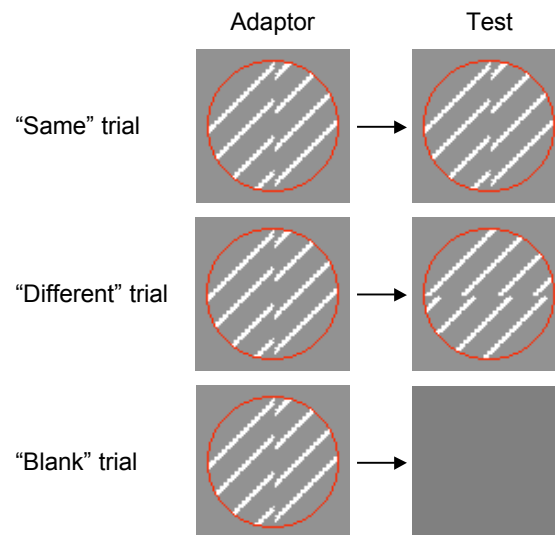


- **Inducers: Line gratings**
(Inducers were jittered)

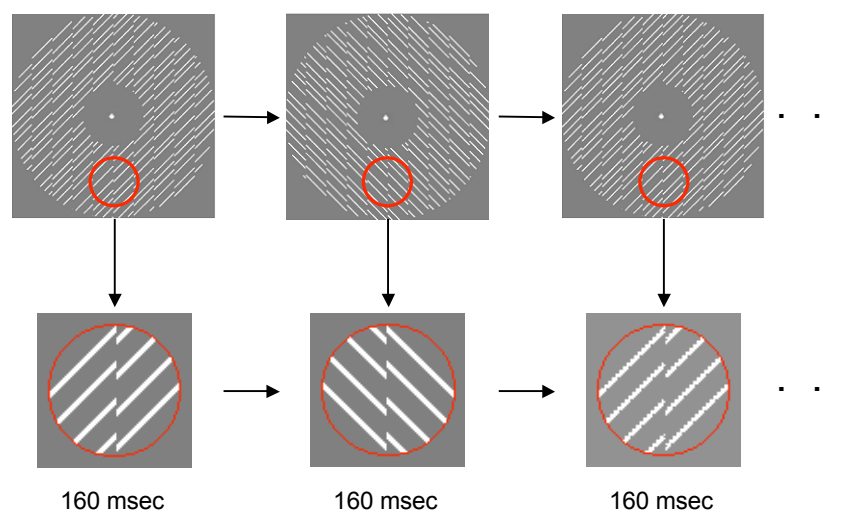


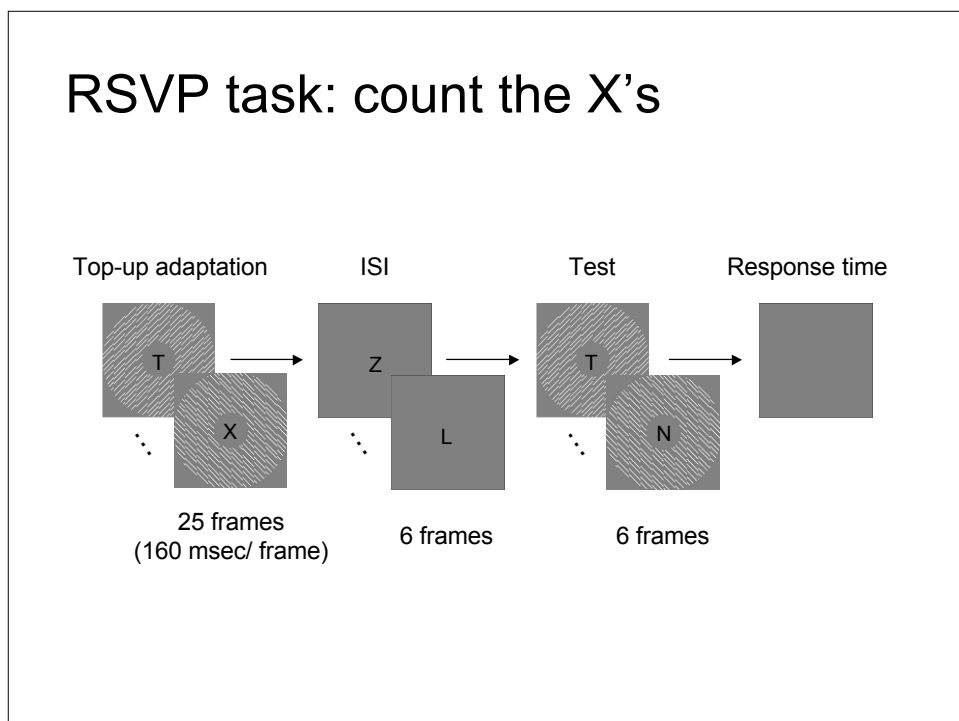
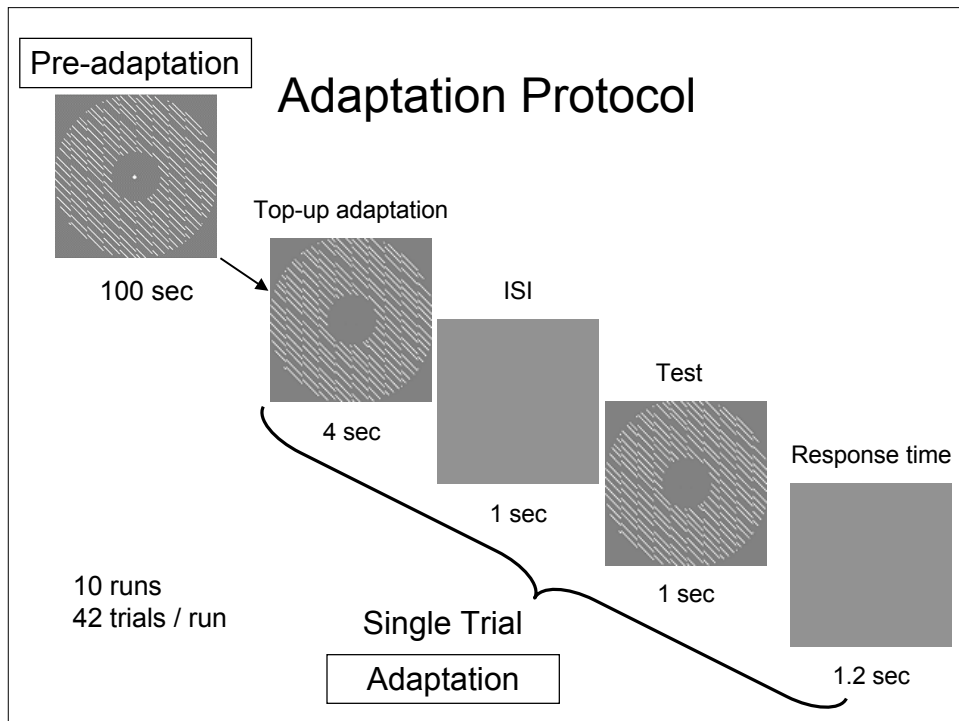
- **Illusory contour orientation:**
Horizontal or Vertical

Measuring orientation selectivity



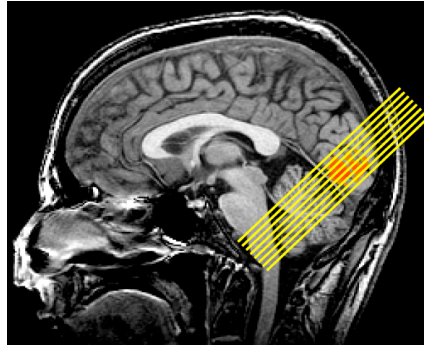
Avoiding adaptation to inducers



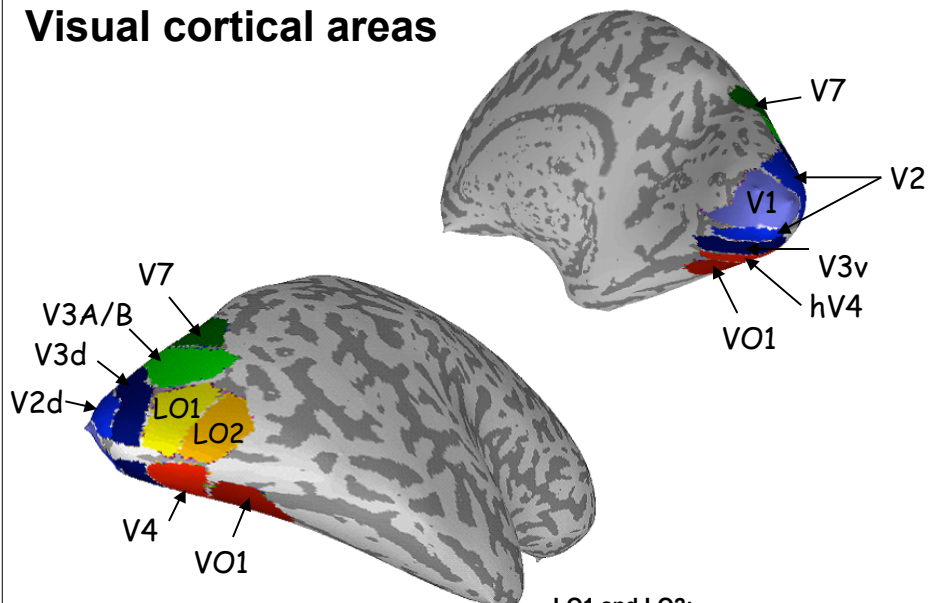


fMRI acquisition

- ❖ 4 participants
- ❖ 3T Siemens
- ❖ Surface coil
- ❖ 19 slices
- ❖ Voxel size: 3 x 3 x 3 mm
- ❖ TR = 1.2 sec, TE = 30 msec



Visual cortical areas

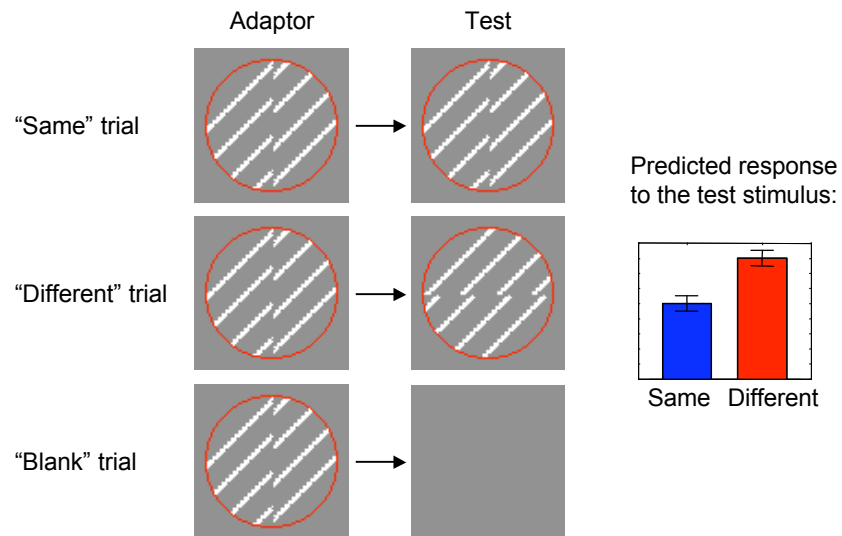


LO1 and LO2:

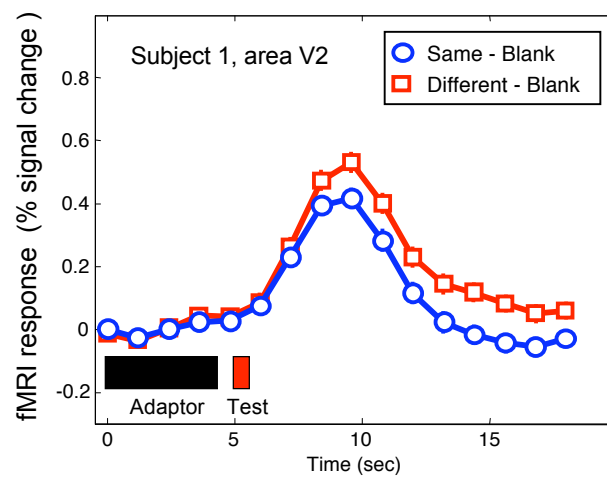
Larsson & Heeger, SFN (2005)

Larsson et al., J Neurophysiology (2006)

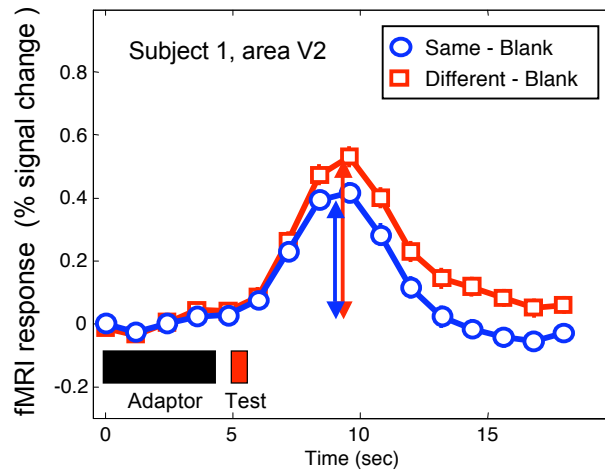
Predicted results



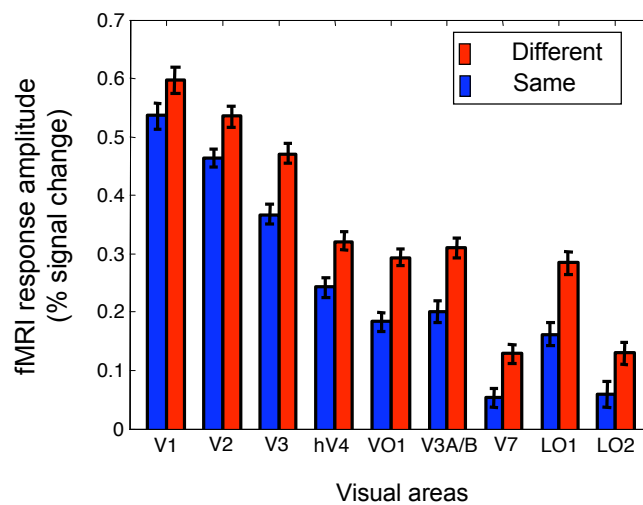
Orientation-selective adaptation



Orientation-selective adaptation

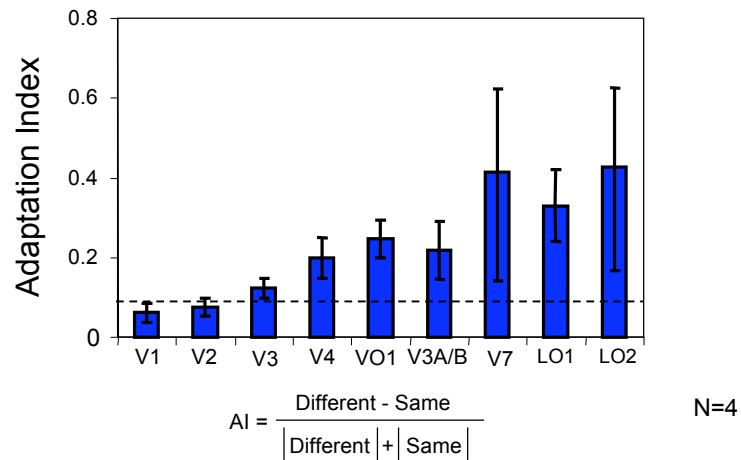


Orientation-selective adaptation in all visual areas

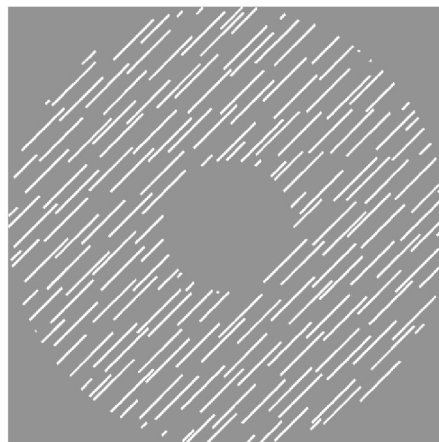


N=4

Adaptation increases in higher visual areas



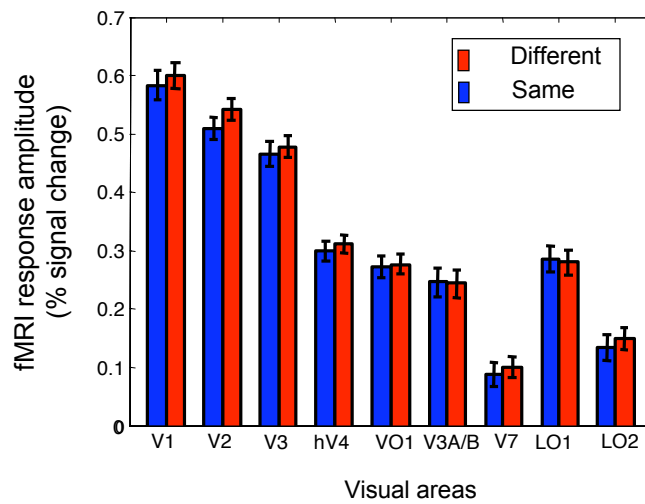
Control adapter stimulus: misaligned inducers



Inducers misaligned

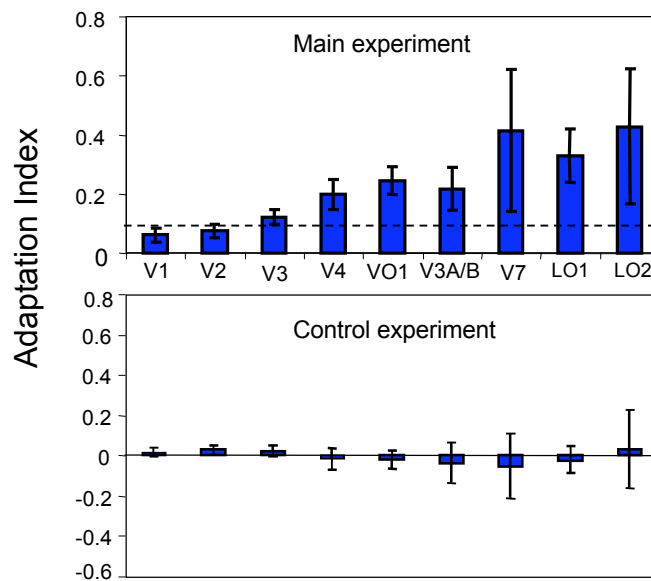
No illusory contours

No orientation-selective adaptation



N=4

Orientation-selective adaptation only to illusory contours



N=4

Conclusion

- ❖ Orientation-selective adaptation to illusory contours in both low- and high-level visual areas.
- ❖ Magnitude of adaptation increased from low- to high-level visual areas.

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- Jonas Larsson
- David Heeger
- Michael Landy
- Heeger lab

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