

Week #8 (March 19 & 31) Sensory Integration
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In one sense this will be a continuation of the previous week's discussion of cortical maps, as we will begin with a discussion of the multiple *parallel pathways* interlinking different cortical areas. The background reading is an excellent introduction to an extreme version of this idea. The concept of the segregation of different functional attributes gives rise to the obvious question of how information represented in anatomically distinct regions is subsequently integrated to form a "seamless" representation of the sensory world. But perhaps we first need to step back and ask *if* such an integration is actually performed by the brain or whether, on the contrary, the seamlessness of reality is not some kind of useful delusion. We will briefly discuss some psychophysical experiments, the results of which were interpreted to indicate that primary attributes (e.g. form, color, motion) are not as tightly bound together as we might think. However, there are clear examples of the re-integration of attributes that are initially processed separately. We will go over a specific example of the convergence of two parallel pathways from some recent experiments that Carlos Ponce has done in my lab. This story involves the integration of information on motion and depth (binocular disparity) used to perform depth ordering of surfaces. It will allow us to consider why such reintegration might occur and why things might be initially processed separately in the first place.

Papers for background reading:

Livingstone, M. and Hubel, D. (1988) Segregation of form, color, movement, and depth: anatomy, physiology, and perception. *Science*. **240**:740-9.

On the Monday following spring break (March 31), we will discuss:

Nadler JW, Angelaki DE and DeAngelis GC (2008) A neural representation of depth from motion parallax in macaque visual cortex. *Nature*. **in press**.

This is a good example of yet another cue that appears to be integrated by MT neurons to compute depth. What do you think is the "other cue"? Our discussion will also prepare us for Greg DeAngelis's seminar on Tuesday, April 1. Everyone should be sure to attend!

Your assignment is to write a standard *News and Views*-style **commentary**, due, as always, before class on Monday (March 31). Bonnes vacances!