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Haxby et al.

The authors in this paper (and the other paper) want to understand the functional architecture of the ventral temporal cortex. More specifically they want to know to understand the computations performed and representations maintained by neurons across the visual hierarchy. To understand this they showed participants in a block design categorical stimuli such as faces, houses, cats, and other objects as well as phase-scrambled versions of the same images. They capture the *pattern* of fMRI response across visual cortex voxels and then compared the correlation of patterns across different stimulus types and different sub-samplings of voxels to understand what parts of cortex are responsible for representing objects. They find that basically any part of visual cortex, even samples of voxels highly selective for specific categories, can be used to identify the category of the stimulus. From this evidence they conclude that visual cortex can be specialized for one category but is never *specific* to a single category. One issue with their approach is that finding a “pattern” of activation does not imply representation—a distributed code of voxels does not necessarily suggest that the underlying voxels are responsible for coding that stimulus.

Kanwisher and Yovel

Kanwisher and Yovel have the same goals, but come to the exact opposite conclusion. They cite a number of lines of evidence that suggest that there are specific isolated regions of visual cortex that selectively respond to a small set of stimuli. Their evidence include: agnosias in particular prosopagnosia, psychophysics measurements that suggest face-specific processing, and physiological recordings from monkeys and humans that suggest that there are regions of cortex with greater than 90% selectivity for faces. In addition, the “fusiform face area” that they are concerned with does not respond to parts of faces as well as “things that look like faces”. They rule out alternative hypotheses that the FFA is related to expertise or configural/relative spacing. They go on to explain their hypothesized understanding of how the FFA represents faces and continue with some open questions. One open question that remains now, years after this finding was published (and continues to be emphasized) is the considerable issue that few other stimuli of major ecological relevance have had a “region” associated with them. Is this because faces are highly consistent while natural landscapes or foods or other items that have high ecological importance are visually inconsistent?