

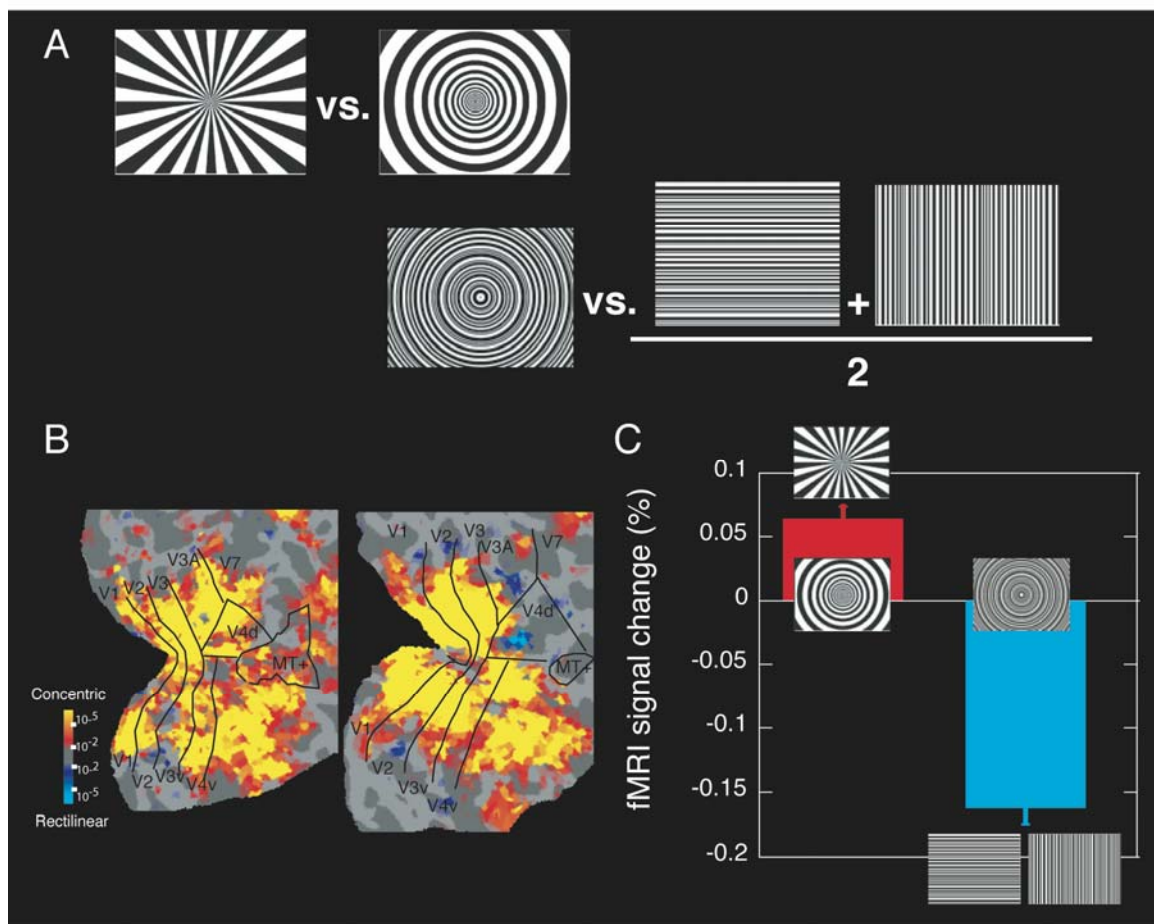
## Supplemental Data

### The Radial Bias: A Different Slant on Visual Orientation Sensitivity

### in Human and Nonhuman Primates

Yuka Sasaki, Reza Rajimehr, Byoung Woo Kim, Leeland B. Ekstrom, Wim Vanduffel,  
and Roger B.H. Tootell

Figure S1. Radial Gratings Produce More fMRI Activity Than Conventional Rectilinear Gratings, in a Two-Stage Comparison

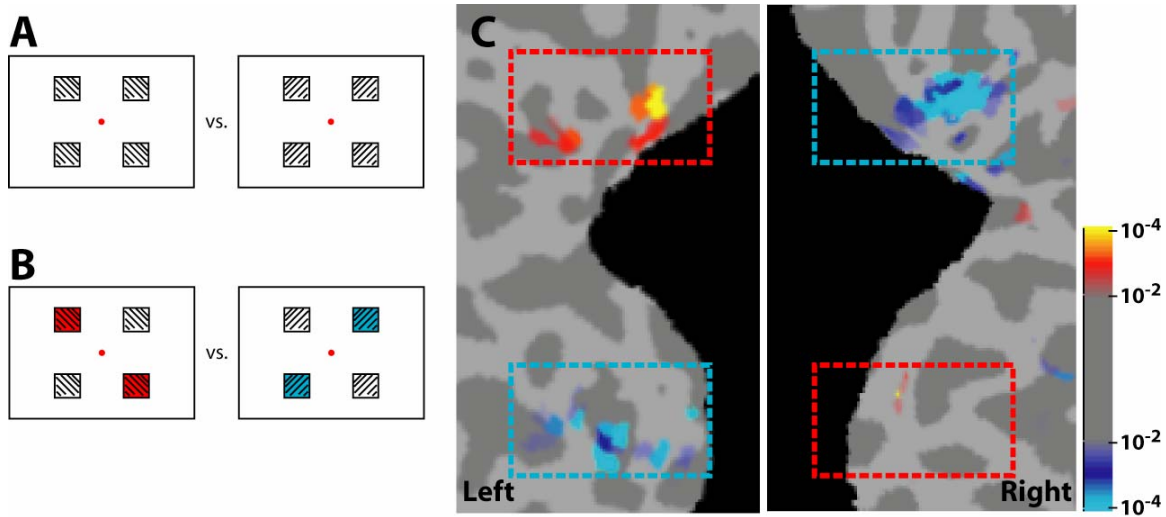


A two-stage (transitive) comparison is necessary because radial gratings and rectilinear gratings cannot be equated for stimulus stripe width at different visual field eccentricities.

(A) Examples of the experimental stimuli. In the first stage (top), activity produced by concentric gratings was subtracted from that produced by radial gratings. In the second stage, activity produced by conventional rectilinear gratings (averaged activity to horizontal and vertical gratings) was subtracted from that produced by concentric gratings. Stripe width was equated within each comparison.

(B) Representative activity maps produced by the second of these subtractive comparisons; no activity difference was found at the representation of different retinotopic eccentricities. Panel C shows the activity produced by both these stimulus comparisons, averaged across the retinotopically-stimulated portion of visual cortex. Activity produced by the two types of concentric grating (stripe width scaled, or not) was normalized. Error bars indicate one standard deviation.

Figure S2. fMRI Tests for a Radial Orientation Bias, using Small Stimulus Patches



(A) Diagram of the stimuli used, which were modeled after those presented in a parallel psychophysical experiment (see Figure 1A). Here, gratings of two different orientations (orthogonal obliques) were presented in alternating blocks during a fMRI experiment, while the subject fixated the center of the stimulus (as in Figure 3).

(B) Illustration of the prediction of the radial orientation hypothesis. During one set of stimulus blocks, the stripes in the red-coded patches were oriented radially; during the second set of blocks, the other set of stripes (blue-coded) patches are radial. All other stimulus-driven activity (including that at different retinotopic locations) should be equal and null, in the subtractive comparison between these two conditions.

(C) Map of fMRI activity obtained in one subject. The red- and blue-coded rectangles enclose those retinotopic regions in which corresponding radial-biased activity was predicted to occur, based on this subjects' retinotopy and the radial orientation prediction. In general, these fMRI results match the predictions, and the psychophysics.