treated with CP-690,550, there were no metabolic abnormalities detected (increases in blood lipids or glucose levels) and no evidence of hypertension nor cases of posttransplant lymphoproliferative disease (*7*). CP-690,550 treatment, however, was associated with dose-related anemia, presumably related to a level of JAK2 inhibition. This was largely restricted to the four animals with the highest drug exposure, who experienced sustained declines in hemoglobin levels. In contrast, the eight animals with □ fourfold lower drug exposure experienced only minor decreases in hemoglobin levels, with animals surviving 90 days recovering to baseline values sov41-359.5sn ering patterns were located more eccentrically, the peak activation was located in a more anterior position (Fig. 2E and fig. S2). The pattern of activation shown in the first experiment (Fig. 2B) is therefore a nearly perfect reversal of retinotopy: Each subject perceived the patterns in one position, but their visual cortex represented the patterns as being in a different location.

Figure 3B shows the event-related averages of seven subjects for the orange patches of activation, where the inward motion response was dominant. Figure 3C shows the event-related averages for the blue patches of activation, where the outward motion response was dominant. Figure S1 shows individual subjects' results.

To ensure that there is no systematic bias in the response to inward compared with outward motion, Fig. 3E shows the event-related average of all seven subjects for the condition in which the patterns were flickering rather than containing motion in any direction (Fig. 3D and fig. S3). Because the event-related averages (Fig. 3E) for each of the stimulus conditions were virtually identical, there was no bias in the response to inward or outward motion over the region as a whole. This is consistent with the fact that senuously performed a difficult task at the fixation point (fig. S7). Although the task was difficult (average accuracy ≈ 73%), the pattern of activation in this experiment was identical to that in the first: Peak fMRI activity occurred not where the patterns were retinotopically located, but closer to the trailing edges of the moving patterns. Spatially localized attention therefore fails to explain the results.

Perhaps subjects attentionally tracked (*20*, *21*) one of the moving bars as it passed through the stationary envelope of the pattern. In this case, observers may have attended to the origin of the moving pattern to choose a moving bar to track. We thus conducted a control experiment in which the patterns contained gratings that moved at ≈ 10 Hz (*8*). Attentional tracking is impossible at such high temporal frequencies (*22*), yet the pattern of activation in the visual cortex remained the same.

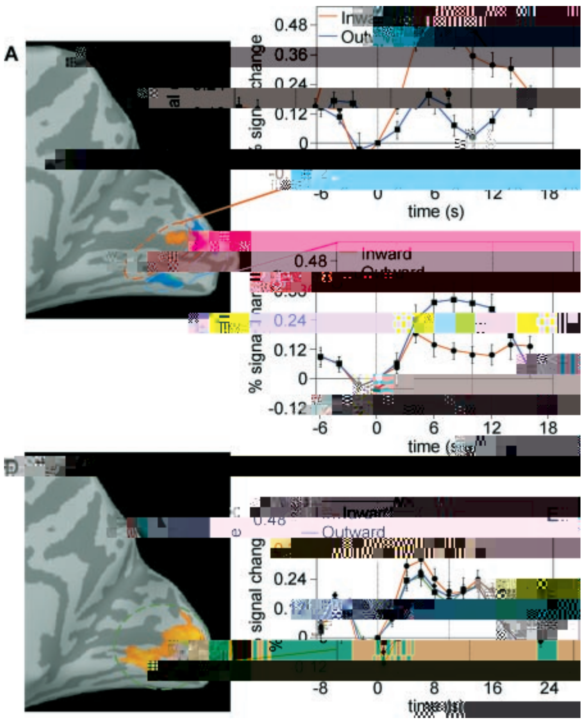

Fig. 3. (A) (*8*) (B) (C) (D) (E)

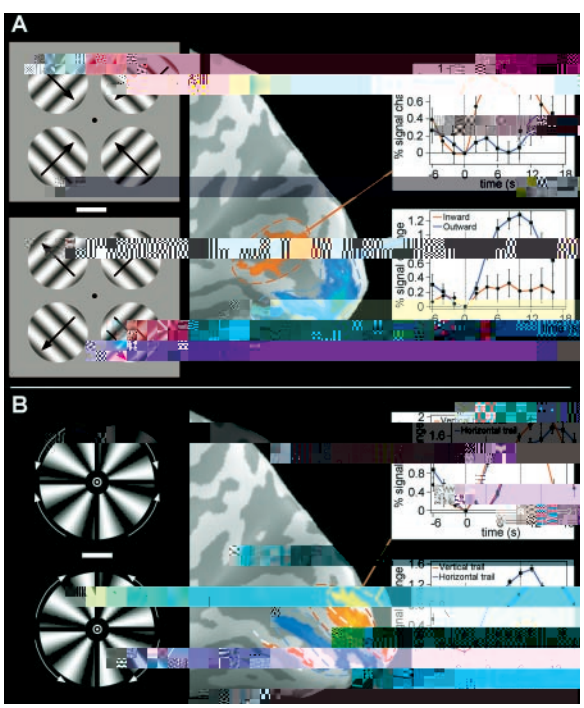

Fig. 4. (A) (B)

Why does an object that appears shifted toward the fovea generate activity that is more eccentric? Why did the activity we found correlate precisely with what subjects did not perceive? Clearly, the location that is assigned to an object in the visual cortex is not simply shifted in the direction of its motion, despite the existence of mechanisms, at least in the retina, that subserve this role (*23*).

The peak activation that we found occurred at the trailing edge or origin of motion in the patterns. Because it is known that there are mechanisms that operate selectively at such trailing edges (*24–28*)—to deblur (*29*) or suppress visual responses, for example—an intriguing possibility is that the activity we measured is the result of a related process, perhaps akin to deblurring, masking, or persistence reduction, that operates more strongly on the trailing edges of moving objects.

If the increased activation that we measured is the product of a mechanism that operates more strongly on the trailing edge of the pattern, then we might expect a reduction in the visibility of the trailing edge. This should cause a compression in the apparent size of the pattern as a whole, as well as a distortion in the apparent luminance distribution of the pattern. In two additional experiments, we measured the perceived position and contrast of both the trailing and leading edges of the patterns containing motion (figs. S4 and S5). The trailing edge of the pattern was perceptually shifted (or compressed) in the direction of motion more dramatically than was the leading edge. The apparent contrast was also reduced more strongly at the trailing edge than at the leading edge of the pattern. These results are consistent with some visual illusions (*25*, *30*, *31*). They also partially explain why the perceived positions of the patterns in our first experiment appeared to be shifted in the direction of motion: Because the contrast of the trailing edge is perceptually reduced, the midpoint of the pattern as a whole appears displaced toward the leading edge.

If there is a mechanism that operates more strongly near the trailing edges of patterns that contain motion, then, in addition to a reduction in the perceived contrast, we might also expect a difference in the nature of the perceived motion that occurs at the trailing and leading edges. We examined this possibility by presenting flickering (directionally ambiguous) gratings at the trailing and leading edges of the patterns containing motion (fig. S8). Although there was no net motion in the flickering stimuli, observers perceived the flickering gratings to move in a direction opposite that of the coherent motion within the pattern. This illusory motion was stronger near the trailing edge of the moving pattern, revealing an imbalance in motion pro-