Supplemental Figures

Supplemental Figure 1. Response model. Each voxel activated by the stimuli were fit to a stimulus model (A) convolved with a standard hemodynamic response function (B) to produce a response model (C). Free parameters included the amplitudes of activations to the attended and unattended segments \( (a_1 \text{ and } a_2) \), respectively), the width or duration of the response, \( w \), and the phase of the response, \( \phi \). The response model covers a single rotation period \( \tau \) of the stimulus.

Supplemental Figure 2. Effects of attention by stimulus type in the LGN and SC. A. The response amplitudes evoked by the dot motion and color/shape stimuli are shown for the LGN. In the two pairs of bars on the left, the amplitudes for the attended (white bars) and unattended (hatched bars) conditions are shown for the two stimulus types averaged across subjects; error bars indicate the SEM. The effects of attention were marginally significant for both the motion and color/shape stimuli, \( F_{1,6} = 5.8, p = .053 \) and \( F_{1,6} = 5.6, p = .055 \), respectively. The pairs of bars in the middle and on the right show the same data, but sorted into two different groups of voxels: one group of voxels with contrast modulation indices (CMI) < .25 (darker shaded bars) and the other group with CMI \( \geq .25 \) (lighter shaded bars). The hatched bars refer to the unattended conditions; the open bars refer to the attended conditions. For each stimulus type and CMI group, there was a significant difference in response amplitude between the attended and unattended conditions \( (F_{1,1334} > 11, p < .001) \). Significant differences in paired comparisons are marked with asterisks, * for \( p < .05 \) and *** for \( p < .001 \); marginal differences are
indicated by their \( p \)-values. B. The response amplitudes in the SC averaged across all voxels and subjects are shown in two pairs of bars to the left. The effects of attention were significant for both the motion and color/shape stimuli, \( F_{1,6} = 5.8, p = .000051 \) and \( F_{1,6} = 99.1, p = .000060 \), respectively. In the pairs of bars in the middle and on the right, response amplitudes are averaged over voxels in all subjects pooled by CMI. For each stimulus type and CMI group, there was a significant difference in response amplitude between the attended and unattended conditions (\( F_{1,656} > 237, p < 10^{-16} \)). Other conventions as in A. C. Attention modulation index values are shown for the motion (M) and color/shape (C/S) conditions for the LGN (left six bars) and SC (right six bars) either averaged by subject (white bars) or voxels grouped by CMI (shaded bars). For the averages by subject, neither of the paired comparisons by stimulus type were significant in the LGN or SC (\( F_{1,6} = 104.9, p = .64 \) and \( F_{1,6} = 99.1, p = .71 \), respectively). In the LGN, the AMI was not significantly different between CMI groups (\( F_{1,1334} = 1.6, p = .20 \)) for the motion stimulus; for the color/shape stimulus, the difference was marginally significant (\( F_{1,1334} = 3.1, p = .078 \)). In the SC, the AMI was significantly larger for the CMI than the CMI group (\( F_{1,656} = 3.9, p = .048 \)) for the motion stimulus, but for the color/shape stimulus, the difference was only marginally significant (\( F_{1,656} = 2.6, p = .11 \)).

Supplemental Figure 3. Spatial maps of attentional modulation in the LGN: Testing the robustness of the effects. The data were split into two halves and analyzed separately. The AMIs maps from these analyses are presented side-by-side for each subject, following the conventions in Figure 7. The left panel for each subject shows the spatial maps of attention effects obtained during stimulus cycles 1, 4 and 6; the right panel
shows the maps obtained during cycles 2, 3 and 5. The two maps contain similar regions of attentional enhancement or suppression, and the AMI was significantly correlated between maps, $r = .13, p = .000021$.

Supplemental Figure 4. Spatial maps of attentional modulation effects by stimulus type in the LGN. The left panel for each subject shows the attentional modulation in response to the dot motion stimulus, and the right panel shows the modulation in response to the color/shape stimulus. Other conventions as in Figure 7.
Supplemental Figure 2

A  LGN

B  SC

C  LGN  SC

Response amplitude

Motion  Color/Shape  Motion  Color/Shape

Attended  Unattended

CMI = .25  CMI = .25

***  ***  ***  ***

Response amplitude

Motion  Color/Shape  Motion  Color/Shape

CMI = .25  CMI = .25

***  ***  ***  ***

Attention modulation index (AMI)

M  C/S  M  C/S  M  C/S  M  C/S

Subject mean  CMI < .25  CMI = .25

p = .053  p = .055  p = .078  p = .11