Supplementary Information

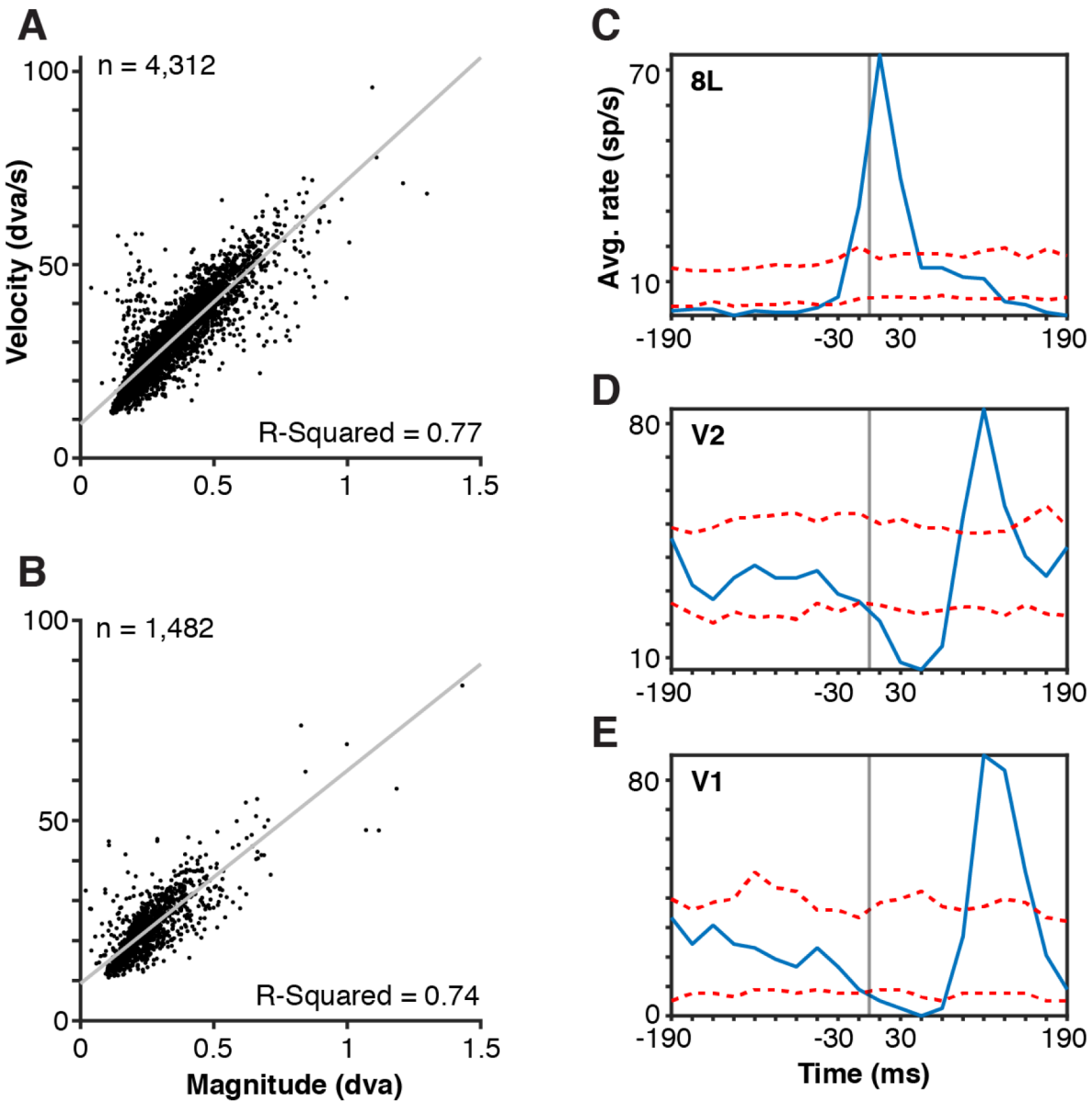

Figure S1. Microsaccade modulation analysis (related to STAR methods and Figure 7). (A, B) Main sequence (magnitude vs. velocity) for all of the microsaccades detected during the fixation trials for Monkey L (A) and Monkey E (B). The x-axis indicates the magnitude (degrees of visual angle, dva) of each microsaccade and the y-axis indicates the velocity (dva/s). Gray diagonal lines show the least-squares fit to the data. R-Squared values are provided at the bottom of each plot. (C-E) Examples of the microsaccade modulation analysis for units in 8L, V2, and V1. Red dashed lines show the 2.5th and 97.5th percentiles of the surrogate distributions for reference only (actual significance testing was performed as described above).

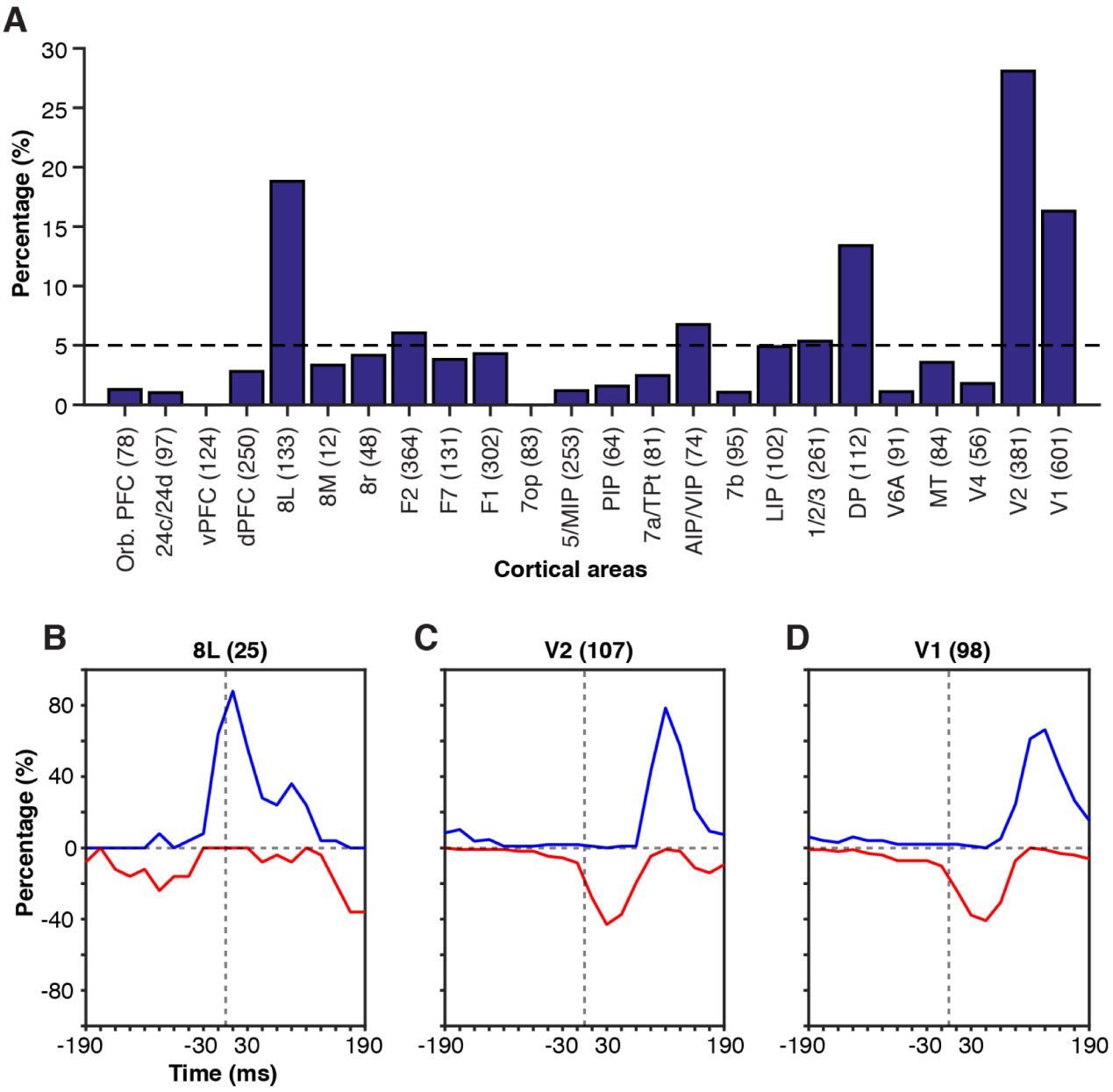

Figure S2. Microsaccade modulation analysis results (related to STAR methods and Figure 7). (A) Percentage of units in each area/group in which the unit activity was significantly modulated by microsaccades. (B-D) Plots showing the percentage of units significantly modulated by microsaccades, relative to the time of occurrence of the microsaccade at 0 ms, in areas 8L, V2 and V1 (SLVR units are included). The blue and red lines indicate the timing of increases and decreases in firing rate, respectively.

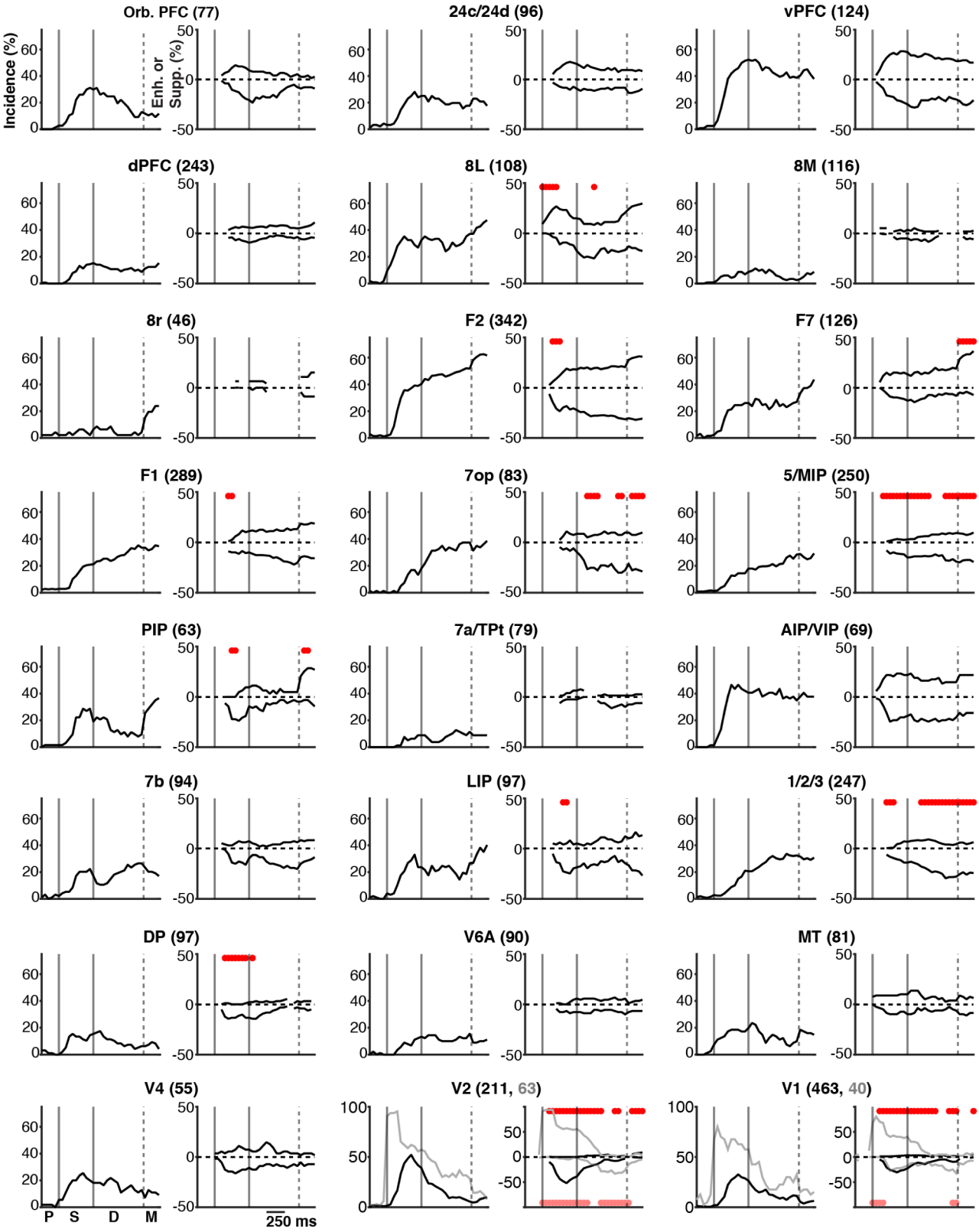
Orb. PFC (77)
24c/24d (96)
vPFC (124)
dPFC (243)
8L (108)
8M (116)
8r (46)
F2 (342)
F7 (126)
F1 (289)
7op (83)
5/MIP (250)
PIP (63)
7a/TPt (79)
AIP/VIP (69)
7b (94)
LIP (97)
1/2/3 (247)
DP (97)
V6A (90)
MT (81)
V4 (55)
V2 (211, 63)
V1 (463, 40)
Incidence (%)
Enh. or Supp. (%)
P S D M
250 ms

Figure S3. Task-dependence analysis for all 24 areas/groups over the course of the task (related to Figure 3). Each pair of plots shows the incidence of significant task-dependent unit activity on the left and the incidence of enhanced or suppressed unit activity on the right. Vertical gray lines mark the onset and offset of the sample. Vertical dashed gray lines mark the end of the fixed delay period. Red asterisks indicate the bins when the number of enhanced or suppressed units is significantly different. The task-dependence for the short latency visual response units in V1 and V2 (V1-SLVR and V2-SLVR, bottom right) is shown in gray. Light red asterisks at bottom of the V1 and V2 plots indicate the bins when the number of enhanced or suppressed units is significantly different for the SLVR units. The labels P, S, D, and M in the lower left indicate the presample, sample, delay, and match locked periods, respectively. Area/group names are shown at the top of each pair of plots. Sample sizes are given in parentheses.

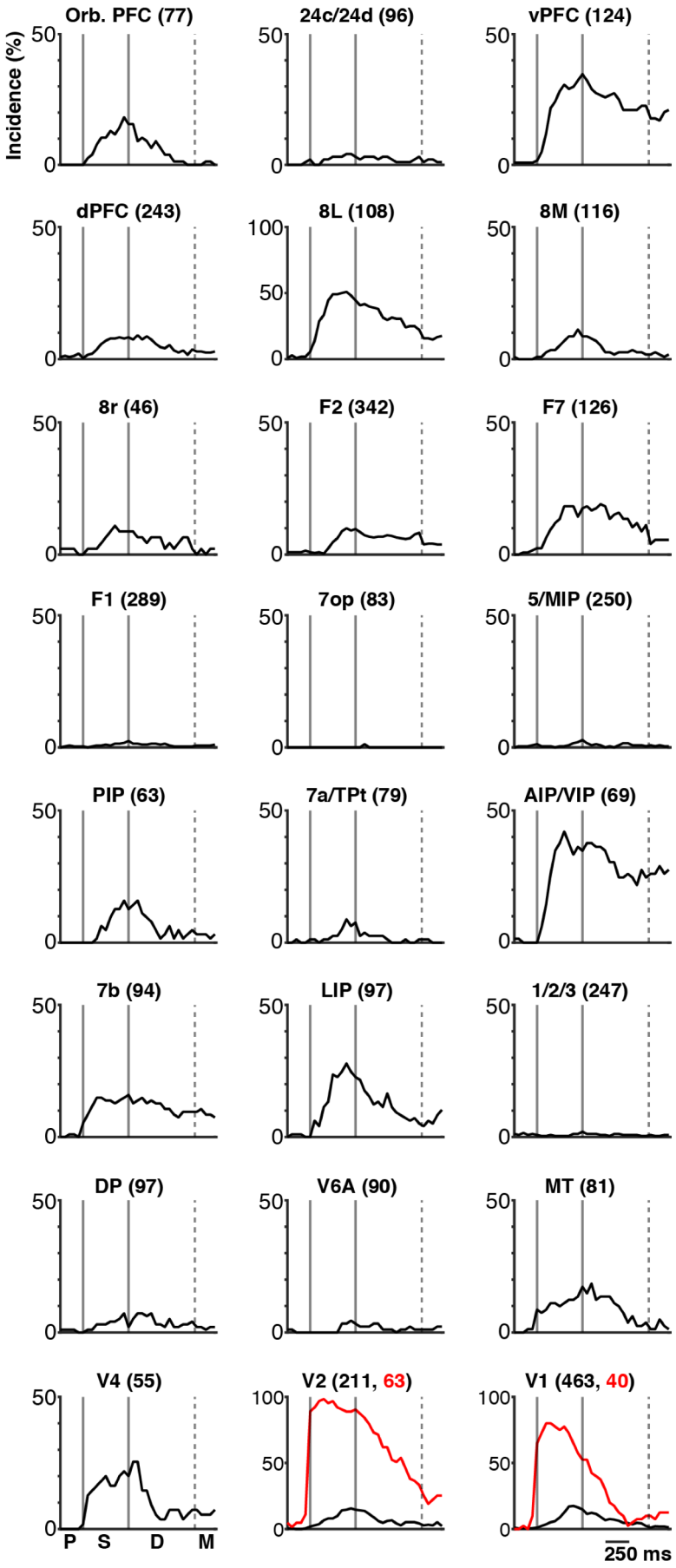
Incidence (%)
Orb. PFC (77)
24c/24d (96)
vPFC (124)
dPFC (243)
8L (108)
8M (116)
8r (46)
F2 (342)
F7 (126)
F1 (289)
7op (83)
5/MIP (250)
PIP (63)
7a/TPt (79)
AIP/VIP (69)
7b (94)
LIP (97)
1/2/3 (247)
DP (97)
V6A (90)
MT (81)
V4 (55)
V2 (211, 63)
V1 (463, 40)
50
100
0
P S D M
250 ms

Figure S4. Stimulus-selectivity analysis for all 24 areas/groups over the course of the task (related to Figure 5). Each plot shows the incidence of significant stimulus-selective activity. Vertical gray lines mark the onset and offset of the sample, and the vertical dashed gray lines mark the end of the fixed delay period. Units in V1 and V2 with a short latency visual response are shown in red. The labels P, S, D, and M at the bottom left indicate the presample, sample, delay, and match locked periods, respectively.

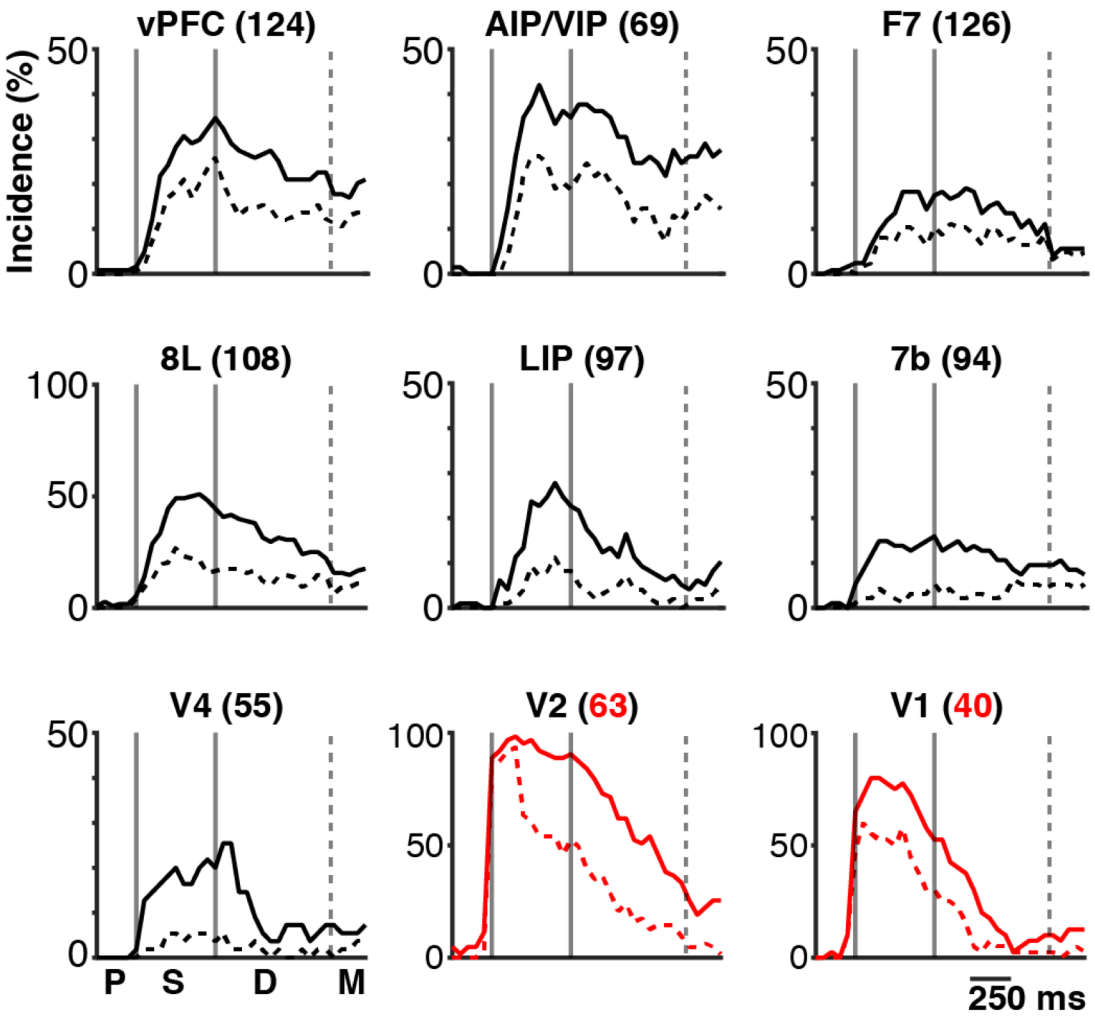

Figure S5. Incidence of stimulus-selective activity (solid lines) and the incidence of both stimulus-selective and task-dependent activity (dashed lines) for the 9 areas/groups in the hierarchy (related to Figure 6). The incidence of both is simply the overlap between the two analyses. Specifically, for each unit, at each time bin we determined if the activity was both stimulus-selective and task-dependent. Only the V1 and V2 units with a short latency visual response were considered (red). Vertical gray lines mark the onset and offset of the sample, and the vertical dashed gray lines mark the end of the fixed delay period. The labels P, S, D, and M at the bottom left indicate the presample, sample, delay, and match locked periods, respectively.