Supplementary Information for

Ventrolateral prefrontal cortex in macaques guides decisions in different learning contexts

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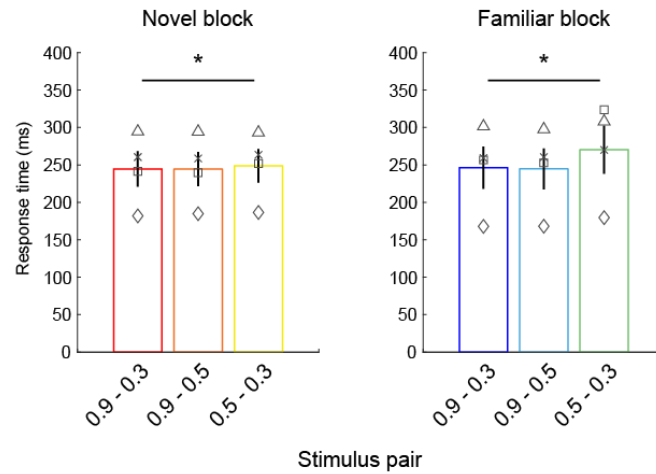
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862   **Supplementary Figures 1-5**

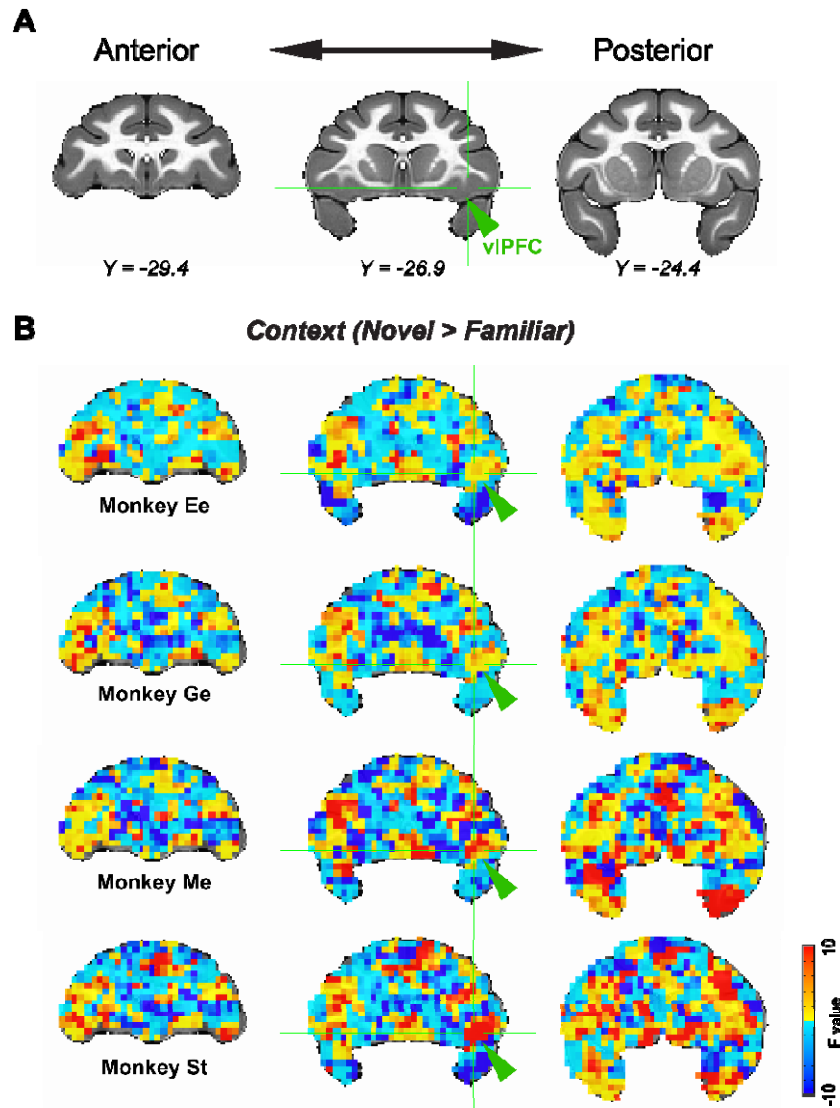863   **Supplementary Tables 1-2**

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Supplementary Figure 1. Response time (RT) of monkeys. Bar graphs show average and SEM of RT for each stimulus pair in novel (left) and familiar (right) blocks. Symbols represent each animal. Asterisks indicate significant main effect of stimulus pair (*p<0.05, 2-way repeated-measures ANOVA).

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Supplementary Figure 2. Context coding in individual monkeys. (**A**) Anatomical templates showing coronal slices around vlPFC ROI. (**B**) Unthresholded map of F-stats superimposed on the anatomical templates in (A). The data for each animal is shown in each row. Crosshairs and arrowheads indicate the peak coordinates of vlPFC ROI used in time-course analyses.

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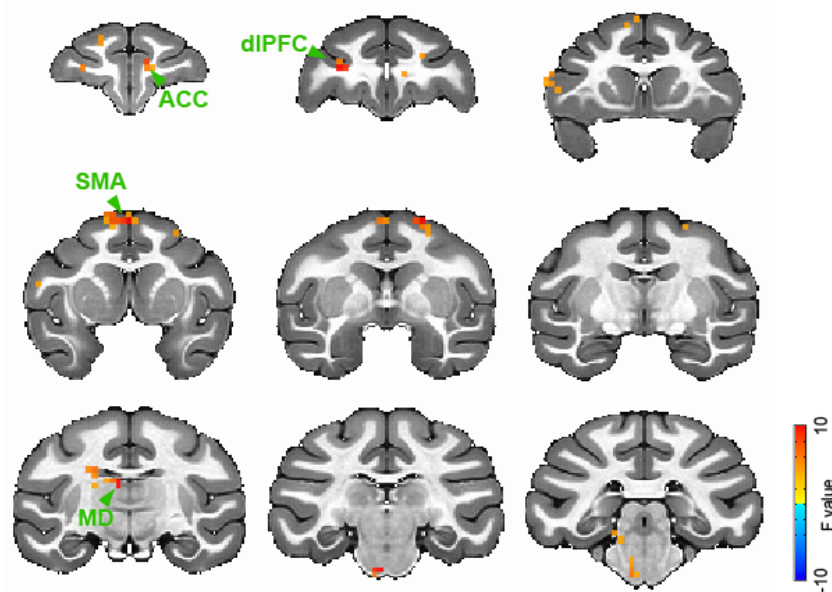
Supplementary Figure 3. Functional connectivity analysis using vlPFC seed. Whole-brain map of F-stats in significant clusters (p < 0.05, cluster-corrected, generalized psycho-physiological interaction or gPPI) superimposed onto an anatomical template. Coronal slices (4.0 mm apart) are shown from anterior (top left) to posterior (bottom right) planes.
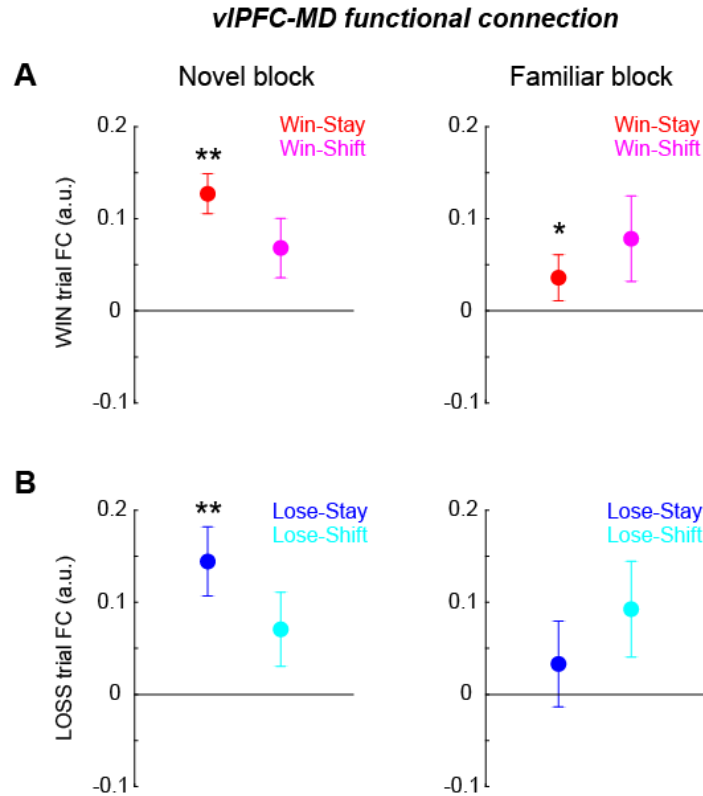
vlPFC-ACC functional connection
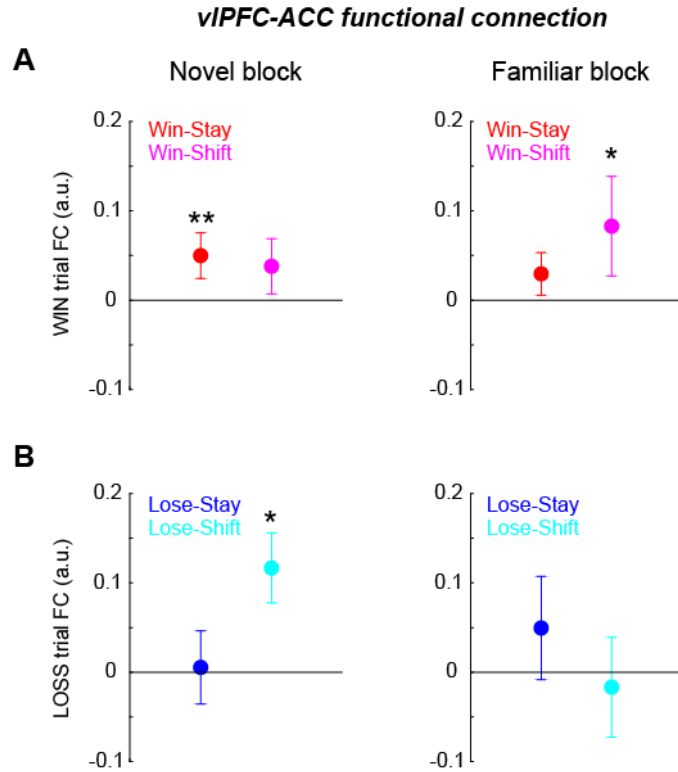
Supplementary Figure 4. The impact of outcome and stay/shift decision on vlPFC-ACC functional connection. The average FC between vlPFC and ACC around the timing of outcome (-2 to +2 seconds after outcome) are plotted for win-stay and win-shift trials (A) and lose-stay and lose-shift trials (B) for novel (left) and familiar (right) blocks, respectively. Error bars indicate SEM. Asterisks indicate significant FC changes from zero (**$p < 0.01$ or *$p < 0.05$, rank-sum test).

Supplementary Figure 5. Functional connection between vlPFC and MD thalamus around the outcome timing. (**A, B**) The average FC between vlPFC and MD around the timing of outcome are plotted for novel (left) and familiar (right) blocks, respectively. The conventions are the same as Figure S4. Asterisks indicate significant FC changes from zero (**p < 0.01 or *p < 0.05, rank-sum test).

Area	Peak coordinates			#voxels
	x	y	z	
V4	-22.5	+7.6	+7.9	236
Medulla	-4.5	+6.1	-7.1	54
Precuneus	+3.0	+3.1	+28.9	53
V2	+24.0	+9.1	+15.4	36
Somatosensory	+15.0	+3.1	+30.4	26
vlPFC	-16.5	-26.9	+13.9	23
V6A	+1.5	+12.1	+27.4	23
dACC	+1.5	-29.9	+24.4	23
Premotor	-22.5	-23.9	+24.4	21
dlPFC	+12.0	-32.9	+31.9	21
Somatosensory	-15.0	-11.9	+25.9	19
SMA	0.0	-32.9	+30.4	18
Pons	-4.5	-1.4	+0.4	17
vlPFC	-13.5	-34.4	+24.4	17
V2	-10.5	+0.1	+12.4	17
V1	+15.0	+12.1	+13.9	17
Auditory	-24.0	-19.4	+13.9	17
vlPFC	+18.0	-26.9	+18.4	16
Precuneus	+1.5	+4.6	+21.4	16
PCC	-4.5	-2.9	+27.4	16
TE	+15.0	-22.4	+0.4	15
TE	-21.0	-7.4	+4.9	15
dlPFC	+13.5	-29.9	+27.4	15
Auditory	+24.0	-14.9	+12.4	15
TEO	+25.5	-1.4	+12.4	14
V3	+19.5	+10.6	+24.4	14
Cerebellum	+3.0	+19.6	+6.4	14
Precuneus	-3.0	+9.1	+25.9	14

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Supplementary Table 1. Full list of clusters in the whole-brain analysis that encoded learning context and reward outcome. dlPFC: dorsolateral prefrontal cortex, vlPFC:

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901   ventrolateral prefrontal cortex, V1: primary visual cortex, V2: secondary visual cortex, V3: third
902   visual cortex, V4: fourth visual cortex, TE: anterior inferotemporal cortex, TEO: posterior
903   inferotemporal cortex, dACC: dorsal anterior cingulate cortex, PCC: posterior cingulate cortex.

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Area	Peak coordinates			#voxels
	x	y	z	
Pons	+1.5	-7.4	-1.1	63
dlPFC	+7.5	-35.9	+31.9	40
Somatosensory	+6.0	+7.6	+34.9	37
Premotor	0.0	-22.4	+36.4	29
Premotor	-9.0	-19.4	+36.4	27
Cerebellum	-3.0	+4.6	+1.9	25
V2	-3.0	+10.6	+19.9	24
MD thalamus	+3.0	+10.4	+19.9	22
V1	+7.5	+19.6	+16.9	21
Medulla	+1.5	+1.6	-7.1	19
V1	-9.0	+16.6	+28.9	19
V2	+9.0	+13.6	+24.4	17
Premotor	+21.0	-23.9	+21.4	15
V1	-12.0	+19.6	+4.9	14
dACC	-4.5	-34.4	+25.9	14

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906 **Supplementary Table 2. Full list of clusters in the functional connectivity (gPPI) analysis**
907 **that encoded learning context in relation to right vlPFC seed timeseries.** dlPFC: dorso-lateral
908 prefrontal cortex, V1: primary visual cortex, V2: secondary visual cortex, dACC: dorsal anterior
909 cingulate cortex.

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