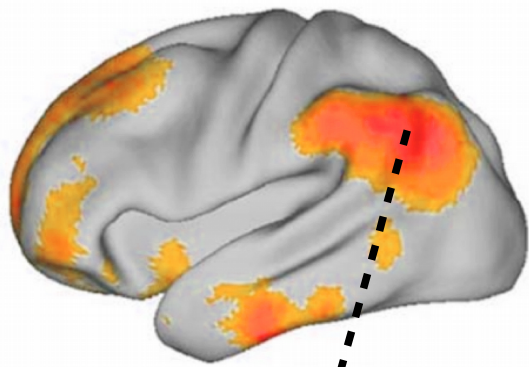


## PMC: Global monitoring and information integration

$$\delta\theta_k \propto -\mathbb{E}_{(s,a,r,s') \sim \mathcal{D}}[(\tilde{Q}(s, a|\theta_k) - y_k) \nabla_{\theta_k} \tilde{Q}(s, a|\theta_k)]$$

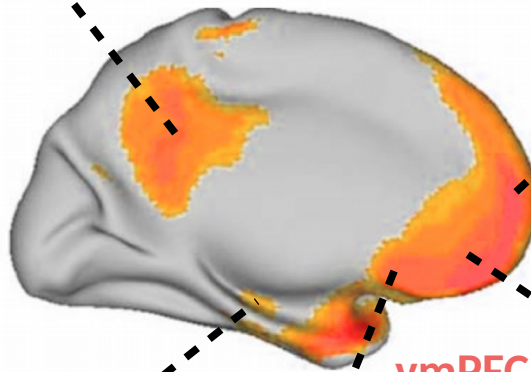
## dmPFC (BA9): Action consideration

$$a_k \leftarrow \operatorname{argmax}_{a \in \mathcal{A}} \tilde{Q}(s_k, a|\theta_k)$$



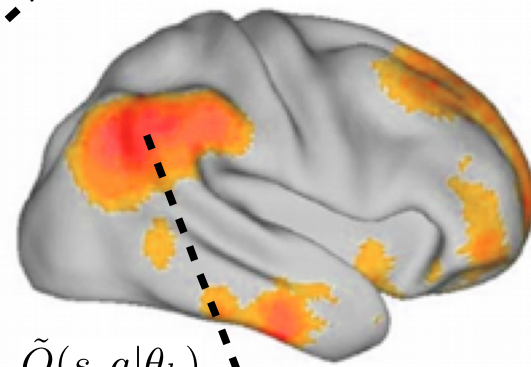
### Left TPJ: World semantics

$$s_0 \xrightarrow{r_1} s_1 \xrightarrow{r_2} s_2 \xrightarrow{r_3} \dots$$



### Ncl. Accumbens:

Reward / punishment signals



### Right TPJ: Prediction error signaling

$$\tilde{Q}(s, a|\theta_k) - y_k$$

**Hippocampus:** Memory,  
space, and experience replay

$$(s, a, r, s') \sim \mathcal{D}$$

**vmPFC (BA10):**  $\tilde{Q}(s, a|\theta_k)$   
Stimulus-value association