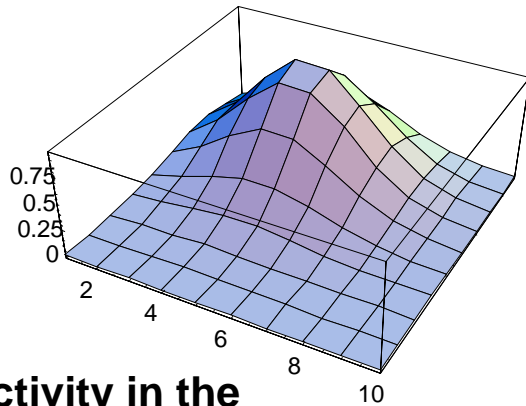
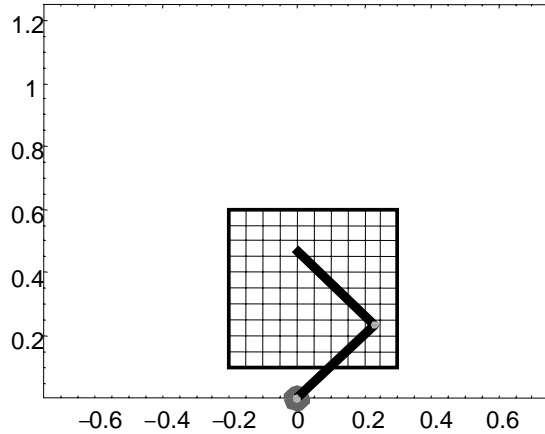


Error Generalization Depends on Representation



Activity in the vision layer

$$\hat{x}_j = \sum_{i=1}^N w_{ij} g_i(\theta)$$

$$\tilde{x}^{(n)} = x^{(n)} - \hat{x}^{(n)}$$

$$e = \frac{1}{2} \tilde{x}^2$$

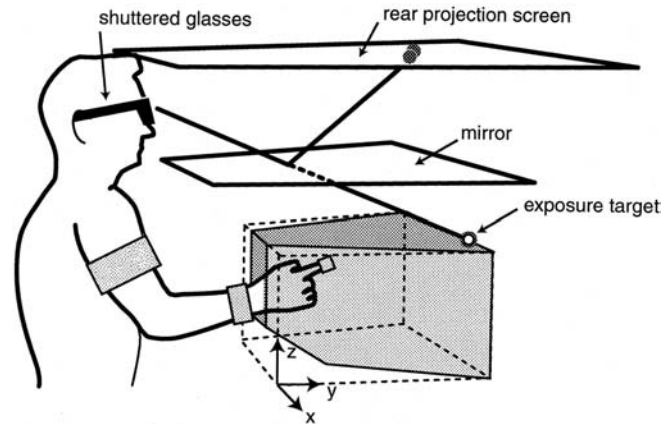
$$\frac{de}{dw_{ij}} = \frac{de}{d\tilde{x}} \frac{d\tilde{x}}{dw_{ij}} = \tilde{x}(-g_i(\theta))$$

$$w_{ij}^{(n+1)} = w_{ij}^{(n)} + \eta \tilde{x}^{(n)} g_i(\theta^{(n)})$$

$$\hat{x}_j^{(n+1)} = \sum_{i=1}^N w_{ij}^{(n+1)} g_i(\theta^{(n+1)})$$

$$\hat{x}_j^{(n+1)} = \sum_{i=1}^N w_{ij}^{(n)} g_i(\theta^{(n+1)}) + \eta \tilde{x}^{(n)} g_i(\theta^{(n)}) g_i(\theta^{(n+1)})$$

Modification of visual feedback at one location has global consequences



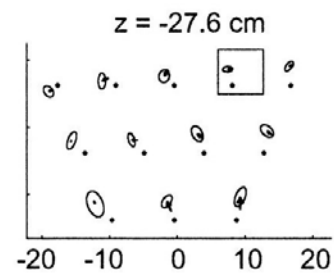
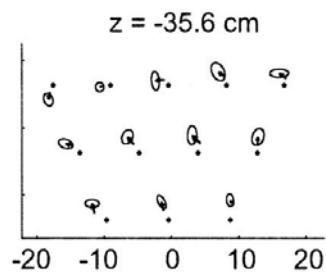
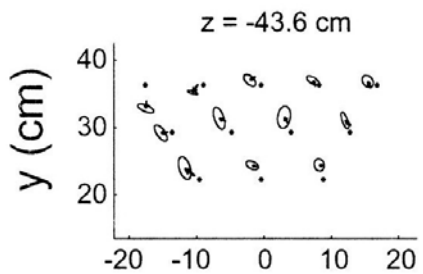
During training, subjects reached to a single target.

Cursor representing finger could not be seen, except at a 3cm region around the target.

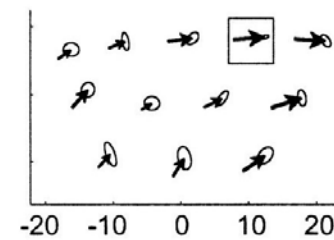
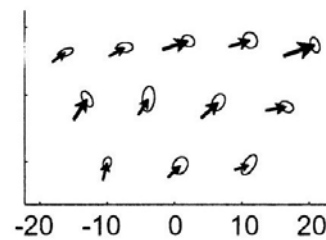
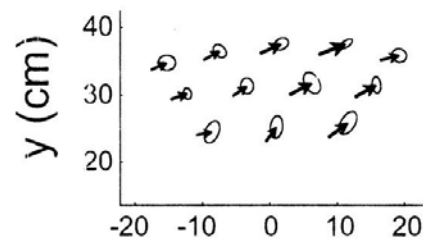
The image representing the finger appeared 6 cm to the left of its actual location along the x -axis.

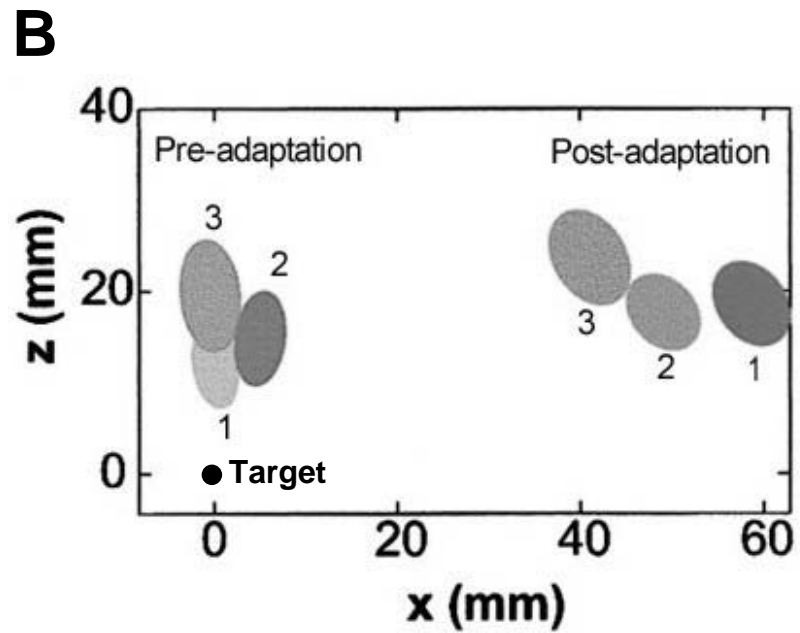
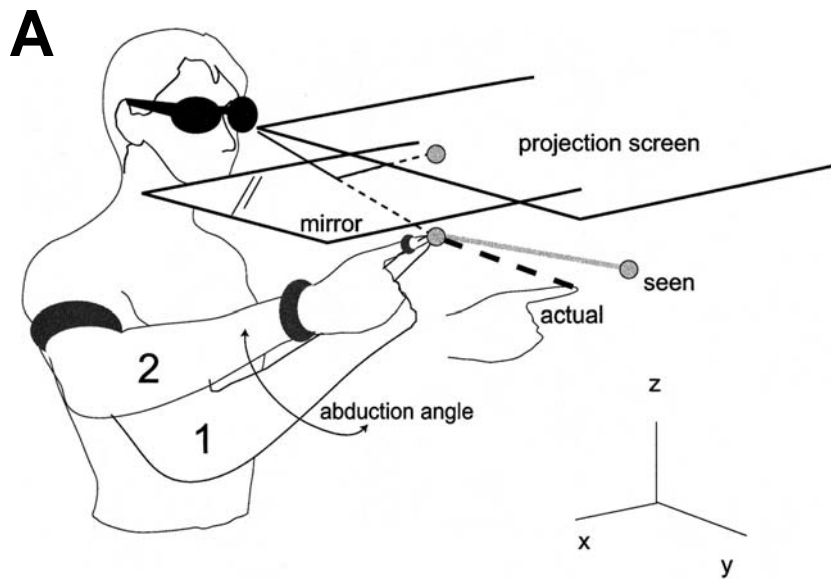
To see the finger at the target, it had to be positioned 6 cm to the right.

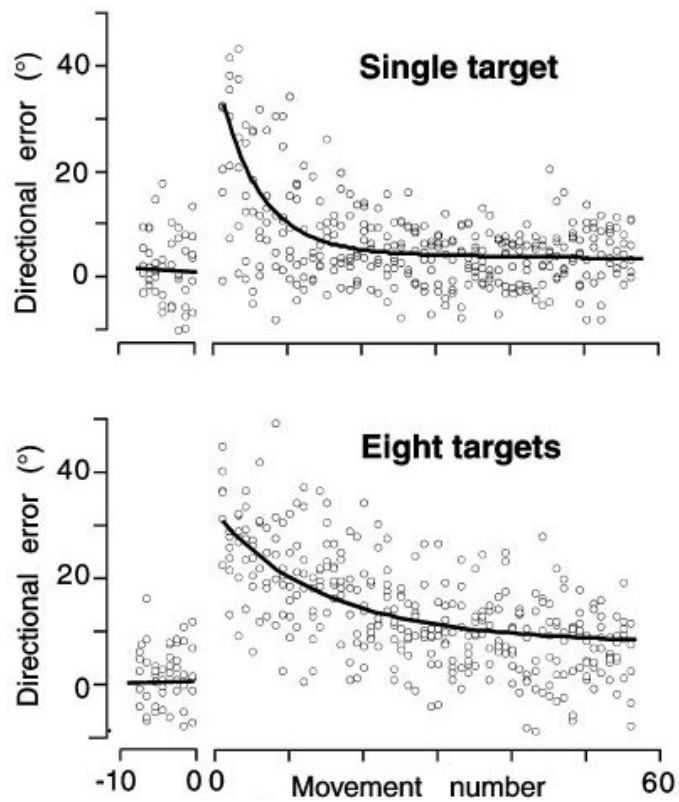
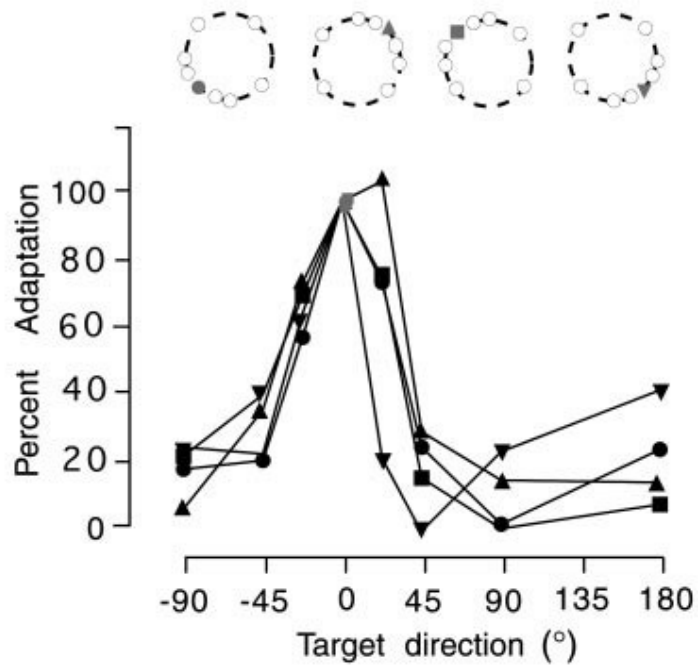
**Pre-
exposure**

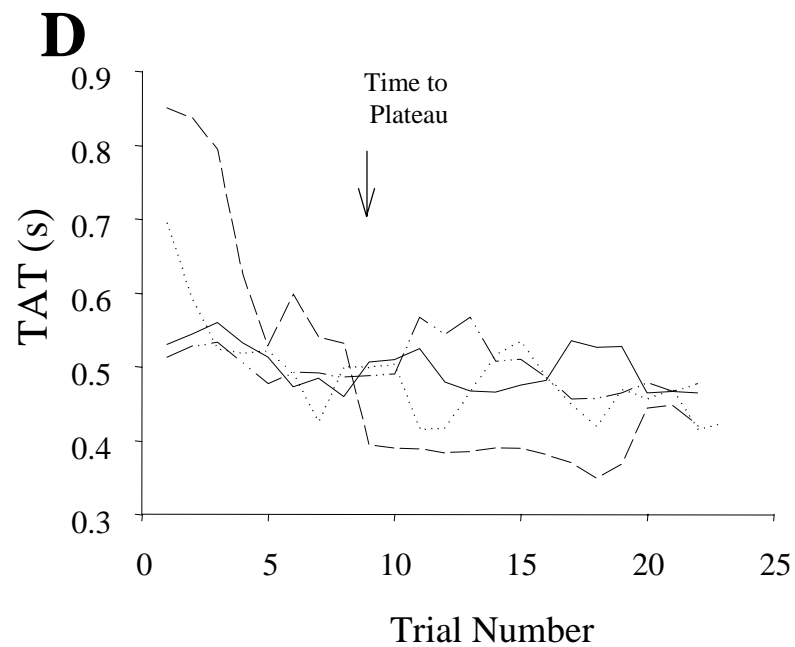
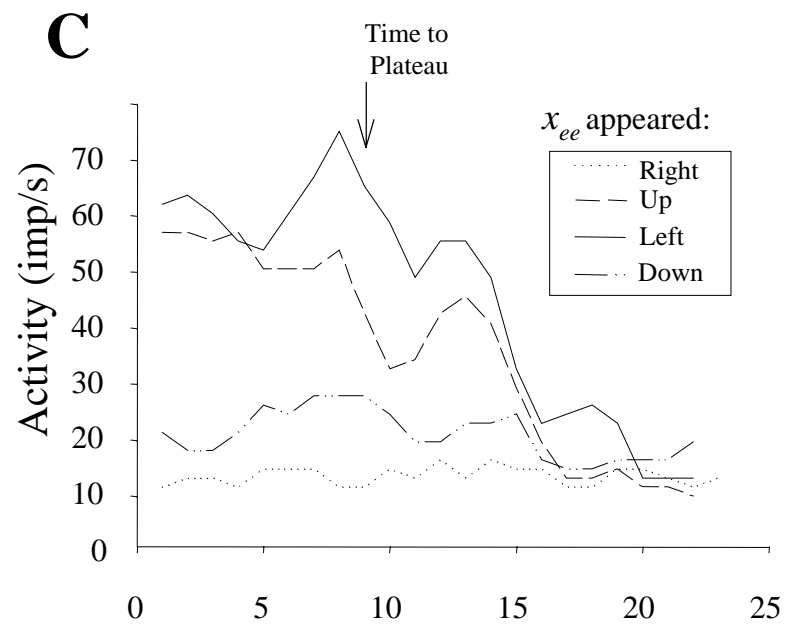
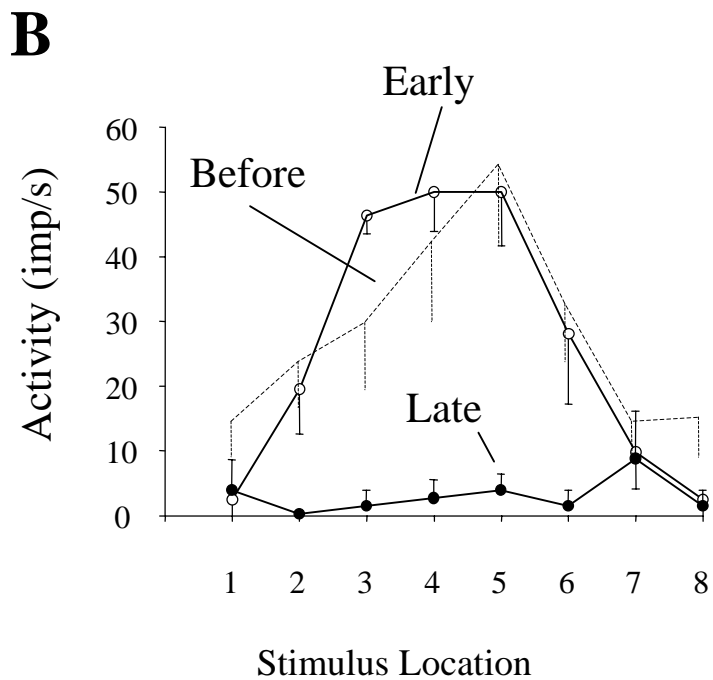
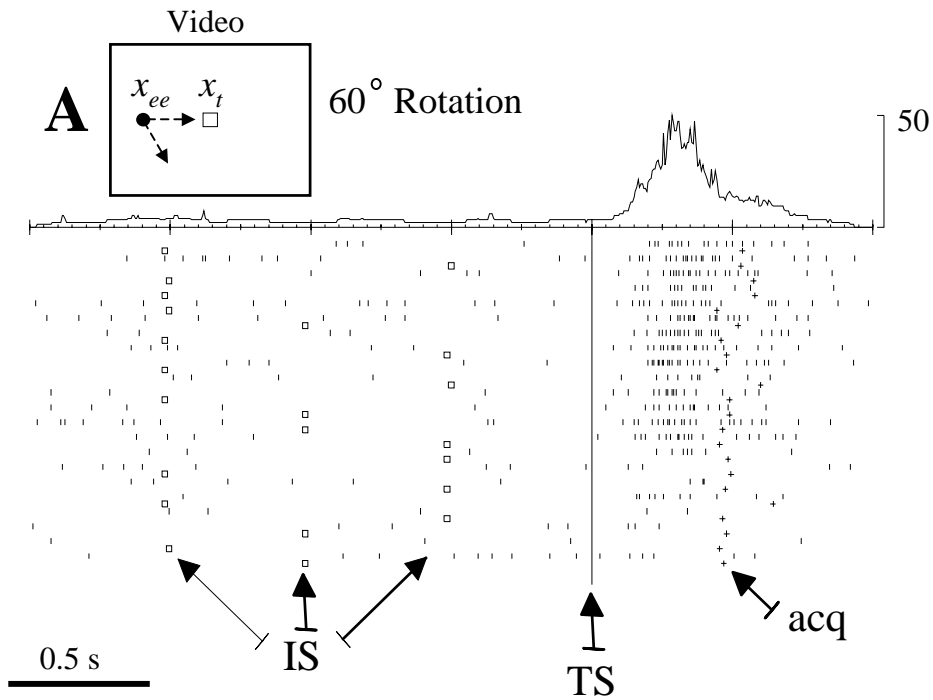


**Post-
exposure**





A**B**



Model

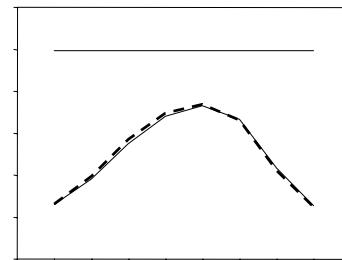
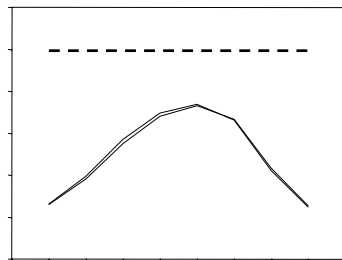
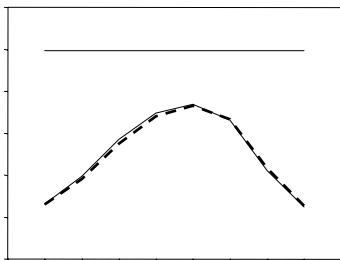
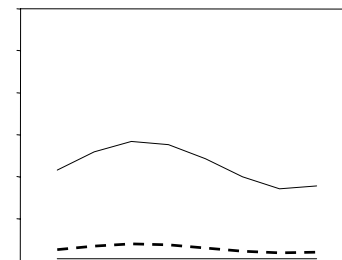
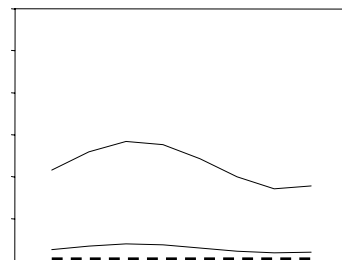
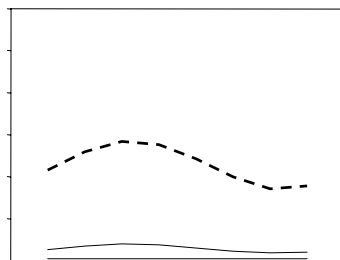
1st Standard

90-degree Transform

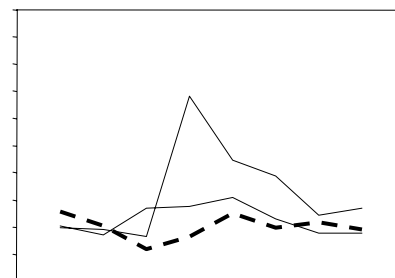
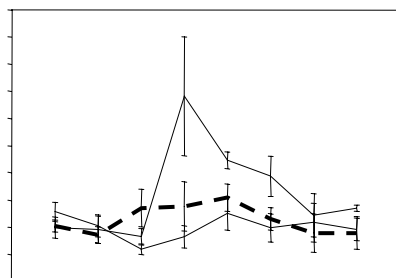
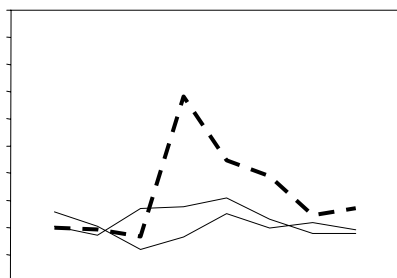
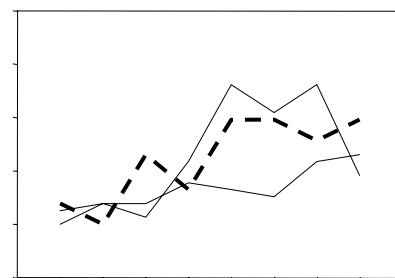
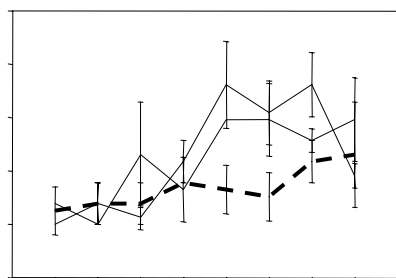
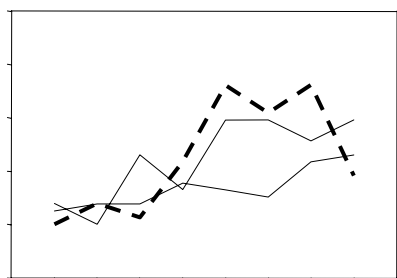
2nd Standard

A

Hidden-unit Activity

Change
ReturnChange
Stay**Motor Cortex****B**

Neuronal Activity (imp/s)

Change
ReturnChange
Stay

0 45 90 135 180 225 270 315

0 45 90 135 180 225 270 315

0 45 90 135 180 225 270 315

Stimulus Location