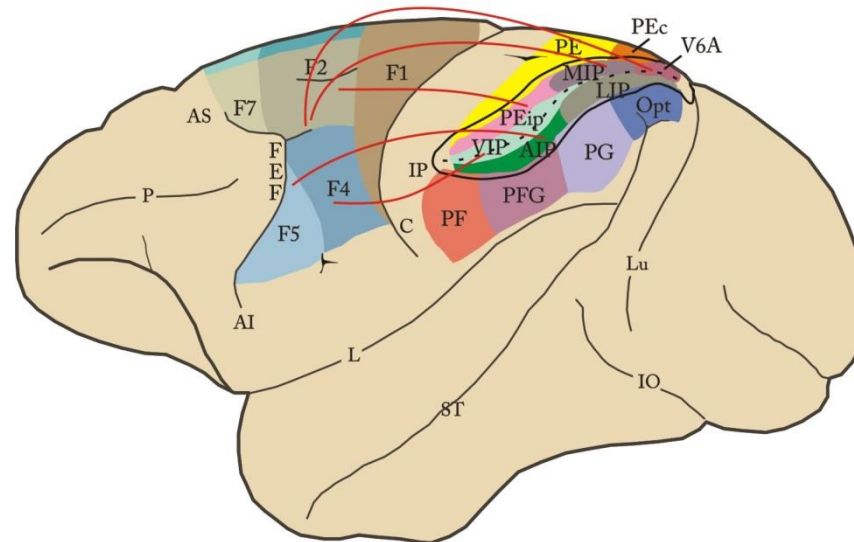
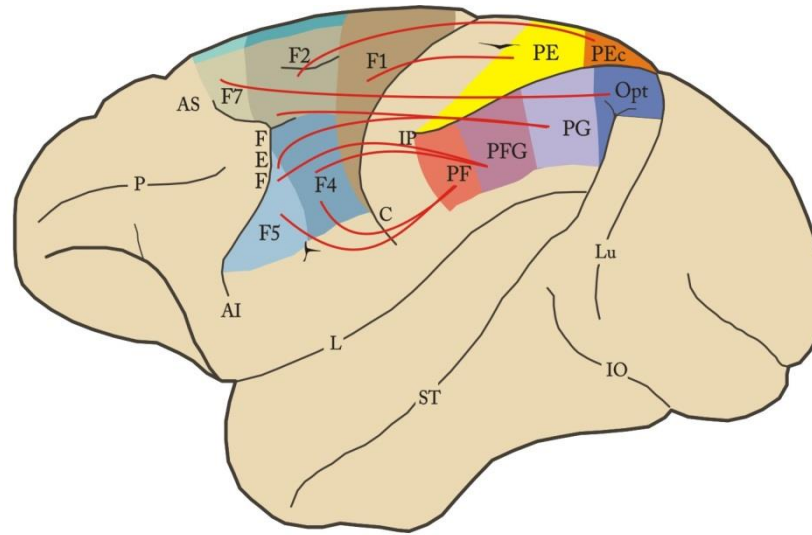


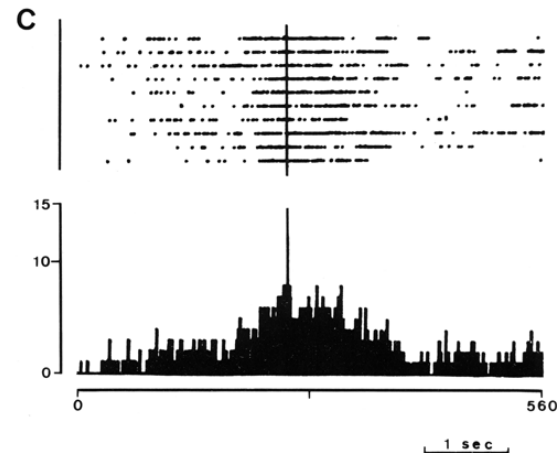
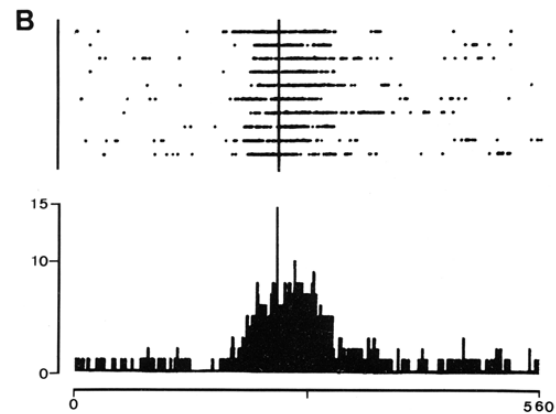
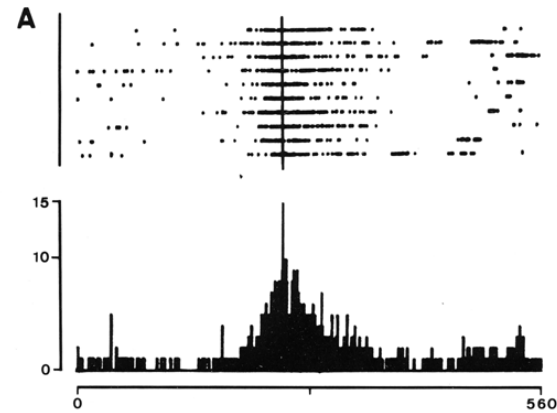
Un circuito per la comprensione delle azioni:

Il sistema mirror

I circuiti parieto-frontali,  
ampiamente segregati, sono il  
substrato anatomico delle  
trasformazioni sensorimotorie



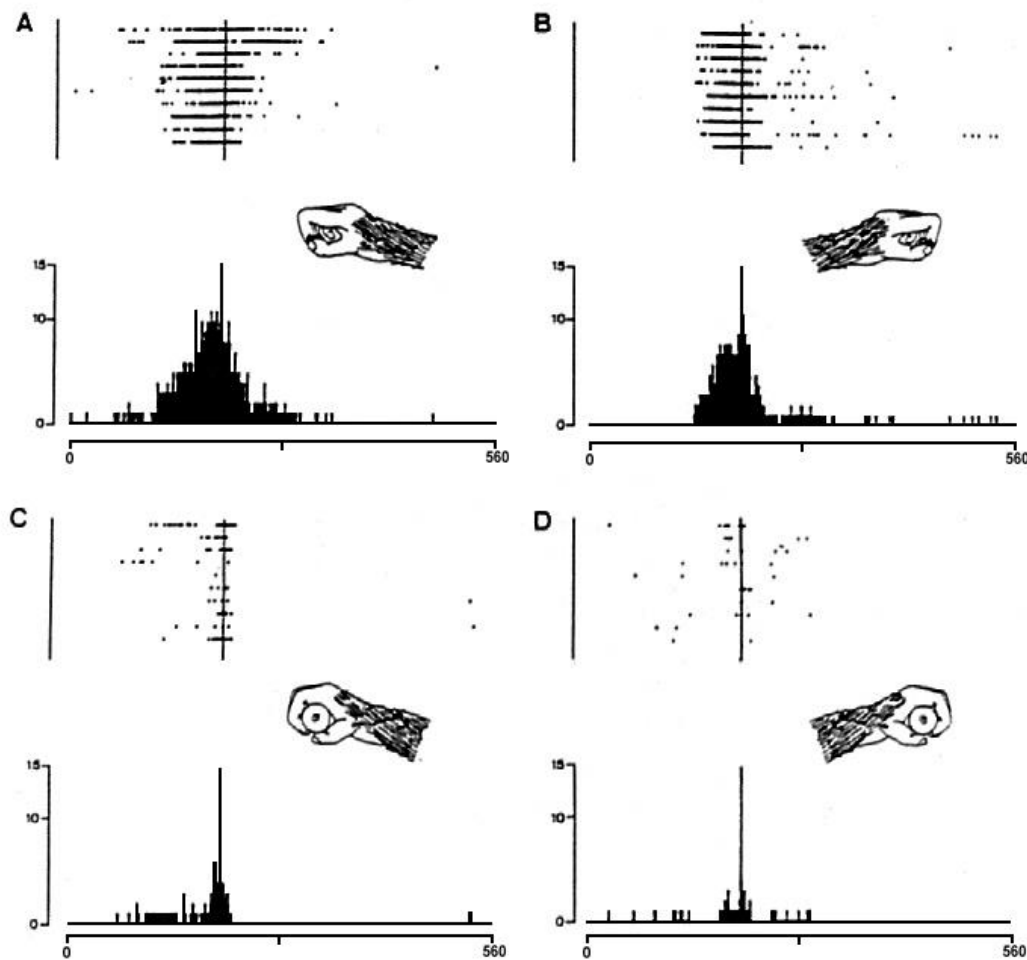
# Neurone dell'afferramento

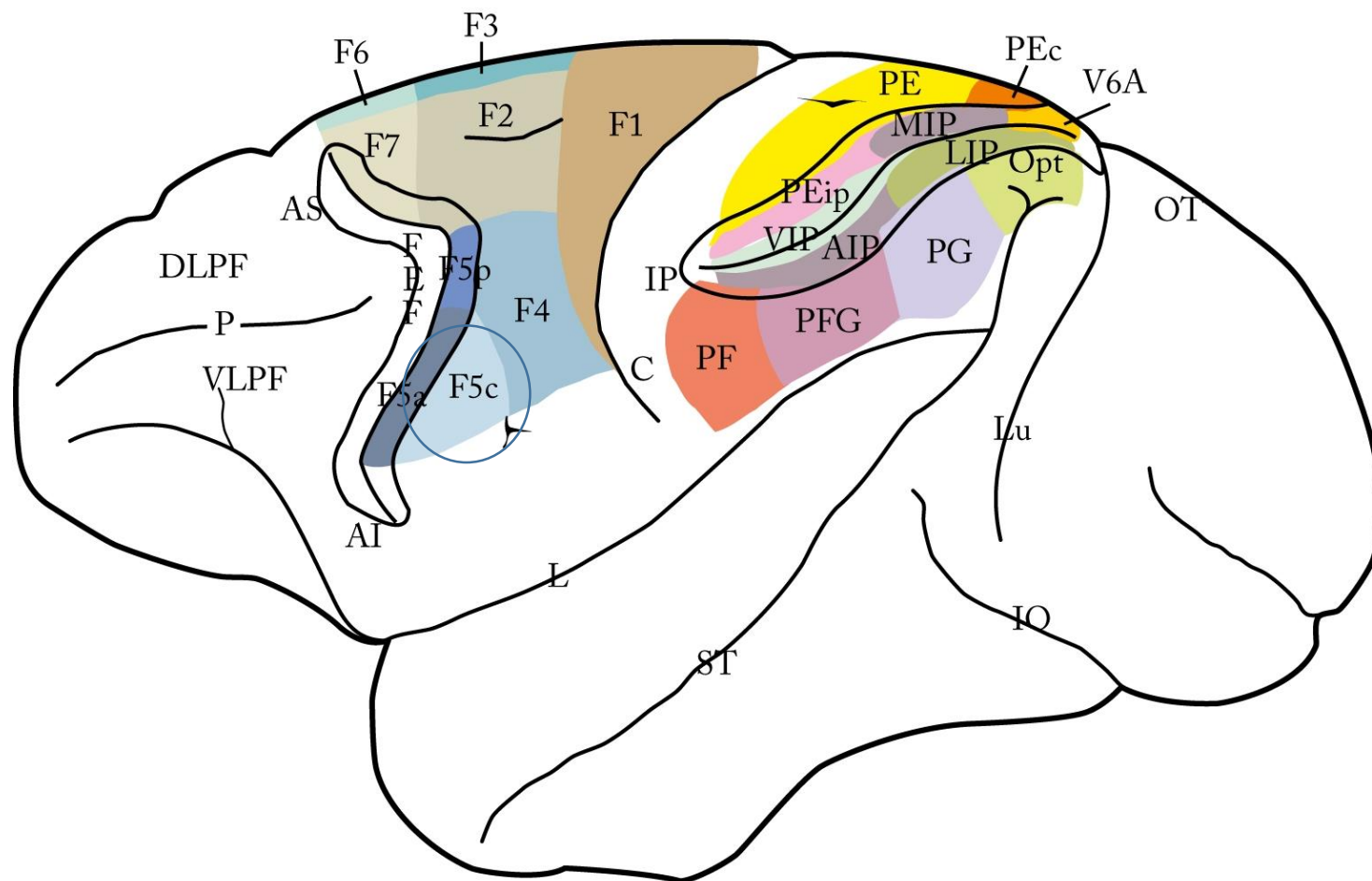


Rizzolatti et al. 1988

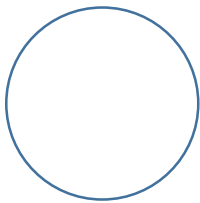
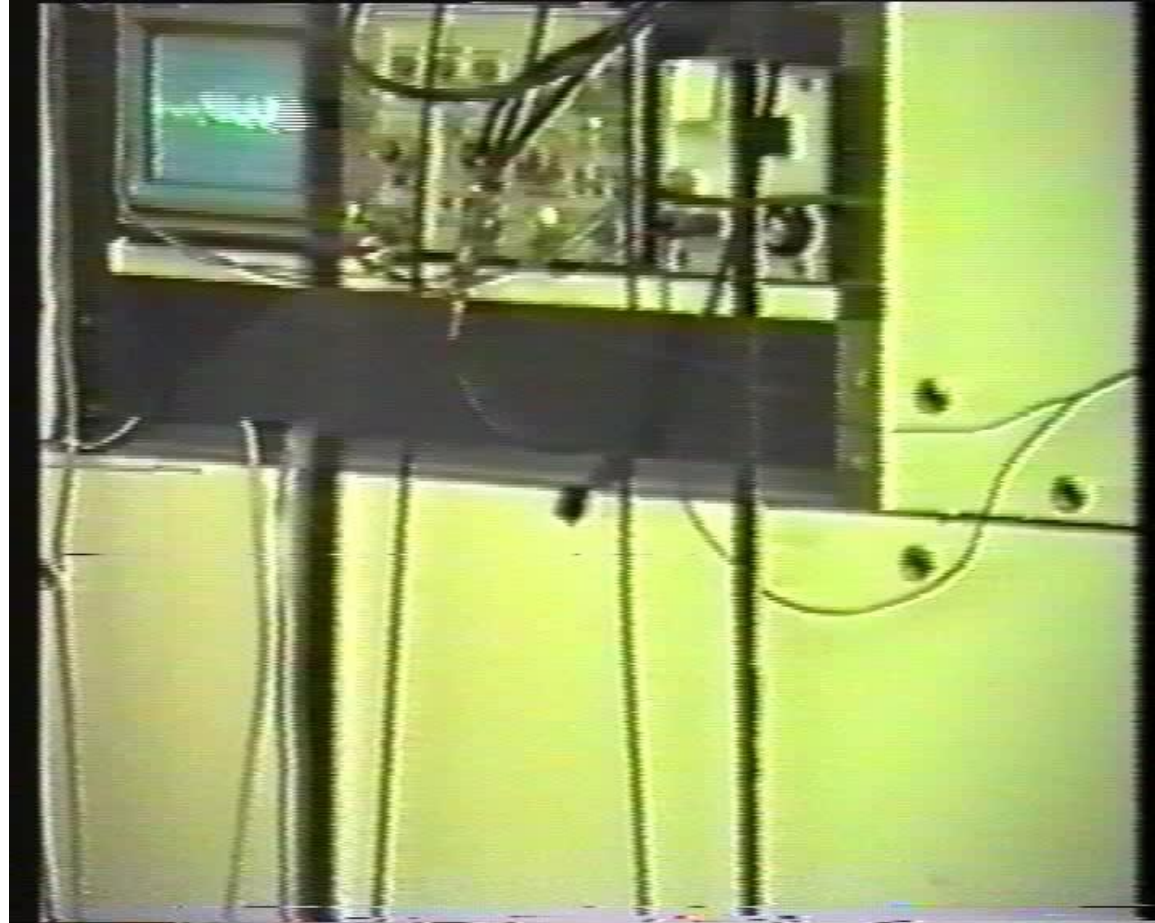
Neurone che si attiva per un particolare tipo di prensione

### U 108-3

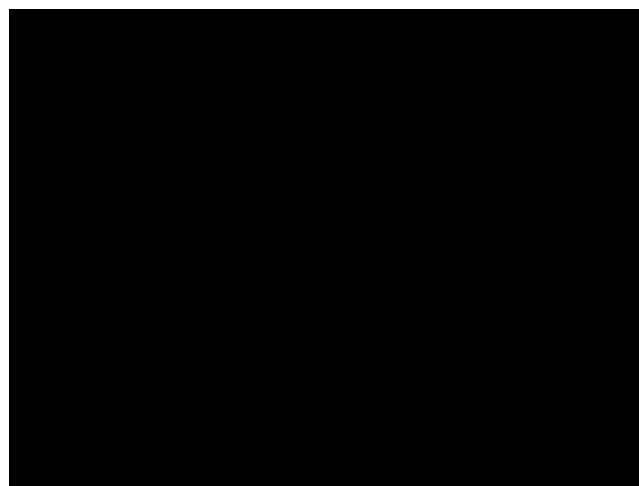
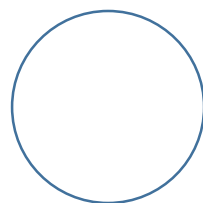


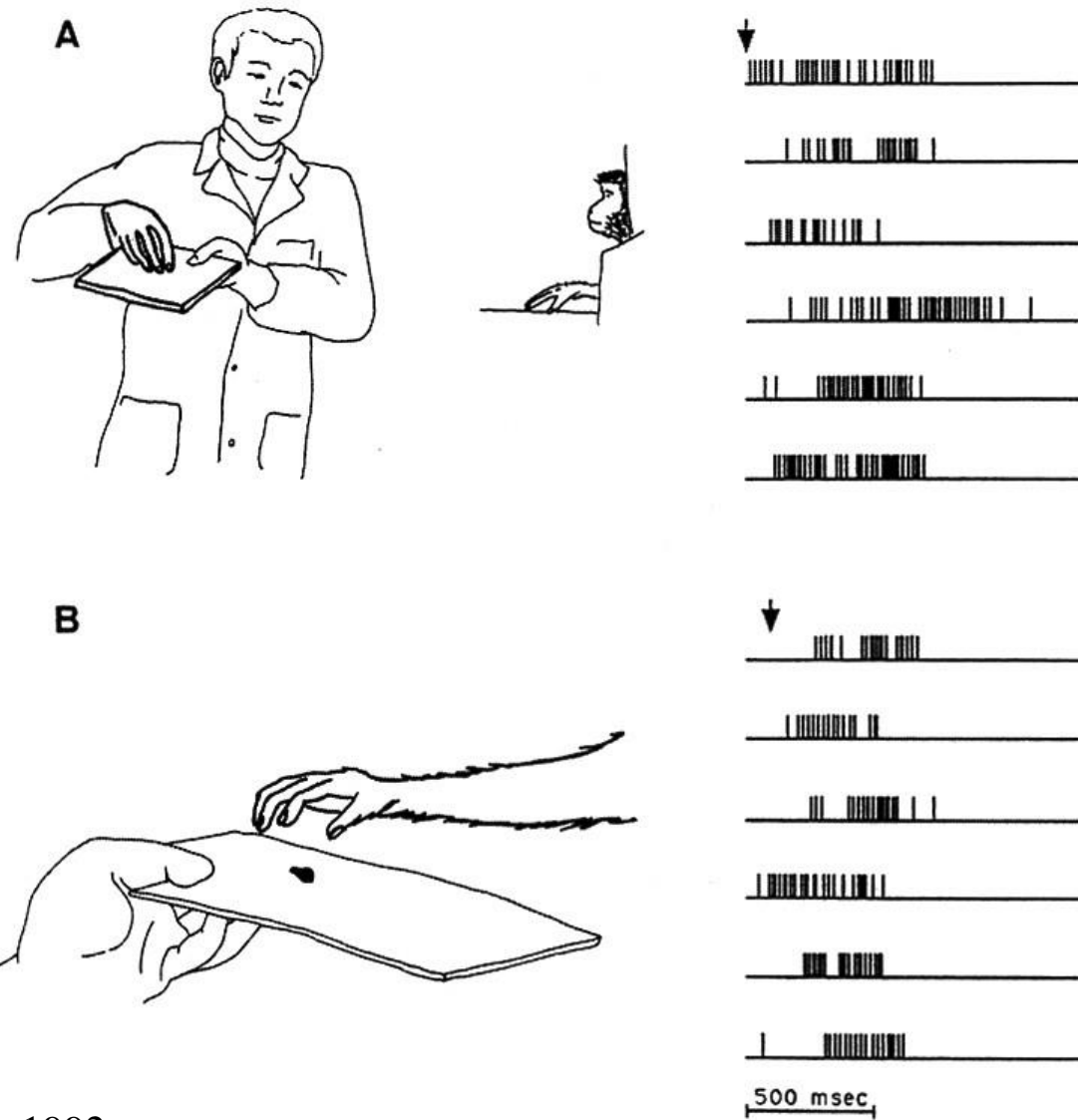


# Neuroni specchio

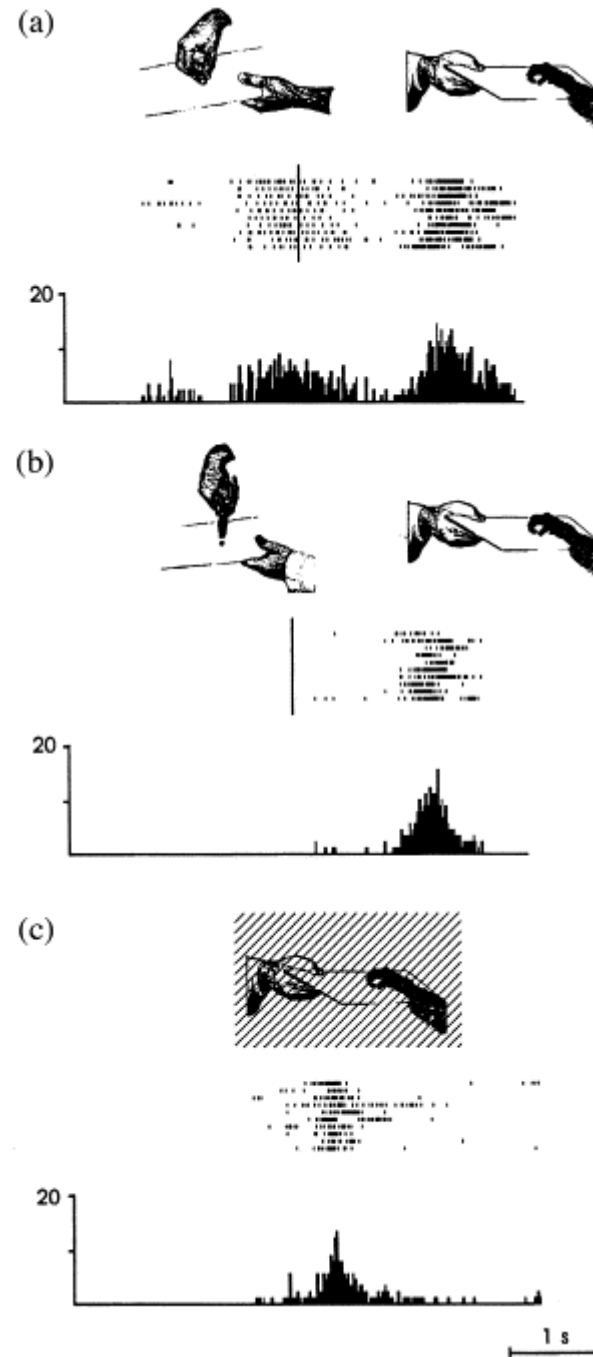


## Neurone specchio inibitorio





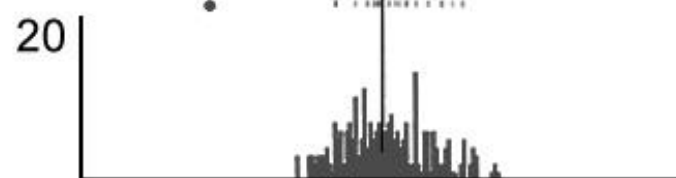




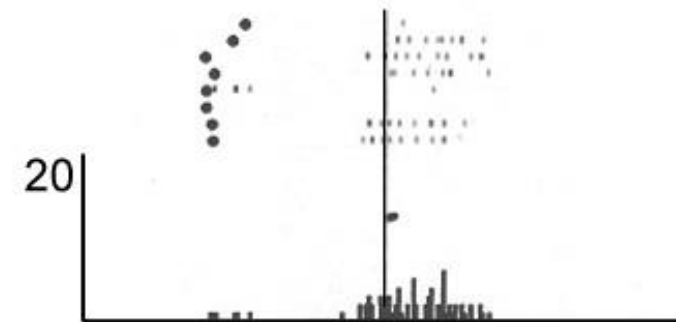
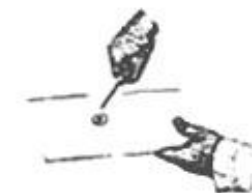
Rizzolatti et al. 1996;  
Gallese et al. 1996

**A**

20

**B**

20

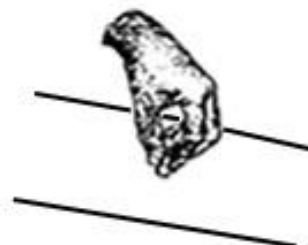
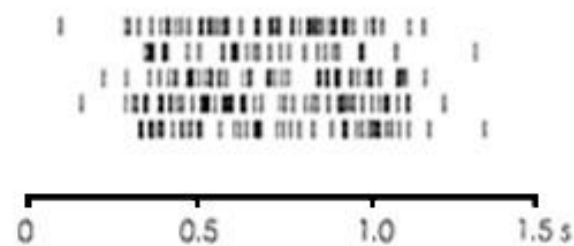
**C**

20



1 s

M9118

**A****B****C**

0 0.5 1.0 1.5 s

**Table 1 .** Mirror neurons subdivided according to hand actions effective in activating them

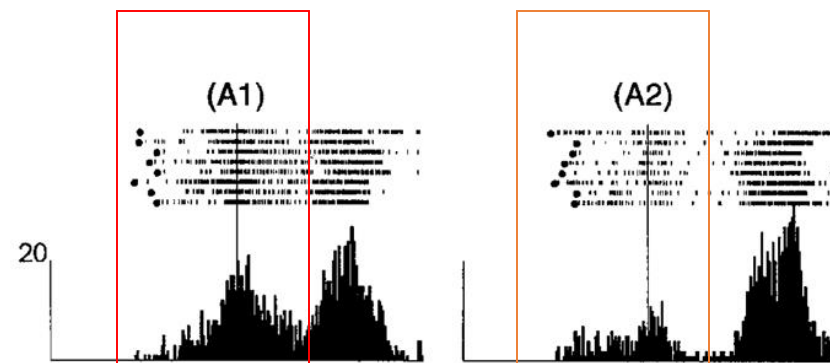
<i>Observed motor acts</i>	<i>No. of neurons</i>
Grasping	30
Placing	7
Manipulating	7
Hands interaction	5
Holding	2
Grasping/placing	20
Grasping/manipulating	3
Grasping/hands interaction	3
Grasping/holding	5
Grasping/grasping with the mouth	3
Placing/holding	1
Hands interaction/holding	1
Grasping/placing/manipulating	1
Grasping/placing/holding	4
Total	92

# Direction preference

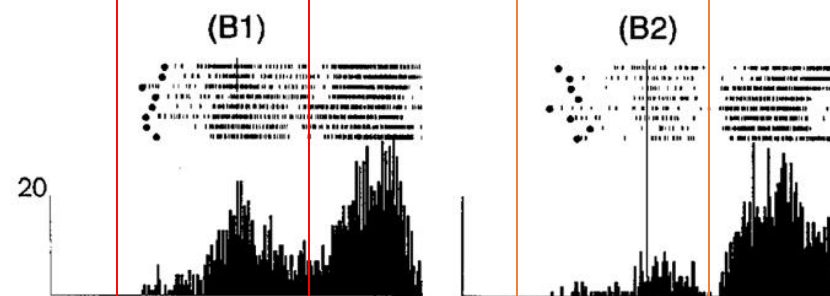
Right → Left

Left → Right

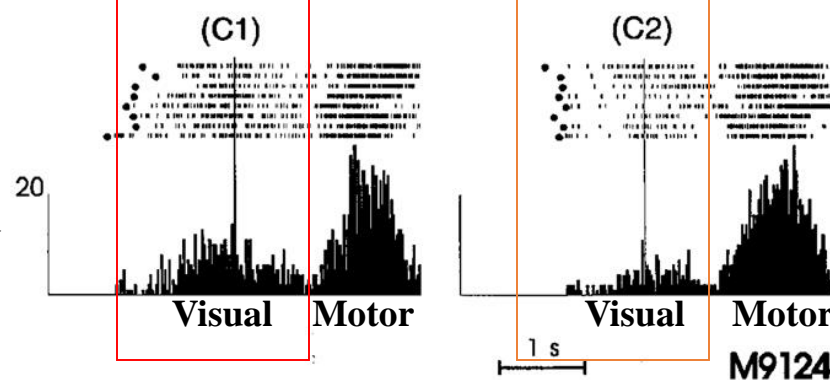
Center



Left hemifield



Right hemifield



# Hand preference

Left hand

Right hand

Center

Left hemifield

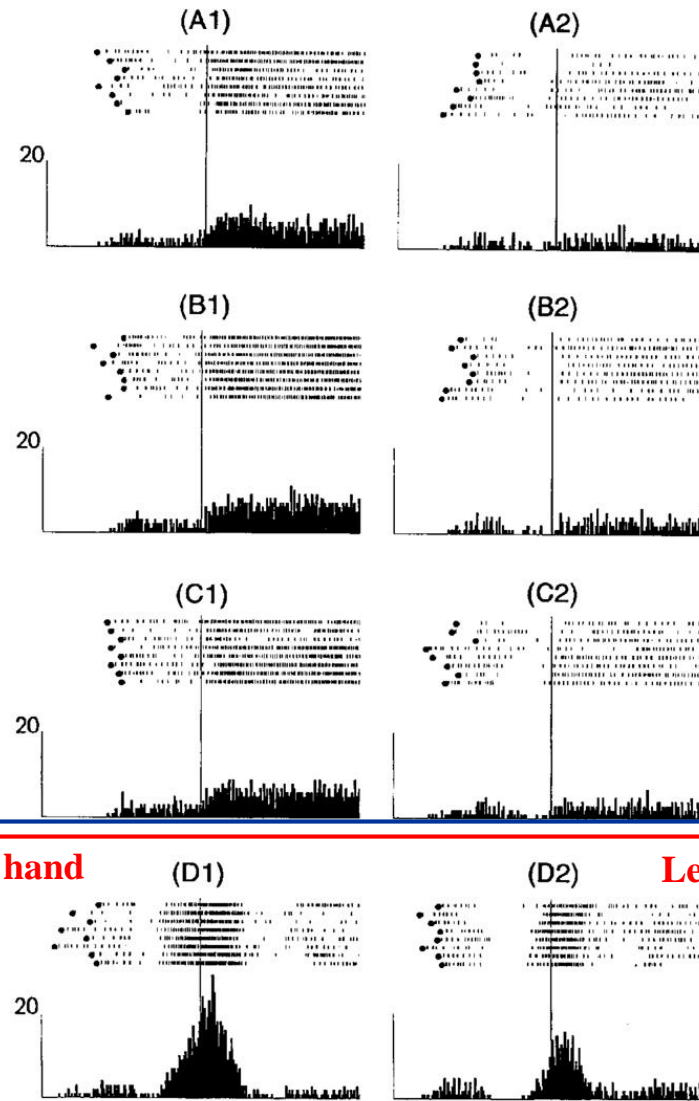
Right hemifield

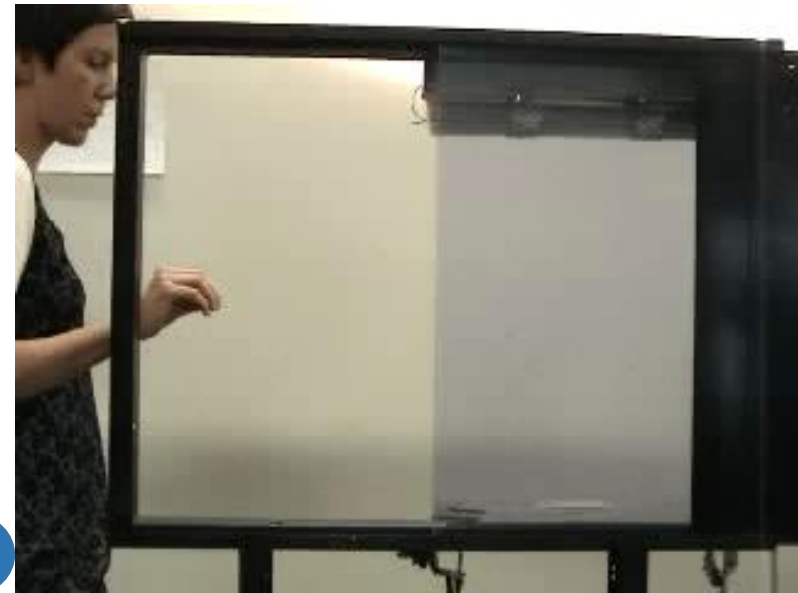
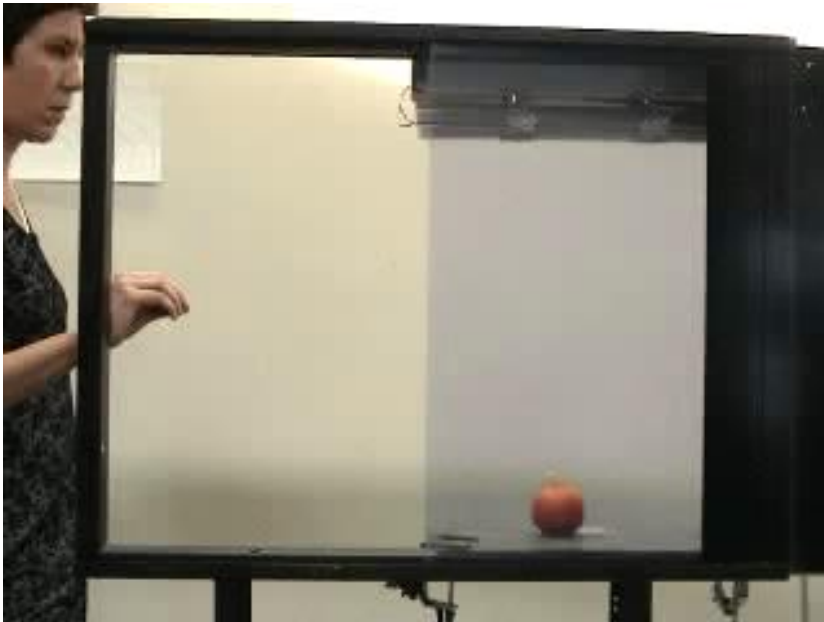
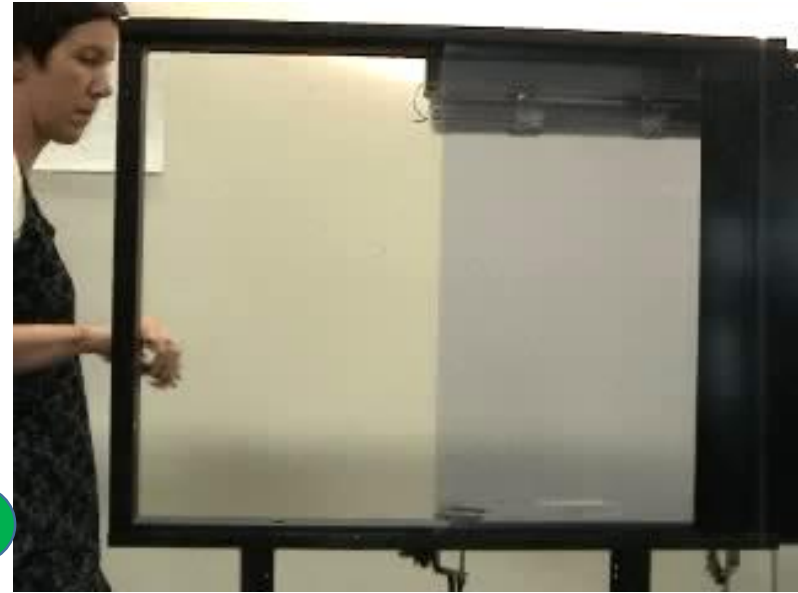
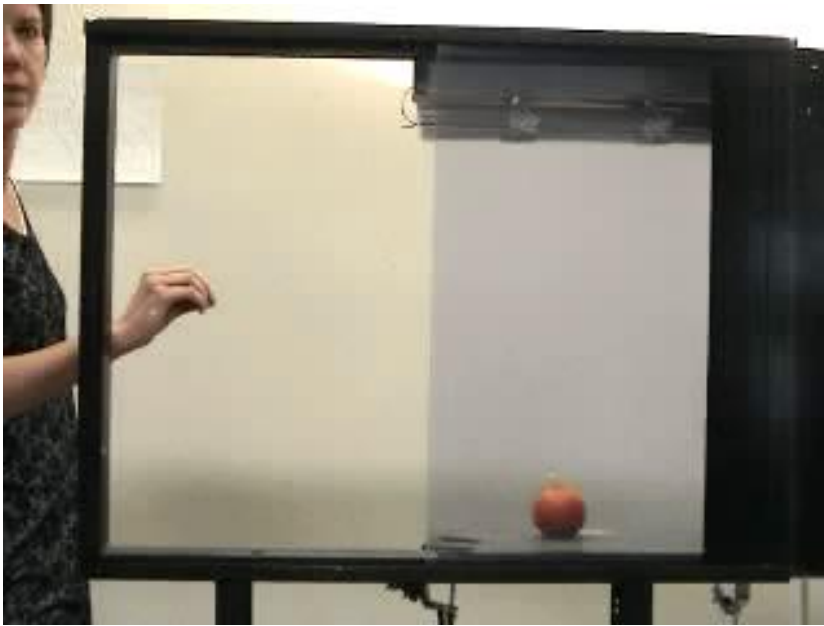
Observation

Right hand

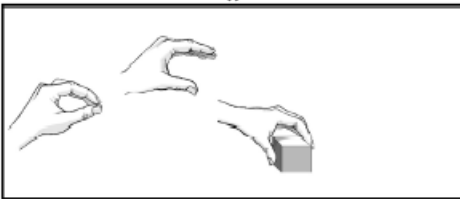
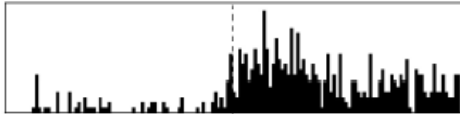
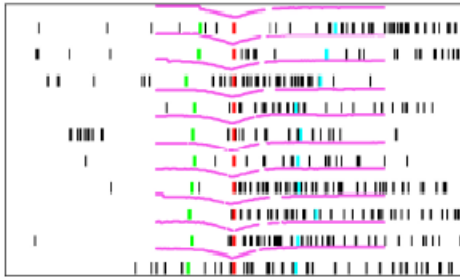
Left hand

Execution

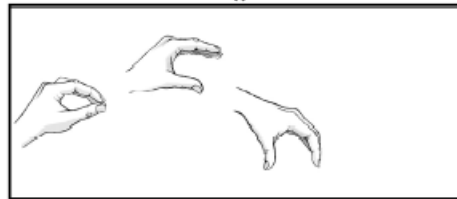
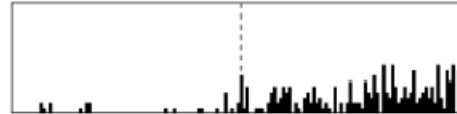
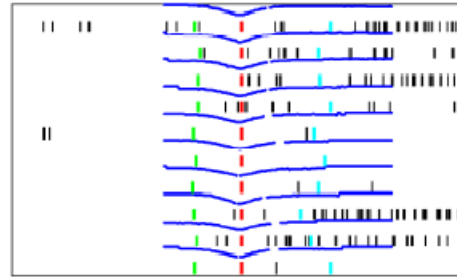




A



C



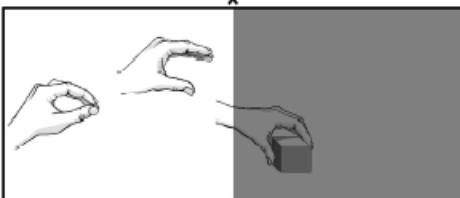
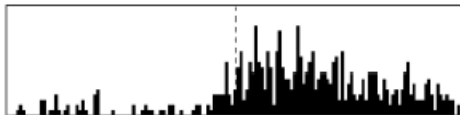
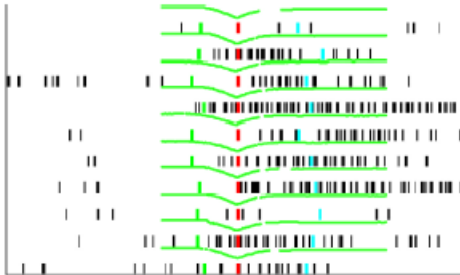
A (Visione completa)

B (Nascosto)

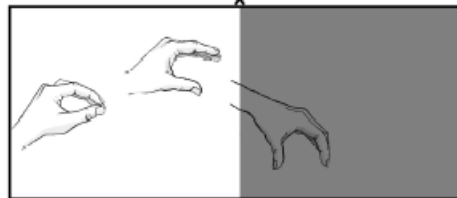
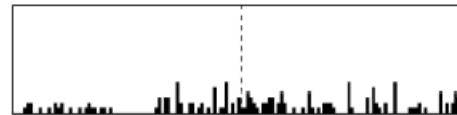
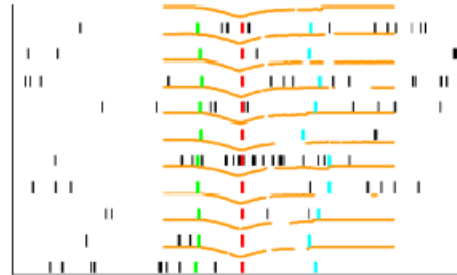
C (Atto mimato in v. completa)

D (Mimato nascosto)

B



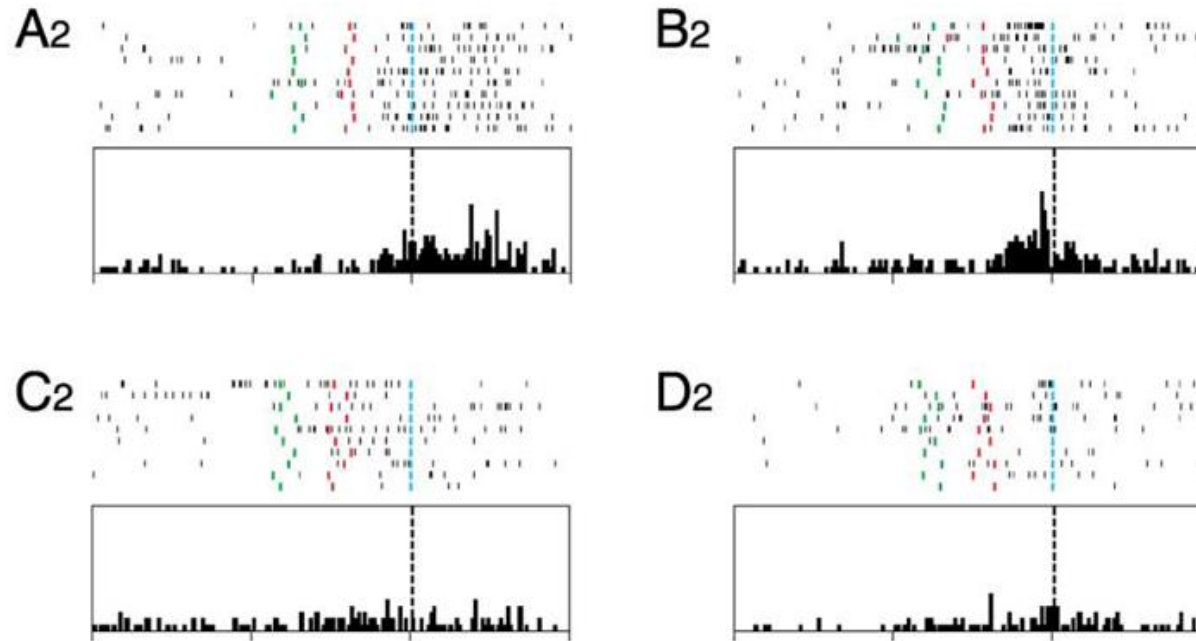
D





# Anticipazione della risposta nella condizione nascosta

## Neuron 2



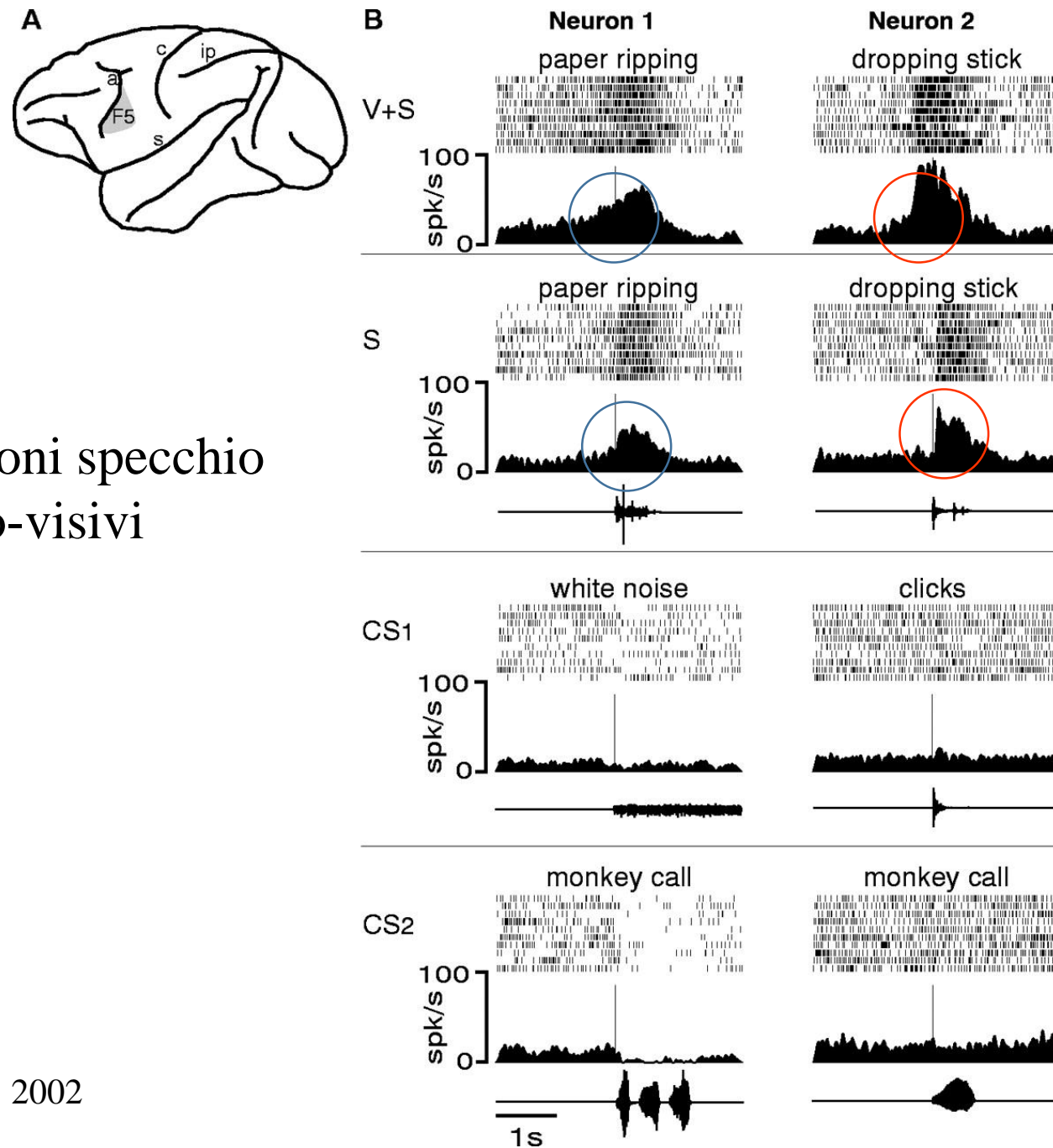
A2=Afferramento di oggetto in piena visione

C2= Pantomima afferramento piena visione

B2= Afferramento di un oggetto nascosto

D2= Pantomima afferramento dietro schermo

# Neuroni specchio audio-visivi



Kohler et al. 2002

