

*Integration Multisensorielle:  
études comportementales, anatomiques et  
Électrophysiologiques.*

P. Barone

Cerveau et Cognition, CNRS-UMR 5549 (Toulouse)



# Multisensory integration

- Effects on perception
- Cortical areas involved in MSI
- Multisensory integration at early stages
  - Evidences in human
  - Heteromodal connections in monkeys
- Multisensory integration and sensory deafferentation
  - Behavioral studies
  - Brain activity studies

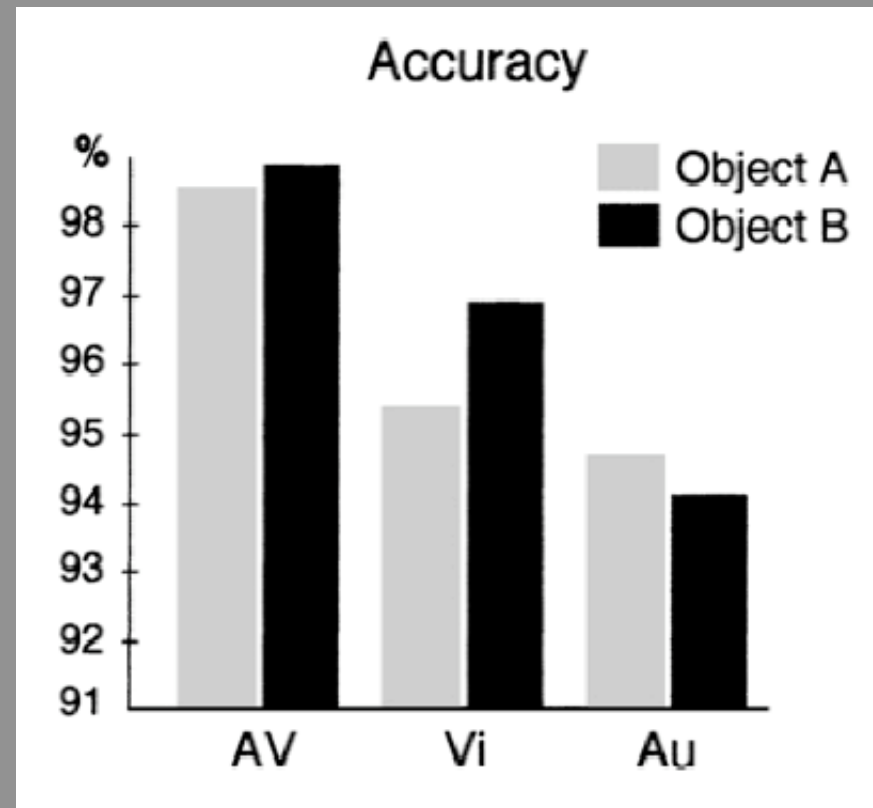
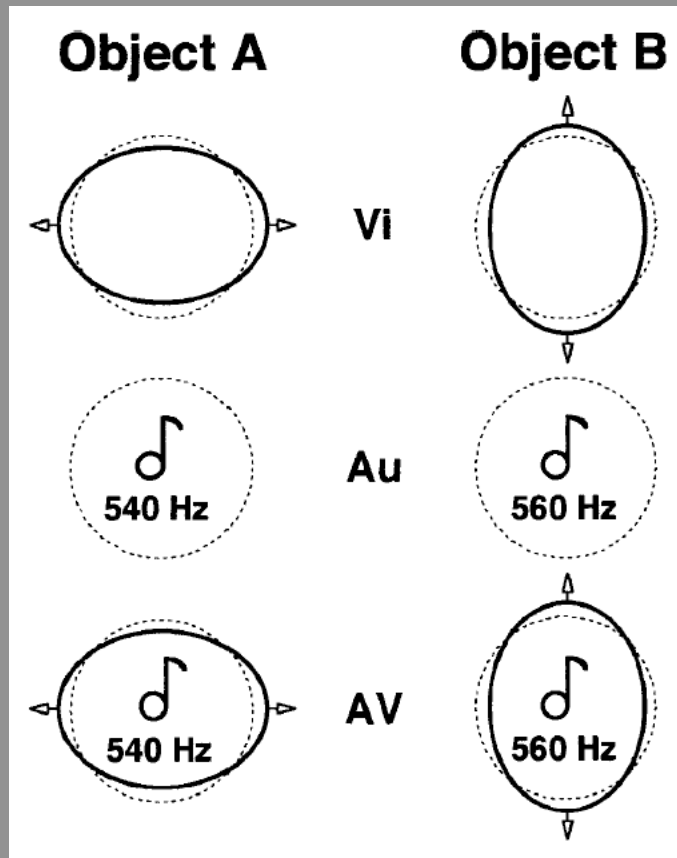
# Multisensory interactions

Illusions

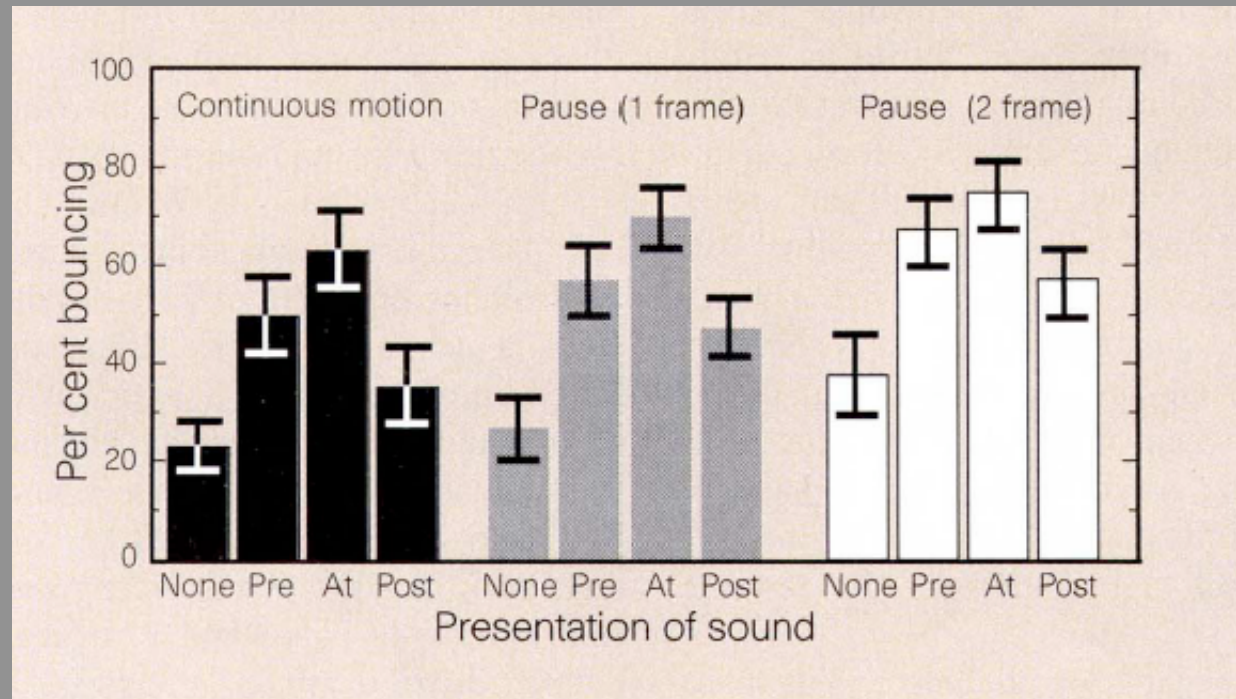
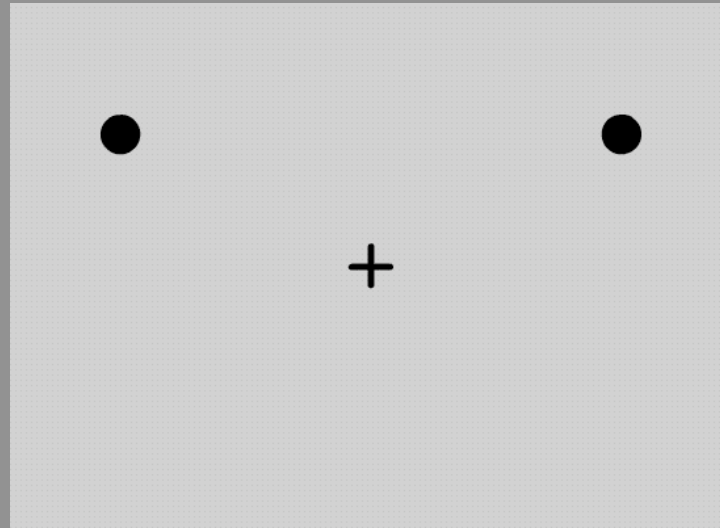
## ↳ La ventriloquie



IMS: amélioration des  
performances



IMS: affecte toute forme  
de perception sensorielle

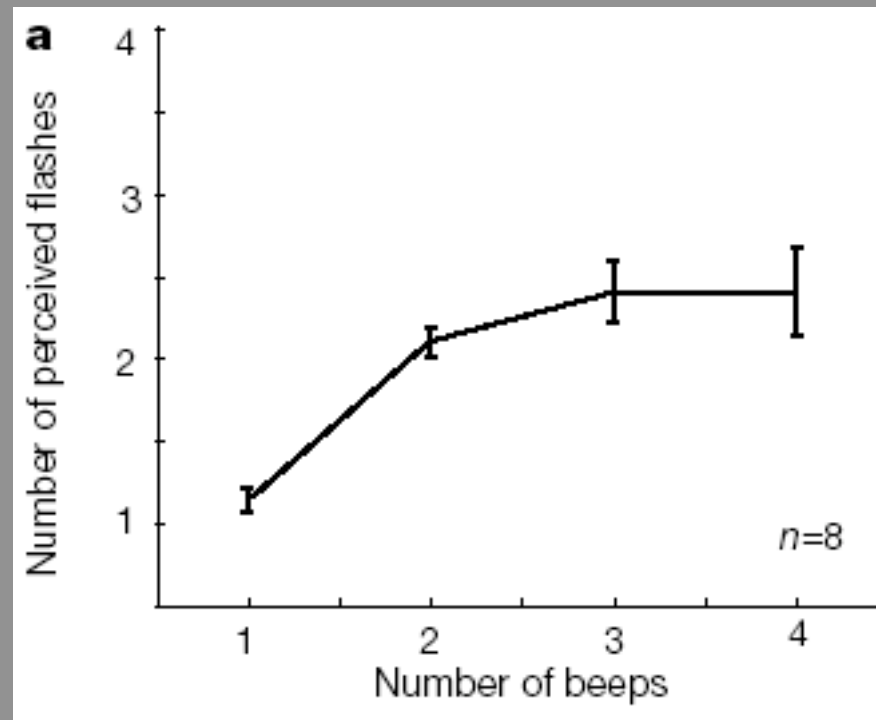
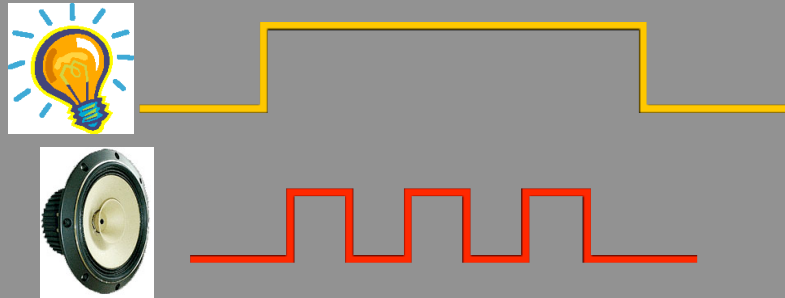


Sekuler et al (1997)

V-A => mouvement

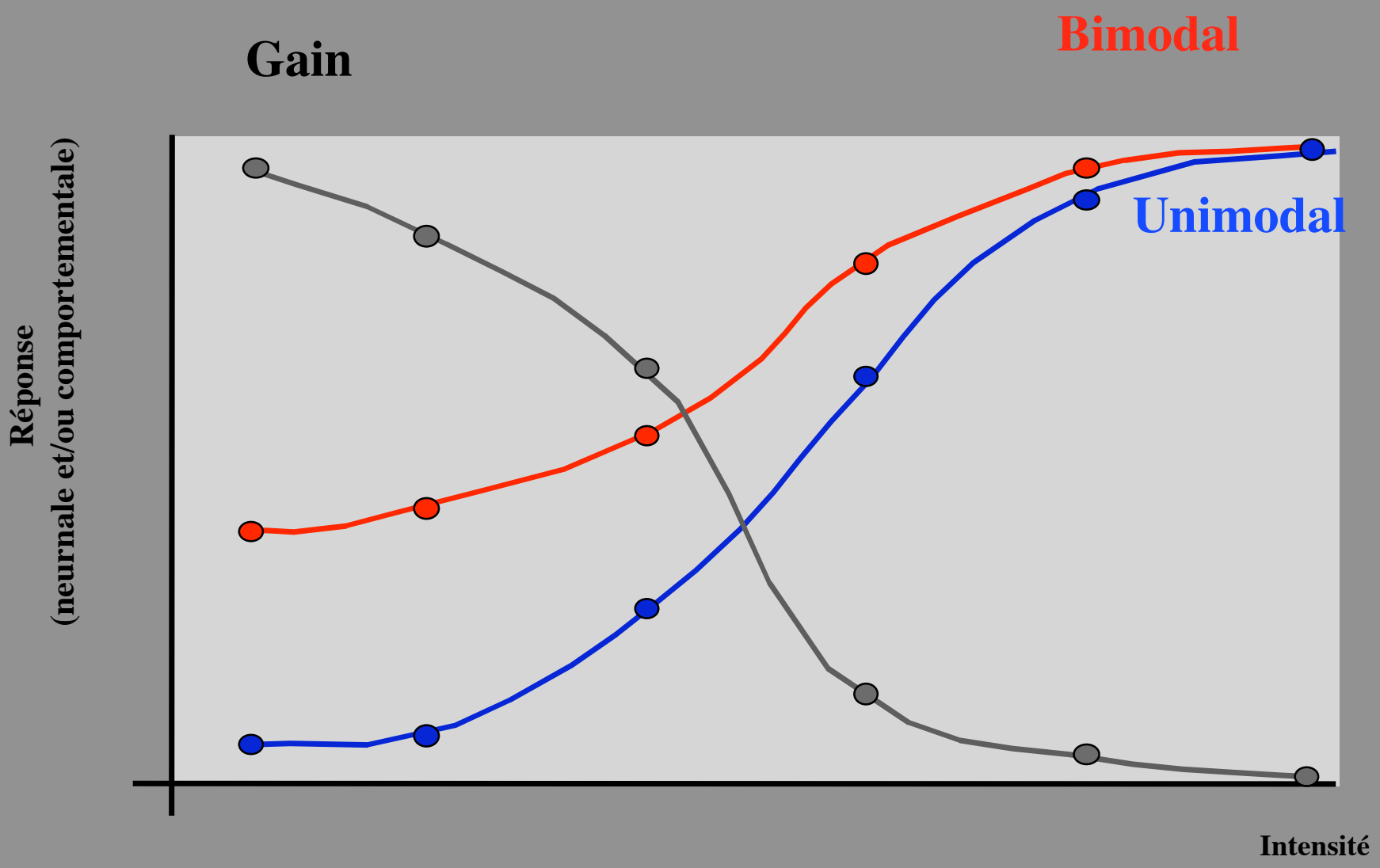


Shams et al (2000)



V-A => temps

IMS: regles



Gain

Bimodal

Unimodal

Intensité

Réponse  
(neurale et/ou comportementale)

➤ Règles de l'intégration multisensorielle :

→ **Congruence temporelle**

→ **Congruence spatiale**

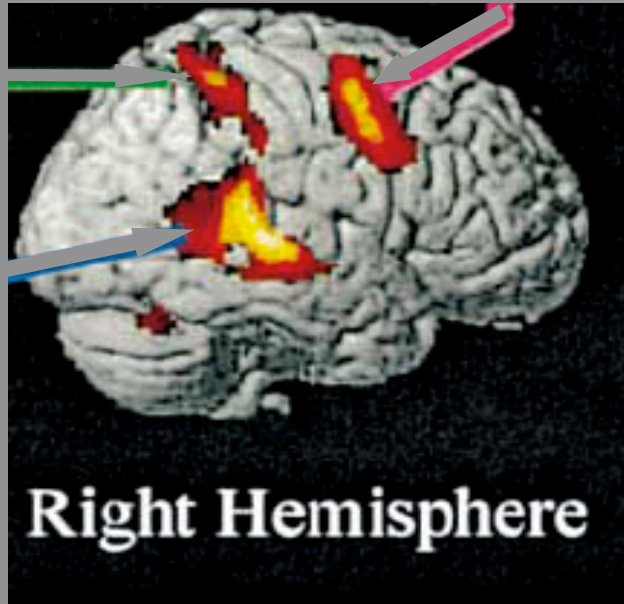
→ **Stimuli proches des seuils de perception**

Sites corticaux de IMS

Premoteur

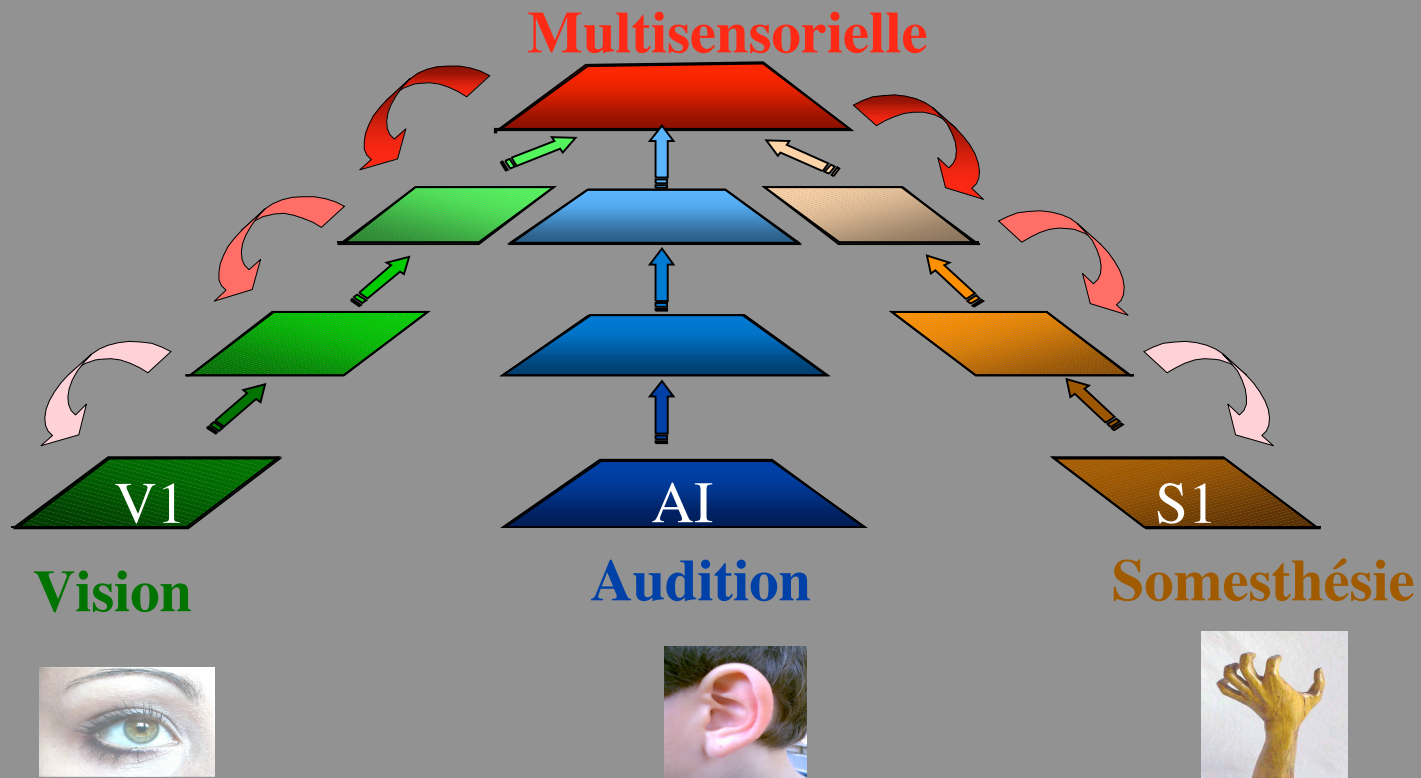
Pariétal

Inferotemporal



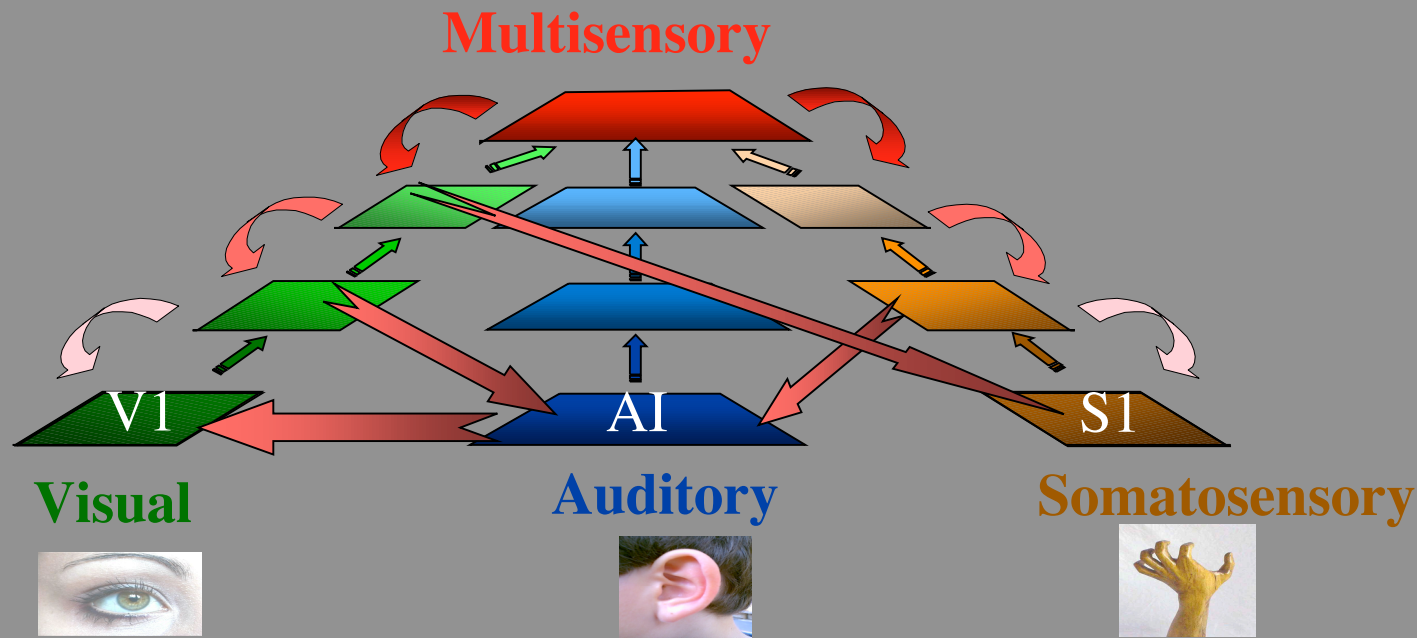
Vision & Somesthésie

Macaluso & Driver 2001



**Multisensory integration at  
early stages: anatomical  
support**



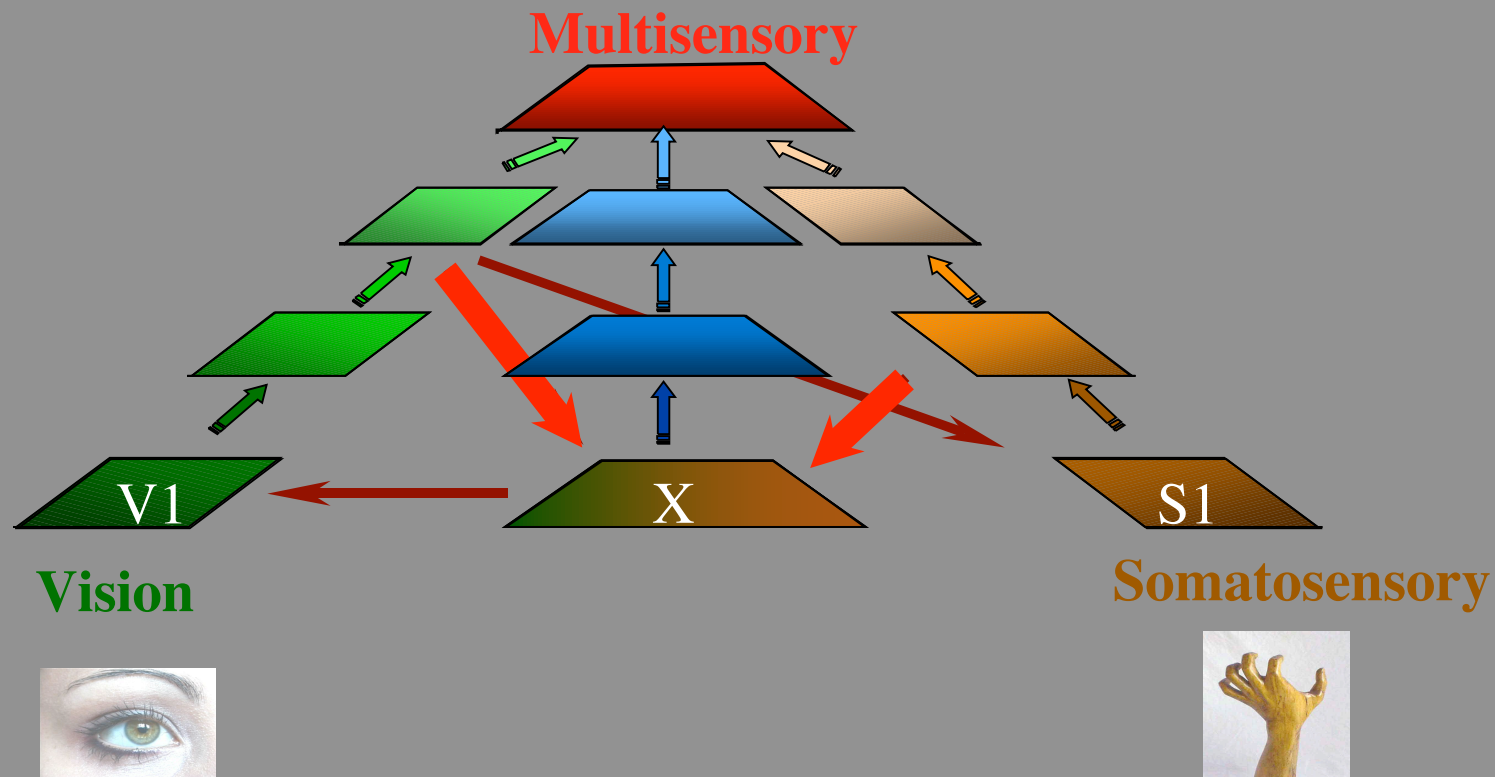


Falchier, Clavagnier, Barone & Kennedy (2002)

Cappe & Barone (2004)

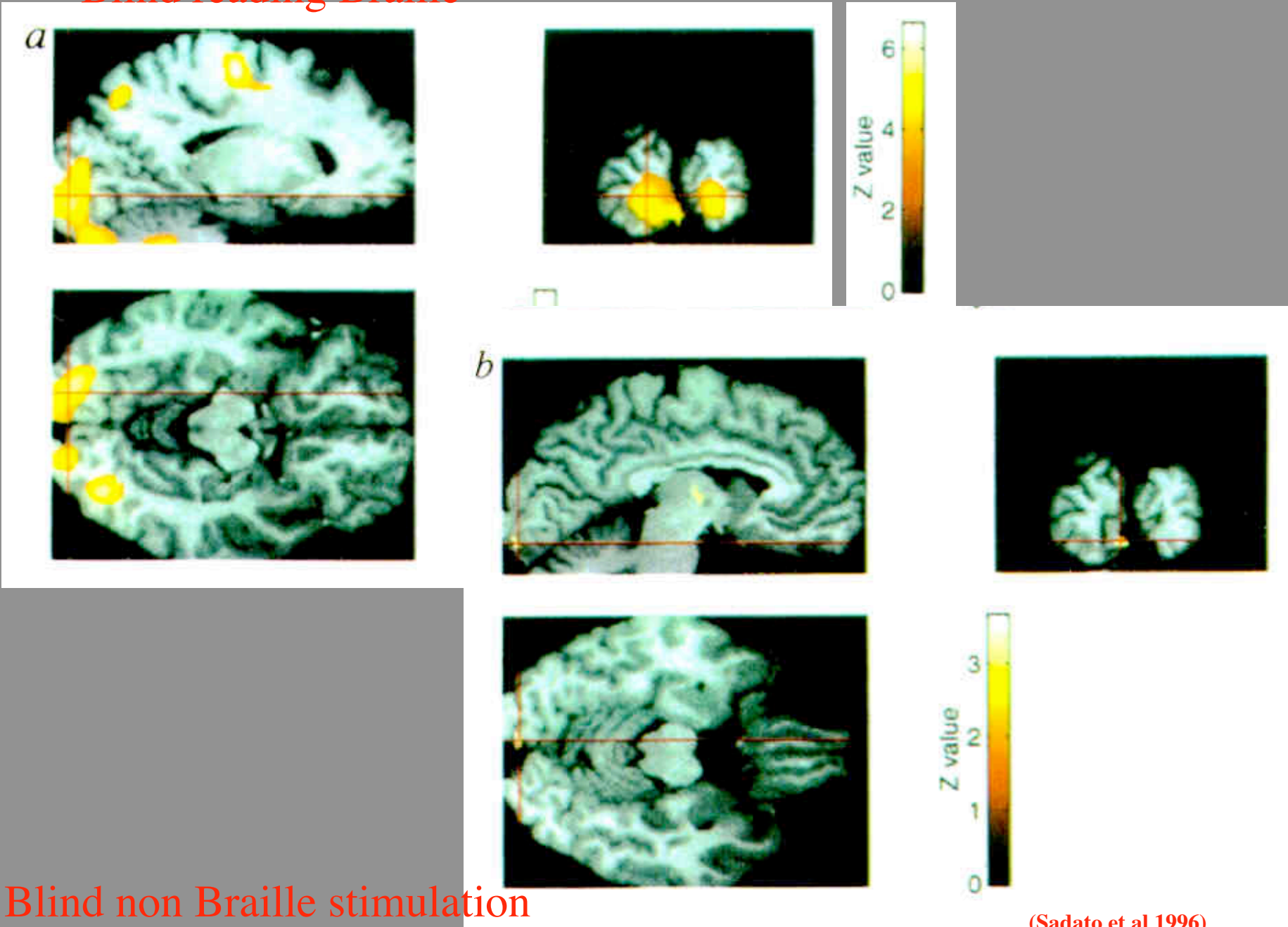
➔ **Heteromodal connexions: multisensory interactions at early stages**

# Plasticity and sensory deprivation



- Perte sensorielle : surdit 
- Compensation intermodalitaire ?

# Blind reading Braille



Blind non Braille stimulation

(Sadato et al 1996)

# Vision and audition : gain from bimodality in speech comprehension in cochlear implanted deaf patients

P. Barone <sup>1</sup> & O. Deguine <sup>1,2</sup>

1) Cerveau et Cognition, CNRS-UMR 5549 (Toulouse)

2) Service ORL Hopital Purpan (Toulouse)



## Visuo-auditory processing in speech comprehension in cochlear implanted patients

- Performances post-implantation.
- Strategies
- Cortical network associated