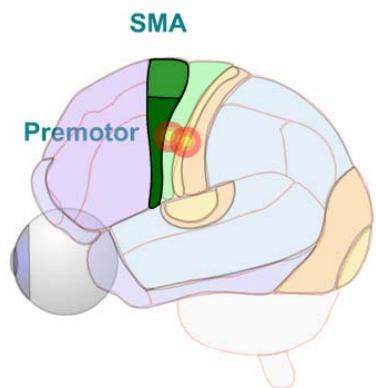
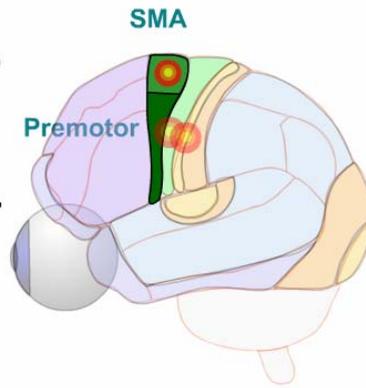


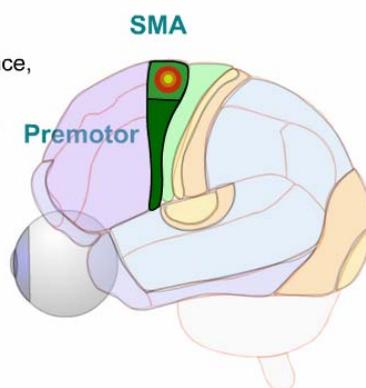
a) When the subject makes a **simple finger press**, activity is seen in the finger area of the **primary motor cortex** and the **primary somatic sensory cortex**.

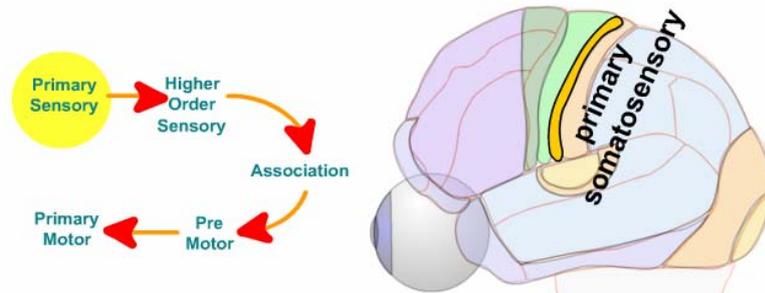


b) When the subject makes a **complex** finger movement **sequence**, such as opposing thumb with each finger in turn, activity is seen in the finger area of the **primary motor** cortex, the **primary somatic sensory** cortex, and the **supplementary** motor area.

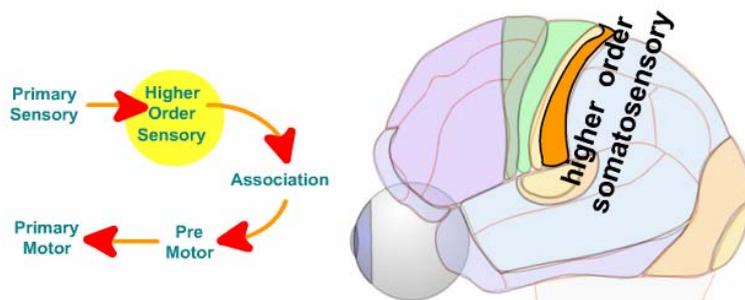


c) When the subject *imagines* the complex finger movement sequence, activity is **seen only** in the **supplementary** motor area.

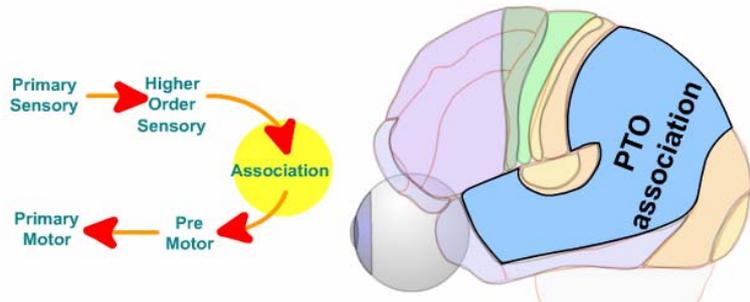




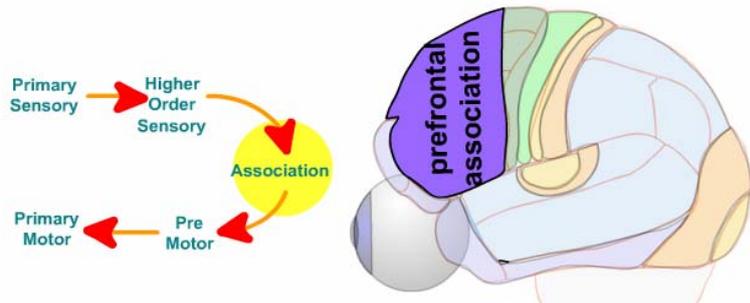
Sensory hierarchy:
Primary sensory areas send information to **higher order areas**
 and then to **association areas**.



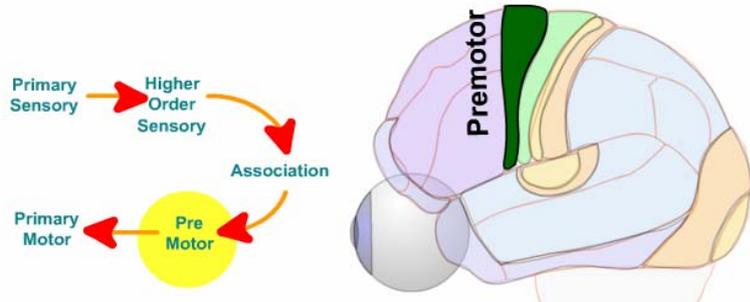
Sensory hierarchy:
Primary sensory areas send information to **higher order areas**
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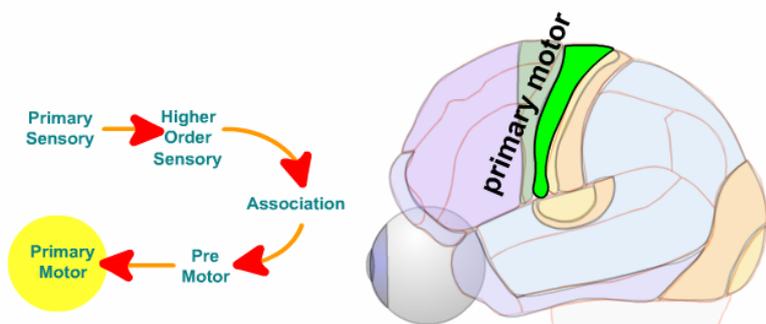
Sensory hierarchy:
Primary sensory areas send information to **higher order areas** and then to **association areas**.



Motor hierarchy:
Prefrontal association areas send commands to **premotor areas** which in turn send commands to **primary motor areas**.



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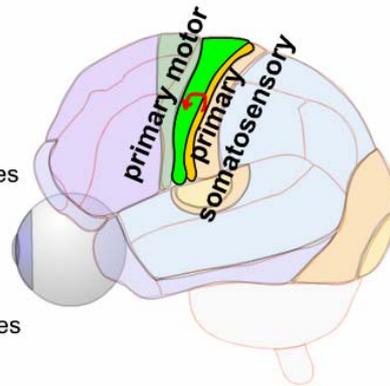
Motor hierarchy:
Prefrontal association areas send commands to **premotor areas** which in turn send commands to **primary motor areas**.

Loop 1

This **short** cortical loop is used for simple acts, like **quickly** regulating the pressure on the cup.

The **primary somatosensory** cortex senses **finger position** from muscle afferents and **pressure** from touch receptors.

The **primary motor** cortex signals the **contraction** of individual synergistic muscles

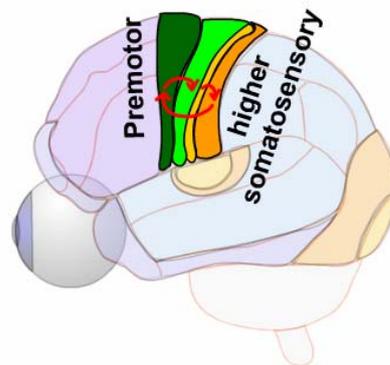


Loop 2

This **longer** loop is used in more complex acts like **selecting a muscle synergy** (which fingers to contract together to lift the cup).

Higher order somatosensory areas contribute to the recognition object **shape** and **texture** by touch.

The **premotor** area selects the **synergy** appropriate for the particular **object**.

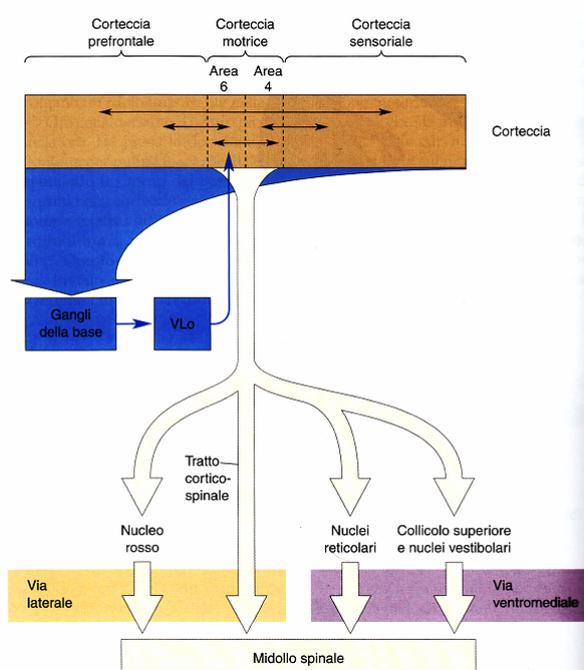
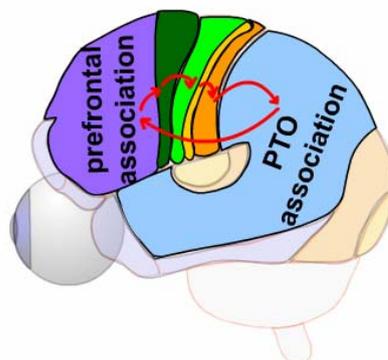


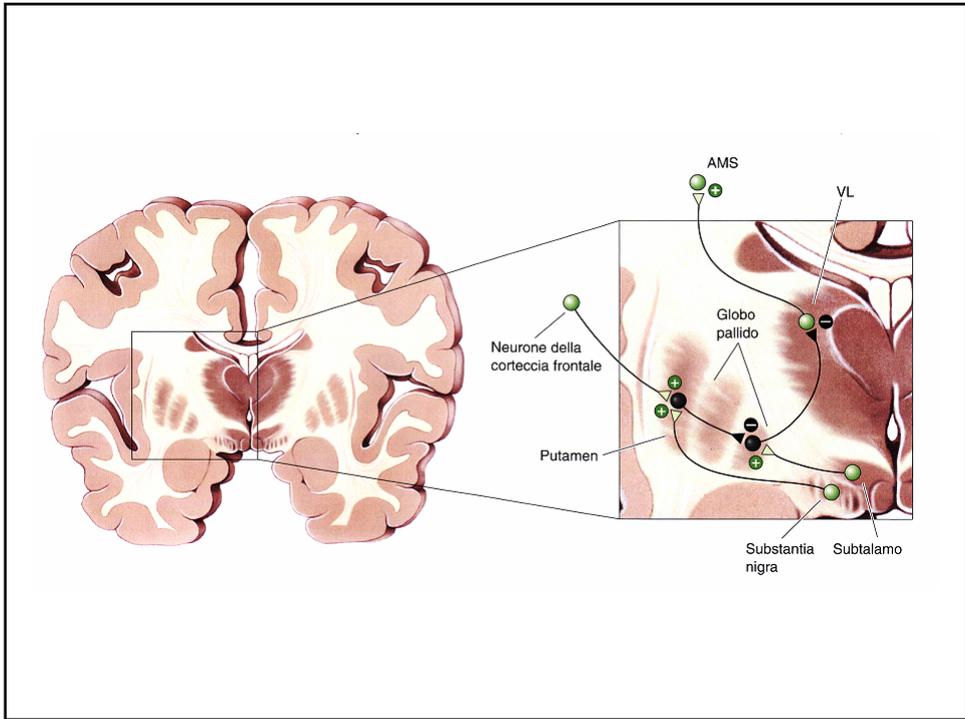
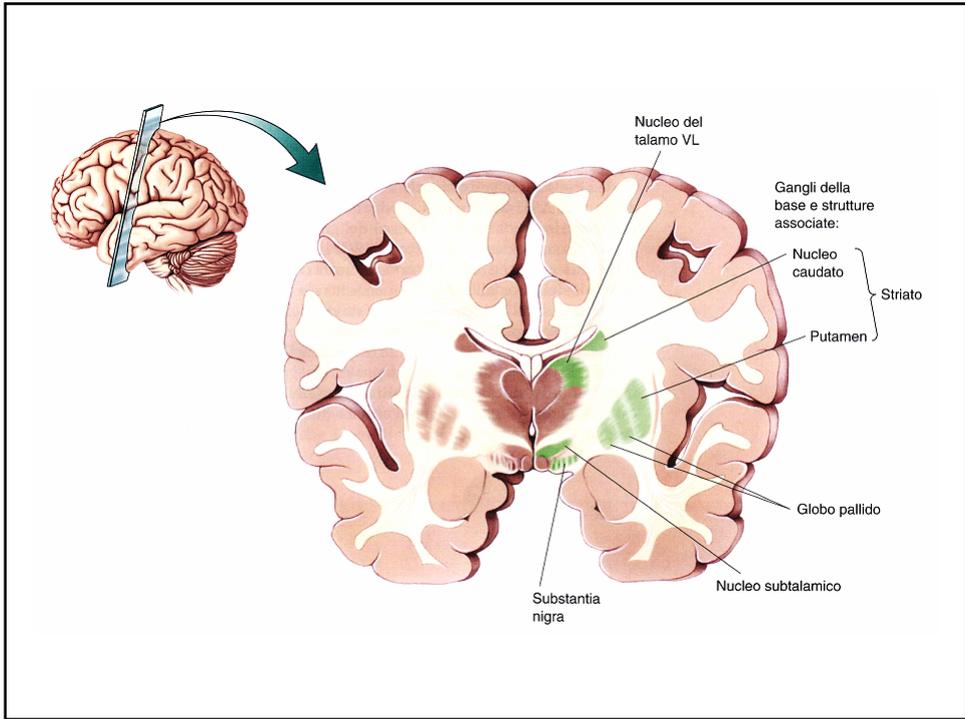
Loop 3

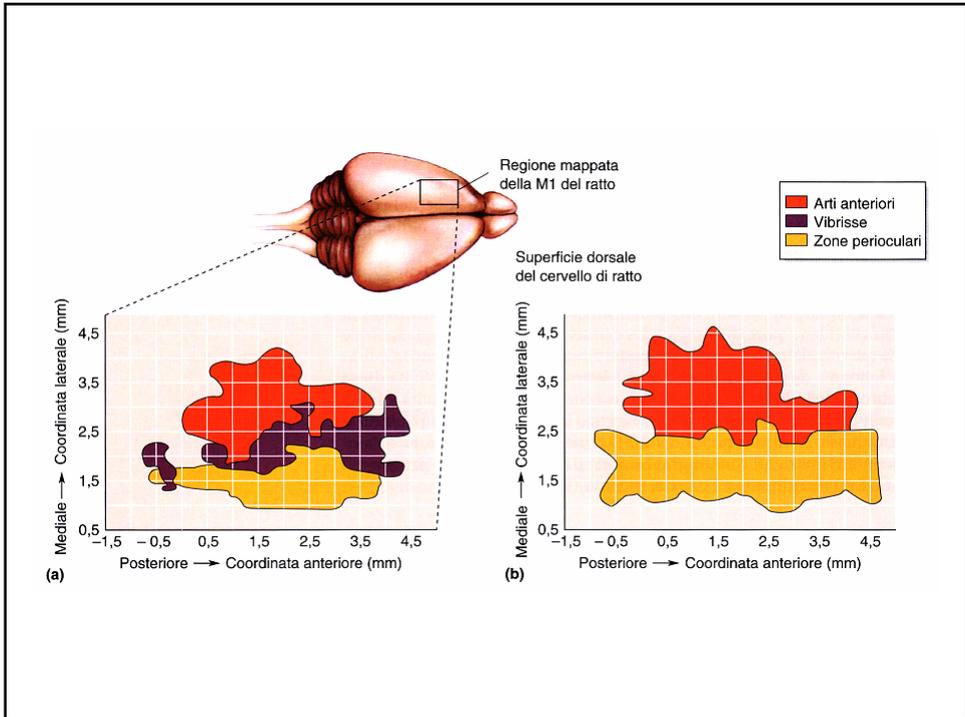
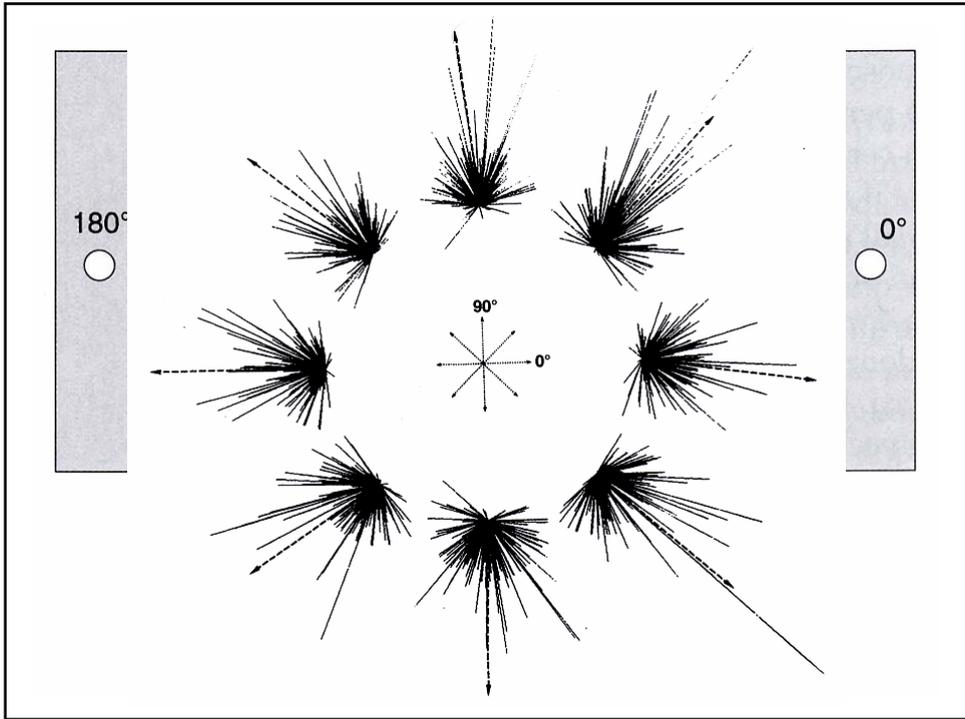
This **longest loop** is used for **still more complex** acts, like **reaching** for the cup.

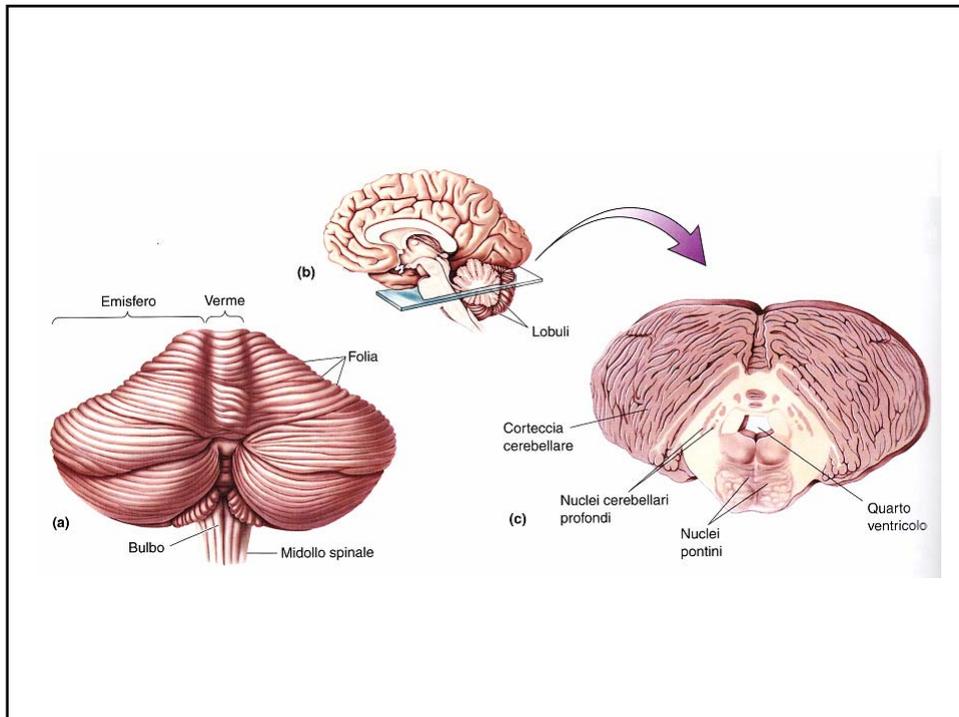
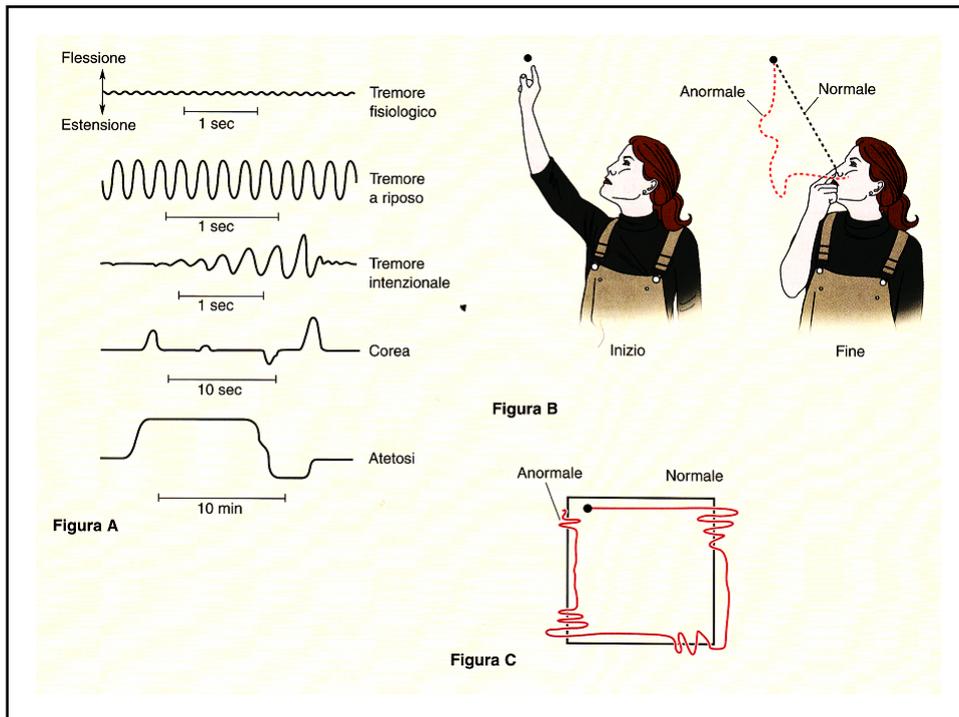
When reaching for a cup, the **parietal association** areas **integrate touch and vision** while focusing **attention** on the cup.

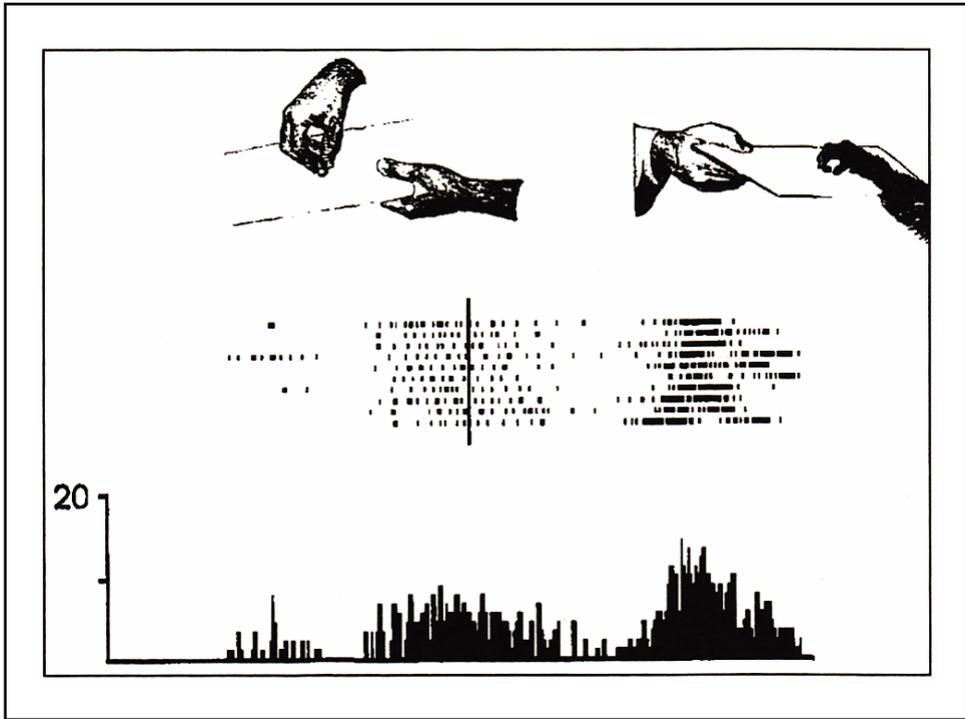
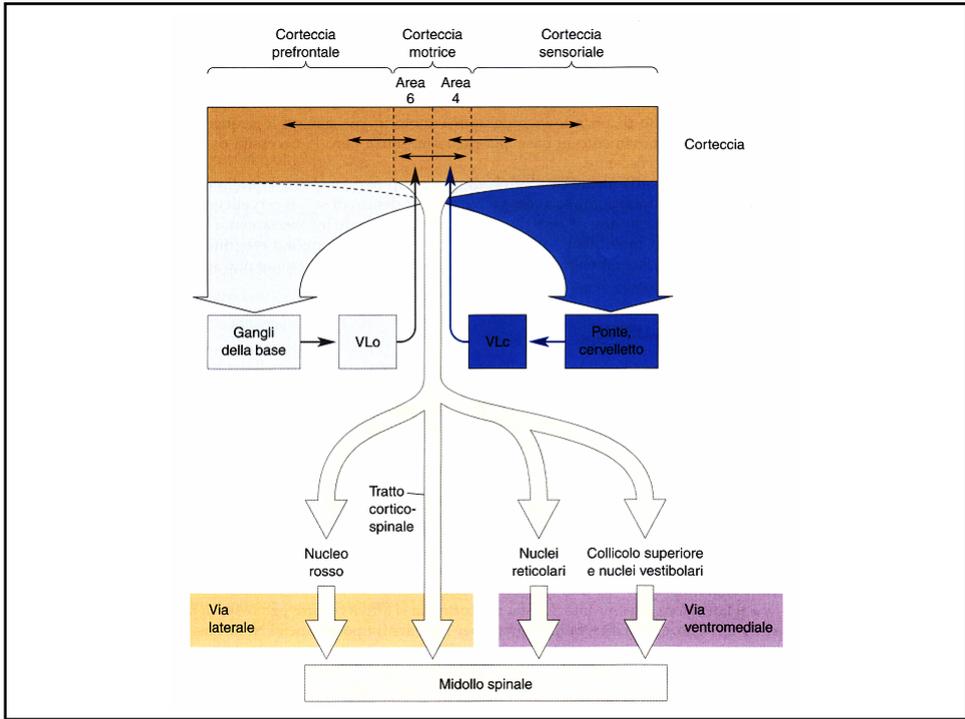
Working memory of where things are, in prefrontal association area, helps to **plan the reach**.

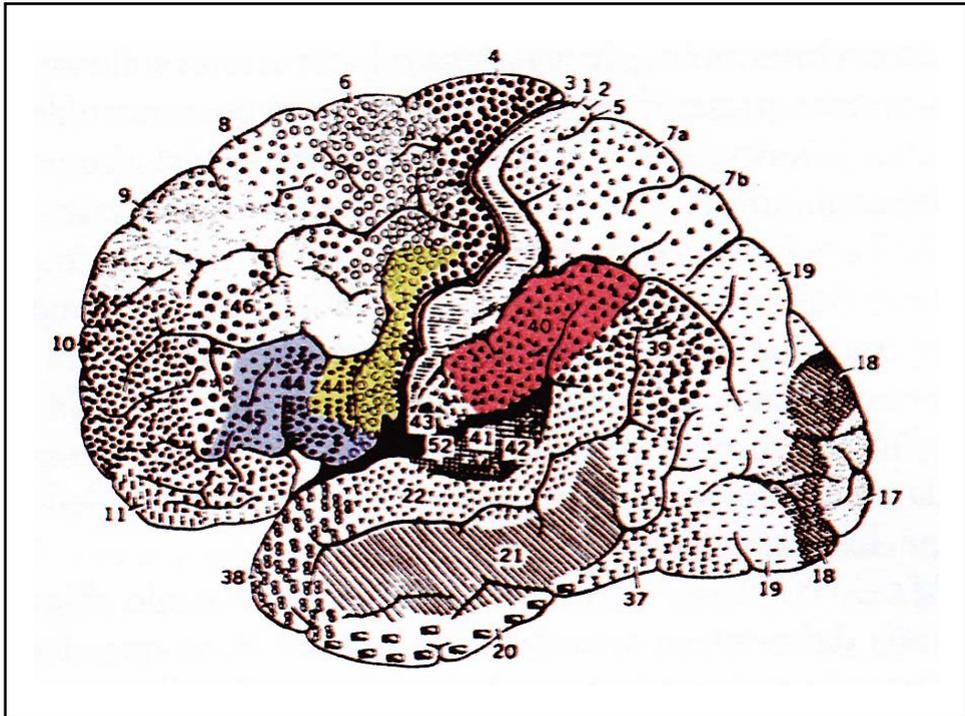












Giacomo Rizzolatti
Lisa Vozza
Nella mente degli altri
Neuroni specchio e comportamento sociale

A photograph of two young children, a boy and a girl, jumping rope. The boy is on the left, wearing a red shirt and blue pants. The girl is on the right, wearing a blue shirt and red pants. They are both holding ropes and jumping over them. The background is white.

CHIAVI DI LETTURA ZANICHELLI