Testing Hypotheses of Mirror Neuron Function

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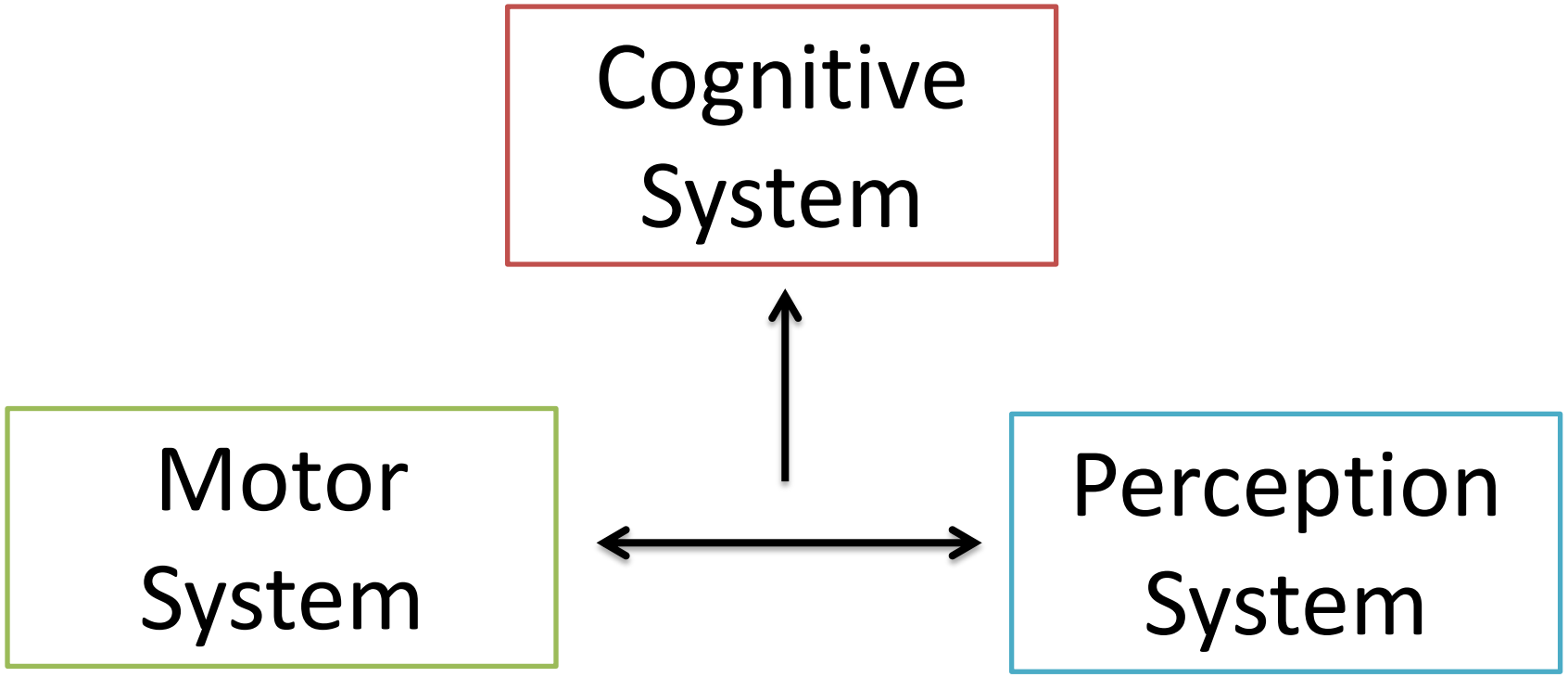
Background



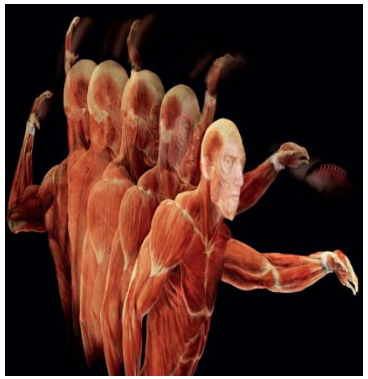
Common Coding Theory

(William James, Roger Sperry etc.)

Action Representations

Perceptual Representations

⟵ Grasping ⟶



⟵ Throwing ⟶

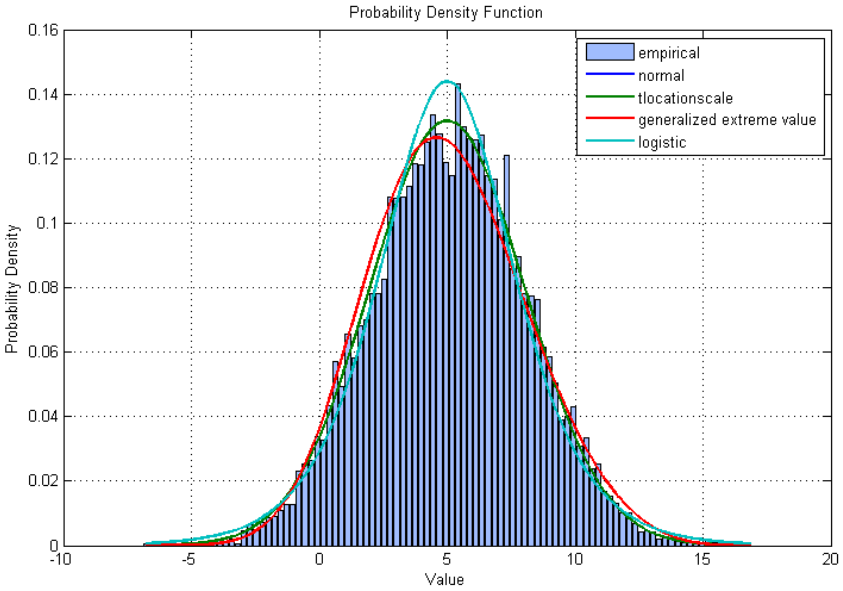
Mirror Neurons:
Embodiment of Common Code

Does the common code extend to **spatial and temporal characteristics** of actions?

Mental imitation of perceived actions

Advantage in perceiving self-generated actions

Analogy



Prediction based on known data

Experimental Design

- Dart board divided into two halves, participants must aim for one half
- Videos will show throwing action only
- Pairs of participants will watch their own and each other's videos, judge which half is aimed

Interpretation of Results

Sensitivity of each participant will be calculated for self- and other-generated actions:

$$d' = z(U) + z(L)$$

U = Fraction of upper-half throws identified correctly

L = Fraction of lower-half throws identified correctly

z(p) = Inverse of normal distribution

d’ values for the two cases will be compared.

Further Insights

- Results dispute claim for development of mirror neurons through Hebbian learning (Keysers, Gazzola et al)

References

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