

## **The imitative decodification between Mirror Neurons hypothesis and imaginative process.**

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Following the discussion about *mirror neurons* and imagery we want to focalize the relationships between imitative decodification (Ruggieri, Fiorenza, Sabatini, 1986) and imagery process. Our psycho-physiological model tries to integrate different functional levels of the organism in a unitary system, where sensations, emotional, cognitive processes, manipulative relationships with environment are functions of Ego structure. The Ego is a psycho-physiological structure-process. It derives from bodily physiological process and become, at the same time, a superior moment of hierarchical organization of all the body activities generating in this way the “psychological dimension” (consciousness etc.). So there is a continuous circular process: between biological mechanism generating Ego, and Ego activity producing not only psychological activities (imagery emotions etc) but giving hierarchical organization to all biological levels of the organism. So the ego is a psycho-physic unit continuously generated and generating.

We started with a research (Ruggieri, Fiorenza, Sabatini, 1986) where the phenomenal of *imitative decodification* was hypothesised many years before mirrors neurons hypothesis was formulated. In our research we examined the level of *mentalis* muscle tension in 36 students and during the presentation of three slides reproducing facial expressions. Analysis showed an increase in the myographic level of *mentalis* muscle after the presentations of the slides in which contraction of the chin was involved. We interpret this result by hypothesizing that the decodification of some facial expressions is realized through a micro-reproduction of the stimulus from the decodifying subject.

So we think that visual decodification involved two, finally confluent, different physiological pathways; the first sensory-modal from the eye receptor to the occipital cortex, where the individuation of the stimulus take place. The second would be produced by the transduction of visually information, analogically, on the muscular system (tonic activity) of the decodifying subject. This second mechanism *transmodal* would be confirmed by our results. We think that this mechanism is present in all perceptual process. This hypothesis gives a new role to the muscular system: trough the modulation of the tonic activity, muscles are the perceptual basis for *subjective feeling*. This function adds to the other functions of proprioceptive activity of the muscular system and is strictly related to regulation of tonic and static motor-activity. The mechanism adds to each sensorial cognitive analysis a micro-emotional contribute. Now we think that the feeling is strictly related to imitative decodification as showed by our results. In other words subject, while recognizing

stimulus-figure, through the transduction on the muscular system and proprioceptive afferences could perceive the emotional meaning of the stimulus, experienced by his own body.

So connotative (micro-emotional), denotative (cognitive) components of the stimulus are unified. In this way a bridge between subject and environment stimuli is made. For us this is the physiological basis of empathic process. This hypothesis could be well linked to the neurons mirror hypothesis that gives an important role to the neurons placed in the pars opercularis of the frontal lobe, These neurons could have a role in understanding emotions in others (Dapretto et al, 2006). The authors single out a mirror neuron dysfunction in children with autism spectrum disorder. They underline the connection between emotional (limbic) system and the *gyro-frontal* neurons. The frontal lobe is determinant for the behavioural program. A lack of connections between the encephalic areas produces big deficit in behavioural integration (emotional and cognitive). For us is important to remember that both systems (of behavioural programming and emotion) act through the stimulation and the control of efferent moto-neurons and through the *gamma* system.

The hypothesized lack of connections between frontal areas and limbic system could be related to irreversible brain damage or functional *synaptic inhibition potentially reversible*. Moreover the analysis of autism must be oriented also to the study of motoric activity that is a structural component of actions gestures and feeling. About the concept of inhibition we suggested in previous work (Ruggieri, 1988) an hypothesis related to some form peripheral muscular stable cronical contraction. How central inhibitory mechanism and peripheral one interact must be analysed in further research .

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