Editorial
Theory of Mind Based on Social and Cognitive Neuro-Science Field

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The concept of the Theory of Mind comes from ethology, with chimpanzee studies (Premack and Woodruf, 1978); however, based on the studies conducted by authors such as Wimmer and Perner, who applied this theory to the study of human development (Wellman, Cross & Watson, 2001), Baron-Cohen and Leslie, who applied it to the study of autism (Baron-Cohen, Leslie & Frith, 1985), and Frith, who did the study in patients with schizophrenia (Frith 2004; Frith & Corcoran 1996), among others, the study of Theory of Mind quickly became of interest for psychology, and more specifically for developmental and cognitive psychology, but later and with the growing boom of the neurosciences in the eighties and nineties, the study of this ability was also taken by neuropsychology and more recently by social cognitive neuroscience, a new research discipline in which the concepts, postulates, and research methods of both social psychology and cognitive neurosciences converge (Lieberman, 2012).

It is important to distinguish social cognitive neuroscience from cognitive neuroscience and social neuroscience. For Lieberman (2001; 2012), and for Ochsner and Lieberman (2001) the difference with cognitive neuroscience consists in that, while cognitive neuroscience studies how the brain executes cognitive processes like memory, the executive function, language, perception, among others, in the individual, social cognitive neuroscience studies how these processes and therefore the operation of the brain are affected by social relations (and vice versa), and adds processes such as: atributional biases, empathy, prejudices, social decision-making, the moral judgment and of course the Theory of Mind. In social neuroscience, according to Lieberman (2012), the difference consists in that it is concerned with understanding how the social environment affects, processes both in the autonomous nervous system, as well as in the peripheral nervous system, in addition to the immune system and the endocrine system; in other words, unlike social cognitive neuroscience, which focuses on the asocial cognitive processes of human interaction, social neurosciences extends its field of action, studying the nervous system in processes that are not necessarily cognitive but which are affected by social interaction.

Social cognitive neuroscience, according Lieberman (2007), focuses on studying four dimensions of social cognition, each of them with their respective processes. The first dimension is the understanding of others, in which the representation of the minds of others is studied, or as it is also known, Theory of Mind and the experience of

the mental states of others, which includes empathy. The second dimension is the understanding of oneself, whose processes to be studied are the recognition and reflection of oneself. The third dimension is the social self-regulation, in which self-regulation, both voluntary and involuntary, is studied. And finally, the fourth dimension deals with the interaction with the social world, in which the role of mirror neurons in imitation, self interaction and social understanding, attitudes, prejudice, social consensus, social rejection and societal decision-making is studied. In addition to these four dimensions, Lieberman (2007) delimits two nuclear processes which are studied in social cognitive neuroscience, and that are transversal to all the dimensions mentioned above. These are the automatic processes or the X system (from the term "reflexive"), those that are carried out unconsiously and involve the amygdala, the basal ganglia, the ventromedial prefrontal cortex, the temporal cortex and the dorsal anterior cingulate cortex. The controlled processes or the C system (from the term "reflective") are those that are realized consciously. This division between automatic and controlled processes, also known as the X and C systems, are approaches that come from social psychology in studies on social cognition (Fiske & Taylor, 2007), and what social cognitive neuroscience has done is to study the underlying neurological substrata and Lieberman (2007) recognizes this, which is why he goes farther and poses a division between the neural correlates of the tasks that focus on the interior psychological world and the tasks that focus on the exterior social world and the physical social agents in it. Processes focused on the outside are associated with the frontal-temporal-parietal network while the processes focused on the interior are associated with the frontal-parietal-medial network.

The temporal-parietal junction is activated with the social cognitive tasks that focus on external, physical aspects and often, the visual characteristics of others, of oneself and of the interaction between them. For its part, the medial frontal-parietal network is activated with social cognitive tasks that focus on the internal, mental, emotional, and experiential (of others and oneself) aspects.

Based on this frame of reference, it is important to take into account that the Theory of Mind has both automatic and controlled components, both internal and external. For the present study, the concept of the Theory of Mind will be handled within the framework of cognitive social neuroscience, understanding it as a controlled process focused on external processes.

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