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Editorial

From Dual Antagonism to Cooperation

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Behavior is the expression of normal or pathological brain functions. It mediates the symptoms of psychiatric illnesses, whether the patients express intense distress, provide verbal descriptions, or develop impaired adaptation strategies. Hence behavioral analysis can be conducted in humans and animals in order to assess changes in brain functions related to ontogeny, phylogeny or pathological processes. A comparative approach offers a unique perspective in understanding these links, but several epistemological hindrances, mainly due to the difficulty in referring to dual antagonisms had to be overcome, in the approach of brain structures or animal behavior.

Cognition Vs Emotion

One serious obstacle has been the view that thinking and cognition were essentially mediated by the neocortex, whereas the limbic system, popularized by PD Mac Lean as an ancient heritage of our «paleo-mammalian brain», was involved in «animal functions», mainly emotion processing. This view maintained a sharp differential view on these structures, in accord with the traditional dualism between reason and emotion. Anatomical data came first in support of a more cooperative view. Detailed analyses of brain phylogeny in mammals by Heinz Stephan showed that the development of specific parts of the limbic system, namely the cubiculum and the entorhinal cortex, is related to that of associative neocortical. These relations are mediated by numerous reciprocal connexions, which led Swanson in 1983 [1] to propose that the hippocampus' function was that of a supermodel associative cortex. Around that time, the theory by O'Keefe and Nadel in 1978 [2] that the rat hippocampus was involved in cognitive mapping obtained considerable support from the comparative ethology. The selective activation of the hippocampus region in the London taxi drivers during the mental elaboration of a complex ride [3] confirmed its role in spatial representation in humans. This changing view slowly contributed to liberate the limbic system from the emotion-vs-cognition alternative. Hence, the activation of specific brain regions (hippocampus and amygdale) could be described as the coupling/uncoupling between cool and hot memory systems [4].

Finally, a more recent view insists on the brain - or the individual - generating hypotheses as to what will happen next, whether in relation to one's own eye movements, or in relation with that of social partners : «what will you do next?» [5]. A link between social complexity and mental abilities had already been proposed in 1976 by an ethnologist, N. Humphrey [6], based on the observation that primates' social skills would require the integration of social relations in complex and flexible cognitive representations. This link is evident in psychiatry, since social maladaptation and spatial disorientation are common symptoms of Alzheimer's and other major psychiatric diseases. Interestingly, a «cognitive theory» is considered to mediate social skills and spatial mapping as well. In both cases, a complex mental process allows to a correct anticipation of what will happen, and contributes to optimal adaptation, whether in adjusting emotional responses or favoring the selection of adequate shortcuts or detours.

Measuring behavioral markers Vs applying an etho - ecological perspective

Animal models of psychiatric illnesses have received limited credit in clinic, mostly because of the unacceptability of explicit comparisons between animals and human patients. Modeling depression seems slightly more acceptable, as it concerns pain and grief, easily recognizable in domestic animals. However, simple transpositions are oversimplifications that no researcher should and does indeed propose. Several conceptual difficulties must be evoked in order to tackle this issue with reduced emotional component, and eventually acknowledge its relevance.

Let us consider two conceptions of animal models. In French, «le model animal» is not equivalent to «l' animal model». The first one is a symptom holder, a bio-behavioral marker, ready for simple and direct comparisons, but does not concern the subject. In this view, the later appears no more as an animal, merely a readymade trial. It helps validating some etiological factors from the induction of expected signs and can subsequently contribute to a primary validation of a therapeutically treatment. Such model is paradoxically easier to accept, due to overshadowing of the animal part, but it neglects the complex process of information integration and cognition.

The second concept is best accounted for by the French expression «l' animal model», where individual behavioral strategies are analyzed for their adaptive value in ecologically relevant situations, social groups or complex environments. Gradually enhancing the information processing load of the task allows to find out some qualitative dissociation threshold of adaptive efficacy. Such design has been developed to test spatial orientation and representation in rats treated with postnatal administration of BSO, aimed at reducing the level of antioxidant protection in the brain. This treatment is supposed to favor the development of schizophrenia in humans (see Berthelot & al, 2014) [7]. The performance of these rats in spatial orientation tests does not fulfill all the conditions of a cognitive map, though very satisfactory strategies can be observed. This kind of approach would add some specific cognitive deficits to the line of 'neurocognitive endophenotypes' [8], such as impulsivity and compulsivity.

For the social dimension, specific animal models have been developed to study the expression of analog autistic traits from the time spent exploring olfactory samples from congeners. This behavior is considered to require high level representations, rather than express a mere bias toward or away from social traces [9]. Combining

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spatial tasks and olfactory responses might provide some differential evaluation, to characterize a multidimensional cognitive deficit.

In favor of a reversible translation

Assessing cognitive maps in animals has led to the development of a rigorous theoretical and methodological framework. It insists on how the subjects rely on body movements, both to collect information during exploration and to express relevant motor decisions. Transposing rats' tests to the study of humans should also contribute to a better understanding of ecologically relevant cognitive problems and might also offer some indications for rehabilitation.

References

1. Swanson LW (1983) The hippocampus and the concept of the limbic system. In: Neurobiology of the hippocampus (Seifert W, ed), pp. 3-19. New York: Academic Press.
2. Muller RU, Stead M, Pach J. The hippocampus as a cognitive graph. J Gen Physiol. 1996; 107: 663-694.
3. Maguire EA1, Frackowiak RS, Frith CD. Recalling routes around london: activation of the right hippocampus in taxi drivers. J Neurosci. 1997; 17: 7103-7110.
4. Metcalfe J, Jacobs WJ. A "hot-system/cool-system" view of memory under stress. PTSD Research Quarterly. 1996; 7: 1-3.
5. Dindo H, Chella A. What Will You Do Next? A Cognitive Model for Understanding Others' Intentions Based on Shared Representations. Lecture Notes in Computer Science. 2013; 8021: 253-266.
6. Humphrey N (1976) The social function of intellect. In: Growing Points in Ethology (PPG Bateson, RA Hinde, eds) pp. 303-317. London: Nature.
7. Bertholet L, Meunier C, Preissmann D, Schenk F. Sex biased spatial strategies relying on the integration of multimodal cues in a rat model of schizophrenia: Impairment in predicting future context? Behav Brain Res. 2014; 262: 109-117.
8. Robbins TW, Gillan CM, Smith DG, de Wit S, Ersche KD. Neurocognitive endophenotypes of impulsivity and compulsivity: towards dimensional psychiatry. Trends Cogn Sci. 2012; 16: 81-91.
9. Zhan Y, Paolicelli RC, Sforazzini F, Weinhard L, Bolasco G. Deficient neuron-microglia signaling results in impaired functional brain connectivity and social behavior. Nat Neurosci. 2014; 17: 400-406.

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