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An Extension of the Neurocomputational Account of Science

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By the final decades of the previous century, P.M. Churchland (in Giere's *Cognitive Models of Science* (1992)) was a leading figure among a party of philosophers of science who declared that we already know enough about the brain's microphysical organization, and mathematical analysis and computer simulation have revealed to be able to make significant claims about the nature of scientific knowledge and scientific reasoning. The social aspects of production and justification of the scientific theories were regrettably absent from this account and Churchland's analysis of knowledge treated the scientists as an autonomous cognitive unit whose only significant transaction is with the abstract environmental stimulus induced by the theoretical source of knowledge which he has to work on. The social aspects of the scientific work, such as the role of distribution of credit and benefits in motivating the scientists, as well as the role of technicians, politicians, financiers, and public opinion and decisions in directing the scientific research which has going to take place within the brain of the scientists (not to speak of the professional relationship of the scientists together) should have been considered within a comprehensive account of the construction of the scientific theories. The normative rules, as ethical or juridical laws play a decisive role in forming the scientific activities as well. Goldman and Cox (1994) and Kitcher (1993) had presented some valuable but rough sketches to show how the impact of the social aspects could be dealt with in terms of decision-theoretic models.

In this flash talk, we develop Goldman and Kitcher's proposal in a different route to explain how the application of a computational evolutionary analysis of social exchange (*sensu* Cosmides and Tooby (1989, 2000)) could be useful in:

- a) Accounting of the cooperation between the scientists and other social factors and active agents who participate in a cost-benefit system, in terms of reciprocal altruism.
- b) Explaining the sustainable stability of the scientific society (by precluding the durability of cheating and deceit).
- c) Coping with the normative (ethical, juridical) aspects of the scientific work.

At the end, we would emphasize that as these are the computational theories which are used in extending the social aspects of the account the genesis of the scientific theories, by supplying it with an evolutionary story, they would mingle with Churchland's neuro-computational account quite appropriately.

This talk is based on a joint work with Seyyed Mojtaba Hosseini.