

**PHD THESIS SUMMARY:
An evolutionary approach on knowledge coordination and theories of mind.**

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PhD in economics, July 2009

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The aim of this thesis is to provide a wide analysis of knowledge coordination from the point of view of cognitive evolutionary economics, and to connect this issue with interdisciplinary fields of research, in particular biological anthropology, behavioural economics, and philosophy of mind.

Knowledge coordination concerns the human social and cognitive capacity to delineate rules of conduct and social practices which become patterns of behaviours, tacitly codified and spontaneously emergent, without any external enforcement. Social norms and conventions are examples of these tacit rules. From an historical perspective, Friedrich A. Hayek's epistemology has been considered a remarkable point of departure for this research. In addition knowledge coordination involves the ability to formulate expectations about other people's behaviour via a *mentalizing or mindreading* skill, which consists in the capacity to attribute mental states (i.e., intentions, beliefs, goals, motivations) to other social actors, also referred to as "theories of mind".

Behavioural economics has shown that *mentalizing* is involved in processes of market exchange and the division of labour, while anthropological studies consider theories of mind as the necessary ingredient for social learning. Moreover, a wide literature in the philosophy of mind provides a clear understanding about how *mentalizing* can occur. Finally, knowledge coordination is strongly related to cultural evolution and knowledge transmission: how can skills, practices, or rules of behaviours be transmitted and spread, and thus become generally recognizable for the members of a group? They are spread through cultural evolution: social norms which have been beneficial for a group are "selected" in certain contexts and maintained in the same population across generations. A crucial question then becomes: how can economic theory deal with this issue?

Chapter 1 of the thesis examines if, and how, Hayek's theory of cultural evolution can be compatible with the current literature in biological anthropology. In particular, Boyd and Richerson's "dual inheritance theory" highlights the importance of cultural group selection in social learning dynamics: frequency-dependent bias (i.e., conformist transmission and normative conformity), prestige bias transmission, and punishment are the social learning processes which allow for cultural group selection. Hayek, then, correctly predicted the importance of this evolutionary force in the emergence of social norms. However, we must be careful in addressing similarities and differences between the cultural and biological theories of evolution: any deterministic and teleological metaphor has to be avoided since natural selection is not the ultimate factor driving cultural evolution. The importance of imperfect perception is noted as a methodological tool typical of the cognitive evolutionary paradigm: human knowledge and transmission are error-prone.

Chapter 2 analyses the methodology of by cognitive evolutionary economics. I reject the orthodox version of methodological individualism in favour of a "sophisticated", "revolutionary", and "subjectivist" version of individualism. The debate on whether Hayek's theory of cultural evolution could be inconsistent with his individualistic methodology is misplaced. Cognitive evolutionary economics is compatible with the emergent properties of social facts and with the biological concept of altruism.

Chapter 3 defines the problem of knowledge coordination as an approach combining behavioural economics and philosophy of mind. When multiple stable equilibria are present in a pure coordination game, there is no player has any material interest to choose one equilibrium over the others. Scholars disagree about how coordination can occur under such circumstances. Two models of the mind known as *theory-theory* and *simulation-theory* are investigated as possible cognitive mechanisms involved in pure coordination games. *Theory-theory* posits that in understanding other people's behaviour subjects have a "folk psychology", a tacitly codified theory about how people feel, believe, and act. By contrast, *simulation-theory* posits that attributing mental states involves a simulation and imagination process characterized by "putting oneself in other people's shoes", without any codified theory. Rather than defend one model over the other, I argue that we should associate *theory-theory* with coordination characterized by non-

derivative salience, and *simulation-theory* with viable mental processes in coordination games having derivative salience.

Finally, I describe an economic behavioural experiment that has been run at ALEX, the cognitive economics laboratory at the University of “Piemonte Orientale”. This experiment consists of a coordination game followed consecutively by a two-step battle-of-the-sexes game. Including an image next to the decision options aims at revealing the effects of context and learning.

It is worth pursuing further interdisciplinary research on the mentioned topics, in particular on the role of derivative and non derivative salience and the possible application of *theory-theory* and *simulation-theory* in behavioural games.

Chiara Chelini received her PhD in economics of complexity and creativity at the University of Torino under the supervision of Salvatore Rizzello, professor of economics and history of economic thought at the department of economics and legal affairs, University of “Piemonte Orientale”. She has also held a research fellowship at the University of “Piemonte Orientale” (March-August 2009). Her research interests the emergence of social norms, cultural evolution, and the cognitive basis of economic behaviour. She is particularly interested in developing an interdisciplinary approach to these issues.

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