

## Three Levels in Human Communication: Emergence and Evolution

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In human communication, we can find three levels: 1) Non-symbolic communication, 2) Symbolic, non-linguistic communication, 3) Linguistic communication. Symbols are not used in the first level, thus it is automatic, unconscious, and non-inferential communication such as emotional contagion and sympathy. We often use social symbolic behavior, such as particular actions for greetings and facial expressions, in order to represent and understand intentional and emotional states. This forms the second level. The third one is communication using hierarchically structured linguistic sentences. While most of the first level is considered as shared with other animals, the second and third levels are characteristic in human communication. Especially, the third level is thought to be human unique. In the origin and evolution of human language, we need to understand the emergence and evolution of all three levels.

In this talk, I will introduce an effective approach to investigate the emergence and evolution of such features in human communication, called evolutionary constructive approach. In evolutionary constructive approach, an objective system is to be understood through constructing the system and operating it, where some autonomous changing processes are incorporated in constructing the system, such as genetic evolution, lifetime development, individual and social learning, and self-organization. The following researches are introduced as examples adopting this approach: an EEG measurement showing activity of human mirror neuron systems in the formation of communication systems (the first level), an experiment of the formation of communication systems and that of displaced communication (the second level), and a simulation of the evolution of ability to make hierarchical structure in object manipulation (the third level).