

[COE workshop abstract Talk]

Attributes of Language Use explained by Activities of Neurons

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[Abstract]

The paradigm of activity throws light on the natural intelligence. It is a new realistic concept where every part of body is considered as a tool for activities. That is, a brain or neuron or gene is a tool for activity. A human being exchanges information to do activities in the future. The origin of those activities can trace back to the birth of a first life. Single-cell organisms have continued to evolve the biochemical reaction about three billion years. If a creature makes action, the surroundings change. The creature must change the action for the life conservation. The creature interacts with the surroundings, and it adapts its behavior to the situation that changed. A creature possesses many biochemical reactions, and the subset of reactions is operated according to the demand of the situation. The meeting of supply and demand is the condition of activity that holds true in every creature. A creature does the adaptive biochemical reaction that accompanies materialization of the activity. A nerve system and a genetic system are the results of materialization, and those are tools for intelligent activities from the viewpoint of activity.

The nerve circuit that make possible to replay is formed at the activity in the real world. The knowledge is the information that expresses activities of the nerve circuits. The real meaning is effects on the real world. There are two subsets of activities in a brain. One is semantic activity in a brain and the other is a subset of activities for expression. There are linkages between two subsets of activities. Since a nerve cell unifies many activities into one activity, each subset of activities forms a hierarchical structure. Since the nerve system is organized by use of existing circuits, a growth of intelligence is achieved by adding a new circuit. This principle of extension economizes the circuits for activities. Although the contents of speech are activities of nerve network in which includes parallel connections, the speech is uttered by means of serial activities of a vocal organ. Therefore, the attributes of language originate from 1) real world, 2) brain mechanism, and 3) vocal organ. The language faculty of human is acquired through language use in the real world. So, the so-called universal grammar is mainly based on the attributes of the real world.

[Keywords] *Brain mechanism, Meaning of activity, Unification of activities, Language, Knowledge expression, Universal grammar*

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