

Notes on the demonstration of the formation of a new “symbol” Dagstuhl Workshop on Computational Creativity, July 2009

Two working groups were formed around the problem of creating new “symbols” (new categories, primitives). Our group took on the problem of coming up with a design for a system that would demonstrate the formation of a new symbolic primitive. Several of us in the group, took “symbol” in Howard Pattee’s more general sense of discrete, time-independent sign vehicles for switching behavior, and were thinking of this problem in terms of design of a device or system that would create new categories or conceptual primitives (not unlike the Pask electrochemical device or the formation of a novel idea). On the other hand, some members of our group, associated symbols strictly with communicative functions (sign vehicles with associated meanings), and we therefore decided to work on the problem of how novel meanings would be associated with particular sign vehicles. In other words, how does a sign become a symbol that is imbued with communicative meaning.

We chose to design an interactive game which would demonstrate this process. The design of the game went through several stages involving the group as a whole in interaction with two members of the group who focused more intensely on the problem. The result is that we came up with a coordination game in which two players attempted to coordinate their understandings of the meanings of signs (which were coins that could be situated in one of several boxes). The task was to evolve a mutual understanding of the meanings of the token (coin) positionings, such that one could communicate the location of a that had been previously placed in a particular location (the location being unbeknownst to the other player). Through a number of trials and error, restrictions were placed on the nature of the sign vehicles (which coin in which position rather than how many or in what spatial configuration), and the game demonstration converged in its design.

The end result is that the players were able to form arbitrary mappings between concrete signs and their semantic meanings with the game, such that a stable system of sign-meanings evolved as the game was played. The game thus demonstrates how signs can be linked to world states, such that the semantic linkages permit the actions of autonomous independent agents to be effectively coordinated.

Although our aim in the end did not demonstrate how new sign vehicles or concepts could arise (these were given by the game constraints), we did show how meaning conventions could evolve de novo amongst human actors. The design of the game turned out to be a useful example of how new shared meanings can be created by interpersonal interactions (community). I think it is fair to say that each of us learned something about the creation of signs, symbols, and meanings, and that a good time was had by all in the course of the interactive, creative design process.

--Peter Cariani, Sept. 17, 2009