

Title	以心伝心における多義性と文脈の役割～言語ゲームシミュレーションによる考察～
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Function of Ambiguity and Context in "Ishin-Denshin-Like Communication" - Consideration with Language-Game Simulation -

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This research mentions the function of ambiguity of utterance and context-information in "Ishin-Denshin-like-Communication". Not only human beings, also all the animals can't live without communication with other persons or environment. Therefore, study about communication is interesting and important to go to comprehension of essential part of life activity. Human has a type of communication that is called "Ishin-Denshin-like-Communication" in daily communication. "Ishin-Denshin" means that one's mind gets through to another one from each other without saying anything. In this research, such type of communication is called "Ishin-Denshin-like-Communication", and it is derived from cognitive science and perspective of language evolution. The model of "Ishin-Denshin-like-Communication" is based on "Language-Game" (Steels, 1996). It is called "Ishin-Denshin-Game". To simulate this game, this paper shows next three things.

1. Constructing the model of "Ishin-Denshin-like-Communication", search for what parameter is important in "Ishin-Denshin", and observe that process.
2. What functions do ambiguity and context have.
3. Failure of communication has what means in communication.

The signal used as a tool of the communication consists of three parts. There is such element on a part of "the interpretation" among three elements. The construction is different in each person. And the construction mechanism of another person is unknowable. This is an important point about essence of the communication.

The communication that human performs daily has dynamics comprising the following

characteristic.

1. Repeat success and failure of the communication.
2. Inconsistency of the construction occurs and modify to reply of communication.
3. There is not the guarantee that it succeeds by the successful communication by all means afterward once.

In addition, "Ishin-Denshin-like-Communication" has the following characteristics.

1. Speaker tries to communication by little utterances. Hearer correctly guesses and understands speaker's mind by that little utterance.
2. Speaker uses ambiguous word as utterance.
3. In both two persons, the mean of ambiguous word is defined.
4. Objectively, people don't show why two persons can communicate by only that utterance.

This research builds simulation model of Ishin-Denshin-Game to reproduce "Ishin-Denshin-like-Communication". Speaker and hearer are used name what represent object to communicate in "Ishin-Denshin-like-Communication". Ishin-Denshin-Game is added the setting that to be able to use context-information and occurs ambiguous word in Language-Game. This research carry out three experiments with "Ishin-Denshin-Game".

In experiment 1, Speaker can attach name to both of object's ID and Feature. Therefore a ambiguous word occurs by this setting. In addition, Hearer rebuilds own Lexicon every 100step.

As a result of experiment 1, next thing was shown.

1. Communication has occurred from non-communicative.
2. The ambiguity of the ambiguous word is lost by rebuilding of Hearer's Lexicon.
3. This result shows a same thing as the final stage of Language-Game.

In experiment 2, ambiguous words produce by reducing words used as name. And Hearer deleted what Lexicon rebuilt. There are two kinds experiment in experiment 2.

In experiment 2a, Speaker can attach Name to both of object's ID and Feature in the same way as experiment 1. But in experiment 2b Speaker can attach Name to only object's ID. As a result of experiment 2, a ambiguous word occurred by reducing the word that be able to use as Name even if there is not Naming to Feature. In addition, one Name will have more ambiguity because the word that could use as Name decreased. By this, plural candidate answers occurs in Object-set. In the case of this situation, Hearer cannot but choose any one at random because it does not have a method to choose right one as from the plural candidates. Therefore, the success rate of the communication through the whole game falls in comparison with experiment 1.

In experiment 3, introduced Situation as context-information. Situation is expressed in difference of the easiness of chosen the specific object in each Object-set. Situation is connected with Name in form to accompany object and registered with Lexicon. Speaker can know that Situation changed but Hearer can't. When Hearer did a wrong answer, it can understand only a thing about "it is not this Situation now". Even experiment 3 performed two

kinds of games by such a setting. Experiment 3a increased Situation to experiment 2b. As for experiment 3b, Hearer can not see Object-set. So, the range that the ambiguous word expresses spreads out when Hearer reply. As a result of experiment 3, Name which signify same object appeared even in different Situation. It is shown that Hearer used context-information to decide the meaning of this kind of ambiguous word to one mean. Furthermore, Hearer was able to succeeded communication by ambiguity of Name in an appearance.

Context-information clear up the ambiguity of the word is necessary to decide the meaning of the word with ambiguity in Ishin-Denshin-like-Communication. And it must be shared between communicating two people. In experiment 3, Hearer can't know that Situation changed but when Hearer reply, Hearer uses information of Situation recorded with Name in Lexicon. In this meaning, it may be said that model of Ishin-Denshin-Game reproduces Ishin-Denshin-like-Communication partially. This research disclose that following thing. The ambiguity change communication uncertainly because of the characteristic. But at the same time it has a function to promote smooth communication as a byproduct. Context-information is used when it clear up the ambiguity of the word.