Day 6: Fillmore and Case Grammar

We will discuss Charles Fillmore, case grammar, and frame nets. The concept of "case" had existed in language before Fillmore, but it was Fillmore who systematically summarized it as a case grammar. Fillmore later became the principal investigator of the global research project Frame

Charles Fillmore

Charles J. Fillmore (1929–2014) was a professor and linguist at the University of California, Berkeley. He has made significant contributions to cognitive linguistics, case grammar, frame semantics, syntax, and lexical semantics.

Charles J. Fillmore
1929–2014

Q1 Look at FIGURE 1 and write Japanese and English sentences.

Q2 Look at FIGURE 1 and consider the difference between what is represented in the picture and the graph.

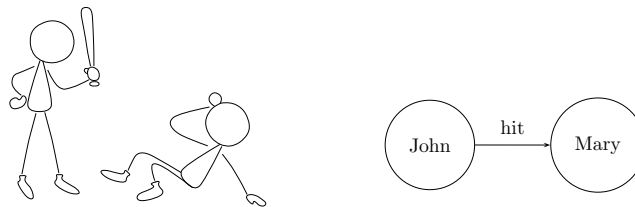Q3 Discuss the differences between what is in a Japanese sentence and what is in an English sentence.

FIGURE 1: Abstract representation of sentences: picture (left), graph (right)

1 Japanese as an example

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Before discussing case grammars, first consider some English cases.

Q4 Discuss what each word in the following English sentences is in relation to the verb. (thematic relation)

1. Agent:
   deliberately performs the action (e.g., Bill ate his soup quietly). In syntax, the agent is the argument of a transitive verb that corresponds to the subject in English.

2. Experiencer:
   the entity that receives sensory or emotional input. (e.g. Susan heard the song. I cried).

3. Instrument
   used to carry out the action (e.g., Jamie cut the ribbon with a pair of scissors.).

4. Source or origin
   where the action originated (e.g., The rocket was launched from Central Command. She walked away from him.).

5. Direction or goal
   where the action is directed towards (e.g., The caravan continued on toward the distant oasis. He walked to school.).

6. Location

   where the action occurs (e.g., Johnny and Linda played carelessly in the park. I'll be at Julie's house studying for my test.).

7. Time

   the time at which the action occurs (e.g., The pitcher struck out nine batters today)

8. Stimulus

   entity that prompts sensory or emotional feeling – not deliberately (e.g. David detests onions!).

9. Theme

   undergoes the action but does not change its state (e.g., We believe in one God. I have two children. I put the book on the table. He gave the gun to the police officer.) (Sometimes used interchangeably with patient.) In syntax, the theme is the direct object of a ditransitive verb.

10. Patient or Object

    undergoes the action and changes its state (e.g., The falling rocks crushed the car.). (Sometimes used interchangeably with theme.) In syntax, the patient is the single object of a (mono)transitive verb.

11. Force or natural cause

    mindlessly performs the action (e.g., An avalanche destroyed the ancient temple.).

12. Recipient

    a special kind of goal associated with verbs expressing a change in ownership, possession (e.g., I sent John the letter. He gave the book to her). In syntax, the recipient or goal is the indirect object of a ditransitive verb.

13. Beneficiary or recipient

    the entity for whose benefit the action occurs (e.g., I baked Reggie a cake. He built a car for me. I fight for the king.).

14. Manner

    the way in which an action is carried out (e.g., With great urgency, Tabitha phoned 911.).

15. Purpose

    the reason for which an action is performed (e.g., Tabitha phoned 911 right away in order to get some help.).

16. Cause

    what caused the action to occur in the first place; not for what, rather because of what (e.g., Because Clyde was hungry, he ate the cake.).

2 Case grammar

What is "case grammar"?

Case grammar is a linguistic theory proposed by Charles Fillmore in 1968. Case grammar is a theory of language that analyzes the combination of predicates (verbs, adjectives, nouns, etc.) and deep cases (deep cases; those that accompany predicates such as agent, place, and tool and add role meaning) as sentence components. The predicate has several hands, which are connected to the hands of several other words to form a sentence. In this case, words that represent tools, places, and the person who performs the action (the operator) are selected as the partners. The types of words that are used as partners are called cases. The type of case depends on the language, but there are eight types of cases that are common to all languages. Each case has a semantic role (the role a word plays in a sentence) as follows.

Agent	Experiencer	Instrument	Object
Source	Goal	Location	Time

The relationship between the predicate and the words that play each semantic role is called the case frame. The case frame defines how the predicates are semantically combined. For example, in "Jack ate the pizza," the location of 'Jack' indicates the subject of the action, and 'Jack' is the subject who performs the action, and "pizza" is the object. In this way, the relation between the predicate, 'eat' and the noun phrases 'Jack' and 'pizza' can be described. There are some restrictions, such that one deep case can only appear in one sentence. There are two types of cases, obligatory and optional, and if the obligatory case is deleted, the sentence is no longer valid. For example, Mary gave the apples is ungrammatical in this sense.

The underlying hypothesis of case grammar is that grammatical roles such as subject and object depend on deep case. In his 1968 paper, Fillmore proposed the following hierarchy as a universal rule for subject selection.

$$Agent > Instrument > Object$$

If the case frame of the verb contains an agent then it is recognized as the subject. Otherwise, the deep case (i.e., instrument) that follows the agent according to this order is promoted to the subject.

Q5 Discuss whether two deep and identical cases can exist in a sentence.

Q6 Make a sentence with multiple cases, and try to see at what stage you feel the sentence strange when you remove the cases one by one from the sentence.

Q7 In the above, discuss whether it really does not hold as a sentence, or if it still holds as a sentence.

Q8 Describe all the predicates and cases of the following sentence:
Using an online store, Mary sent Jack some chocolates for Valentine's Day.

Q9 Draw a graph of the relationship between the predicate and the cases.

3   Frame semantics

Frame semantics

Frame semantics is Fillmore's theory of language. It is an extension of Fillmore's own theory of case grammars, and combines linguistic semantics with encyclopedic knowledge. The basic idea of frame semantics is that understanding a word requires access to the world knowledge associated with that word. For example, understanding the word "buy" requires background knowledge about business transactions, including the relationships among sellers, buyers, products, money, and the relationships between them. A word evokes (or, in the terminology of frame semantics, "highlights") a frame of semantic knowledge related to the particular concept it denotes. A semantic frame is a coherent structure consisting of related concepts. If some knowledge is missing, it becomes incomplete and incomprehensible knowledge about the concepts belonging to the frame. In this sense, a frame is a kind of Gestalt. Frames are based on repeated experience. In other words, a business transaction frame is established by repeated experience of business transactions.

A word not only highlights an individual concept, but also specifies the perspective from which it is viewed in the frame. For example, 'selling' refers to a business transaction from the perspective of the seller, while 'buying' refers to it from the perspective of the buyer. Similarly, even though the word 'seaside' means both 'shore' and 'coast,' 'coast' is used from the perspective of land, while 'shore' is used from the perspective of the sea. According to Fillmore, this explains many asymmetries in lexical relations. Although the scope of frame semantics description was initially limited to lexical items, it is now being extended to syntax and other larger linguistic units, and is merging with syntactic grammar as its semantic foundation. The concept of frames is based on Marvin Minsky's theory in the field of artificial intelligence, and is also similar to that of Ronald Langacker's concept of profiling in cognitive grammar.

Q10   How can the relationship between 'buy' and 'sell' be described by case grammar? Create two sentences that show the same situation with 'buy' and 'sell' and discuss how the case frame differs between the two sentences.

Q11   Make a sentence with two predicates, 'pass' and 'cross,' and discuss how the case frame differs between the two sentences.

Q12   Consider and discuss in groups whether the above relationships vary by language.

Q13   Discuss whether it is possible to develop frame semantics not only as a component of sentences, but also as a component of paragraphs. Also, demonstrate your ideas on what kind of analysis can be done then.

Q14   Having considered frame semantics up to this point, discuss the relationship between human cognition and frame semantics and exchange your ideas in groups.

4   A graph expression by Graphviz

Draw the relationship between the components of a sentence using the graph tool Graphviz. As shown in Figure 2, a graph is a shape consisting of points (vertex) and edges connecting them. Unlike geometric figures, the position of the points and the length and shape of the edges do not affect the graph at all (Sato 1999: 2).
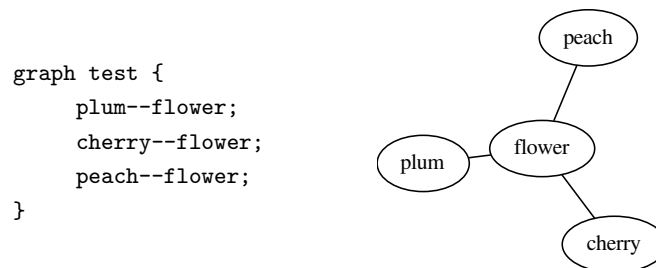
```
graph test {
    plum--flower;
    cherry--flower;
    peach--flower;
}
```


FIGURE 2: The dot language script for drawing the relationships between "plum, cherry, peach, and flower," and the graph

LIST 1: An output by Graphviz

1   % neato −Tsvg t.dot > t.svg
2   % neato −Tps:cairo t.dot > t.eps

Based on this, we will use Graphviz to output the people chart of "Botchan". The main characters in "Bottchan" are, according to Wikipedia 1. Botchan (me)", 2. Kiyo, 3. Yamaarashi, 4. Redshirt, 5. Nodaiko (noda), 6. Uranari, 7. Tanuki 8. Madonna. These are the eight names. Botchan" is the narrator, and appears mostly in the first person as 'I'. Nodaiko" appears exclusively in the abbreviated form of 'Noda'. Divide the text into sentences, count the number of times any two of the characters appear together in a sentence, and draw a graph.

5   To learn more

1. Fillmore (1968) is the first paper on case grammar written by Fillmore.
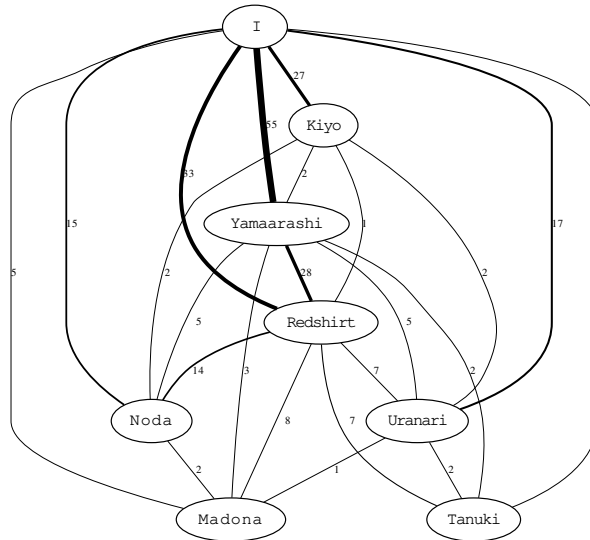2. Tsunoda (2009) introduces the typology of languages of the world.

FIGURE 3: How often do the characters in "Botchan" appear in one sentence at the same line: the thickness of the edges translates to a tenth of the frequency

3. Framenet Project: Fillmore is the head of a project called FrameNet, which is being carried out in various countries.

References

Fillmore, Charles J. (1968) "The Case for Case", in Bach and Harms eds. *Universals in Linguistic Theory*, New York: Holt, Rinehart, and Winston, pp. 1–88.

Sato, Kimio (1999) *Gurafu riron nyumon: C gengo ni yoru puroguram to ouyomondai (Introduction to graph theory:, Graph Theory Introduction: exercises for programmings and application in C language)*, Genri ga wakaru kougaku sensho (Engineering selections which are introduction to the principle), Tokyo: Nikkan kogyo shimbunsha.

Tsunoda, Tasaku (2009) *Sekaino gengo to nihongo kaiteiban: gengo ruikeiron kara mita nihongo (World languages and Japanese, revised edition: Japanese from the perspectives through linguistic typology*: Kuroshio shuppan.