Title	Lexical and constructional meanings in Japanese FrameNet
Sub Title	語彙と構文の意味：日本語フレームネットにおける記述の試み
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Publisher	慶應義塾大学日吉紀要刊行委員会
Publication year	2009
Jtitle	慶應義塾大学日吉紀要. 英語英米文学 (The Hiyoshi review of English studies). No.54 (2009.) ,p.45- 58
JaLC DOI	
Abstract	
Notes	
Genre	Departmental Bulletin Paper
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=AN10030060-20090331-0045

Lexical and Constructional Meanings in Japanese FrameNet

Kyoko Hirose Ohara

1. Introduction

This study is a preliminary attempt to represent interactions between semantics of lexical units and constructions of Japanese sentences in Japanese FrameNet (Ohara 2008b, Saito et al. 2008),[1] in terms of combined lexicon and "constructicon" currently being developed in FrameNet (Fillmore 2008, Baker 2006).[2] Japanese FrameNet is an online lexicon-building project, whose model project is FrameNet. Adopting a theoretical framework called Frame Semantics (Fillmore 1968, 1976), FrameNet has been analyzing meanings of English lexical units with respect to the frames they evoke.

Conducting contrastive analyses of Japanese and English, Ohara (2007, 2008a, 2008b) argued that in order to look into how different languages encode the same scene, it is also necessary to make cross-references between lexical units and grammatical constructions in each language rather than only analyzing the semantics of lexical units. This paper investigates how such cross-references can be represented in Japanese FrameNet.

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1) The Japanese FrameNet website   http://jfn.st.hc.keio.ac.jp/
2) The FrameNet website   http://framenet.icsi.berkeley.edu/

The rest of the paper is structured as follows. In Section 2, I will give a background to the current study. I will start out by briefly presenting the theoretical framework of Frame Semantics, and then introduce the FrameNet and Japanese FrameNet projects. In Section 3, I will explain the method used in the current study. In Section 4, I will discuss four cases of interactions between frames, lexical units, and constructions. Finally, I will summarize the discussion in Section 5.

2. Background

Frame Semantics is a research program in empirical semantics which emphasizes the links between language and experience. In Frame Semantics, each word is described in terms of the conceptual frame it evokes. Here, frame is defined as "a script-like conceptual structure that describes a particular type of situation, object, or event along with its participants and props" (Ruppenhofer, et al., 2006: 5). *Frame* as used in Frame Semantics refers to any system of linguistic choices that can be associated with prototypical instances of scenes (including not only visual scenes but also familiar kinds of interpersonal transactions, standard scenarios, familiar layouts, institutional structures, enactive experiences, body image, and in general, any kind of coherent segment, large or small, of human beliefs, actions, experiences, or imaginings). Each frame has a number of frame elements (hereafter FEs), which can be thought of as semantic roles.

Since 1997 the FrameNet project has been creating an online lexical resource for English, based on Frame Semantics and supported by corpus evidence. Japanese FrameNet has been seeking to produce a comparable frame-semantic lexicon for Japanese since 2002. Its goal is to create a prototype of an online Japanese lexical resource in the FrameNet style, by describing the senses of each word with respect to the frames it evokes and

by annotating corpus examples of each word with frame-semantic tags.

Using the frames defined in FrameNet, Ellsworth et al. (2006) contrasted frames involved in motion descriptions in an English novel and its corresponding Japanese, Spanish, and German translations. They found regularities of translation which had not been previously discussed in terms of the semantic typologies proposed by Talmy (2003) or Slobin (2004). They analyzed frame-evoking words only, however, in accordance with the existing FrameNet method.

The purpose of the current study is to try to represent how the semantics of words interact with the semantics of grammatical constructions. In other words, in addition to examining semantics of frame-evoking words the current study also analyzes semantics of grammatical constructions as well. In this study, I analyzed the same aligned parallel corpus as the one used by Ellsworth et al., namely, Chapter 14 of a Sherlock Holmes novel and two of its Japanese translations.

3. Method

I conducted a contrastive analysis of the two languages, using FrameNet-style frame semantics and Construction Grammar as main tools. First, the reason for using FrameNet-style frame semantics is the following: FrameNet-style Frame Semantics has a scene-based or frame-centered view, which makes it easy for contrastive analysis of texts and their translations. As demonstrated by contrastive and cross-linguistic comparisons by Hasegawa et al. 2006 and Ellsworth et al. 2006, FrameNet-style Frame Semantics has a potential for cross-linguistic applicability.

Second, the reason for employing Construction Grammar as a main tool is that Construction Grammar goes well with Frame Semantics, which is a model of meaning. Especially, two frame-semantic notions, which have

been developed recently in FrameNet, will play an important role in the fol-
lowing analysis (Hasegawa et al. 2008). The first notion is that "Construc-
tions may evoke frames." Subparts of a construction (construction elements;
hereafter CEs) provide semantic information and the semantic information
associated with CEs combines to create some kind of a semantic structure.
It thus follows that a construction itself may evoke a frame and that its CEs
may satisfy the frame's FEs. The second is the distinction between Inner and
Outer CEs. Something internally consisting of juxtaposition of words and
phrases externally functions as a "valence" of the construct and corresponds
to FEs.

　　The procedures I adopted in analyzing the parallel corpus are the fol-
lowing:

1) Find a corresponding pair of English and Japanese expressions;
2) Examine whether the English and Japanese expressions evoke the same
　　frame or not;
3) Represent the interactions between the frames, lexical units, and construc-
　　tions in each language.

4. Interactions between Frames, Lexical Units, and Constructions

In general, texts and their translations into other languages should encode
the "same" scenes or frames, but in many cases they do not. I will discuss
four cases of mismatches between frames, lexical units, and constructions
in the two languages. They can be classified into two types: those that
pertain mainly to lexically-evoked frames; and those that have to do with
constructionally-evoked frames. Lexically-evoked frames are frames that
are evoked by lexical items; and constructionally-evoked frames are evoked
by constructions (cf. Section 3).

4.1. Lexically-evoked frame: The same frame in English and Japanese

The first case involves English and Japanese corresponding predicates evoking the same frame but the predicates have different valence patterns. In (1) below, both of the vision verbs in English and Japanese, namely, *see* and *miru*, evoke the Perception_experience frame (PERCEIVERS have perceptual experiences that are not necessarily voluntary). In English, the FE PERCEIVER_PASSIVE (the being who has a perceptual experience) is realized as the subject of the sentence, *I*, while the FE PHENOMENON (the entity or phenomenon that the PERCEIVER_PASSIVE experiences with his or her senses) is realized as the direct object, namely, *the lights of a house*. In Japanese, on the other hand, the FE PERCEIVER_PASSIVE is a zero pronoun, while the FE PHENOMENON is realized as the subject of the sentence, namely, *tomosibi ga*.

(1)

E: *I* **see** [Perception_experience]   *the lights of a house ahead of us.*

J2[3)]: *zenpoo*   *ni*   *tomosibi ga*

   forward.direction   LOC light   NOM

   mie[Perception_experience] *masu*   *yo*

   visible   POLITE SFP

   "Ahead, a light/lights is/are visible."

(2) is another example of English and Japanese predicates evoking the same Perception_experience frame, but this time with verbs of hearing, *hear* and *kikoeru*. Again, the FE PERCEIVER_PASSIVE is realized as the subject in English and as a zero pronoun in Japanese. Moreover, the FE

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3)   Here and in the rest of the paper, "J1" refers to sentences taken from Nobuhara (1954) and "J2" refers to sentences taken from Suzuki (1956).

PHENOMENON is realized as the direct object in English and as the subject in Japanese.

(2)

E: *I* **heard**[Perception_experience] *the crisp sound of boots upon gravel.*

J2: *naga-gutu de   zyari o   humu, zarizari to   yuu oto   ga*
     long shoes INSTR gravel ACC step SOUND QUOTE say sound NOM
     kikoe[Perception_experience] *te, ...*
     audible
     "the crunching sound of stepping on grave with boots was audible…."

Figure 1 represents the interactions between the `Perception_experience` frame and the *Perception_experience* constructions in each of the two languages. For the English sentence, the second line represents grammatical functions (e.g. object) and the third line represents FEs (e.g. PERCEIVER_PASSIVE, PHENOMENON). In Figure 1, "External_Arg" is an abbreviation for "external argument", which is a term used in Construction

E: | *I* | | **_see_** | *the lights* |
   | External_Arg | | | Object |
   | **Perceiver_passive** | | | **Phenomenon** |

J: | *tomosibi ga* | | | **_mieru_** |
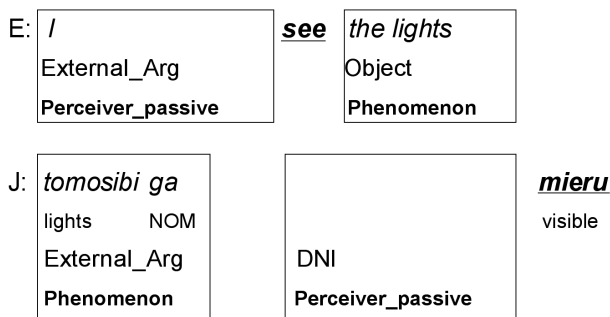 | lights   NOM | | | visible |
   | External_Arg | DNI | | |
   | **Phenomenon** | **Perceiver_passive** | | |

Figure 1. The `Perception_experience` frame and
the *Perception_experience* constructions in English and Japanese

Grammar and Frame Semantics to refer to a "subject" (Ruppenhofer 2006). For the Japanese sentence, the third line represents grammatical functions and the fourth line FEs. "DNI" in the third line is an abbreviation for "Definite Null Instantiation," which is a term used in Construction Grammar and Frame Semantics to refer to a type of zero pronouns (ibid.).

4.2. Lexically-evoked frames: Different frames in English and Japanese

The second contrast between English and Japanese involves different lexically-evoked frames but somehow the linguistic expressions in the two languages seem to convey comparable meanings.

In (3), the English predicate shown in bold evokes the Motion frame (THEME starts out at SOURCE and ends up at GOAL, having covered some space between the two (PATH).). On the other hand, the Japanese predicate *hirogaru* in bold evokes the Expansion frame (An ITEM changes its physical size).

(3)

E: *It's* **moving**[Motion] *towards us, Watson.*

J1:   *ano kiri wa   kotti   e   **hiroga**[Expansion] tte kuru ne, watoson-kun*

       that fog TOP this. way GOAL spread   come SFP Watson

       "That fog is **spreading** this way, Watson."

Here, it is possible to say that whereas the English original sentence focuses on the motion of the fog, the Japanese expression focuses on the state change of the fog. The contrast between focus on motion and focus on state in English and Japanese has been pointed out by Ikegami (1991) and others.

(4) is another example in which lexical units evoking different frames in the two languages, but they end up conveying similar meanings.

(4)

E: *he* **emerged**[Departing]   *into the clear, starlit night.*

J1: *… sumikitta hosiakari no   yoru ni   **na**[Becoming] tta*

     clear   starlit   GEN   night DAT become.PAST

     "… (it) **became** a clear starlit night …"

Here, the English predicate evokes the Departing frame (A THEME moves away from a SOURCE). The Japanese predicate *naru*, on the other hand, evokes the Becoming frame (An ENTITY ends up in a FINAL_STATE or FINAL_CATEGORY which it was not in before). The English sentence and the Japanese sentence may be characterized as focusing on an individual entity and focusing on the whole scene respectively. Such contrast is another example of preferred encoding patterns in the two languages discussed by Ikegami (1991).

4.3. Constructionally-evoked frame: Different frames in English and Japanese (1)

The third and fourth cases involve constructionally-evoked frames.

In (5), as the segment highlighted by bold shows, the English original sentence employs *tied*, which evokes the Being_attached frame ("An ITEM is attached via a CONNECTOR, to a GOAL."), while the Japanese translation pertains to *sibaritukeru* 'bind,' evoking the Attaching frame ("An AGENT attaches an ITEM to a GOAL by manipulating a CONNECTOR, creating an asymmetric relationship between the ITEM and the GOAL.").

Transitive volitional verbs in Japanese, including verbs of attaching, when followed by the auxiliary form *te aru*, describe a resultant state of an action. Therefore, the verb *sibaritukeru*, together with the auxiliary verb *te aru*, "focuses on the resultant state of a past action rather than the action

itself" (Hasegawa, 2005: 229).

(5)

E: *To this post a figure was* **tied**_[Being_attached]*, so swathed and muffled in the sheets which had been used to secure it that one could not for the moment tell whether it was that of a man or a woman.*

J1: *kono hasira ni   siitu o   guruguru   to   makitukete,*
    this   pillar LOC sheets ACC MANNER COMPL swathed
    tyotto mita   no   de   wa   otoko ka onna   ka wakaranai
    little seeing NOM COP TOP   man Q woman Q tell-NEG
    *ningen ga   hitori **sibarituke**_[Attaching] **te a-tta***
    person NOM one   bind   exist-PAST
    "To this pillar a person, who was swathed in sheets and whom one could not tell whether it was a man or woman, **had been bound**."

I argue that (5) is an instance of the *Resultant_state* construction in Japanese. As I mentioned in Section 3, there are two types of CEs: Inner and Outer. In the *Resultant_ state* construction, as shown in Figure 2, the Inner CEs consist of ACTION (e.g. *sibarituke*) and the RESULTATIVE_MARKER (*te aru*). The two Inner CEs combine to form a state expression which has a valence, i.e. an Outer CE: ENTITY. The Outer CE is linked to the FE ENTITY in the Resultant_state frame, which describes an ENTITY's STATE resulting from an ACTION. In other words, the *Resultant_state* construction evokes the Resultant_state frame, which is compatible with the Attaching frame evoked by the predicate *sibarituke*.
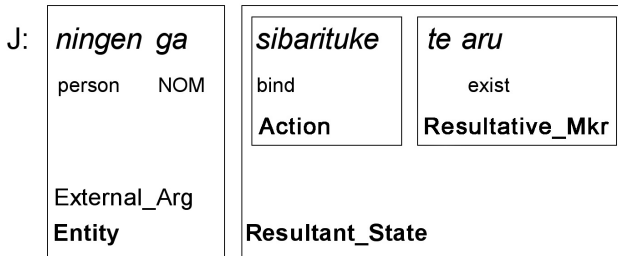
J:	*ningen ga*	*sibarituke*	*te aru*
	person　　NOM	bind	exist
		Action	**Resultative_Mkr**
	External_Arg		
	Entity	**Resultant_State**	

Figure 2. The `Resultant_state` frame and the *Resultant_state* Construction in Japanese

4.4. Constructionally-evoked frame: Different frames in English and Japanese (2)

The last case I introduce involves another constructionally-evoked frame, exemplified by the Japanese sentence in (6).

(6)

E:　*There were only two men in the room, Sir Henry and Stapleton.*

J1:　**miru to**,　　*syokudoo　ni　　wa　　henrii kyoo*
　　　look　CONJ　dining.room LOC TOP　Henry Sir
　　　to suteepuruton ga　　　iru　　bakari　dearu
　　　and Stapleton　　NOM　exist　ONLY　COP
　　　"**When (I) looked**, (I saw) there are only Sir Henry and Stapleton in the dining room."

In the Japanese sentence, as shown in bold, the vision verb *miru* is followed by the conjunctive marker *to*, and then by a main clause encoding a scene. The vision verb is often not accompanied by a subject and in that case the subject is understood to be the narrator. In other words, the narrator is construed as the perceiver and the main clause reports a scene from the

perspective of the narrator.

The construct corresponding to the Inner CE *PERCEPTION* is often the verb of seeing *miru*, as in (6). A verb of awareness *omou* "surmise" may also be used for the Inner CE *PERCEPTION*, as shown in (7).

(7)

E: *... our friend's eyelids shivered and he made a feeble effort to move.*

J1:   *henrii kyoo wa   mabuta o   pikupiku   saseta*

Henry Sir   TOP eyelids ACC MANNER caused

ka to   **omou   to**,   *tuduite kasukani*

Q QUOTE   surmise CONJ   then   slightly

karada o   ugokasita

body   ACC moved

"**When (I) surmised that Sir Henry had blinked**, (I saw) he slightly
  moved his body."

The interaction between the `Perspective_providing` frame and
the *`Perspective_providing`* construction in Japanese is represented
in Figure 3. In the *`Perspective_providing`* construction, two In-

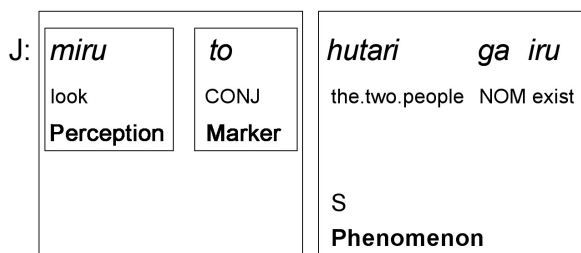| J:	*miru*	*to*	*hutari ga iru*
	look	CONJ	the.two.people NOM exist
	Perception	**Marker**	
			S
			Phenomenon

Figure 3. The `Perspective_providing` frame and the
`Perspective_providing` Construction in Japanese

ner CEs, PERCEPTION (e.g. *miru*, *omou*) and the MARKER (*to*), combine to form a perspective-providing expression which has a valence, i.e. an Outer CE: PHENOMENON. The Outer CE is linked to the FE PHENOMENON in the `Perspective_providing` frame.

5. Summary

To summarize, by identifying contrasting pairs of English and Japanese expressions with respect to frames, lexical units, and grammatical constructions, I have attempted to represent the interactions between the semantics of lexical units and that of constructions in Japanese. I have discussed four cases of such interactions: two of them involved lexically-evoked frames; and the other two involved constructionally-evoked frames. It is hoped that the study will give support to the new FrameNet direction of combining lexicon and "constructicon" (Fillmore 2008).

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