Perspective, Logophoricity, and Embedded Tense in Japanese

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1. Introduction

This paper investigates the following questions regarding the tense system in Japanese:

(i) Are Japanese tenses (tense forms) indexical? (OR: Do they have an indexical use, at least?)

(ii) Can tenses occurring in matrix clauses, complement clauses of attitude verbs, and adjunct clauses (e.g. relative clauses) be given a uniform semantic analysis?

(iii) Sometimes the choice of a tense form is conditioned by the speaker's choice of perspective. Under what conditions, and why?

The organization of the paper is as follows. In Section 2, I review the two major approaches to Japanese tenses in past studies, i.e. the "uniform/non-indexical" approach (e.g. Ogihara 1996) and the "non-uniform/indexical" approach (e.g. Oshima 2006), drawing on data that involve tenses in matrix clauses and in complement clauses (of utterance/attitude predicates).[1] In Sec-

[1] Throughout the paper, by the term "complement clause" I refer to the complement clause of an utterance or attitude predicate.

tion 3, I consider tenses in relative clauses, which are often ambiguous between the so-called independent and relative interpretations, and demonstrate data sets that pose a challenge for the uniform analysis along the lines of Ogihara (1996).

In Section 4, I propose that Japanese tenses are ambiguous between the indexical use and the perspectival use, where the former may be further split into the primary indexical use and the secondary indexical (logophoric) use. I also point out that the proposed indexical/perspectival ambiguity is attested in the domain of pronominal anaphora too, and thus is resonant with Partee's (1973) observation that tenses and pronouns have a number of analogous properties. In Section 5, I discuss properties of the perspectival tense in formal syntactic/semantic terms. In Section 6, I consider tenses in types of adjunct clauses other than relative clauses, such as BEFORE-, AFTER-, and WHEN- clauses, and propose that tenses under BEFORE and AFTER require an exceptional treatment.

2. Tenses in Matrix Environments and Complement Clauses

Japanese has a two-way distinction of tense: present and past. (The present tense is sometimes called the "non-past" tense.) A present tense form on a matrix predicate indicates that the time of the described event is posterior to or includes the speech time (*event time* $>$ *speech time* or *event time* $\supseteq$ *speech time*); the "inclusion" interpretation is available only with a stative predicate (Inoue 1989: 177). A past tense form on a matrix predicate, on the other hand, indicates that the time of the described event is prior to the speech time (*event time* $<$ *speech time*).

(1) a. Ken-wa asita Mari-ni a-**u**.
K.-Top tomorrow M.-Dat see-Pres
'Ken will see Mari tomorrow.'
b. Ken-wa kinoo Mari-ni at-**ta**.
K.-Top yesterday M.-Dat see-Past
'Ken saw Mari yesterday.'

Data like (1) suggest that Japanese tenses are Kaplanian indexicals on a par with *watashi* 'I', *kyoo* 'today', *koko* 'here', etc., whose meanings are contingent on the (external) context of utterance.

A tense occurring in a complement clause, however, cannot be considered a Kaplanian indexical (a primary indexical; see Schlenker 2003).

(2) (both uttered on Wednesday)
a. Getuyoobi, Ken-wa [Mari-ga kinyoobi-made-ni ku-**ru**]
Monday K.-Top M.-Nom Friday-by come-Pres

to omotte-i-ta.
Comp believe-Past
'On Monday, Ken thought that Mari would come by Friday.'

b. Kinyoobi, tabun Ken-wa [Mari-ga moo Tokyo-ni
Friday probably K.-Top M.-Nom already Tokyo-Dat
kaet-**ta**] to omo-u daroo.
return-Past Comp believe-Pres it.is.likely
'On Friday, Ken will probably think that Mari already returned to Tokyo.'

In (2a), if the tense in the complement clause is anchored to the external "now" (= Wednesday), the complement clause would denote the proposition that *Mari comes sometime between Wednesday and Friday*. But this is obviously not the proposition that Ken is related to by the "believing" relation; the object of Ken's original belief must be something like: "Mari comes sometime between *now* and Friday". Similarly, in (2b), if the embedded tense is anchored to the external utterance time, the complement clause would denote the proposition that *Mari returns (returned) to Tokyo prior to Wednesday*, which clearly is not the object of Ken's original belief.

In the following, I briefly illustrate two competing approaches of Japanese tenses in matrix clauses and in complement clauses, which I call the "uniform/non-indexical" approach and the "non-uniform/indexical" approach.

2.1. The Uniform/Non-indexical Approach

Ogihara (1996) maintains the view that Japanese tenses are not inherently indexical (see also Kusumoto 1999). According to his analysis, a tense form introduces two temporal arguments, which can be informally called the "reference time" argument and the "event time" argument.

When a tense form occurs in a matrix environment, the reference time argument is replaced by the external "now" by a semantic interpretative rule (truth definition) on the logical translation of the whole sentence; the event time argument, on the other hand, is existentially bound by the same rule. The following illustrates a semantic derivational process of a simple tensed sentence, with relevant syntactic and semantic rules suggested by Ogihara (1996: 64–66) (here, an intensional logic with time variables is adopted as the meaning language).

(3) Ken-ga ki-ta
K.-Nom come-Past
'Ken came'

(4) a. **Relevant Syntactic Rules**:
S → NP VP T

VP → V

b. **Relevant Translation Rules**:
[$_{S}$ NP VP T] ↦ **T**(**NP**(**VP**))
[$_{VP}$ V] ↦ **V**

(5) 1. Ken-ga ↦ $\lambda P_{\langle e,\langle i,t\rangle\rangle}[P(\textbf{ken})]$
2. ki- ↦ $\lambda x[\lambda t_1[\textbf{come}(x)(t_1)]]$
3. -ta ↦ $\lambda\varphi_{\langle i,t\rangle}[\lambda t_2[\lambda t_3[t_3 < t_2 \wedge \varphi(t_3)]]]$
4. Ken-ga ki-ta ↦ $\lambda t_2[\lambda t_3[t_3 < t_2 \wedge \textbf{come}(\textbf{ken})(t_3)]]$

(6) **Truth Definition**: An IL expression ϕ of type $\langle i,\langle i,t\rangle\rangle$ that serves as a translation of a natural language is true with respect to context c, world w, and assignment g iff $[\![\exists t_0[\phi(c_{T})(t_0)]]\!]^{c,w,g} = 1$

(n.b.) $[\![\, c_{T}]\!]^{c,w,g}$ = the time of c

When a tense form occurs in a complement clause, on the other hand, its reference time argument is left bound to a lambda operator and is not linked to a particular temporal point. The following illustrates a semantic derivational process for an attitude report sentence (Ogihara assumes that an attitude predicate denotes a relation between an individual and a set of world-time-individual triples).

(7) Mari-wa [Ken-ga ki-ta] to omot-ta
M.-Top K.-Nom come-Past Comp believe-Past
'Mari thought that Ken came.'

(8) a. **Relevant Syntactic Rules**:
CP → S C
VP → CP V

b. **Relevant Translation Rules**:
[$_{CP}$ S C] ↦ **S**
[$_{VP}$ CP V] ↦ **V**($^{\wedge}\lambda t_4[\lambda y[\exists t_5[\textbf{CP}(t_4)(t_5)]]]$)

(9) 1. Ken-ga ki-ta (to) ↦ $\lambda t_1[\lambda t_2[t_2 < t_1 \wedge \textbf{come}(\textbf{ken})(t_2)]]$
2. omot- ↦ $\lambda\wp_{\langle s,\langle i,\langle e,t\rangle\rangle\rangle}[\lambda x[\lambda t_3[\textbf{believe}(\wp)(x)(t_3)]]]$
3. [Ken-ga kita] to omot- ↦ $\lambda x[\lambda t_3[\textbf{believe}(^{\wedge}\lambda t_4[\lambda y[\exists t_5[t_5 < t_4 \wedge \textbf{come}(t_5, \textbf{ken})]]])(x)(t_3)]]$
4. Mari-wa [Ken-ga kita] to omot-ta ↦ $\lambda t_6[\lambda t_7[t_7 < t_6 \wedge \textbf{believe}(^{\wedge}\lambda t_4[\lambda y[\exists t_5[t_5 < t_4 \wedge \textbf{come}(t_5, \textbf{ken})]]])(\textbf{mari})(t_7)]]$

Ogihara's analysis is "uniform" in the sense that it assigns the same lexical meanings to matrix tenses and an embedded tenses.

2.2. The Non-uniform/Indexical Approach

In Oshima (2006), I proposed that (at least certain occurrences of) Japanese tense forms are indexicals, and that they can be used either as primary indexicals (on a par with first person pronouns, etc.), or as secondary indexicals (on a par with logophoric pronouns; see Schlenker 2003, among others). (10) and (11) illustrate a semantic derivation process for (3), where the past tense is used as a primary indexical and is interpreted relative to the external context of utterance; note that the lexical meaning of the tense directly makes reference to the external context, through the special context variable $c*$.[2]

(10) a. **Relevant Syntactic Rules**:
IV $\rightarrow$ IV_{stem} T
S $\rightarrow$ NP IV

b. **Relevant Translation Rules**:
$[_{\text{IV}}\ \text{IV}_{\text{stem}}\ \text{T}] \mapsto \lambda x[\mathbf{T}(\mathbf{IV_{stem}}(x))]$
$[_{\text{S}}\ \text{NP IV}] \mapsto \exists t_1[\mathbf{NP}(\mathbf{IV}(t_1))]$

(11) 1. ki- $\mapsto \lambda x[\lambda t_1[\mathbf{come}(x)(t_1)]]$
2. -ta $\mapsto \lambda\varphi_{\langle i,t\rangle}[\lambda t_2[\varphi(t_2) \wedge t_2 < \mathbf{Time}(c*)]]$
3. ki-ta $\mapsto \lambda y[\lambda t_2[\mathbf{come}\ (y)(t_2) \wedge t_2 < \mathbf{Time}(c*)]]$
4. Ken-ga $\mapsto \lambda P_{\langle e,\langle i,t\rangle\rangle}[P(\mathbf{ken})]$
5. Ken-ga ki-ta $\mapsto \exists t_3[\mathbf{come}(\mathbf{ken})(t_3) \wedge t_3 < \mathbf{Time}(c*)]$

(n.b.) a. (i) $[\![c*]\!]^{\text{c,w,g}}$ is defined only if g($c*$) = c. If defined $[\![c*]\!]^{\text{c,w,g}}$ = g($c*$).
(ii) $[\![c_n]\!]^{\text{c,w,g}}$ = g(c_n).

b. $[\![\mathbf{Time}(c)]\!]^{\text{c,w,g}}$ = the time of $[\![c]\!]^{\text{c,w,g}}$ (where $c = c*$ or c_n)

When tense forms are used as secondary indexicals, they are interpreted with respect to a secondary context associated with a reported attitude, utterance, etc. Following Oshima (2006), here I take the view that propositional attitudes are relations between an agent and a propositional character, i.e., a function from contexts to propositional contents (where a propositional content is understood as a function from worlds to truth values). (12) and (13) illustrate a semantic derivation process for (7), which contains a "logophoric" tense (i.e. a tense as a secondary indexical); "PAV" stands for "propositional attitude verb", and the subscript "log" indicates a logophoric tense.

(12) a. **Relevant Syntactic Rules**:
CP $\rightarrow$ S C
S $\rightarrow$ NP CP PAV

[2]Here again, an intensional logic equipped with time variables is adopted as the meaning language, for ease of comparison with Ogihara (1996). In Oshima (2006), an extensional logic with world, time, and event variables is adopted as the meaning language.

b. **Relevant Translation Rules**:
$[_{\text{CP}}$ S C$] \mapsto$ **S**
$[_{\text{S}}$ NP CP PAV$] \mapsto$ **NP**(**PAV**(λc_1[$^\wedge$**CP**]))

(13) 1. -ta$_{\text{log}} \mapsto \lambda\varphi_{\langle i,t\rangle}[\lambda t_2[\varphi(t_2) \wedge t_2 <$ **Time**$(c_1)]]$
2. Ken-ga ki-ta$_{\text{log}}$ to $\mapsto \exists t_3$[**come**(**ken**)$(t_3) \wedge t_3 <$ **Time**(c_1)]
3. omot-ta $\mapsto$
$\lambda\chi_{1\langle c,\langle s,t\rangle\rangle}[\lambda x[\lambda t_4$[**believe**$(\chi_1)(x)(t_4) \wedge t_4 <$ **Time**$(c*)]]]$
4. Mari-wa [Ken-ga ki-ta$_{\text{log}}$] to omot-ta $\mapsto$
$\exists t_5$[**believe**(λc_1[$^\wedge\exists t_3$[**come**(**ken**)$(t_3) \wedge t_3 <$ **Time**(c_1)]])
(**mari**)$(t_5) \wedge t_5 <$ **Time**$(c*)$]

The grammar needs further restrictions (which I leave out here) to ensure that the contextual variable introduced by a logophoric tense is properly lambda-bound and that a primary indexical tense does not occur in a complement clause (see Oshima 2006 for a solution).

As long as the types of data discussed so far are concerned, the uniform/non-indexical analysis (along the lines of Ogihara 1996) and the non-uniform/indexical analysis (along the lines of Oshima 2006) make equally adequate empirical predictions. On grounds of conceptual parsimony, however, I believe that the non-uniform/indexical analysis is more advantageous for two reasons: (i) it dispenses with an *ad hoc* interpretative rule along the lines of (6), and (ii) an ambiguity between a primary indexical and a secondary indexical is a commonly attested phenomenon across languages and across various components of the context of utterance (Oshima 2006, 2007b; cf. Schlenker 2003). Besides, it conforms to the "common-sensical" view that tenses are inherently indexical (Perry 1997, among others).

In the following section, I consider additional types of data that involve tenses in relative clauses, and argue that although they provide *prima facie* support for the uniform analysis (and a challenge for the indexicality-based analysis), they bring up a crucial problem for the uniform analysis too (and thus neither Ogihara's nor Oshima's account provides a complete picture of the Japanese tense system).

3. Tenses in Relative Clauses

Tenses occurring in relative clauses are often ambiguous between the so-called "independent" and "relative" interpretations.

(14) (the "independent" interpretation)
a. Ken-wa [ima kokuban-no mae-ni tatte-i-**ru**]
K.-Top now blackboard-Gen front-Dat stand-Asp-Pres
otoko-to kinoo kenka-si-ta.
man-with yesterday fight-Past.

'Yesterday Ken had a fight with the man who is now standing in front of the blackboard.'

b. Ken-wa [sakki heya-o dete-it-**ta**] otoko-to
K.-Top a.while.ago room-Acc go.out-Past man-with
kinoo kenka-si-ta.
yesterday fight-Past.
'Yesterday Ken had a fight with the man who left the room a while ago.'

(15) (the "relative" interpretation)

a. Ken-wa [soozi-o site-i-**ru**] otoko-ni "Ohayoo" to
K.-Top cleaning-Acc do-Asp-Pres man-Dat *ohayoo* Comp
it-ta.
say-Past
'Ken said "Good morning" to the man who was cleaning up.'

b. Raisyuu Ken-wa [yuubinbutu-o azukatte-kure-**ta**] otoko-ni
next.week K.-Top mail-Acc keep-Ben-Past man-Dat
"Arigatoo" to i-u-daroo.
arigatoo Comp say-Pres-probably
'Next week, Ken will probably say "Thank you" to the man who kept his mail.'

The availability of the relative interpretation is problematic for the indexicality-based analysis illustrated above; since the embedded tenses in (15) do not occur under attitude predicates, it predicts that only the independent interpretation (i.e., the primary indexical interpretation) is available for them.

Ogihara (1996), on the other hand, proposes a rather simple solution, which appears to give credit to his uniform analysis. He attempts to reduce the independent/relative ambiguity of a tense in a relative clause to a matter of NP-scoping. That is, when an NP modified by a relative clause takes wide semantic scope in relation to the matrix tense, the embedded tense receives the independent interpretation; if an NP with a relative clause stays in the scope of the matrix tense, then the embedded tense receives the relative interpretation.[3]

The scope-based analysis, however, has one crucial problem: it fails to ac-

[3] Although Ogihara does not elaborate on this point, his specific analysis (that utilizes a quantifier raising rule à la May) appears to make certain problematic predictions, such as: (i) a tense in a relative clause modifying a subject NP allows only the independent interpretation, and (ii) when a quantificational object NP with a relative clause takes wide (narrow) scope in relation to a quantificational subject NP, the embedded tense allows only the independent (relative) interpretation. Neither of these predictions holds (I leave out specific illustrations due to space limitation). It may be possible, however, to solve such technical difficulties with additional syntactic/semantic stipulations.

count for an important property of tenses in adjunct clauses (on their relative interpretation), i.e., their perspective-sensitivity.

Tenses in adjunct clause can receive the relative interpretation only when the speaker takes the viewpoint (in the sense of Kuno and Kaburaki 1977) of a higher subject's referent, and conversely, when the speaker takes the viewpoint of a higher subject's referent, the relative interpretation of the subordinate tense is forced or favored (cf. Uno and Ikegami 2005; Hirose 2000; Inoue 1989: 175–182). Consider the examples below, which all involve perspective-sensitive expressions ($\surd$ = "fully acceptable").

(16) Hanako-ga heya-ni haitte-kita-toki, Taro$_i$-wa
H.-ga room-Dat enter-come-when T.-Top
[{a. **kare**$_i$/b. **zibun**$_i$}-ga suwatte-i-**ru**] isu-no sita-ni
{a. he/b. self}-Nom sit-Asp-Pres chair-Gen underneath-Dat
hon-o oi-**ta**.
book-Acc put-Past
'When Hanako came into the room, Taro put the book under the chair on which he **is** sitting (now).' (a: $\surd$; b: ?*)
'When Hanako came into the room, Taro put the book under the chair on which he **was** sitting (then).' (a: (?); b: $\surd$)

(adapted from Hirose 2000)

(17) (Intended: 'Ken verbally abused Yumi, who **was** helping him fix the car.')

a. Ken-wa kuruma-no syuuri-o tetudatte-**agete**-i-**ta** Yumi-ni
K.-Top car-Gen repair-Acc help-Ben-Asp-Past Y.-Dat
akutai-o tui-ta.
bad.mouth-Acc make-Past

b. Ken-wa kuruma-no syuuri-o tetudatte-**kurete**-i-**ta** Yumi-ni
K.-Top car-Gen repair-Acc help-Ben-Asp-Past Y.-Dat
akutai-o tui-ta.
bad.mouth-Acc make-Past

c. ?Ken-wa kuruma-no syuuri-o tetudatte-**agete**-i-**ru** Yumi-ni
K.-Top car-Gen repair-Acc help-Ben-Asp-Pres Y.-Dat
akutai-o tui-ta.
bad.mouth-Acc make-Past

d. Ken-wa kuruma-no syuuri-o tetudatte-**kurete**-i-**ru** Yumi-ni
K.-Top car-Gen repair-Acc help-Ben-Asp-Pres Y.-Dat
akutai-o tui-ta.
bad.mouth-Acc make-Past

(18) Ken-wa [**migigawa**-ni oite-a(t)-{a. **ru**/b. **ta**}] hon-o
K.-Top right-Dat put-Asp-{a. Pres/b. Past} book-Acc
te-ni tot-ta.
hand-Dat take-Past
'Ken took in his hand the book that **was** placed on his right (from his viewpoint).' (a: √; b: (?))
'Ken took in his hand the book that **was** placed to the right (from my viewpoint).' (a: ?; b: √)
'Ken took in his hand the book that **is** (now) placed on his right (from his viewpoint).' (a: (?); b: *)
'Ken took in his hand the book that **is** (now) placed to the right (from my viewpoint).' (a: √; b: *)

In (16), when *zibun* in its perspectival use, which indicates that the speaker takes the point of view of its antecedent's referent (Kuno 1978; Oshima 2007a), is used instead of a regular pronoun, the embedded tense allows the relative interpretation only. In (17), the relative interpretation of the embedded tense is easier to obtain with *-kureru*, which indicates that the speaker takes the beneficiary's perspective, than with *-ageru*, which indicates that the speaker takes the benefactor's perspective or the neutral perspective (see also (25) below) (Kuno and Kaburaki 1977; Oshima 2006).[4] (18) illustrates that the relative interpretation of an embedded tense elicits the "intrinsic frame"-based interpretation, rather than the "relative frame"-based interpretation, of a deictic angular expression (e.g. *migigawa* 'to the right'; see Levinson 2003). As pointed out in Oshima (2007a), the choice between the intrinsic and relative frames too has an intimate correlation with the speaker's perspective: when the speaker takes a particular individual's perspective, the intrinsic frame (whose center is the individual in question) becomes predominant.

Obviously, the illustrated, perspective-related phenomena do not follow from the scope-based analysis (alone).

4. Another Analogy between Pronouns and Tenses

Based on the data discussed in the previous section, I propose that "relatively interpreted" tenses in adjunct clauses constitute a distinct use of tense forms: i.e., the perspectival use. A tense in its perspectival use (i) poses a restriction on the time of an event in relation to that of the event described in a higher clause (typically the matrix clause), and furthermore (ii) indicates that the speaker takes the perspective of the referent of the subject of the higher clause in question (see Section 5 for details). Combined with the non-uniform/indexical analysis illustrated in Section 2, this idea implies that

[4] *-ageru* is a polite form of *-yaru*; the two forms share the same argument-taking pattern and are subject to the same perspective-related constraint.

Japanese tenses are ambiguous (or underspecified) between: (i) the primary indexical use, (ii) the secondary indexical use (the logophoric use), and (iii) the perspectival use.[5]

Interestingly, a similar type of ambiguity is attested in the domain of pronominal anaphora too. The pronoun *zibun* in Japanese, for example, is ambiguous between the secondary indexical use and the perspectival use (among others) (Oshima 2004, 2006, 2007a; Kuno 1978).

Parallels between *zibun* and Japanese tenses can be summarized as follows:

(19) *Zibun* has, besides the reflexive use, a secondary indexical use and a perspectival use. *Zibun* in its perspectival use is bound to a structurally commanding subject, and indicates that the speaker takes the viewpoint of its referent. (Furthermore, *zibun* is used as a primary indexical too in certain speech styles.)

(20) Japanese tenses have, besides the primary indexical use, a secondary indexical use and a perspectival use. A tense in its perspectival use is linked to the tense of a structurally higher clause, and indicates that the speaker takes the viewpoint of the referent of the subject of the higher clause.

The proposed analysis provides a straightforward account of the fact that in many languages, such as Russian and Imbabura Quechua, tenses in complement clauses allow the (so-called) relative interpretation but tenses in relative clauses do not (Kusumoto 1999; Comrie 1985): tenses in such languages simply lack a perspectival use, while they have a secondary indexical use. The tense systems in such languages can be analogized with the pronominal systems in languages like Icelandic and Mundang, which have "logophors" but lack perspectival pronouns (see Table 1, adapted from Oshima 2007a; cf. Culy 1997).

The logophoric/perspectival ambiguity, thus, can be considered an addition to "analogies between pronouns and tenses (pronominal and temporal anaphora)", which are extensively discussed by authors like Partee (1973) and Kratzer (1998).

5. Syntactic/Semantic Formulations of the Perspectival Tense

Let us now turn to formal discussions of syntactic/semantic properties of the perspectival tense (in Japanese). The meaning of a perspectival tense has a

[5] It may be possible to combine the same idea with the uniform/non-indexical analysis as well; here I do not adopt this option, for the reasons stated in Section 2.2.

TABLE 1 Homophony of locally-bound anaphors, logophors, and perspectival pronouns (adapted from Oshima 2007a)

	reflexive	**logophoric**	**perspectival**
Japanese	*zibun*	*zibun*	*zibun*
Icelandic	(*sjálfan*) *sig*	*sig*	(no counterparts)
Ewe, etc.	refl. forms	log. pronouns	log. pronouns
Mundang, etc.	refl. forms	log. pronouns	(no counterparts)

"semantic" side, i.e., a restriction on the temporal ordering of events, and a "pragmatic" side, i.e., a restriction on the speaker's perspective.

5.1. The Semantic Side

A perspectival tense poses a restriction on the time of the event described by a subordinate predicate in relation to the time of the event described by a higher predicate. The event that serves as the "reference point" for a perspectival tense does not have to be the one described by the matrix predicate, or the one described by the immediately dominating predicate; the following example illustrates this point, where the deeply embedded tense can be interpreted with respect to either the time of the matrix event or the time of the intermediate event (or the utterance time).

(21) 2-nen-mae, Ken-wa [[Kanbozia-de NGO-katudoo-o
2.years.ago K.-Top Cambodia-Loc NGO-activity-Acc
site-i-**ru**] zyosee-ga kai-ta] hon-o yon-da.
do-Asp-Pres woman-Nom write-Past book-Acc read-Past
'Two years ago, Ken read a book written by a woman working for an NGO in Cambodia.'

(22) Possible interpretations of (21), where:
t_0 = the utterance time; t_1 = the time of reading (= two years ago);
t_2 = the time of writing; t_3 = the time of being an NGO member
a. **relative interpretation #1**: $t_2 < t_1 < t_0$ and $t_2 \subseteq t_3$
b. **relative interpretation #2**: $t_2 < t_1 < t_0$ and $t_1 \subseteq t_3$
c. **independent interpretation**: $t_2 < t_1 < t_0$ and $t_0 \subseteq t_3$

Even if we put aside the issue of perspective-sensitivity, to give a proper logical representation of a sentence involving a perspectival tense (or a relative tense in the general sense) is not a trivial matter. While sentences like (15) and (21) are relatively unproblematic, as far as I can tell, there is no straightforward way to provide adequate logical translations of sentences like (23), which involve quantification with ALL, MOST, etc., in a static framework

(let alone deriving them compositionally).

(23) a. Sotugyoo-su-**ru** dono gakusee-mo Yamada-kyoozyu-ni
graduate-Pres any student Y.-professor-Dat
aisatu-ni-it-ta.
greet-go-Past
'Every student who was going to graduate paid a visit to Professor Yamada.'

b. Hotondo-no sotugyoo-su-**ru** gakusee-ga
most graduate-Pres student-Nom
Yamada-kyoozyu-ni aisatu-ni-it-ta.
Y.-professor-Dat greet-go-Past
'Most students who were going to graduate paid a visit to Professor Yamada.'

The problem here is that the time (or event) variable introduced by the subordinate predicate cannot be properly linked to the one introduced by the higher predicate. Partee (1989) discusses similar types of difficulties concerning the treatment of temporal bound variables in English sentences like (24), and provides a (somewhat schematic) solution couched in the Discourse Representation Theory framework (cf. Pratt and Francez 2001).

(24) a. Whenever Mary telephoned, Sam was asleep.
b. When Mary telephoned, Sam was always asleep.

The solution suggested by Partee (1989), which utilizes the concept of (updatable) "reference time", seems to be applicable to the perspectival tense as well.

5.2. The Pragmatic Side

A perspectival tense indicates that the speaker takes the viewpoint of the referent of a higher subject, or more precisely, the subject of the higher clause in relation to which it is interpreted. Technically, we can think of the possibility that a perspectival tense may be temporally linked to a higher clause and perspectivally linked a higher subject, where the latter is not necessarily the subject of the former. This possibility, which is intuitively quite implausible, can be refuted by considering data like the following:

(25) 2-nen-mae, Ken-wa [[Kanbozia-de NGO-katudoo-o
2.years.ago K.-Top Cambodia-Loc NGO-activity-Acc
site-i-**ru**] Yumi-ga kai-ta] syoosetu-o
do-Asp-Pres Y.-Nom write-Past novel-Acc

syuppan-site-{a. age/b. kure}-ta.
publish-Ben-Past
'Two years ago, Ken published the novel that Yumi wrote, who {is/was} working for an NGO in Cambodia (for Yumi's sake).'

The interpretation where the deeply embedded *-ru* is anchored to the time of writing is more predominant for (25b), where *-kureru* indicates that the speaker takes Yumi's viewpoint rather than Ken's. The interpretation where *-ru* is anchored to the time of publishing (and thus the time of writing may be prior to the time when Yumi became an NGO member) is more easily available for (25a), where *-ageru* indicates that the speaker takes Ken's viewpoint or keeps the neutral perspective.

To represent the perspective-sensitivity of the perspectival tense, we need to incorporate the following components in the grammar:

(26)
(i) A formal mechanism to represent the notion of the speaker's perspective.
(ii) Constraints at the syntax/semantics interface, which allow us to properly link (through syntactic feature specifications and indexing, for instance) a perspectival tense to a higher subject/predicate.

For (i), we can utilize the theory of linguistic empathy (Kuno and Kaburaki 1977; Kuno 1978, among others) and its model-theoretic implementation along the lines of Oshima (2006, 2007a). I leave details of (ii) open for future studies.

6. Temporal Adverbial Clauses

The independent/relative ambiguity of a tense form is attested in WHEN-clauses as well (at least when the predicate in a WHEN-clause is stative), but not in BEFORE- and AFTER- clauses. BEFORE- and AFTER- clauses allow the relative tense interpretation only.

(27) Ken-wa, Mari-ga benkyoo-site-i-{a. ru/b. ta} toki, terebi-o
K.-Top M.-Nom study-Asp-Pres/Past when TV-Acc
mite-i-ta.
watch-Asp-Past
'Ken was watching TV while Mari was studying.'

(28) Ken-wa, Mari-ga kae(t)-{a. ru/b. *ta} mae-ni, ki-ta.
K.-Top M.-Nom go.home-Pres/Past before come-Past
'Ken came before Mari went home.'

(29) Ken-wa, Mari-ga kae(t)-{a. *ru/b. ta} ato, ku-ru-daroo.
K.-Top M.-Nom go.home-Pres/Past after come-Pres-probably
'Probably Ken will come after Mari goes home.'

Ogihara's (1996) analysis can easily deal with data like (28) and (29); the irregular behavior of a tense under WHEN, however, is a problem for his analysis.

Furthermore, while a relatively interpreted tense under WHEN is sensitive to the speaker's choice of perspective (on a par with a relatively interpreted tense in a relative clause), there seems to be no reason to believe that a tense under BEFORE or AFTER has this property.

(30) (Intended: 'Ken was quiet while Mari was helping him out.')
a. Ken$_i$-wa, Mari-ga **zibun**$_i$-o tetudatte-**kurete**-i-{**ru**/?**ta**} toki,
K.-Top M.-Nom self-Acc help-Ben-Asp-Pres/Past when
zutto damatte-i-ta.
all.along be.quiet-Asp-Past
b. Ken$_i$-wa, Mari-ga **kare**$_i$-o tetudatte-**agete**-i-{?**ru/ta**} toki,
K.-Top M.-Nom he-Acc help-Ben-Asp-Pres/Past when
zutto damatte-i-ta.
all.along be.quiet-Asp-Past

I propose that tense forms under BEFORE/AFTER are "expletive" (not semantically interpreted; cf. Kratzer 1998). The temporal ordering between the matrix and subordinate events is encoded by the semantics of *mae* 'before' and *ato* 'after'; the present and past forms within BEFORE- and AFTER-clauses are chosen merely due to idiosyncratic selectional conditions enforced by *mae* and *ato*.[6]

7. Conclusion

I argued that the tense forms in Japanese have three distinct uses (putting aside the "expletive" use mentioned in Section 6): (i) the primary indexical use, (ii) the secondary indexical (logophoric) use, and (iii) the perspectival use. The logophoric/perspectival ambiguity is attested in the domain of nominal anaphora too, and thus can be considered an addition to "parallels between tenses and pronouns".

The present study leaves several issues open for future inquiry. First, The precise formulation on syntactic/semantic constraints on the perspectival tense is yet to be developed. Second, questions from the typological viewpoint, such as "What other languages have perspectival tenses?" are left open,

[6]This line of analysis may be applicable to certain irregularities concerning the tense form choice under English *before* and *after* as well (see Ogihara 1996: 184–187).

too. Finally, data that involve a fuller range of subordinate clause types (e.g. IF- and BECAUSE- clauses) need to be investigated (cf. Uno and Ikegami 2005).

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