# Aspectual Presupposition, Entailment, and Composition in Japanese V-teiru

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## 1    Introduction

Japanese aspectual morpheme *-te i(-ru)*, which consists of conjunctive particle *-te* and a verb of existence *i(-ru)*, is well known for its interpretive ambiguity between progressive (which is imperfective in nature) and perfective (Kindaichi 1950, Matsushita 1914, Nakatani 2005, Nishiyama 2006, Ogihara 1998, Soga 1983, among many others). Linguists have attempted to establish a grammatical mechanism to derive this ambiguity from the interaction between the semantics of *-te i(-ru)* and the aspectual properties of the predicate to which *-te i(-ru)* is attached. Another issue of *-te i(-ru)* that has been studied to a lesser extent is how to account for the fact that there are cases in which the "change-of-state" reading of an achievement verb is absent in terms of the truth condition when *-te i(-ru)* is attached to it. This paper discusses such cases and explore a better treatment of them.

## 2    Absence of the "change-of-state" reading in V-*te i(-ru)*

Many of the formal studies on V-*te i(-ru)* deal with the perfective vs. imperfective paradox. It is known that, roughly speaking, the combination of an achievement verb and *-te i(-ru)* induces a perfective reading and the combination of an activity verb and *-te i(-ru)* often induces an imperfective, progressive reading, an observation that can be traced back to Kindaichi (1950). Nakatani (2005) and Nishiyama (2006) propose that the V-*te i(-ru)* denotes an underspecified state resulting from the full or a partial completion of the event denoted by V. For example, the progressive reading in *hasit-te i(-ru)* 'run-TE exist-PRES' emerges when the predicate denotes a state resulting from a partial completion of the event of running; on the other hand, an achievement verb like *sin(-u)* 'die', when *-te i(-ru)* is attached to, induces the perfective, resultative reading because achievement verbs denotes an instantaneous change of state and thus its "partial" completion is impossible. Under such an approach, the perfective reading of V-*te i(-ru)* presupposes the completion of the change of state.

However, this presupposition does not always work, as pointed out by Kusumoto (2003) (as well as Kindaichi 1950). For example:

(1)    sono taoru-wa   kawai-te        i-ru.
       that   towel-TOP dry(verb)-TE exist-PRES
       'That towel is dry/has dried.'

(1) can be true even if "that towel" has never been wet before: for example, "that towel" may be brand-new fresh out of the factory, and (1) is true under such a condition, even though no change of state is involved. Under Nakatani's (2005) or Nishiyama's (2006) approach, such a reading would not emerge.

## 3    An Intensional Approach

In order to derive this "no-change-of-state" reading of the combination of an achievement verb and *-te i(-ru)*, Kusumoto (2003) proposes that the perfective (as opposed to the progressive) version of *-te i(-ru)* introduces an intensional context in which the "bringing-about" activity of the achievement takes place, while the result

state is in the extensional context (evaluation world). Therefore, the "drying" process may not take place in the evaluation world, which gives rise to the apparent "no-change-of-state" reading.

Although Kusumoto's (2003) formalism works on the surface, I believe that it suffers from several problems. First, her introduction of an intensional context is likely to be an abuse of it, in the sense that it is unfalsifiable. Second, the presence of an intensional context is intuitively dubious: when we know that the towel is freshly out of the factory and truthfully utter (1), do we think in such a way that the towel used to be wet and has undergone a drying process in some hypothetical world? I do not think so. Third, it is not clear in Kusumoto's analysis why the causative version of *kawak(-u)*, namely *kawakas(-u)* 'to dry (transitive),' does not yield such a "no-change" interpretation, although it is at least possible in her formalism to capture the fact by stipulation.

# 4   A Cancellation Approach

I argue for a simpler solution: when *-te i(-ru)* is attached to an achievement verb, the presupposition of the achievement event may be cancelled. In (1), the presupposition of the denotation of *kawak(-u)* 'dry (inchoative verb),' namely the "not-dry" state, may be cancelled, and only the entailment of it, the "dry" state, survives. This approach of course works in terms of formalism, like Kusumoto's intensional solution, so the question is which approach is conceptually better motivated.

I would like to start my argument by discussing event types. It is more or less uncontroversial in the literature to identify at least two event types: process (activity) and state. Whether or not other ontological types should be set up is a debatable matter. Pustejovsky (1991), for example, introduces "transition" in addition to process and state in order to capture the achievement and accomplishment events; however, he also suggests that a transition event can be decomposed into a process and a state, which might indicate that "transition" is not considered a primitive type.

I, however, argue that transition should be considered a primitive event type. I first assume, following researchers such as Jackendoff (1990) and Kageyama (1996), that an achievement unaccusative predicate does not encode a process in its semantic representation; this explains various facts including the fact that the achievement verbs resist the progressive reading when *-ing* is attached to in English, and when *-te i(-ru)* is attached to in Japanese. Then the achievement predicates are of the transition type, without a process. According to Pustejovsky (2000), a transition without a process can be regarded as an "opposition structure" which is constituted of a stative event (say $S$) and its negated counterpart ($\neg S$). However, if this assumption is literally taken, then a transition is an event that spans over $\neg S$ and $S$, which is, aspectually, a state. This is undesirable because the achievement predicates are not stative. They are not of the process type (in the sense of activity) either, so it is necessary to consider transition to be a primitive type that cannot be reduced to the other types.

Thus I argue that transition is *not constituted of* two opposite states; rather, transition *entails* a particular state and *presupposes* the negation of that state. Assuming time is discrete:

(2)    a.    $\exists e_1{}^T[P(e_1{}^T) \text{ at } t]$ entails $\exists e_2{}^S[P(e_2{}^S) \text{ at } t+1]$.
       b.    $\exists e_1{}^T[P(e_1{}^T) \text{ at } t]$ presupposes $\exists e_2{}^S[\neg P(e_2{}^S) \text{ at } t-1]$.
             (where $e^T$ is an event variable of the transition type and $e^S$ is of the state type.)

I further assume, following previous studies such as Gazdar (1979), Givon (1972), Karttunen (1973), Karttunen and Peters (1979) and Levinson (1983) among others, that the presupposition triggered by a lexical item is not encoded in its lexical semantics, but rather is conventionally implicated. In the literature, this assumption is motivated by the fact that when a predicate is negated, its entailment is negated while its presupposition is not (e.g., *John didn't opened the door* does not entail the door's opening, but still presupposes the door's having been closed).

Now let us see how a presupposition (conventional implicature) triggered by an achievement verb in Japanese may be cancelled when *-te i(-ru)* is attached to it. I assume the following compositional calculation:

(3)     [[**kawak**]] 'dry (inchoative)'$= \lambda x \lambda e^T[\mathbf{dry}(e^T, x)]$

(4)    a.    [[**-te**]] $= \lambda P, Q, x, e_2 \exists e_1 [P(x)(e_1) \wedge Q(x)(e_2) \wedge e_1 <_\propto e_2]$
         (where $e_1 <_\propto e_2$ reads $e_1$ temporally precedes $e_2$, and no event intervenes between $e_1$ and $e_2$.)

     b.    [[**kawai-te**]] $= \lambda Q, x, e_2 \exists e_1{}^T[\mathbf{dry}(e_1{}^T, x) \wedge Q(x)(e_2) \wedge e_1{}^T <_\propto e_2]$

(5)    a.    [[**i**]] 'exist' $= \lambda x, e^S[\mathbf{exist}(e^S, x)]$

     b.    [[**kawai-te i**]] $= \lambda x, e_2{}^S \exists e_1{}^T[\mathbf{dry}(e_1{}^T, x) \wedge \mathbf{exist}(e_2{}^S, x) \wedge e_1{}^T <_\propto e_2{}^S]$

     c.    [[**taoru-ga kawai-te i**]] $= \lambda e_2{}^S \exists e_1{}^T[\mathbf{dry}(e_1{}^T, \mathbf{towel}) \wedge \mathbf{exist}(e_2{}^S, \mathbf{towel}) \wedge e_1{}^T <_\propto e_2{}^S]$

(6)    a.    [[**-ru**]] $= \lambda P \exists e[P(e) \wedge e \circ s*]$
         (where $e \circ s*$ reads $e$ overlaps with $s*$, the speech time.)

     b.    [[**taoru-ga kawai-te i-ru**]] $=$
         $\exists e_1{}^T, e_2{}^S[\mathbf{dry}(e_1{}^T, \mathbf{towel}) \wedge \mathbf{exist}(e_2{}^S, \mathbf{towel}) \wedge e_1{}^T <_\propto e_2{}^S \wedge e_2{}^S \circ s*]$

The last line reads, there exist two events, $e_1$ and $e_2$, in this order, where $e_1$ is a transition that entails a state of the towel being dry immediately following the moment of transition, and $e_2$ is a state of the towel existing in some discourse-prominent space.

Adopting the Generative Lexicon theory (Pustejovsky 1991, 1995, 2001), I assume that events and objects are characterized in terms of QUALIA structure. Following Nakatani (2005), I assume that *-te i(-ru)* stativizes the predicate *P*, restructuring the semantic representation in such a way that the FORMAL of the predicate be the underspecified state introduced by *i(-ru)* and the AGENTIVE be the semantics of *P*. Because the QUALIA is defined as neo-Aristotelian modes of explanation, some causal connection between AGENTIVE and FORMAL must be present in order to be semantically well formed. It is easy to obtain such a connection in the above example, for the transition event (AGENTIVE) entails a specific state.

(7)    a.    $\mathbf{dry}(e_1{}^T, \mathbf{towel})$ entails $\mathbf{dry}(e_3{}^S, \mathbf{towel})$, where $e_1{}^T <_\propto e_3{}^S$ (from (2))

     b.    $e_1{}^T <_\propto e_2{}^S \wedge \mathbf{dry}(e_1{}^T, \mathbf{towel}) \wedge \mathbf{exist}(e_2{}^S, \mathbf{towel})$ (from (6b))

     c.    Therefore, $e_3{}^S \circ e_2{}^S \wedge \mathbf{dry}(e_3{}^S, \mathbf{towel}) \wedge \mathbf{exist}(e_2{}^S, \mathbf{towel})$

Because of the conclusion of the calculation (7c), the underspecified FORMAL can be identified with the specific state entailed from the AGENTIVE, a move that is desirable considering the required causal chain between the AGENTIVE and the FORMAL.

Now the question is under what condition the presupposition part of the AGENTIVE event (i.e., the towel being wet) may be cancelled. As pointed out by Karttunen (1973), Gazdar (1979) and many others, presupposition can be overridden by various pragmatic information and be cancelled. I simplistically assume that this property of presupposition leads to the cancellability of the presupposition in the present case: when the information in the discourse context tells the opposite of the presupposition of the achievement event, then the latter may be cancelled. For example, in the above case, if it is known that the towel is likely to have never been wet before, the presupposition of the towel having been wet may be cancelled. This also works for other cases like *miti-ga magat-te i-ru* '(lit.) road-NOM bend(inchoative)-TE exist-PRES' = 'the road does not run straight (bends to some direction)' as well (Kindaichi 1950), because it is implausible, according to our knowledge about the world, to hypothesize that the road used to be straight and then became bent.

However, the presupposition of a transition is not always cancellable the way described here. For example, when used in the simple past tense form rather than in the *-te i(-ru)* form, the presupposition must be retained:

(8)    a.    taoru-wa    kawai-ta.
         towel-TOP dry(verb)-PAST
         'The towel dried. (It must have been wet before it dried.)'

     b.    [[**taoru-ga kawai-ta**]] $= \exists e_1{}^T[\mathbf{dry}(e_1{}^T, \mathbf{towel}) \wedge e_1{}^T \circ s*]$

One difference between (8) and the *-te i(-ru)* version is whether or not the transition event is anchored to the speech time. $e_1{}^T$ is directly anchored to the speech time in (8b) ($e_1{}^T \circ s*$), while the corresponding event is only indirectly anchored to the speech time in (6b) ($e_1{}^T <_{\propto} e_2{}^S \wedge e_2{}^S \circ s*$). I thus suggest that the presupposition of the transition (achievement) verb may be cancelled if the transition event is not directly anchored to the speech time.

This analysis has several advantages over Kusumoto's (2003) intensional semantic analysis. First, this analysis circumvents an abuse of the intensional context, for it does not make use of an intensional context. Second, "cancellation" is intuitively more natural than assuming an intensional context: I believe we never think of the towel having been wet in any hypothetical world when we truthfully utter (1) in the non-transitional sense. Finally, the present analysis naturally accounts for the fact that the transitive, causative counterpart of an achievement predicate (such as *kawakas-u* 'dry (transitive)') never gets a non-transitional interpretation even if *-te i(-ru)* is attached to it: because the process part of the transitive counterpart is, unlike presupposition, which is conventionally implicated, part of the lexical specification by the predicate. Thus the process part is not cancellable, which makes pragmatically inappropriate to cancel out the presupposition part of the transition any way: if there is no presupposed "opposite" state, then the presence of the process part cannot be motivated.

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