

Aspect Shift without Coercion: Continuous Causative Verbs in Japanese and Korean

Toshiyuki Ogihara and Eun-Hae Park

Abstract:

This article discusses special agentive transitive verbs in Japanese and Korean (such as *noru/thata* ‘board’) that yield concrete result states (which we call target states) that are under the agentive subject’s control throughout their duration. These verbs (Continuous Causative (CC) verbs) produce two distinct interpretations: accomplishment and target state readings. The latter surface with several distinct constructions: (i) the aspectual morphemes *-te iru* (Japanese) and *-ko iss* (Korean); (ii) the simple past tense; (iii) nominalization. Intuitively, what the agentive subject does is one continuous act: (i) attaining the target state in question, and (ii) preserving it. The name “continuous causative verb” stems from the fact that the agentive subject continues to behave like an agent throughout the complex eventuality. However, when we utter a sentence containing a CC verb, we either refer to the accomplishment portion or the continuation of the target state, not both at the same time. Our formal proposal posits an Aspect Shift Rule in the lexicon, which is responsible for the target state reading of each CC verb. The target state is indicated by a relation that holds between the agent and the theme entity, which in turn predicts that the agent is responsible for keeping the state intact. Positing a semantic rule in the lexicon to predict the aspect shift allows us to account for the two interpretations of CC verbs. The behavior of temporal adverbials also receives a natural account in our proposal.

Toshiyuki Ogihara, Eun-Hae Park

Department of Linguistics, University of Washington

Box 352425, Seattle, WA 98195, U.S.A.

email: ogihara@uw.edu, ehpark@uw.edu

Keywords: result state, aspect shift, causation, agentivity

1. Introduction

This article will discuss aspectual properties of special agentive transitive verbs in Japanese and Korean such as *noru/thata* ‘board’, which describe events that result in concrete states that are controlled by the agentive subject. For example, if you board a train, then you are on the train; if you put on a coat, then you have it on. If you wish to do away with the target state in question, you can get off the train or take off the coat. We shall refer to these verbs as continuous causative (CC) verbs because the agentive subject first causes a physically identifiable state to come into existence and then continues to “cause” the state in question to continue its existence at least for some time. Here is the basic idea behind our proposal: a CC verb can be used as an agentive transitive accomplishment verb as well as a verb that indicates continuation of the concrete state that is attained as a result (called a target state by Parsons (1990)) and is under the agent’s control. In our formal proposal, these two readings of the same predicate are made available from an aspect shift rule posited in the lexicon.

It is extremely important to understand the subtypes of result states for the purpose of this paper. We shall, therefore, explain the terms *target state* and *resultant state* introduced by Parsons (1990) in some detail here. A target state is a physical state that is temporary in nature and can be terminated. A resultant state is one that is permanent by definition. Parsons (1990: 235) provides one concrete example.

- (1) It is important not to identify the Resultant-state of an event with its “target” state. If I throw a ball onto the roof, the target state of this event is the ball’s being on the roof, a state that may or may not last for a long time. What I am calling the Resultant-state is different; it is the state of my having thrown the ball onto the roof, and it is a state that cannot cease holding at some later time.

We adopt this distinction between target states and resultant states as two subtypes of result states, and we will use these terms in the rest of this article. They will be formally characterized in the next section.

CC verbs such as *noru/thata* ‘board’ have a “reflexive character” in that the act of boarding a bus (for example) causes the agent to obtain the property of being on the bus (Okuda 1978a, 1978b, Kudo 1995, Takezawa 1991, Matsumoto 1996, Ogihara 1999, Shirai 2000, Kawana 2000, Toruhina 2014).¹ The existence of this “target state” at the utterance time can be indicated in Japanese and Korean by sentences such as (2a, b).

- (2) a. Hanako-wa ima basu-ni not-te iru. [Japanese]
Hanako-TOP now bus-DAT board/get.on-TEIRU.PRES
‘Hanako is now on the bus (as a result of having boarded the bus).’ or ‘Hanako is getting on the bus’²
- b. Minho-ka cikum bus-ey tha-ko iss-ta. [Korean]
Minho-NOM now bus-LOC board/get.on-KOISS.PRES
‘Minho is now on the bus (as a result of having boarded the bus).’ or ‘Minho is getting on the bus.’

(2) is a Japanese sentence containing the verb *noru* ‘board’ in the *-te iru* form, and it can receive

¹ We will not provide English glosses for *-te iru* and *-ko iss* because no established morpheme labels would be appropriate. We will simply gloss them as TEIRU and KOISS so as not to mislead the reader about their interpretations.

² According to the native speakers’ judgments, the Korean *-ko iss* form perhaps allows for progressive readings more readily than the Japanese *-te iru* form. Nevertheless, (2a, b) both can yield result state interpretations, and that is what is important here.

a target state reading (which indicates that the subject is on the bus at the utterance time). Generally, a Japanese sentence in the *-te iru* form cannot receive a target state reading if the subject denotes an agentive entity. Since Hanako is clearly an agentive entity in (2a), this sentence has an exceptional character.³ (2b) is a corresponding Korean example with the aspectual morpheme *-ko iss* that can receive the same target state interpretation. The *-ko iss* form in Korean only yields progressive interpretations with non-CC verbs regardless of the thematic role of the subject. Thus, the Korean case provides a definitive piece of evidence for a unique character of CC verbs.

In this article, we will characterize the Japanese and Korean data in terms of continuous causation. We shall show in what follows that continuation of the target state in question is an activity-like meaning available to any CC verb in Japanese or Korean in addition to an accomplishment interpretation. The two semantic interpretations assigned to each CC verb will be characterized as instances of ambiguity, but this is guaranteed by a lexical semantic rule that applies to all CC verbs in Korean and Japanese and shows the connection between the two types of interpretations. The case at hand is similar to aspect shift proposed by de Swart (1998). However, the aspect shift under discussion is not coerced by the construction in which the verb is used; the interpretation to be adopted in a particular situation is largely dictated by the pragmatic factors.

2. Preliminaries

Let us first establish that the Japanese verb *noru* ‘board/get on’ and the Korean verb *thata* ‘board/get on’ can be used as agentive transitive verbs that indicate telic events of boarding or

³ (2a) can also receive a progressive reading indicating an on-going event of Hanako getting on the bus if the boarding process takes time and understood to be a durative event.

getting on some mode of transportation.⁴ As shown in (3a) and (3b), these verbs in the simple past tense indicate telic events that took place in the past.⁵ These examples show that *noru* and *thata* ‘board’ are clearly indicators of agentive events that result in changes of states, i.e., accomplishments.

- (3) a. Hanako-wa basu-ni not-ta. [Japanese]
Hanako-TOP bus- DAT board/get.on-PAST
‘Hanako boarded/got on the bus.’
- b. Minho-nun bus-ey tha-ass-ta. [Korean]
Minho-TOP bus-LOC board/get.on-PAST.DECL
‘Minho boarded/got on the bus.’

(4a, b) show that the two “progressive” forms *-te iru* (Japanese) and *-ko iss* (Korean) generally express progressive interpretations with agentive transitive verbs such as ‘build (a house)’.⁶

⁴ In fact, the meaning of *noru* ‘board’ in Japanese is broader than that of *thata* ‘board’ in Korean in that the destination can be the flat surface of an object higher than the ground level, such as a chair or table.

⁵ We will see later that these verbs can also indicate combination of telic events and continuation of the target state, which strongly suggests that the continuation of the target state is part of the lexical meaning of the verbs in question.

⁶ The morphemes *-te iru* and *-ko iss* can express progressive interpretations with activity verbs, too. (i) is a Japanese example with an activity verb — an unergative verb with an agentive subject, to be more specific. Korean examples with an activity verb, as in (ii), have the same semantic property.

(i) Hanako-ga asoko-de nai-te iru.

- (4) a. Jiroo-ga ima ie-o tate-te iru. [Japanese]
 Jiro-NOM now house-ACC build-TEIRU.PRES
 ‘Jiro is building a house now.’
- b. Minho-nun cikum cip-ul cis-ko iss-ta. [Korean]
 Minho-TOP now house-ACC build-KOISS-DECL
 ‘Minho is building a house now.’

The Japanese example (4a) contains the aspectual morpheme *-te iru* and receives a progressive reading. The Korean example (4b) features the aspectual morpheme *-ko iss*, which behaves in the same way as its Japanese counterpart in this case. Note, however, that (4a, b) cannot receive a target state interpretation in which the existence of the house in question at the utterance time is asserted.

Let us provide here a formal rendition of the distinction between target states and resultant states (Parsons, 1990) in terms of different types of properties.⁷

- (5) a. Mary threw a ball onto the roof.
 b. Target state: The ball’s being on the roof.

Hanako-NOM over.there-at cry-TEIRU.PRES
 ‘Hanako is crying over there.’

- (ii) Minho-ka ceki-eyse wul-ko iss-ta.
 Minho-NOM over.there-at cry-KOISS-DEC
 ‘Minho is crying over there.’

⁷ To be in line with the Montagovian definition of property, information about possible worlds must be added. For example, (5b) would more officially be $\{ \langle x, t, w \rangle \mid x \text{ owns a book written by Chomsky at } t \text{ in } w \}$.

$\{ \langle x, t \rangle \mid x \text{ is on the roof at } t \}$

c. Resultant state: Mary's having thrown a ball onto the roof.

$\{ \langle x, t \rangle \mid \text{There is a time } t' \text{ earlier than } t \text{ such that } x \text{ throws a ball onto the roof at } t' \}$

Suppose that (5a) is true. This means that there was a past time (normally, within a contextually salient past time) at which Mary throws a ball onto the roof. The truth of (5a) guarantees that there was a past interval throughout which the ball had the property (5b), which is a temporary property on the part of the ball in that the ball may or may not be on the roof at a later time. For example, Mary may have climbed onto the roof immediately and retrieved the ball. Thus, this property is in principle non-permanent and is a **target state** in the sense of Parsons (1990). By contrast, the property (5c) becomes a permanent property of Mary as soon as she throws a ball onto the roof. By definition, Mary never loses this property once she acquires it. Parsons (1990) refers to this type of permanent property acquired by someone or some entity a **resultant state**.⁸ We shall use the term **result state** as a non-technical cover term that encompasses both **target states** and **resultant states**. This is summarized in (6).⁹

(6)

⁸ If we wish to use states as part of our ontology, we can restate X 's having the property P as X 's being in the state of having the property P . We will not adopt this strategy in this article since using properties of individuals is sufficient for our purposes.

⁹ Maslov (1988) adopts the cover term "perfect" for "the statal perfect" and "the actional perfect." This classification is similar to the use of the terms "result state" and its sub-classes "target state" and "resultant state" in (6).

informal and holistic term	result state	
formal and fine-grained terms/concepts (Parsons 1990)	target state (concrete and temporary in principle)	resultant state (abstract and permanent by definition)

The range of the result state readings that the *-te iru* form in Japanese is capable of producing is given in (7) (Fujii 1966, Ogihara 1998). Consider (7a-c).

(7) **Japanese Examples Involving Result States**

- a. Ima doa-ga ai-te iru. [target state]
now door-nom now open-TEIRU.PRES
'The door is open now.'
- b. Hanako-wa ima basu-ni not-te iru. [target state]
Hanako-TOP now bus- DAT board/get.on-TEIRU.PRES
'Hanako is now on the bus (as a result of having boarded the bus).' This sentence can also receive a progressive interpretation.¹⁰
- c. Hanako-wa zyuu-nen mae ie-o ik-ken tate-te iru. [resultant state]
Hanako-TOP ten-year before house-ACC one-COUNTER build-TEIRU.PRES
'Hanako now has the property of having built a house ten years ago.'

Setting aside the resultant state readings, the subject thematic role generally determines the semantic interpretation of *-te iru* sentences in Japanese. Okuda (1978a, 1978b) observes that the

¹⁰ For example, (7b) could receive a progressive reading if Hanako is among the people who are lining up to board the bus.

difference in subject thematic roles determines the differences in lexical aspect classes (Aktionsarten) in Japanese.¹¹ (7a, b) yield **target state interpretations**, which are non-permanent result states. (7a) asserts that the door is in the state of being open at the utterance time; (7b) says that Hanako is on the bus at the utterance time. The properties such as “being on the bus” are non-permanent in principle because any entity that has such a property can lose it at any time, for example, by getting off the bus. (7a) cannot receive a progressive interpretation, whereas (7b) can if the event in question is understood to be a protracted event.

Note that (7a) and (7b) are different from each other regarding the nature of the subject. (7a) contains an intransitive verb that requires a theme argument as its subject and might be categorized as an unaccusative verb in the sense of Perlmutter (1978). By contrast, the verb *noru* ‘board’ in (7b) describes an agentive action and requires an agentive subject. The fact that the subject entity of (7b) is an agent and can still receive a concrete non-permanent result state (i.e., a target state) makes this case theoretically interesting.

Unlike (7a), the subject of the sentence in (7b) plays an agentive role. The sentence skeleton of (7b) behaves like an accomplishment in that boarding the bus clearly has a well-defined goal: being on the bus. What is interesting about the verb *noru* ‘board’ is that a complete event of boarding the bus gives the agent a new physically identifiable property: the property of being on the bus. (7b) can be used to claim that Hanako now has the property of being on the bus, and her boarding the bus brought about this state.

At this point, let us address an important question about the definition of target state. Consider the examples in (8). (8a) seems to entail that for some interval immediately following the buying event, Hanako owned the book in question (and she may still own it). Since Hanako’s owning a book is her property, and she is the agent of the buying event, (8b) appears to mean that Hanako owns a book now (as a result of having bought it). However, it actually cannot

¹¹ For a detailed comparison of Vendler’s (1967) system and Kindaichi’s (1950), see Jacobsen (1992).

receive this reading.¹² Instead, it can only receive a progressive reading: Hanako is in the process of purchasing a book.¹³

- (8) a. Hanako-wa hon-o kat-ta.
Hanako-TOP book-ACC buy-PAST
'Hanako bought a book'
- b. Hanako-wa hon-o kat-te iru.
Hanako-TOP book-ACC buy-TEIRU.PRES
'Hanako is buying a book'
(It cannot mean 'Hanako owns a book, which she bought.')

We explain this fact as follows: (i) x's buying y does not necessarily result in x's owning y. For example, if a staff person at a company buys a computer for the CEO, it won't belong to this staff person when the purchase is made; (ii) even if x owns y after x buys y, the ownership relation between x and y is not physically identifiable, and the definition of the target state under discussion is not satisfied. Our account is only responsible for physically identifiable state created by relevant events and controlled by the agent.

Let us now return to the discussion of (7a-c). (7c) is very different from (7a, b) in that it receives a **resultant state interpretation**. Note that (7c) contains an agentive verb *tateru* 'build' but the agent does not receive any physically identifiable target state unlike (7b). (7a) and (7b) contain the temporal adverbial *ima* 'now', which denotes the utterance time, despite the fact that the entire sentence is in the present tense. In (7a, b), this adverb indicates the temporal location of each target state. By contrast, (7c) contains a temporal adverbial, *zyuunen mae* 'ten years ago',

¹² We thank a JEAL reviewer for pointing out this fact.

¹³ It can receive a resultant state reading, which entails that the event is located wholly in the past. But this reading does not guarantee that Hanako still owns the book she bought.

which refers to a past time and indicates the time of the building event. We assume that the entire sentence describes a current abstract property (i.e., a resultant state) that Hanako has as a result of the past event. (7c) definitely does not assert the existence of the target state (the complete house's being in existence) at the utterance time. In this article, we will not be concerned with resultant state interpretations of *-te iru* such as the one that (7c) receives. The reader is referred to Ogihara (1998) for one possible formal analysis of resultant state interpretations of *-te iru*.

A major focus of this article is the fact that the Korean “progressive form” *-ko iss* can yield target state interpretations only in examples that parallel (7b), as we shall show in (9b). The interpretations that *-ko iss* can produce are more narrowly defined compared to the Japanese morpheme *-te iru*. In (9a), *-ko iss* can only yield a progressive interpretation unlike the Japanese example (7a).¹⁴ (9c) is completely ungrammatical and is uninterpretable unlike the Japanese example (7c).^{15, 16} That is, the *-ko iss* construction in Korean can only yield a result state (i.e., a

¹⁴ Korean has a separate aspectual construction *-e iss*, which specializes for target state interpretations associated with unaccusative verbs as shown in (i). We will not provide an English gloss for *-e iss*. It will be glossed as EISS on par with the case of *-ko iss*.

- (i) Salam-i cikum ceki-ey ssuleci-e iss-ta.
 person-NOM now there-at fall-EISS-DECL

‘Someone is lying on the ground (as a result of having fallen over).’

¹⁵ The Korean morpheme *-ko iss* cannot produce resultant state interpretations at all, as shown by the anomaly of (9c). See Ahn and Fukushima (2005) for a possible explanation of why Korean aspectual forms *-ko iss* and *-e iss* cannot produce resultant state interpretations.

¹⁶ If necessary, Korean can resort to the “past tense form” *-ess* is employed to indicate a resultant state reading. Here is one example:

- (i) Minhonun caknyen-uy sihem-ey pwuth-ess-ta.

target state in our terms) interpretation with verbs such as *thata* ‘board’ (referred to as CC verbs in this article) (Lee 2008, Kim 2009, among many others).

(9) **Korean Examples Corresponding to the Japanese data in (7)**

- a. Mwun-i yeli-ko iss-ta. [progressive only]
door-NOM open(iv)-KOISS.PRES-DECL
‘The door is opening.’ [It cannot mean ‘The door is open.’]
- b. Minho-ka cikum bus-ey tha-ko iss-ta. (ambiguous) [target state possible]
Minho-NOM now bus-LOC board/get.on-KOISS.PRES
‘Minho is now on the bus.’ or ‘Minho is getting on a bus.’
- c. *Minho-nun caknyen-uy sihap-eyse wusungha-ko iss-ta.
Minho-TOP last.year-GEN game-at get.first.prize-KOISS.PRES-DECL
Intended: ‘Minho now has the property of having gotten the first prize in the game last year.’

We find an important similarity between the Japanese example (7b) and the Korean example (9b). Both examples involve a target state that the agent acquires as a result of the accomplishment event, and they are both capable of expressing the existence of the relevant target state at the utterance time. In addition, (9b) highlights the uniqueness of Korean CC verbs in that they are the only verbs that yield target state interpretations in the *-ko iss* form; (9a) can only receive a progressive interpretation, and (9c) is completely uninterpretable. Note, for comparison, that the corresponding progressive sentences in English such as (10a, b) clearly cannot express target

Minho-TOP last.year-GEN exam-at pass-RESULTANT-DECL

‘Minho now has the property of having passed the exam last year.’

state interpretations; they can only receive on-going process readings.

- (10) a. Mary is now boarding the bus.
b. Mary is now putting on her sweater.

This difference between Japanese and Korean on the one hand and English on the other is a significant finding for the tense and aspect literature in general and for the semantics literature involving Japanese and Korean in particular.

Let us discuss another example ('put on') from Japanese and Korean to firmly establish our generalization about those cases in which both *-te iru* (Japanese) and *-ko iss* (Korean) can yield target state interpretations of the special type. The key point is that the subject entity is an agent and this entity obtains a physically identifiable target state (i.e., wearing a sweater) when the event is completed.

- (11) a. Hanako-ga seetaa-o ki-te iru. [Japanese]
Hanako-NOM sweater-ACC put.on-TEIRU.PRES
'Hanako is wearing a sweater.' or 'Hanako is putting on a sweater.'
- b. Minho-ka sweater-lul ip-ko issta. [Korean]
Minho-NOM sweater-ACC put.on/wear-KOISS.PRES
'Minho is wearing a sweater.' or 'Minho is putting on a sweater.'

The examples in (11) involve *kiru/ipta* 'put on (a piece of clothing)' which are like *noru/thata* 'board' in that they are agentive verbs that are characterized by a well-defined target state that the subject entity acquires. For example, as shown in (11a, b), if someone puts on a piece of clothing, then this person has it on, and this state can be described with the present tense "progressive" form in each language. We can safely conclude that as far as CC verbs are concerned, *-te iru* and *-ko iss* behave in the same way.

At this point, let us address a possible objection to the idea that Japanese and Korean verbs like *noru/thata* ‘board’ have special properties. Some might argue that English verbs such as *board* convey the same information in that *Mary boarded the bus*, for example, entails that Mary was on the bus at least for a while (after the boarding event was completed) and that the Japanese and Korean CC verbs do not have noteworthy properties. This view is misguided in that we are talking about the fact that the target state in question can be asserted to exist at a particular time, e.g., at the utterance time, by Japanese and Korean sentences in the present “progressive” form.

We also wish to briefly discuss the monosemous analysis of *-te iru* proposed by McClure (1995) and Nishiyama (2006), who argue that the different “interpretations” of sentences in the *-te iru* form can be explained by saying that a subpart of an event described by the verb (which may not be a proper subpart) be located in the past. For example, (7a) and (7c) show that the relevant events (the door’s opening and Hanako’s building a house, respectively) are wholly in the past. (7b) also meets the requirement because part of Hanako’s boarding-the-bus event is located in the past regardless of which interpretation is adopted. Speaking very broadly, we completely agree that *-te iru* has a non-future orientation. However, to say simply that V-*te iru* places part of the V event at a past time (and relevant result state occurs at the utterance time) is definitely not fine-grained enough. Different verbs and different temporal adverbials interact with *-te iru* in complex ways, and this type of consideration is not sufficient in the account given by McClure (1995) or Nishiyama (2006). We also need to explain what types of result state readings are available and how. Indeed, the present article discusses an important group of verbs that can express a specific type of result state reading that other verbs cannot, as we shall detail in the rest of this article. Lastly, a standard test of ambiguity vs. vagueness (Zwicky and Sadock 1975) shows that the difference between a progressive/target state reading and a resultant state (or experiential) reading is not an instance of vagueness.¹⁷ (12) shows that Hanako’s running and Jiro’s running must have the “same temporal property” in that either of the following must hold

¹⁷ See also Kennedy (2011).

for the original sentence to be true: (i) Hanako is now running, and so is Jiro; (ii) Hanako has run, and so has Jiro. The denotation of the expression *hasit-te iru* ‘run-TEIRU.PRES’ must be set in advance before the sentence is interpreted. Since the decision of which “interpretation” is employed must be made before (12) is interpreted, this must be an instance of ambiguity.

- (12) Hanako-wa hasit-te iru. Jiro-mo da.
Hanako-TOP run-TEIRU.PRES Jiro-also PRES
‘Hanako and Jiro are both running both running.’ OR
‘Hanako and Jiro have both run.’

This shows convincingly, we believe, that the difference between a resultant state readings and a progressive/target state reading is an instance of ambiguity. Note, in this connection, that the Korean aspectual form *-ko iss* never yields resultant state (or experiential) readings with adverbials indicating past times. This also suggests strongly that resultant state readings require a different type of semantic processing.

From the foregoing discussion, we derive (13) as our provisional empirical generalization regarding the *-te iru* (Japanese) and *-ko iss* (Korean) forms regarding their ability to express the special target state interpretation with CC verbs.

(13) **Preliminary Generalization**

V-te iru (Japanese) / *-ko iss* (Korean) (in the present tense) can be used to assert the existence of the target state associated with the V event, which must be a physically identifiable state stemming from the V event, at the utterance time if the subject **is the agent of the V event in the past and is responsible for the continuation of the target state holding at the utterance time.**¹⁸

¹⁸ Note that *V-te iru* in Japanese is capable of expressing resultant state interpretations (in the

(13) excludes target state readings involving unaccusative verbs in Japanese such as (7a) because they do not have agentive subjects. Ultimately, we need an account that explains not just the similarities between Japanese and Korean expressed in (13), but also the differences between *-te iru* and *-ko iss* regarding unaccusatives.

3. Discussion

The generalization summarized in (13) is a good factual generalization about the data involving CC-verbs and *-te iru/-ko iss* in Japanese and Korean. However, it does not say explicitly why CC verbs are special. One clear characteristic of the target state that a CC verb yields is that since it belongs to the agent, it is under her/his control. This turns out to be a crucial difference between CC verbs and other agentive transitive verbs.

When Japanese unaccusative verbs such as *taore* ‘fall’ occur with *-te iru* and receive target state interpretations, there is no sense in which the target state in question is under the subject entity’s control. In fact, the subject of an unaccusative verb generally has no control over the state it is in as shown by (7a). The case of CC verbs is clearly different; the agentive subject’s action brings about the target state, and the agent continues to be a responsible individual regarding the continuation or termination of the target state. The table in (14) summarizes the data in Japanese and Korean discussed so far.

(14)

Interpretation types →	Progressive/on-going process (agentive	target states which are not	target states which are	resultant states
------------------------	--	------------------------------------	-------------------------	------------------

sense of Parsons (1990)), too. We will not discuss this possibility here since they are not the focus of our discussion.

	transitive verbs; unergative verbs)	subject- controlled (unaccusative verbs)	subject-controlled (CC verbs)	(any verb)
Japanese <i>-te iru</i>	yes	yes	yes	yes
Korean <i>-ko iss</i>	yes	no	yes	no
Korean <i>-e iss</i>	no	yes	no	no
Korean <i>-ess</i> 'past tense'	no	no	no	yes

There are some published analyses of the Korean data. Son (2004) claims that *-ko iss* sentences with CC verbs produce progressive readings when the subject gets both an agentive and locative role, but convey result state readings when the subject only bears a locative role. Lee (2008) offers a syntactic analysis according to which *-ko iss* attaches to a VP that takes an agentive subject, a result state reading (a target state reading in our vocabulary) is obtained.¹⁹ Kim (2009) presents a formal semantic analysis in which *-ko iss* is claimed to be ambiguous between the progressive and result state readings. Our proposal to be presented in Section 5 will claim that the source of the ambiguity is the lexical semantics of the predicate and not the aspect morpheme *-ko iss*, and an aspect shift rule and a semantic constraint posited in the lexicon account for the ambiguity of each CC verb in a systematic way.²⁰

¹⁹ Park (2014) provides a similar analysis of the ambiguity. See Chae (2018) for an alternative syntactic analysis of the ambiguity.

²⁰ See also Hamanoue (1992), Ogoshi (1995) for additional important works discussing the data in question.

3.1 A hybrid thematic role AGT-TH as a possible solution

At this point, let us look at Ogihara's (1999) formal proposal about the behavior of CC-verbs in the *-te iru* form in Japanese. This proposal discusses CC verbs and refers to them as "accomplishment + resultative predicates." First, a special thematic role AGT-TH (agent-theme) is posited, which is true of an individual, an eventuality, and a maximum time throughout which the agent entity engages in a hybrid eventuality, which consists of an accomplishment and a (target) state. The thematic role AGT-TH indicates that the individual that bears this role is an agent first, and then becomes a theme in the latter half of the continuous event.

Ogihara's (1999) proposal points to the possibility that the perceived ambiguity of sentences containing CC verbs in the "progressive form" in Japanese and Korean originates in the complex meaning of the CC verbs and different "readings" result depending upon which part of the complex eventuality is referred to by the "progressive form." According to this proposal, the "progressive form" itself has a constant meaning.

We find instances in which CC verbs occur in the simple past tense and can still yield two distinct interpretations, and they show convincingly that the source of the two different readings is the semantics of CC verbs, not the *-te iru/-ko iss* forms. Consider (15a, b).

- (15) a. Hanako-wa (moo) sinkansen-ni not-ta.
Hanako-TOP already bullet.train-DAT board-PAST
'Hanako (already) boarded the bullet train.' (i.e., She is on the train now.)
- b. Hanako-wa nihon-de sinkansen-ni not-ta.
Hanako-TOP Japan-in bullet.train-DAT board-PAST
'Hanako had a ride on the bullet train in Japan.'

(15a) can be used to indicate that Hanako completed the boarding event, which is a telic event, in the past. Including the adverbial *moo* 'already' helps the 'boarding' reading to become salient. In

this case, Hanako may still be on the bullet train when (15a) is uttered. By contrast, (15b) can be used to indicate that Hanako experienced a ride on the bullet train in Japan, which means that the sentence skeleton includes information about the riding of the train.²¹ (15b) strongly suggests that the train ride is already complete. (15a, b) clearly show that the “boarding” and “riding” interpretations of *noru* ‘board’ come from the meaning(s) of the verb itself and is not contributed by the aspectual morpheme *-te iru*. Slightly modifying Ogihara’s (1999) notation, we can symbolize (15a, b) as in (16). Here, INITIAL (t_1, t_2) for any intervals t_1 and t_2 means ‘ t_1 is an initial subinterval of t_2 ’; FINAL (t_1, t_2) for any intervals t_1 and t_2 means ‘ t_1 is a final subinterval of t_2 ’; AGT-TH(Hanako)(e)(t_1) for any event e and interval t_1 means ‘Hanako is the agent-theme of e at t_1 ’.

$$(16) \quad \exists e \exists t_1 \exists t_2 [t_1 < \text{now} \ \& \ \text{time}(e) = t_2 \ \& \ [\text{INITIAL-SUB}(t_1, t_2) \vee \text{FINAL-SUB}(t_1, t_2)] \ \& \\ \text{AGT-TH}(\text{Hanako})(e)(t_1) \ \& \ \text{board}(e) \ \& \ \text{LOC}(\text{the-bullet-train})(e)]$$

The basic point here is that past tense locates the temporal argument of AGT-TH (and not the temporal trace of the event of boarding the train) in relation to the utterance time, and this time includes the time of the boarding event as a final subinterval or as an initial subinterval. If the time of the boarding is a final subinterval of the temporal argument of AGT-TH, then the entire sentence describes the accomplishment event of boarding the train. If the time of the boarding event is an initial subinterval of the temporal argument of AGT-TH, then the sentence as a whole talks about the train ride. In other words, the perceived ambiguity is understood as an instance of vagueness that comes from a complex (but single) meaning attributed to the verb *noru* (‘board’) in this analysis.

The two different readings that the predicate *noru* ‘board’ permits become even more

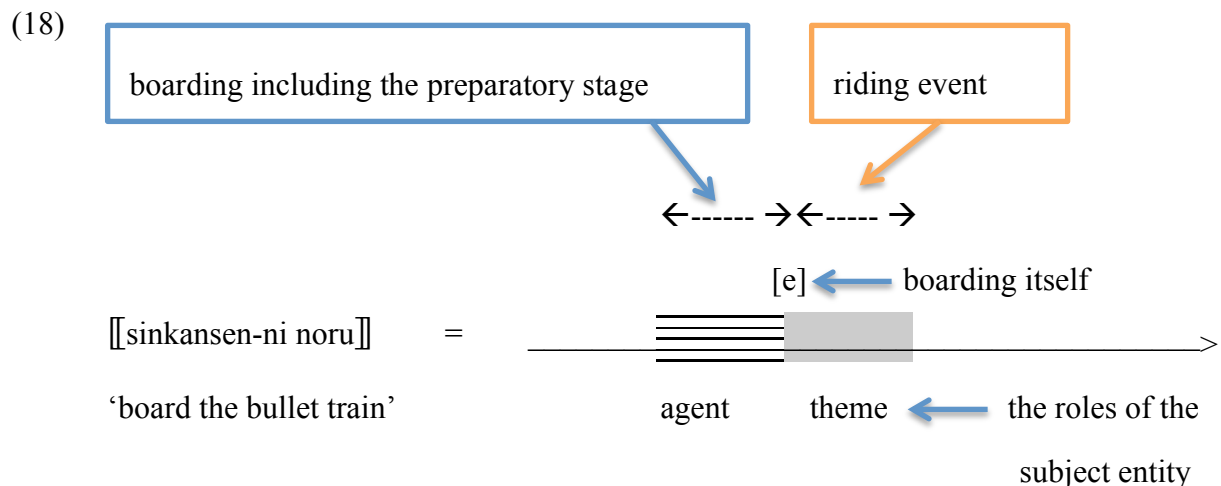
²¹ Needless to say, this is merely a pragmatic fact in that a different type of locative such as *Tokyo-eki de* ‘at Tokyo station’ makes the boarding reading much more plausible.

pronounced with the progressive form of the same sentence. Consider (17a), and its translation (17b).

- (17) a. Hanako-wa ima sinkansen-ni not-te iru.
 Hanako-TOP now bullet.train- DAT board/get.on-TEIRU.PRES
 ‘Hanako is now on the bullet train (as a result of having boarded the train).’ or
 ‘Hanako is now boarding the bullet train.’
- b. $\exists e \exists t_1 \exists t_2$ [now $\subseteq t_1$ & time(e) = t_2 & [INITIAL-SUB (t_1, t_2) \vee FINAL-SUB (t_1, t_2)] &
 AGT-TH(Hanako)(e)(t_1) & board (e) & LOC(the-bullet-train)(e)]

(17b) says that there is a time t_2 that contains the utterance time and t_2 is either the time of the accomplishment event or the time of the train ride (during which the subject entity is a theme). This is based on the traditional analysis of the progressive (Bennett and Partee 1974, Dowty 1979).

Let us continue to use (17a) as an example and show schematically in (18) how (17b) is capable of covering the two interpretations. The symbol [e] indicates the change of state from not being on the bullet train to being on the train, and the proposal is that the agent-theme can be associated with this event either as the agent of boarding or the theme associated with the riding.



Consequently, the sentence skeleton of (17a) can be true at the horizontal line area (the boarding event) or at the gray area (the riding of the train). This means that (17a) is taken to indicate one of the two things: (i) Hanako is getting on the bullet train—a progressive interpretation; (ii) Hanako is on the train — indicating the ongoing train ride. This proposal says that the lexical meaning of the verb *noru* ‘board’ covers both the boarding part and the riding part, but the temporal argument of the subject can be determined independently of the time of the event, and this results in two interpretive possibilities.

The above proposal posits a new hybrid thematic role that indicates that the agentive subject can also be a theme when the verb is a CC verb. However, if the fact that the subject entity is the theme after the target state is attained allows us to use *-te iru* to mark the continuation of the target state, we cannot account for the fact that the Korean *-ko iss* form treats *thata* ‘board’ and *ssulecita* ‘fall’ in different ways: it can mark the continuation of the target state when the verb is *thata* ‘board’, but not when the verb is *ssulecita* ‘fall’. This point is crucial in order to understand the true significance of the data under discussion.

3.2 Continuous Causation

In order to highlight the crucial difference between undergoers of falling events and alleged “themes” of CC verbs, let us now discuss the case of *noru/thata* ‘board’ again but think about a situation where one rides a horse or bike. In such cases, Japanese and Korean use the same verb as the case of boarding trains or busses.²²

²² Just as in earlier examples, the Korean example (19b) can easily receive a progressive reading as well, whereas the progressive reading for Japanese one (19a) is less salient and less natural. Any difference between Korean and Japanese on this matter is not our concern in this article, however, since our focus is the availability of the target state reading in these languages.

- (19) a. Hanako-wa ima uma-ni not-te iru. [Japanese]
 Hanako-TOP now horse-DAT board-TEIRU.PRES
 ‘Hanako is now riding a horse.’
- b. Minho-nun cikum mal-ey tha-ko iss-ta. [Korean]
 Minho-TOP now horse-DAT board-KOISS.PRES-DECL
 ‘Minho is now riding a horse.’

(19a, b) can indicate relevant target states existing at the utterance time, just like the case of train or bus rides. However, horse riding reveals an important ingredient that train or bus rides do not make explicit: Hanako has to continue making efforts to keep the target state intact because a horse is not a very stable form of transportation. She definitely has to hold onto the reins very firmly; she may also have to control the horse’s movements so as not to be shaken off from it. A similar point can be made of bicycle riding. When you ride the bike, you will need to keep on pedaling and keep your balance so as not to fall over. What these examples show is that the target states associated with horse and bike rides clearly require non-trivial actions on the part of the agent, and this becomes essential partly because the state in question is something that the agent controls. To go one step further, we should define the target state in question as a non-permanent physical relation between the agent and patient (Hanako and the horse in (19a)) and whether or not this relation continues to hold depends on whether the subject engages in some action directed to the theme such that it allows the state in question to continue. The two relations in question can be given as in (20). R_1 indicates the target state, and R_2 indicates what the subject does to maintain this state.

- (20) $R_1: \{ \langle x, y, t \rangle \mid x \text{ is on } y \text{ at } t \}$
 $R_2: \{ \langle x, y, t \rangle \mid x \text{ is holding onto the reins of } y \text{ and is controlling } y \text{'s movement at } t \}$

We find another persuasive example in *te-ni motu* in Japanese and *(son-ey) tulta* ‘pick up/carry’ in Korean, both of which mean ‘pick up by hand’. They both show that the target state in question cannot be maintained unless the agent keeps holding onto the object having been picked up, thereby showing convincingly that the subject’s active involvement is necessary to keep the target state intact.

- (21) a. Hanako-wa handobaggu-o te-ni mot-ta. [Japanese]
 Hanako-TOP handbag-ACC hand-at pick.up-PAST
 ‘Hanako picked up her handbag (by hand).’
- b. Hanako-wa handobaggu-o te-ni mot-te iru. [Japanese]
 Hanako-TOP handbag-ACC hand-at pick.up-TEIRU.PRES
 ‘Hanako is carrying her handbag (by hand).’
- c. Jiho-nun handbag-ul (son-ey) tul-ko iss-ta. [Korean]
 Jiho-TOP handbag-ACC hand-at pick.up-KOISS.PRES-DECL
 ‘Jiho is carrying her handbag.’ or ‘Jiho is picking up her handbag.’

The Japanese verbal expression *te-ni motu* ‘pick up by hand’ describes an event of picking up (as its default reading) when it occurs in the simple past tense as shown in (21a). However, when it occurs in the *-te iru* form (in the present tense) as in (21b), the entire sentence indicates that Hanako is holding/carrying her handbag, which is clearly the target state of her picking up her handbag.²³ Crucially, maintaining this state requires Hanako’s carrying the handbag in her arms or holding onto its handle by hand. Otherwise, it would fall to the ground. This clearly shows that Hanako’s continued efforts enable the handbag to be carried by her and to be off the ground. The Korean example with *(son-ey) tul* ‘pick up (by hand)’ in the *-ko iss* form in (21c) makes

²³ The target state reading is strongly preferred in (21b) perhaps because the event of picking up something is hardly conceived of as a protracted event.

exactly the same point. This example is significant in that the continued existence of the target state clearly requires the agent's continued efforts (i.e., supply of the necessary force). Another important point to be made here is that the target state in question can be described as a temporary relation that the agent and the theme are in after the accomplishment event. To be more specific, the relevant relations in question are those given in (22). R_1 is the target state, and R_2 indicates what the agent does to keep the target state intact.

(22) $R_1: \{ \langle x, y, t \rangle \mid x \text{ holds } y \text{ (in } x\text{'s hand) at } t \}$

$R_2: \{ \langle x, y, t \rangle \mid x \text{ supplies appropriate force to keep } y \text{ held in } x\text{'s hand at } t \}$

R_1 in (22) is clearly a non-permanent property in that if $\langle \text{Hanako, the handbag, } t_1 \rangle$ happens to be a member of R_1 , this does not guarantee that $\langle \text{Hanako, the handbag, } t_2 \rangle$ for some time t_2 later than t_1 is also a member of R_1 . Whether or not this condition holds depends on whether $\langle \text{Hanako, the handbag, } t_2 \rangle$ is related via R_2 in (22).²⁴

The target state of unaccusative verbs such as 'fall' is clearly different in that the undergoer theme is understood as an entity that cannot control the target state in question. Thus, the entity is typically a non-sentient entity such as trees, fences, etc. People can be the undergoers, but they are treated as if they are "things" that cannot control their own fate. Therefore, cases of fainting, etc. will be appropriate for *taore* 'fall' because it looks as if the state is not under the subject's control. Correspondingly, it is clear that unaccusative cases necessarily involve situations that do not require any efforts on the part of the undergoer for the target state to continue. Put another way, the target state that (23a) describes is simply a property given in (23b). The understanding

²⁴ There are many other Japanese/Korean CC verbal predicates having to do with body movements such as *me-o akeru/nwun-ul ttu-ta* 'open (one's) eyes', *te-o hirogeru/phal-ul pelli-ta* 'extend (one's) arms', *baaberu-o motiageru/papeyl-ul meli wilo tul-e olli-ta* 'lift up a barbell (with weight plates) (above one's head)'.

is that there is no need for an agentive entity that keeps the state alive.

- (23) a. Ki-ga taore-te iru.
tree-NOM fall-TEIRU.PRES
'A tree is lying on the ground after having fallen.'
- b. $\{ \langle x, t \rangle \mid x \text{ is lying flat (on the ground) at } t \}$

To sum up the above comparison of the two types of “target states”, the ones involved in CC verbs are controlled by the agent (i.e., the denotation of the subject), whereas the ones associated with unaccusative verbs are not controlled by the theme subjects. We believe that this indicates a crucial difference between CC verbs and unaccusative verbs.

3.3 Regular Accomplishment Cases

Given the way “target state” is defined by Parsons, we also need to discuss the case of regular accomplishments like ‘build a house’, ‘write a dissertation’, etc. These cases are different from CC verb cases in that the target states are not under the agent’s control after coming into existence. In some cases, the target state can be undone as in the case of building a house, but the agent has no special privilege; anybody can destroy the house, thereby “undoing” this state. In other cases, the target state is arguably permanent in that the writing of a dissertation cannot be undone in that this is creation of an abstract object; destroying a copy of the dissertation is not enough to “undo” the accomplished product. If so, ‘the state of a dissertation being in existence’ may be a resultant state (in the sense of Parsons (1990)). In any case, the agentive subject cannot control such target states unlike the instances of CC verbs.^{25, 26}

²⁵ Kim (2009) presents a similar descriptive generalization about the relevant data in Korean: a target state reading arises when the object keeps its physical form and the object’s state is

- (24) a. # Hanako-wa kyoo ie-o tate-te iru. [Japanese]
 Hanako-TOP today house-ACC build- TEIRU.PRES
 [Intended] ‘Hanako is making sure that the house she built will keep standing today.’
- b. # Minho-nun onul kenmwul-ul seywu-ko iss-ta. [Korean]
 Minho-TOP today building-ACC build/make.stand-KOISS.PRES-DECL
 [Intended] ‘Minho is making sure that the building he built will keep standing today.’

Thus, regarding regular accomplishments, the agent is not in a privileged position to control the (dis-)continuation of the target state unlike CC verbs. In other words, the target state in question continues to exist without a sustained relation between the agent and the theme that acts like a necessary force to preserve the state in question.

3.4 Descriptive Generalization

A clear generalization emerges from the discussion so far. (25) is our descriptive generalization of our findings. In Section 5, we will propose our theory that provides an explanation for the generalization in (25).

maintained by the subject.

²⁶ One can also think of cases in which the subject entity acquires a state, but this entity cannot “undo the change” such as the case of ‘cutting his left little finger’. (i) simply does not have a target state reading presumably because the change is (felt to be) irreversible.

- (i) Jiro-wa genzai hidarite-no koyubi-o zibun-de kiriotosi-teiru.
 Jiro- TOP now left.hand- GEN little.finger- ACC by.oneself cut.off-TEIRU.PRES
 [Intended] ‘Jiro is now intentionally keeping the state of not having his left little finger.’

(25) **Generalization**

A sentence containing a verb in the *-te iru/-ko iss* form with an agentive subject produces a target state reading (i.e., can indicate the existence or continuation of a target state) if **the agent is the controller of the target state**, and the target state under discussion is **physically identifiable, non-permanent and reversible**. Put another way, if some relation R holds between the agentive subject and the theme, and this causes a relevant target state to be preserved, the target state reading of this sentence becomes available. We call this type of verbal expression in Japanese or Korean a **continuous causative (CC) verb**.

The above discussion leads us to conclude that CC verbs in Korean and Japanese exhibit special properties that the corresponding English verbs do not exhibit. The crucial property of CC verbs is that they are capable of conveying a “continued causation” effect of the agent regarding the target state, and this is like an activity from the viewpoint of the Vendlerian four-way aspectual classification of verbs. The net effect of this proposal is that the status of the “target state” continuation is different from unaccusative verb cases because the agent continues to be responsible for the target state’s lifespan. In this sense, the semantics of CC verbs in the *-te iru/-ko iss* form is similar to that of the “progressive form” of the same aspectual morphemes in that the agentive subject continues to behave like an agent even after the target state is attained. If so, it is natural for the Korean *-ko iss* form and the Japanese *-te iru* form to be able to yield this interpretation.²⁷

In Section 4, we will provide additional evidence for our analysis of CC verbs. In Section 5, we shall present and discuss our formal proposal of the ideas developed throughout this article.

²⁷ Progressive readings are default readings in that resultant state readings are also possible when the utterance context allows for them.

4. Toward an Empirically Accurate and Explanatory Proposal

4.1 Nominalization

Additional evidence that CC verbal expressions in Japanese and Korean are different from English accomplishment verbs is provided by the semantic interpretation of nominalized phrases containing CC verbs in the simple past tense or tenseless forms.

First let us compare (26a, b) in Japanese/Korean and (26c, d) in English, which involve nominalized forms of the relevant verbs.

- (26) a. Tanosikat-ta no-wa sinkansen-ni not-ta koto desu. [Japanese]
'The ride I had on the bullet train was fun.'
- b. Culkewe-ss-ten kes-un sinkhansey-n-ey tha-ass-ten il-i-ta. [Korean]
be.delightful-PAST NOMINALIZER-TOP bullet.train-LOC board-PAST fact-be-DECL
[Literal] 'The fact that I boarded the bullet train was a delightful thing.'
[What it means] 'The ride/trip I had on the bullet train was fun.'
- c. # That I boarded the bullet train was fun.
- d. # My boarding the bullet train was fun.

(26a, b) contain the verbs *noru* and *thata* 'board' and each nominalized clause is in the simple past tense. Note that each example sentence clearly asserts that the riding event was fun, not the boarding event. The corresponding English sentences in (26c, d) cannot convey this meaning—they can only mean that the boarding event was fun. The contrast between (26a, b) and (26c, d) shows that the Japanese verb *noru* and the Korean verb *thata* can make an assertion about the continuation of the target state unlike their English counterpart *board/get on*, and this is not due to any semantic difference that may exist between the aspectual morphemes under discussion.

Nominalized forms of the verbs *kiru/ip* ‘put on’ can also be used to indicate the target state of wearing a piece of clothing, in addition to the event of putting it on. Consider examples like (27a, b) and compare them to (27c, d).

- (27) a. Hanako-wa kekkonsiki-de weddingu doresu-o kiru koto-ga uresikat-ta. [Japanese]
 Hanako-TOP wedding-at wedding dress-ACC put.on fact-NOM be.pleased-PAST
 ‘The fact that she would wear a wedding dress for her wedding made Hanako happy.’
- b. Jiho-nun kyelhonsik-eyse wedding dress-lul [Korean]
 Jiho-TOP wedding-at wedding dress-ACC
 ip-nun kes-i kippu-ess-ta.
 put.on-REL fact-NOM happy-PAST
 ‘The fact that Jiho would wear a wedding dress for her wedding made her happy.’
- c. # The fact that she would put on a wedding dress for her wedding pleased Hanako.
- d. # Putting on a wedding dress for the wedding pleased Hanako.

(27a, b) clearly show that the lexical semantics of the verbs *kiru/ip* in Japanese and Korean includes reference to the target state continuation. In other words, what pleased Hanako was not that she would put on the wedding dress but that she would wear it during her forthcoming wedding ceremony. Note also that the verb *kiru/ip* is in the simple present tense (or tenseless) form in (27a, b), which are also aspectless. The target state interpretation is unavailable to the parallel nominalization examples in English, as shown in (27c, d). This shows convincingly that the ambiguity of CC verbs in Japanese and Korean stems from the semantics of the predicate, not the tense or aspect morphemes.

4.2 Temporal Adverbials

Data involving ‘in-’ and ‘for-’ adverbials tell us that we should distinguish between the

accomplishment and target state readings as instances of genuine ambiguity. Let us first consider (28a, b), which contain ‘*for*-adverbials’ and *noru/thata* ‘board’ and indicate continuations of target states. Needless to say, the literal translation of (28a) or (28b) into English is anomalous, as shown in (28c).

- (28) a. Hanako-wa densya-ni iti zikan not-ta. Sosite Sendai-ni tui-ta.
 Hanako-TOP train-DAT one hour board-PAST and Sendai-DAT arrive-PAST
 ‘Hanako was on the train for one hour and arrived in Sendai.’
- b. Minho-nun kicha-ey han-sikan-(tongan) tha-ass-ta.
 Minho-TOP train-LOC one-hour-for board/get.on-PAST-DECL
 kuliko Busan-ey tochakha-yess-ta.
 and Busan-LOC arrive-PAST-DECL
 ‘Minho was on the train for one hour and arrived in Busan.’
- c. # Mary boarded the train for two hours, and she arrived in Chicago.

The adverbials *iti zikan/han-sikan* ‘for an hour’ indicate the duration of the train ride, not the time it took the subject entity to get on the train. Standardly, we assume that *for*-adverbials indicate the duration of an atelic eventuality described by the sentence in question. If this assumption applies to the case at hand, the verb *noru/thata* ‘board’ must be able to assert the existence of the target state itself, not as part of a more inclusive event.

To show that the accomplishment reading of the same verb *noru/thata* is clearly different from the target state reading in that it requires ‘*in*-adverbials’ instead of ‘*for*-adverbials’, let us add a couple of examples here:

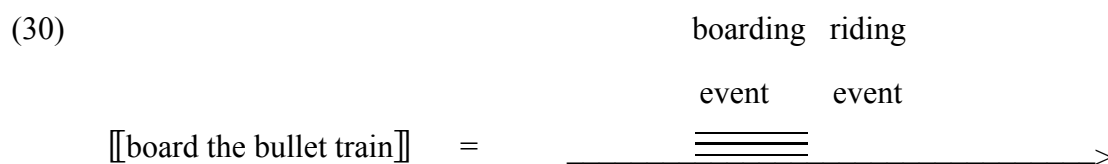
- (29) a. Hanako-wa ippun-de hikooki-ni not-ta. [Japanese]
 Hanako-TOP one.minute-in airplane-DAT board-PAST
 ‘Hanako boarded the plane in one minute.’

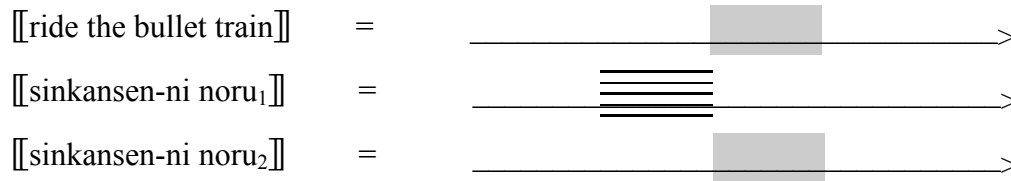
- b. Minho-nun ilpwun-maney pihayngki-ey tha-ss-ta. [Korean]
 Minho-TOP one.minute-in a plane-LOC board-PAST-DEC
 ‘Minho boarded a plane in one minute.’

(29a) assumes that boarding the plane takes some time. For example, think of a traditional style boarding process that requires climbing a gangway ladder. In this case, we can use the same verb *noru* ‘board’ and it is natural to use ‘in a minute’ to indicate the time needed for the accomplishment event. The same is true of the Korean example in (29b). We can conclude from the examples presented above that the accomplishment interpretation and the interpretation that indicates continuation of the target state are distinct readings that should be treated formally as ambiguity of a relevant CC verb in Japanese or Korean, rather than an instance of vagueness as in the alternative mentioned in Section 3.1.

4.3 Proposal

The difference between *board* in English and *noru/thata* ‘board’ in Japanese and Korean is indicated graphically in (30). The horizontal line area indicates the accomplishment portion of each verb, and the shaded area indicates the continuation of the target state. As shown in the pictures, the English verb *board* only indicates the accomplishment section indicated by horizontal lines, which includes the initial instant of the target state but nothing beyond. The gray area is indicated by *ride* in English as shown in the diagram. By contrast, the Japanese verb *noru* and the Korean verb *thata* ‘board’ ambiguously refer to the accomplishment event or the continuation of the target state.





The most economical and theoretically appealing option for us is to posit a lexical semantics of CC verbs in such a way that they are systematically ambiguous between an accomplishment interpretation and an activity-like reading in which continuation of the target state is asserted. Technically, what we will do is to posit a semantic constraint applicable to all CC verbs in the lexicon in Japanese and Korean so that both meanings are always provided as alternative denotations. This is different from de Swart’s (1998) proposal about aspect shift via coercion since the two alternative interpretations of a CC verb are equally natural according to the native speaker’s intuitions.

Assuming that we are on the right track, let us consider the implications of this proposal for the semantics of *-te iru* and *-ko iss*. According to the classical account of the English progressive (Bennett and Partee 1974), *be V-ing* in English can indicate any subpart of the horizontal line area in the above diagram for the verb *board* in English. This means that the accomplishment event is ongoing. Analogously, the English verb *ride* indicates the gray area, which comprises the activity of riding (the train), and the progressive can indicate that the riding is ongoing. The same is true of *-te iru* and *-ko iss* in that they can indicate that the utterance time is part of the horizontal line area or the gray area, depending upon which meaning of *noru* ‘board/ride’ is used. This results in two possible interpretations: (i) the agent’s boarding the train is ongoing, or (ii) the agent’s riding the train is ongoing. This accounts for the two readings of the relevant Japanese and Korean examples. Thus, we conclude that the source of the multiple meanings is the lexical semantics of the predicate in question, not the ambiguity of *-te iru/-ko iss*.

Technically, this attributes ambiguity to each CC verb in Japanese or Korean, but the two interpretations of each verb are systematically related via a semantic rule posited in the lexicon. This will be shown in the formal account presented in the next section.

5. Formalization

5.1 Basic Cases

In this section, we will propose a formal analysis of CC verbs in Japanese and Korean that accounts for their intriguing semantic properties. The central idea to be encoded here is that the continuation of the target state associated with a CC verb is reanalyzed as an atelic event (an activity) because (i) the agentive entity continues to hold a privileged position in controlling the target state, thereby behaving like an agent, and (ii) the agentive entity does not have a specific “goal” other than maintaining the target state; in a sense, the goal is already attained. This activity-like property of target states associated with CC verbs enables *-te iru* and *-ko iss* to mark the existence of a relevant target state. This property of CC verbs is predictable as far as Japanese and Korean are concerned though no regular pattern is observed in a language like English.

Our proposal to be presented in this section is similar to de Swart’s (1998) proposal about aspect shift that yields two distinct aspectual interpretations for the same verb. However, unlike de Swart’s proposal, our proposal about aspect shift is not based on coercion. For each CC verb, the two readings are equally plausible and natural. We will posit a lexical semantic rule that produces an aspect alternation for CC verbs in Japanese and Korean.²⁸ This proposal preserves the standard Aktionsarten classification based on Vendler’s classical account. Yet it also allows us to explain the obvious connection between the accomplishment reading and target state reading of the same CC verb.

²⁸ de Swart’s (1998) proposal is based on Discourse Representation Theory, and the central idea is that aspectual shift is coerced by grammatical aspectual markers. Therefore, our proposal only borrows some basic ideas from de Swart (1998). However, we could say that the choice between two alternative readings is made on the basis of pragmatic plausibility. This is in a sense interpretable as coercion of sorts.

The standard semantic characterization of accomplishment as involving causation (e.g., Dowty 1979) applies to CC verbs when used as accomplishment verbs. Dowty's (1979) classical account of accomplishments partially depends on Lewis's (1973b) proposal about causal dependence. Let us present Dowty's proposal (1979: 108-109) about his sentential connective CAUSE, which is made in terms of causal dependence and causal factor:

- (31) ϕ depends causally on ψ if and only if ϕ , ψ and $\neg\phi \square\rightarrow \neg\psi$ are all true.²⁹
- (32) ϕ is a causal factor for ψ if and only if there is a series of sentences $\phi, \phi_1, \dots, \phi_n, \psi$ (for $n \geq 0$) such that each member of the series depends causally on the previous member.
- (33) [ϕ CAUSE ψ] is true if and only if (i) ϕ is a causal factor for ψ , and (ii) for all other ϕ' such that ϕ' is also a causal factor for ψ , some $\neg\phi$ -world is more similar to the actual world than any $\neg\phi'$ -world is.

To understand (31), it is necessary to understand Lewis's (1973a) theory of counterfactuals. Put informally, ϕ is said to causally depend on ψ (i.e. ψ causes ϕ) if and only if ϕ and ψ are true (in the actual world) and the counterfactual conditional *if it were the case that not ϕ , then it would also be the case that not ψ* is also true. For example, if the alarm clock's going off caused you to wake up, then it must be the case that the alarm went off, you woke up, and if it were the case that you did not wake up, it would also be the case that the alarm clock did not go off. (32) provides for the possibility that the two sentences (ϕ and ψ) are connected indirectly via some intervening factors that are causally related. (33) tells us that the causal factor(s) must be the most immediate one(s) so that we can exclude causes that are too "fundamental." For example,

²⁹ The semantics we assume for the counterfactual operator $\square\rightarrow$ is that of Lewis (1973a). For example, $\phi \square\rightarrow \psi$ is true in w_0 iff in all worlds closest to w_0 among those in which ϕ is true, ψ is also true.

that Donald Trump was born in the U.S. can be said to have “caused” him to become the U.S. President. However, this is something that is too fundamental and is not considered to be a cause for him to become the U.S. President for our purposes. We would have to find a different and more immediate cause that occurred during his Presidential campaign in 2016.

For the details of Lewis’s proposal about the semantics of counterfactuals, we refer the reader to Lewis’s original (1973a, 1973b) and Dowty’s (1979) adaptation. For our purposes, it is sufficient to note that an accomplishment sentence like (34a) is logically analyzed as in (34b), which is in turn paraphrased as in (34c).

- (34) a. Bill killed John.
 b. There is a property P such that [Bill had P] CAUSE [BECOME [John was dead]]³⁰
 c. There is a property P such that Bill had P & John died & if it were the case that John did not die, it would have been the case that Bill did not have P .

If (34b) is indeed accepted as a correct rendition of the accomplishment sentence (34a), this also means that Bill’s having some property P was a causal factor for John’s becoming dead.

Having discussed the semantics of Dowty’s CAUSE operator in detail, we will adopt it in the following discussion. Our example sentences only require very straightforward causative relationships between causing event propositions and causee event propositions and we can safely use (31) as our guide. For example, consider the sentence (35a) (= (19a)) and its target state interpretation. It seems intuitive to paraphrase this interpretation into an English sentence with *cause* used as a regular verb as shown in (35b). This in turn is paraphrasable into two simple statements and a counterfactual conditional as in (35c) with a property variable bound by an existential having scope over the entire paraphrase. This is in line with Lewis’s idea of causal

³⁰ Dowty’s (1979: 202) specification of *kill*’s lexical meaning is the following:

$\lambda \varphi . \lambda x . \varphi \{ \lambda y [\exists P [P \{ x \} \text{ CAUSE BECOME } \neg \text{alive}'(y)]] \}$

dependence presented in (31). Moreover, what Hanako has been doing is the most immediate causal factor for the effect (Hanako's remaining on the horse) satisfying (33). Thus, it is reasonable to assume that this is a relation that can be captured by Dowty's operator CAUSE.

- (35) a. Hanako-wa ima uma-ni not-te iru. [Japanese]
Hanako-TOP now horse-DAT board/get.on/climb.onto-TEIRU.PRES
'Hanako is now riding the horse.'
- b. There is a relation R such that Hanako stands in R to the horse (e.g., holding onto the reins and controlling the horse's movements) and the fact that Hanako is related to the horse via R is causing her to remain on the horse.
- c. There is a relation R such that Hanako stands in R to the horse (holding onto the reins and controlling the horse's movements) & Hanako is on the horse & if it was the case that Hanako is not on the horse then it would be the case that she is not related to the horse via R .

The continued existence of the target state is caused by Hanako's active involvement, such as holding onto the reins firmly and controlling the horse's movements. We understand this to be the causing proposition and can be described in terms of a temporary relation as shown in (35b, c). The Lewis-Dowty proposal about the cause operator is still applicable here. However, the target of the causing operator is a stative proposition rather than a "becoming" proposition since there no target state yet to be attained; in fact, the target state is already attained. This is indicated by the operator REMAIN, which is prefixed to a stative proposition and asserts that the proposition holds throughout a relevant time interval. Another amendment we have made here is that instead of positing a property that the agent has as part of the causing proposition, we posit a relation that involves the agent and the theme. This makes the requirement for the "continuous causation" more fine-tuned than Dowty's proposal for accomplishments. The counterfactual "test" is also valid here: if Hanako is not riding the horse (anymore), then it is also the case that Hanako is not

related to the horse in the specified manner (say, holding the reins and controlling the horse's movements properly) (anymore).

Given the above discussion, the interpretation of (35b) is formalized as in (36). Here, we adopt the traditional extensional analysis of the English progressive (Bennett and Partee 1974) and use it for the *-te iru* form in Japanese (or *-ko iss* form in Korean), which is sufficient for our purposes.³¹ The letter *R* is used as a relation variable of type $\langle e, \langle e, \langle i, t \rangle \rangle \rangle$ here. We assume the standard typed system where *e*, *i*, *s*, *t* indicate entities, time intervals, worlds and truth values, respectively, combining types used in Dowty (1979) and in Heim and von Stechow (2011). In (36), CAUSE applies to two propositions.

(36) $\exists t[\text{now} \subseteq t \wedge \exists R[R(\text{the horse})(\text{Hanako})(t) \text{ CAUSE } [\text{REMAIN ON}(\text{the_horse})(\text{Hanako})]]$

(36) says that the sentence is true iff there is an interval *t* that contains the utterance time and there is some relation *R* such that Hanako's standing in *R* with the horse throughout *t* causes her to remain on the horse.³² Although the causee proposition contains no time information, the time *t* is understood to be the time of Hanako remaining on the horse as well.

In order to explain the relation between the accomplishment reading of a CC verb and its activity-like target state reading, let us propose the lexical semantic rule in (37).

³¹ Needless to say, an intensional analysis of *-te iru* and *-ko iss* is needed for examples involving the imperfective paradox (Dowty 1979). The reader is referred to Landman (1992), Portner (1998) among many others regarding the English progressive and to Ogihara (1998) regarding the Japanese *-te iru* form.

³² Since the entire sentence is understood to be atelic, we can assume that it has the subinterval property (Bennett and Partee 1974). This means that any subinterval of the time represented by the time variable *t* is a time when Hanako is actively maintaining the state in question, i.e. her being on the horse.

(37) **Aspect Shift Rule in the Lexicon for CC verbs [Japanese and Korean]**³³

If a verb V denotes $\lambda y \lambda x \lambda t \exists P[P(x)(t) \text{ CAUSE } [\text{BECOME } R_1(y)(x)]]$ where R_1 is a stable physical relation between two entities such that for any entities α, β , and time t_1 , if $R_1(\beta)(\alpha)(t_1) = 1$, there is a time $t_2 > t_1$ such that $R_1(\beta)(\alpha)(t_2) = 0$, there is an alternative denotation of V : $\lambda y \lambda x \lambda t \exists R_2[R_2(y)(x)(t) \text{ CAUSE } [\text{REMAIN } R_1(y)(x)]]$.

Some comments on the formalism are in order here. *BECOME* (Dowty (1979)) indicates that its argument proposition becomes true at a crucial time referred to in the sentence. *CAUSE* has already been discussed above. To simplify our presentation, we only specify the time argument for the causer proposition and let the rest of the temporal properties be inferred. For example, if the time of the causing proposition is t , then the causee proposition (i.e., the target state) becomes true at the end of t in the case of an accomplishment reading.³⁴ Regarding an activity-like reading indicating continuation of the target state, the time of the causing proposition is the same as the time of the duration of the causee proposition thanks to the *REMAIN* operator. This is in line with our intuitions and sufficient for our purposes.

The idea represented in (37) is that a CC verb must be associated with both an

³³ We believe that even with the accomplishment meaning of a CC verb, we could posit a relation holding between the agent and the theme that serves as the causing proposition, rather than a property of the agent. However, since the accomplishment meaning is not the central part of our discussion, we simply adopt Dowty's classical analysis regarding the accomplishment meaning of each CC verb.

³⁴ Since the variable R_1 is assumed to be of type $\langle e, \langle e, \langle i, t \rangle \rangle \rangle$, $R_1(y)(x)$ is of type $\langle i, t \rangle$. The semantics of *CAUSE* and *BECOME* would be defined in the lexicon so as to ensure that $\exists P[P(x)(t) \text{ CAUSE } [\text{BECOME } R_1(y)(x)]]$ means that x 's having the property P at t causes x to be related to y via R_1 at the end of t .

accomplishment interpretation and an activity-like interpretation (of maintaining a target state) that are interrelated in the specified manner. This allows us to see that the two meanings obtained from the same CC verb are predictable variants, and makes the aspectual specification of CC verbs economical and explanatory. It is important to see that the Aspect Shift Rule is triggered by the relation R_1 , which holds between the agent and theme. This must be a physically specifiable and transitory relation holding between the agent and the theme, is a hallmark of a CC verb.³⁵ Since this relation holds between an agentive entity and a theme, it is natural to conclude that the agentive entity controls this state. R_2 then indicates the conditions that must hold between the agent and the theme to keep the target state alive.

In order to further substantiate our proposal, we should also explain why our formalized proposal blocks target state readings of regular accomplishments like (24a) (repeated here as (38)).

(38) # Hanako-wa kyoo ie-o tate-te iru. [Japanese]

Hanako-TOP today house-ACC build- TEIRU.PRES

[Intended] ‘Today, Hanako is making sure that the house she built is standing.’

The intended reading is illicit because Hanako’s building a house does not cause her to enter into a stable physical relationship with the theme (the house in this case). For example, Hanako is not necessarily in the house (or anywhere near the house) after the completion of the building event. That is, there is no physically specifiable relation that involves Hanako and the building she built that qualifies for R_1 in (37). The cases of CC verbs in Japanese and Korean are clearly different.

³⁵ The condition on R_1 , which is that it must be a physically specifiable relation, is only informally stated in (37), but we assume that its intuitive content is clear. For example, the agent is inside the theme entity (e.g., the case of ‘boarding/riding’) or is covered by the theme entity (e.g. the case of ‘putting on/wearing’).

If you get on a bus, you are on the bus; if you put on a sweater, you have the sweater on. The agent enters into a physically identifiable and stable relationship with the theme object. This ensured that a CC verb receives a second “activity-like” interpretation thanks to (37).

(37) is a language specific rule in that it does not apply to English verbal expressions like *board a train* and *put on a sweater*. Thus, in order to describe target states of such events, English is required to furnish separate expressions such as *ride (a train/bus)* and *wear a sweater*. In Section 5.3, we will present some exceptional English sentences involving agentive transitive verb (or verbal expression) which can yield target state interpretations. However, we shall show that (37) is too liberal for English in that the English examples necessarily involve themes that are *physical parts* of the agent. Therefore, we will propose a separate Aspect Shift rule for English that encodes this special condition.

We already discussed two types of relations above regarding (19a) (= (35a)). The relation that holds between the agent and the theme and represents the target state is R_1 in (39). The relation that holds between the same individuals and is used to indicate the causing proposition is R_2 in (39).

$$(39) \quad R_1: \{ \langle x, y, t \rangle \mid x \text{ in on } y \text{ at } t \}$$

$$R_2: \{ \langle x, y, t \rangle \mid x \text{ holds the reins and controls } y \text{'s movements at } t \}$$

Given the above description of the Aspect Shift rule posited in the lexicon, we should also constrain admissible models in such a way that a time at which a sentence with a CC verb is true for an accomplishment interpretation is immediately followed by another time throughout which the same sentence is true for an activity-like meaning involving a target state. Put another way, if (35a) is true at 12 noon because Hanako is in the process of getting on the horse, then it cannot be the case that (35a) is also true at 12 noon to mean that Hanako is already on the horse and she is doing what she needs to do to keep this state. We propose the required semantic constraint in (40).

(40) **A Constraint on Admissible Models**³⁶

In any world of any admissible model, given any instantiations of t, x, y , and a relation R_1 with the properties described in (37), there is a t_1 such that t abuts t_1 and (ii) holds.³⁷

(i) $\exists P[P(x)(t) \text{ CAUSE } [\text{BECOME } R_1(y)(x)]]$

(ii) $\exists R_2[R_2(y)(x)(t_1) \text{ CAUSE } [\text{REMAIN } R_1(y)(x)]]$

Let us explain what (40) says using a concrete example involving a climbing-onto-a-horse event and a riding-a-horse event. Suppose that Mary climbs onto a horse at t that causes her to be on the horse (R_1). This is an accomplishment event covered by (i). Given this fact, we also know that a different relation R_2 that holds between Mary and the horse (e.g., her holding the reigns of the horse) “right after t ” (at a time that t abuts) such that this relation causes her to remain on the horse. This is the continuation of the target state guaranteed by (ii). Note that this constraint is a purely semantic constraint and is not language specific. For example, (40) requires that *Mary is climbing onto the horse* and *Mary is riding on the horse* cannot be true simultaneously.

In this way, the fact that sentences with CC verbs in the *-te iru* in Japanese or the *-ko iss* form in Korean can indicate two distinct situations is explained by positing an accomplishment meaning for each continuous causative verb and by deriving the activity-like target state meaning

³⁶ To be more precise, for intervals t_1 and t_2 , t_1 abuts t_2 iff every element of t_1 precedes every element of t_2 , $t_1 \cup t_2$ is an interval (i.e., has no gap) and $t_1 \cap t_2 = \emptyset$.

³⁷ This formalization allows for the possibility that the condition (ii) holds but (i) does not. This accommodates a state that is sustained by an agentive entity but was not produced by the agentive entity’s action in the past. One possible scenario is one in which a toddler is wearing a bib which her mother put on. Even though there was no event of the toddler’s putting it on, she can still control its fate. She could take it off by pulling it, for example. If this happens, she is no longer wearing it.

via the Aspect Shift Rule given in (37). Furthermore, the temporal adjacency condition between the two readings is guaranteed by the semantic constraint in (40). Let us now present our compositional semantic proposal using *uma-ni noru* ‘climb onto a horse’ and the aspectual morpheme *-te iru* in Japanese as an example. Please note, however, that exactly the same analysis applies to the Korean expression *mal-ey thata* ‘get on/ride a horse’ and the aspectual morpheme *-ko iss* as well. Consider now the example (41).

- (41) Hanako-ga uma-ni not-te iru. [Japanese]
 Hanako-NOM horse-DAT board-TEIRU.PRES
 ‘Hanako is getting on the horse.’ (progressive) or
 ‘Hanako is riding the horse.’ (target state/‘activity-like’ reading)

The lexical meaning of *noru* ‘board’ in (42) is obtained straightforwardly from (36).

- (42) **Lexicon**
 $[[\text{noru}_1 \text{ ‘board/get on/climb onto’}]] = \lambda y . \lambda x . \lambda t . \exists P[[P(x)(t)] \text{ CAUSE } [\text{BECOME } [\text{on}(y)(x)]]]$
 $[[\text{uma ‘(the) horse’}]] = \text{horse}$
 $[[\text{Hanako}]] = \text{Hanako}$
 $[[\text{-te iru}]] = \lambda f_{\langle i, t \rangle} . \lambda t . \exists t_1 [t \subseteq t_1 \ \& \ f(t_1) = 1]$

Truth definition: If the denotation of the sentence applies to the utterance time (c_T) and yields true (i.e., 1), then the sentence is true at the utterance time.

The lexical semantics of the verb *noru* ‘get on’ given in (42) is that of an accomplishment and produces a progressive interpretation. As mentioned earlier, the semantics of *-te iru* posited here is a classical one proposed for the English progressive (Bennett and Partee 1974) and has an extensional semantics: for the sentence to be true at the utterance time, there is a more inclusive time at which the conditions given by the sentence skeleton hold. On the basis of (42), the

semantic computation of (41) proceeds as in (43). Here, the speech time is indicated by c_T (mnemonic for “the context time”).

- (43) 1. $\llbracket \text{uma-ni noru}_1 \text{ ‘climb onto the horse’} \rrbracket =$
 $\lambda x . \lambda t . \exists P [P(x)(t) \text{ CAUSE } [\text{BECOME on (horse)}(x)]]$
2. $\llbracket \text{Hanako-ga uma-ni noru}_1 \text{ ‘Hanako gets on the horse.’} \rrbracket =$
 $\lambda t . \exists P [P(\text{Hanako})(t) \text{ CAUSE } [\text{BECOME on (horse)}(\text{Hanako})]]$
3. $\llbracket \text{Hanako-ga uma-ni not}_1\text{-te iru ‘Hanako gets on the horse + te iru’} \rrbracket =$
 $\lambda t . \exists t_1 . t \subseteq t_1 \ \& \ \exists P [[P(\text{Hanako})(t_1)] \text{ CAUSE } [\text{BECOME on (horse)}(\text{Hanako})]]$
4. **[Truth Definition]**
 $\llbracket \text{Hanako-ga uma-ni not}_1\text{-te iru ‘Hanako gets on the horse + te iru’} \rrbracket = \text{true iff}$
 $\lambda t . \exists t_1 . t \subseteq t_1 \ \& \ \exists P [[P(\text{Hanako})(t_1)] \text{ CAUSE } [\text{BECOME on (horse)}(\text{Hanako})]] (c_T) = 1$
 This is the case iff
5. $\exists t_1 . c_T \subseteq t_1 \ \& \ \exists P [[P(\text{Hanako})(t_1)] \text{ CAUSE } [\text{BECOME on (horse)}(\text{Hanako})]]$

The final line of (43) says that there is a property P that Hanako has at a time that surrounds the utterance time, and the fact that Hanako has P causes her to be on the horse. (43) assumes that the *-te iru* form requires the utterance time to fall within some t which is the time of an accomplishment event (that of climbing onto the horse).³⁸ The reading is that of a progressive sentence: Hanako is climbing onto the horse.

The Aspect Shift rule (37) yields another denotation for *noru* ‘board/ride’ (*noru*₂ to be technically precise) in (44) and allows us to predict the activity (= target state) interpretation. All

³⁸ Strictly speaking, the progressive reading could trigger an imperfective paradox situation: Hanako may not succeed in climbing onto the horse. This possibility necessitates an intensional analysis (or some other equally complex analysis) of the progressive. However, since this is not the central issue in this article, we are content with the extensional semantics for the *-te iru* form.

other expressions used in the sentence have the same denotations as in the accomplishment reading. Note, in particular, that the aspectual morpheme *-te iru* has the same denotation. This setup of our proposal represents the idea that the ambiguity comes from the verb and not from the aspectual morphemes *-te iru/-ko iss*.

$$(44) \quad \llbracket \text{noru}_2 \text{ 'ride'} \rrbracket = \lambda y . \lambda x . \lambda t . \exists R_2 [R_2(y)(x)(t) \text{ CAUSE } [\text{REMAIN on}(y)(x)]]$$

The activity (= target state) reading of (41) is compositionally calculated as in (45).

$$(45) \quad \begin{aligned} 1. & \llbracket \text{uma-ni noru}_2 \text{ 'ride the horse'} \rrbracket = \lambda x . \lambda t . \exists R_2 [R_2(x)(t) \text{ CAUSE } [\text{REMAIN on}(\text{🐎})(x)]] \\ 2. & \llbracket \text{Hanako-ga uma-ni noru}_2 \text{ 'Hanako rides the horse.'} \rrbracket = \\ & \lambda t . \exists R_2 [R_2(\text{🐎})(\text{👧})(t) \text{ CAUSE } [\text{REMAIN on}(\text{🐎})(\text{👧})]] \\ 3. & \llbracket \text{Hanako-ga uma-ni not-te iru 'Hanako rides the horse + te iru'} \rrbracket = \\ & \lambda t . \exists t_1 . t \subseteq t_1 \ \& \ \exists R_2 [R_2(\text{🐎})(\text{👧})(t_1) \text{ CAUSE } [\text{REMAIN on}(\text{🐎})(\text{👧})]] \\ 4. & \text{ [Truth Definition]} \\ & \llbracket \text{Hanako-ga uma-ni not-te iru 'Hanako rides the horse + te iru'} \rrbracket = \text{true iff} \\ & \lambda t . \exists t_1 . t \subseteq t_1 \ \& \ \exists R_2 [R_2(\text{🐎})(\text{👧})(t_1) \text{ CAUSE } [\text{REMAIN on}(\text{🐎})(\text{👧})]] (c_T) = 1 \\ & \text{This holds iff } \exists t_1 . c_T \subseteq t_1 \ \& \ \exists R_2 [R_2(\text{🐎})(\text{👧})(t_1) \text{ CAUSE } [\text{REMAIN on}(\text{🐎})(\text{👧})]] \end{aligned}$$

The last line says that there is some relation R_2 such that the fact that Hanako is related to the horse via R_2 at a time encompassing the utterance time causes the state of her being on the horse to continue. This is an activity-like reading describing continuation of a target state. Since the subject entity is an agentive entity that keeps the target state intact, the Japanese *-te iru* form and the Korean *-ko iss* form are capable of producing this progressive-like reading.

Even when an activity reading involving a target state does not appear to require any specific action on the part of the agent (e.g. riding a train), the agent is still related to the theme in an important way when the target state continues to exist, and this relation is said to cause the target

state to continue. For example, when someone is riding a train, this individual chooses not to exit the train even when that is possible. This is a temporary relation holding between this person and the train and is considered to be the causing proposition in this case.

The adverb facts mentioned in (28a, b) are also accounted for if the second reading of *noru/thata* ‘board’ is an activity rather than an accomplishment. We can say that *for*-adverbials can occur with the target state reading because the verb is used as an activity (i.e., an atelic predicate) with this reading. This proposal allows the Korean morpheme *-ko iss* to receive a straightforward analysis as a ‘progressive marker’ on a par with the English progressive, which is another advantage of our proposal.³⁹

5.2 Pragmatic Extensions

In this subsection, we consider cases in which a relevant target state reading is pragmatically induced even though the verb in question is not a CC verb as defined so far in this article. In the above discussion, we characterized a relevant target state in terms of a non-permanent physical relation involving the agent and the theme. The examples we will briefly discuss here involve target states in which the agentive subject appears to play no role. Here are a couple of relevant example sentences in Japanese.

- (46) a. Hanako-wa ima doa-o ake-te iru. [Japanese]
Hanako-TOP now door-ACC open-TE IRU.PRES
‘Hanako is now keeping the door open (by holding it).’ or
‘Hanako is opening the door.’

³⁹ Since *-ko iss* attached to unaccusative verbs can only indicate progressive interpretations unlike *-te iru*, target state interpretations obtained with unaccusative verbs in the *-te iru* form in Japanese may deserve a different treatment.

b. Hanako-wa ima aite-o taosi-teiru. [Japanese]

Hanako-TOP now opponent-ACC push.down-TEIRU.PRES

‘Hanako is keeping the opponent down on the floor by holding her down.’ or

‘Hanako is in the process of pushing down the opponent.’

In addition to progressive interpretations, both (46a) and (46b) can be used to indicate the continuation of a target state in some special situations as indicated by the English glosses.

Regarding (46a), the relevant situation is where Hanako has opened a spring-loaded self-closing door and is holding it open (for others who want to enter or exit). The door’s state of being open is not really Hanako’s state since it can be described as P_1 in (47a). However, the key is to realize that in the special circumstance being depicted, the target state is maintained thanks to the agent’s involvement; the subject must keep pushing the door so that it stays open. We can think of the agent’s effort to keep the door open in terms of the relation R_2 given in (47a). Regarding (46b), assume the scenario according to which Hanako is fighting against an opponent in a wrestling match. Hanako pushes down her opponent and is now holding her down on the mat. Needless to say, Hanako’s opponent tries to get up again. So Hanako must keep applying force in order to prevent this from happening. This situation can be described in terms the property P_1 and the relation R_2 defined in (47b).

(47) a. $P_1: \{ \langle y, t \rangle \mid y \text{ is open at } t \}$

$R_2: \{ \langle x, y, t \rangle \mid x \text{ pushes } y \text{ at } t \text{ so that } y \text{ stays open at } t \}$

b. $P_1: \{ \langle y, t \rangle \mid y \text{ is lying on the mat at } t \}$

$R_2: \{ \langle x, y, t \rangle \mid x \text{ supplies force against } y \text{ to keep } y \text{ lying on the mat at } t \}$

The target state reading in question is made possible by the fact that the state is maintained by the agent’s continued involvement. In both cases, the state in question cannot be maintained unless the agent keeps exerting some force against the theme’s natural movement. The

corresponding Korean sentences in (48) enable us to make the same conclusion as indicated by the English glosses.

- (48) a. *Minho-nun cikum mwun-ul yel-ko iss-ta.* [Korean]
Minho-TOP now door-ACC open-KOISS-DECL
'Minho is now keeping the door open (by holding it).' or
'Minho is now opening the door.'
- b. *Minho-nun cikum sangtay-lul ssulettuli-ko iss-ta.* [Korean]
Minho-TOP now opponent-ACC push.down-KOISS-DECL
'Minho is keeping the opponent down (on the floor by holding her down).' or
'Minho is in the process of pushing down the opponent.'

We only need to slightly modify (37) for such pragmatically induced “target state” interpretations. We can reason as follows: in the case of genuine CC verbs, the target state semantically encodes the idea that the agent controls the target state since it is described in terms of a relation involving the agent and the theme. With the pragmatically induced examples, we need to see that in the situation being described, the target state is such that the agent must get involved to keep it going. This in turn leads us to conclude that if the target state were to continue, that would be due to the extra efforts on the part of the agent. This can be represented as the causer proposition that involves a transitory relation between the agent and the theme. Let us present our idea more specifically with the example (46a) in mind. Since *akeru* ‘open’ (transitive) is a regular (non-CC) accomplishment verb, the accomplishment interpretation of the sentence skeleton (49a) is given as in (49b). This alone would not yield a target state interpretation. However, when we have reasons to believe that Hanako had some property *P* and this caused the target state to be preserved, we are allowed to create an alternative denotation of the sentence skeleton as shown in (49c).

- (49) a. Hanako-ga doa-o akeru. [Japanese]
 Hanako-NOM door-ACC open
 ‘Hanako open(s) (the) door.’
- b. $\lambda t. \exists P[P(\text{Hanako})(t) \text{ CAUSE } [\text{BECOME open}(y)]]$
- c. $\lambda t. \exists R_2[R_2(\text{the_door})(\text{Hanako})(t) \text{ CAUSE } [\text{REMAIN open}(\text{the_door})]]$

(49c) is the activity-like meaning of (49a) that is licensed only when the pragmatic conditions described above are satisfied. It says that Hanako stands in a relation R_2 to the door and this causes the door to remain open. This is indeed an accurate description of the scenario underlining the special “progressive” reading associated with (46a). A similar analysis would account for the example (46b).

5.3 English Examples

For the purpose of this article, our claim about (37) is limited to Korean and Japanese. English does not show a systematic ambiguity with verbs that correspond to CC verbs in Japanese or Korean. However, there are some English verbs that show some resemblance to the behavior of Japanese or Korean CC verbs. Let us discuss a couple of examples briefly here. We think it is reasonable to claim that (50a, b) are ambiguous between a progressive (= on going process) reading and a target state reading. The target state reading of (50a) is that Chris’s tongue is extended so that the tip of his tongue is already outside of his mouth, and he is keeping it steady. Similarly, (50b) can describe a situation where Robin’s hand is already raised, which is the target state of the telic event of Robin’s raising her hand. These examples suggest that the Japanese and Korean data discussed in this article is not completely language specific, to say the least.

- (50) a. Chris is sticking out his tongue.
 b. Robin is raising her hand.

The reason that these examples work is that the theme object is a physical part of the agentive entity. (50a) and (50b) involve the agent's tongue and the agent's hand, respectively. Thus, we propose the Aspect Shift rule in the English lexicon in (51).

(51) **Aspect Shift Rule in the Lexicon for some special cases [English]**

If a verb V denotes $\lambda y . \lambda x . \lambda t . \exists P[P(x)(t) \text{ CAUSE } [\text{BECOME } R_1(y)(x)]]$ where R_1 is a stable physical relation between two entities such that for any entities α, β such that β is a physical part of α , if $R_1(\beta)(\alpha)(t_1) = 1$ for a time t_1 , there is a time $t_2 > t_1$ such that $R_1(\beta)(\alpha)(t_2) = 0$, there is an alternative denotation of V: $\lambda y . \lambda x . \lambda t . \exists R_2[R_2(y)(x)(t) \text{ CAUSE } [\text{REMAIN } R_1(y)(x)]]$.

Note that in (51) is restricted to those cases in which the theme entity is a body part of the agent. (51) correctly sanctions examples like (50a, b) and excludes cases that involve verbs like *board* and *put on*. This means that the generalization we found with Japanese and Korean CC verbs apply to English with much stricter conditions. Thus, it is correct for us to restrict the application of (37) to just Japanese and Korean.

6. Conclusion

This article proposes a formal semantic analysis of verbs like *noru/thata* ‘board’ and *kiru/ipta* ‘put on’ in Japanese/Korean, which exhibit target state readings (along with progressive readings) that are not predicted by the standard lexical denotations assigned to English accomplishment verbs like *board (the bus)* and *put on (a sweater)*. Our proposal accepts the ambiguity thesis of each such verb (which we refer to as a CC (continuous causative) verb) but predicts the two readings in a systematic way by positing an Aspect Shift Rule in the lexicon in the spirit of de Swart (1998) and a semantic constraint that goes with this rule. The basic idea is

described as follows: (i) The target state is described in terms of a relation holding between the agent and the theme; (ii) Since the agent is by definition agentive, this individual holds the key regarding whether this state continues; (iii) Given this assumption, we can say that the state continues to exist if the agent stands in some appropriate relation to the theme; (iv) This possibility yields a target state (activity-like) interpretation: there is a relation R_2 such that the fact that the agent is related to the theme via R_2 keeps the target state alive. Since the agentive subject plays a major role in sustaining the target state, the verb used for a target state reading counts as an activity, and *-te iru/-ko iss* in Japanese and Korean can yield “progressive-like” interpretations of the target state. This is particularly important for *-ko iss* in Korean because this form generally only produces progressive interpretations (rather than result state interpretations of any variety).

We adopted the idea that the ambiguity results from an Aspect Shift rule that uniformly applies to CC verbs. Unlike aspect shifts coerced by co-occurring grammatical constructions or adverbials as discussed by de Swart (1998), these “shifts” are smooth and are not coerced in any way. The choice between these two readings is made by the discourse context in that the reading that makes more sense is chosen as the actual interpretation. Our research presented here shows that Aspect Shifts that are smooth, unmarked and requires no coercion are possible.

Our discussion of CC verbs centered on Japanese and Korean. However, we do not believe that this is an idiosyncratic phenomenon that concerns just these two languages. A small number of English verbs show similar behavior as we saw above, and the examples in question involve theme entities that are body parts of the agents. Since it is natural to see the continuation of a target state controlled by the agentive entity as an atelic event, some languages other than Japanese and Korean might employ the same strategy in naming this type of event. We will eagerly await research results that cover more cross-linguistic data regarding this topic.

Acknowledgements Preliminary versions of this article were presented at a Semantics Roundtable meeting at the University of Washington on May 25, 2016, and at a Semantics

Workshop in Tokai meeting in Nagoya, Japan on August 11, 2016. We thank the participants of these meetings for their comments and encouragement. In particular, we would like to thank Edith Aldridge, Barbara Citko, Takenobu Fukushima, Chris Kennedy, and the JEAL reviewers for comments, and their help in many ways. We also wish to thank the editorial assistance we received from Kristen Howell and Bryan Thompson. We finally wish to thank Vali Tamm for her copyediting work. All errors and inadequacies are of course ours.

References

- Ahn, Pyeong-ho and Takenobu Fukushima. 2005. Chuusei-makki nihongo to gendai kankokugo no tensu • asupekuto taikai: Sonzai-gata asupekuto no bunpooka no doai [Tense-Aspect systems of Late Medieval Japanese and Modern Korean: The problem of grammaticalization]. *Nihongo no Kenkyuu* 1-3: 139-154.
- Bennett, Michael and Barbara Partee. 1974. *Toward the Logic of Tense and Aspect in English*. Distributed by Indiana University Linguistics Club, Bloomington.
- Chae, Hee-Rahk. 2018. The structural ambiguity of the (im)perfective [V-ko iss-] in Korean. *Journal of East Asian Linguistics* 27: 377-411.
- Dowty, David R. 1979. *Word meaning and Montague grammar*. Dordrecht: Kluwer.
- Fintel, von Kai and Irene Heim. 2011. *Intensional Semantics*, manuscript, MIT.
- Fujii, Tadashi. 1966, Dooshi+te iru no Imi [The Meaning of V-te iru], *Kokugo Kenkyuushitsu* 5. Tokyo: Tokyo University. Reprinted in Kindaichi (1976), pp. 97–116.
- Hamanoue, Miyuki. 1992. Gendai Choosengo no kekkasoo = jyootai paafekuto — doosapaafekuto tono taihi wo chuushin ni — [On the Resultative, or Statal Perfect, in Modern Korean — focusing on the comparison with action perfect]. *Choosen Gakuhoo* [Journal of the Academic Association of Koreanology in Japan] 142: 41-108.
- Jacobsen, Wesley M. 1992. *The Transitive Structure of Events in Japanese*, Tokyo: Kurosio Shuppan.

- Kawana, Yasuko. 2000. Shutai henka wo arawasu tadooshibun no bunseki. [An analysis of sentences containing transitive verbs which involve the change of the agent.] *Tsukuba Nihongo Kenkyuu* 5: 39-52.
- Kennedy, Chris. 2011. Ambiguity and Vagueness: An Overview. In *Semantics: An International Handbook of Natural Language Meaning*, Volume 1, eds, Claudia Maienborn, Klaus von Heusinger and Paul Portner, 507–535, Berlin: de Gruyter.
- Kim, Min-Joo. 2009. A Fresh look at the Ambiguity Puzzle of KO ISS Imperfective in Korean. *Proceedings of the 2nd International Conference on East Asian Linguistics*. Vancouver: Simon Fraser University.
- Kindaichi, Haruhiko. 1950. Kokugo dooshi no ichibunrui [A classification of Japanese verbs]. *Gengo Kenkyuu* 15: 48–63. Reprinted in Kindaichi (1976), pp. 5-26.
- Kindaichi, Haruhiko. (ed.) 1976. *Nihongo Dooshino Asupekuto* [Aspectual Properties of Japanese Verbs]. Tokyo: Mugi Shoboo.
- Kudo, M. 1995. *Asupekuto, Tensu Taikei to Tekusuto: Gendai Nihongo no Jikanno Hyougen* [The structure of Tense ad Aspect, and Text]. Tokyo: Hituzi Syobo.
- Landman, Fred. 1992. The Progressive, *Natural Language Semantics* 1: 1-32.
- Lee, EunHee 2008. Argument Structure and Event Structure: the Case of Korean Imperfective Construction. *Journal of East Asian Linguistics* 17: 117-139.
- Lewis, David. 1973a. *Counterfactuals*. Cambridge: Harvard University Press.
- Lewis, David. 1973b. Causation, *The Journal of Philosophy* 70: 556-567.
- Maslov, Jurij S. 1988. Resultative, perfect, and aspect. In *Typology of Resultative Constructions*, ed. Vladimir P. Nedjalkov, 63-85. Amsterdam: John Benjamins.
- Matsumoto, Yo. 1996. Subjective-change expressions in Japanese and their cognitive linguistic bases. In *Spaces, worlds, and grammar*, eds. Gilles Fauconnier and Eve Sweetser, 124-156. Chicago: University of Chicago Press.
- McClure, William T. 1995. *Syntactic Projections of the Semantics of Aspect*, Tokyo: Hituzi Syobo.

- Nishiyama, Atsuko. 2006. The Meaning and Interpretation of the Japanese Aspect marker *-te i-*, *Journal of Semantics* 23: 185-216.
- Ogihara, Toshiyuki. 1998. The ambiguity of the *-te iru* form in Japanese. *Journal of East Asian Linguistics* 7: 87-120.
- Ogihara, Toshiyuki. 1999. Tense and Aspect, in Natsuko Tsujimura, ed. *The Handbook of Japanese Linguistics*, pp. 326-348. Oxford: Blackwell
- Ogoshi, Naoki. 1995. Chosengo *hayss-ta* kei, *hayiss-ta* kei (*hako iss-ta* kei) to Nihongo *shita* kei, *shiteiru* kei [Korean constructions *hayss-ta*, *hayiss-ta*, (*hako iss-ta*) and Japanese constructions *-ta* (past) and *-te iru*]. *Kenkyuu Houkokushuu* 16: 185-206, Kokuritsu Kokugo Kenkyuujo [National Institute for Japanese Language and Linguistics].
- Okuda, Yasuo. 1978a. Asupekuto no kenkyuu o megutte (zyoo) [On the study of aspect (I)]. *Kyoiku Kokugo* 53: 33-44.
- Okuda, Yasuo. 1978b. Asupekuto no kenkyuu o megutte (ge) [On the study of aspect (II)]. *Kyoiku Kokugo* 54: 14-27.
- Park, Chongwon. 2014. The ambiguity and alternative construals of the [X-ko iss-ta] construction in Korean. *Korean Linguistics* 16: 18-50.
- Parsons, Terence. 1990. *Events in the Semantics of English*. Cambridge: MIT Press.
- Perlmutter, David M. 1978. Impersonal passives and the Unaccusative Hypothesis. In *Proceedings of the 4th Annual Meeting of the Berkeley Linguistics Society*, 157-189. Berkeley: Berkeley Linguistics Society.
- Portner, Paul. 1998. The Progressive in Modal Semantics, *Language* 74: 760-87.
- Reichenbach, Hans. 1947. The tenses of verbs. In *Elements of symbolic logic*, 287-298. New York: The Macmillan Company.
- Shirai, Yasuhiro. 2000. The semantics of the Japanese imperfective *-teiru*: An integrative approach. *Journal of Pragmatics* 32: 327-361.
- Son, Minjeong. 2004. The Syntax and Semantics of the Ambiguity of *-ko iss-* in Korean. In *Proceedings of WCCFL 23*, 101-114. Somerville: Cascadilla Press.

- Swart, de Henriette. 1998. Aspect shift and coercion, *Natural Language & Linguistic Theory* 16: 347–385.
- Takezawa, Koichi. 1991. Judootai, nookakubun, bunri-fukanoo shoyuu koobun to *-te iru* no kaishaku [Passive, Ergative case, Inalienable Possession, and the Interpretation of *-te iru*]. In *Nihongo no boisu to tadoosei* [The Voice and Transitivity in Japanese], ed. Y. Nitta, 59-81. Tokyo: Kurosio Shuppan.
- Toruhina, Anna. 2014. Iwayuru “Saikikoubun’ to sono genkai — tadooshi no teiru kei ga kekka zanzon wo arawasutoki towa — [On the so-called reflexive constructions and their limits — when transitive verbs in the *-te iru* form yield result state interpretations]. *Nihongo Bunpoo* v14 n1: 20-36.
- Vendler, Zeno. 1967. *Linguistics in Philosophy*. Ithaca, New York: Cornell University Press.
- Zwicky, Arnold and Jerrold Sadock 1975. Ambiguity Tests and How to Fail Them. In *Syntax and Semantics* 4, ed. John P. Kimball, 1-36. New York: Academic Press.