On the Semantic Properties of Unaccusativity*
Natsuko Tsujimura
Indiana University

Abstract
Although much research has been conducted on unaccusativity, the question as to what makes a verb unaccusative is yet to be answered. Unaccusative mismatches provide significant contribution to the investigation of the true nature of unaccusativity. Two instances of unaccusative mismatches are examined on the basis of Japanese data. It is shown that the notions of inherent direction and lack of protagonist control are crucial to characterizing the determining properties inherent to unaccusativity. This work provides strong cross-linguistic evidence for Levin & Rappaport’s (1988) proposal.
(Area of interest: syntax)

0. Introduction
Since the work on unaccusativity by Perlmutter (1978), a number of diagnostic tests for unaccusativity have been discussed in the literature. Such tests are “diagnostic” in that they are apt to identify unaccusative verbs, but they do not reveal more fundamental properties inherent to unaccusativity. The question of what makes a verb unaccusative is yet to be answered.

The focus of one of the most common disputes regarding unaccusativity is on the question of whether unaccusativity should have its foundation in syntax or in semantics. The former position has been defended by Rosen (1984), who claims that a semantically coherent group of verbs exhibit syntactically different behavior within and across languages and thus the semantic approach should be abandoned. For example, among the verbs which can be categorized as “involuntary bodily processes” such as snore and blush, the words corresponding to English snore are all unergative in Italian, Albanian, and Dutch while those corresponding to English blush are all unaccusative in the same set of languages. On the other hand, the word whose meaning is equivalent to English sneeze is unergative in Italian, but it is unaccusative in Eastern Pomo. Hence, Rosen supports the syntactic encoding of unaccusative verbs as having the underlying object which surfaces as subject in the course of a derivation. This syntactic encoding of unaccusative verbs is further elaborated in the Government and Binding framework (Burzio (1986)). (1) shows the proposed difference in the syntactic encoding between unergatives and unaccusatives.
By contrast, such a syntactic approach has been refuted by Van Valin (1987), Napoli (1988), and Zaenen (1987), among others. Van Valin, for instance, defends the semantic approach by observing unaccusatives behave differently in each language, and each language is parameterized as to whether unaccusatives in the language are sensitive to agency or to aspectual properties inherent to the verb. Zaenen also shows that impersonal passivization, which has been proposed to be an unaccusative diagnosis by Perlmutter (1978), is sensitive to protagonist control, regardless of whether the verb is unergative or unaccusative. All these authors, thus, conclude that syntactic distinction between unergatives and unaccusatives is not well founded at all.

Despite the progress made from both a syntactic approach and a semantic approach, it is still not clear what the true nature of unaccusativity is. However, recently, there have been some attempts to explore the defining properties of unaccusativity. Levin & Rappaport (1989) and Levin (1990) take the position that unaccusativity is syntactically represented but semantically determined. The syntactic encoding such as in (1) should be maintained because unaccusative verbs and passives exhibit a similar set of behavior in unaccusative diagnostics, and yet they do not share anything common semantically. The syntactic representation, then, would be the only mechanism to bridge this gap. On the other hand, the semantic determination of unaccusatives should not be ignored especially when we take language acquisition issues into consideration. For these reasons, Levin & Rappaport claim that syntactic representation and semantic determination should go side by side.

Under such a hypothesis, Levin & Rappaport investigate the semantic properties which would lead to the determination of unaccusativity by looking at unaccusative mismatches. What is meant by unaccusative mismatches is "the situation in which different unaccusative diagnostics single out different classes of intransitive verbs within and across languages" (Levin & Rappaport 1989:2). Unaccusative mismatches are particularly interesting in that they contribute to capturing crucial semantic differences when different diagnostics pick out (what seem to be) semantically incoherent groups of verbs. That is, identifying what is semantically common among the verbs that are singled out by the diagnostic would lead to a true characterization of unaccusativity. After surveying verbs of motion in English, Levin & Rappaport claim that the following two generalizations are relevant (at least to verbs of motion).

(2) Generalization 1: Verbs whose meaning includes a specification of inherent direction are found in the unaccusative syntactic configuration.

Generalization 2: If the meaning of the verb specifies a direct external cause, then the verb is unaccusative, and otherwise it is unergative.

Levin & Rappaport further discuss that in order to maintain the assumption that unaccusativity is syntactically represented and semantically determined, the following three steps would need to be followed.

(3) (i) Identify the diagnostics that indeed test for unaccusative syntactic configuration.
(ii) Isolate the significant components of meaning which correlate with unaccusative or unergative syntactic configuration.
(iii) Determine the exact correlations between meaning and syntactic structure.

The nature of this paper is empirical: I will follow each step in (3) and examine two instances of unaccusative mismatches in Japanese. Then, I will investigate the cross-linguistic relevance of the two generalizations in (2) on the basis of the Japanese data.

1. Diagnostic Tests For Unaccusativity

In order to maintain the position that unaccusatives are syntactically represented but semantically determined, it is necessary to isolate diagnostic tests for unaccusativity in Japanese, as suggested by (3i). The unaccusative diagnostics in Japanese
include Numeral Quantifiers, Resultative Constructions, and so-called -TE IRU and -TE ARU constructions. Miyagawa (1988a, 1988b, 1988c, 1989a, 1989b) extensively discusses Numeral Quantifiers (NQ's) and claims that they provide a reliable diagnosis for unaccusativity. When objects or persons are counted, classifiers are necessarily suffixed to the numerals in Japanese. The classifiers that accompany NQ’s vary depending on the characteristics of what is counted. For example, -nin is used when human beings are involved while -hon1 is used when long and cylindrical objects are counted.

(4) Gakusei-ga go-nin kita.
    students-Nom five-cl came
    ‘Five students came’

(5) John-ga pen-o san-bon katta.
    John-Nom pen-Acc three-cl bought
    ‘John bought three pens’

Miyagawa claims that a noun and its NQ must be in a mutual c-command relationship. This constraint can be observed in the contrast between (6) and (7) below. (The hierarchical structure for each example is illustrated immediately below it.)

(6) a. Gakusei-ga go-nin neta.
    students-Nom five-cl slept
    ‘Five students slept’

   a'. 
        S  
      / |  
     NP NQ VP
    /         
   gakusei-ga go-nin neta

    John-Nom pen-Acc three-cl bought
    ‘John bought three pens’

   b'. 
        S  
      / |  
     NP NQ VP
    /         
   gakusei-ga pen-o san-bon katta

In (6), the NQ and the noun of which the NQ is predicated are in a mutual c-command relation: In (6a), the NQ is predicated of the subject while the NQ is predicated of the object in (6b), and the mutual c-command holds between the NQ and the subject in (6a’) and between the NQ and the object in (6b’). Such a mutual c-command relation is not observed in (7) between the specifier of the subject (i.e., gakusei ‘student’) and the NQ (i.e., san-nin ‘three people’) in (7a’) and between the subject (i.e., gakusei) and the NQ (i.e., san-nin) in (7b’). Rather, what the structural configuration suggests is that the NQ in (7a’) would be predicated of the head noun of the subject NP, i.e., neko ‘cat’, and that the NQ
in (7b') would be interpreted with the object pen ‘pen’. Thus, the intended reading fails to be obtained.

Given the constraint on NQ, the following sentence is predicted to be ungrammatical.

(8) Doa-ga [vp kono kagi de huta-tu aita]
door-Nom this key with two-cl opened ‘Two doors opened with this key’ (Miyagawa’s (12))

The subject doa c-commands the NQ expression huta-tu, but the NQ does not c-command the subject because it is within the VP. Contrary to the prediction, the sentence is grammatical. Miyagawa explains this discrepancy as follows: The verb akuruma is unaccusative, and the subject doa is in the object position at D-structure. For case theoretic reasons (Burzio (1986)), the underlying object must move to the subject position. Since the trace of the surface subject stays within VP, maintaining a mutual c-command relation with the NQ, the sentence is grammatical.

The second diagnostic test comes from the Resultative Construction. As Simpson (1983) discusses extensively, the Resultative Construction is a reliable test for unaccusativity in English. Simpson claims that the resultatives are always predicated of direct object regardless of whether the objecthood is defined at D-structure or S-structure. With a transitive verb, thus, the resultative is straightforwardly predicated of the object, as in (9).

(9) John hammered the metal flat.

where flat is the resultative, which is predicated of the object metal. The interpretation of (9) is that the metal became flat as a result of John’s having hammered it. The generalization of objecthood as a controller of a resultative, thus, explains why resultatives with intransitive verbs do not generate grammatical sentences, as is demonstrated by sentences like *I danced tired. However, there is a group of intransitive verbs with which Resultative Constructions are acceptable. (10) provides an instance.

(10) a. The ice cream froze solid.

b. The butter melted to a liquid.

c. The vase broke into pieces.

The reason why sentences like (10) are grammatical, according to Simpson, is that the verbs in (10) are unaccusative and the subject originates from the object position at D-structure. Since the surface subject is the underlying object, the resultative can be predicated of it, resulting in an acceptable sentence.

Miyagawa (1989b) and Tsujimura (1990a,b) claim that the situation is identical in Japanese. Resultatives are predicated of the object of a transitive verb as well as of the surface subject of an unaccusative verb. (11-12) show the two cases.

(11) John-ga kuruma-o akaku nutta.

John-Nom car-Acc red painted ‘John painted the car red’

(12) Pan-ga makkuroni kogeta.

toast-Nom really black burned ‘The toast burned really black’

The verb in (11) is a transitive verb, and the direct object of the verb kuruma ‘car’ is the controller of the resultative akaku ‘red’. On the other hand, the verb in (12) is unaccusative. The surface subject pan ‘bread’ is the underlying object at D-structure, of which the resultative makkuroni ‘really black’ is predicated. Hence, the Resultative Construction provides a crucial test for unaccusativity.

The availability of a particular interpretation in the -TE IRU construction also serves as a diagnostic test for unaccusativity. The -TE IRU comprises the gerund form of a verb and IRU ‘be, exist’, expressing various meanings depending on the type of verb that is used in this construction. The interpretations crucial to the present discussion are the progressive interpretation and the “resultative state” interpretation*. The latter further means “the state resulting from the action taking place and changing things” (Martin (1987:517)). The examples of the two interpretations are demonstrated in (13-14).

(13) Taroo-wa asa-kara eigo-o benkyoo-site iru.

Taro-Top morning-from English-Acc study-do ‘Taro has been studying English since this morning’
(14) Hanako-wa amerikazin-to kekkon-site iru.
Hanako-Top American-with marry-do
'Hanako is married to an American'

(13) illustrates only the progressive reading: The action of Taro's studying started this morning and is still continuing. On the other hand, (14) does not express such a progressive activity, but describes the state in which Hanako is: Hanako IS married as a result of having gotten married on her wedding day. Not every verb is associated with both interpretations, as we observed in (13-14). Takezawa (1989) suggests that the "resultative state" interpretation is available with unaccusatives but not with unergatives. Contrast the following two sentences:

(15) Masao-wa ima eki-no mae-o aruite-iru.
Masao-Top now station-Gen front-along walk
'Masao is walking in front of the station right now'

(16) Mado-ga zenbu aite-iru.
window-Nom all open
'All the windows are open'

The verb aruke 'walk' in (15) is unergative, and the "resultative state" interpretation is not available while aku 'open' in (16) is unaccusative, thus allowing for the interpretation.

There is yet another construction to which verb classifications are sensitive. Shigeru Miyagawa (personal communication) informs me that the so-called -TE ARU construction can be considered a diagnostic test for unaccusativity. The -TE ARU construction is formed by suffixing ARU to the gerund form of a verb, and it refers to the state which is a result of the action denoted by the verb to which ARU is suffixed.

(17) Mado-ga ake-te aru.
window-Nom open
'The windows have been opened'

(18) Kabin-ga kowasi-te aru.
vase-Nom break
'The vase has been broken'

(17) describes the state where the windows are open as a result of someone's having opened them, and (18) means that someone broke the vase, and, as a result, the vase is in the state of being broken. Notice that the verbs with which the -TE ARU construction is formed are transitive verbs. Miyagawa observes that -TE ARU can cooccur only with transitive verbs such as in (17-18) and unergative verbs like asobu 'play', but not with unaccusatives, as is seen in *tuite aru (tuite = gerund of tuku 'arrive') and *aite aru (aite = gerund of aku 'open').

The -TE IRU and -TE ARU constructions are quite similar in meaning, both expressing a state as a result of some action. A crucial difference, however, is whether the agent of the action is implied or not. The -TE ARU construction does imply an agent whereas the -TE IRU construction does not. I will come back to this point in Section 2.2 below.

The first two diagnostic tests introduced earlier, namely NQ's and Resultative Construction, are syntactic in nature in that they both refer to particular grammatical functions defined in hierarchical structure. Setting up these two diagnostic tests satisfies the first step in (3). On the other hand, -TE IRU and -TE ARU appear to be sensitive to the verb's semantic properties. Thus, both constructions may contribute to the investigation of semantic properties of unaccusativity, and for this reason, I will return to these constructions in relation to unaccusative mismatches.

2. Unaccusative Mismatches in Japanese

Levin & Rappaport (1989) and Levin (1990) discuss the relevance of unaccusative mismatches to the study of unaccusativity. In this section I will show two instances of unaccusative mismatches in Japanese, which will provide support for the generalizations on unaccusativity claimed in Levin & Rappaport (1989). Before doing so, however, I would like to introduce the three-way classification of verbs of motion as well as the semantic generalizations pertinent to unergative and unaccusative verbs proposed in Levin & Rappaport.

In looking at verbs of motion, Levin & Rappaport divide intransitive verbs into three classes: (i) arrive class, (ii) roll class, and (iii) run class. The membership of each class is illustrated in (19).
(19) a. **arrive** class: arrive, come, go, depart, fall, return, descent  
b. **roll** class: roll, slide, move, swing, spin, rotate  
c. **run** class: run, walk, gallop, jump, hop, skip, swim

They further capture semantic properties inherent to each group. The summary of their observations is in (20).

(20) a. **arrive** class: direction  
b. **roll** class: manner, no protagonist control  
c. **run** class: manner, protagonist control

Given the classification along with the semantic characterization of each class, they propose the two generalizations introduced earlier in (2), which I repeat below as (21).

(21) Generalization 1: Verbs whose meaning includes a specification of inherent direction are found in the unaccusative syntactic configuration.

Generalization 2: If the meaning of the verb specifies a direct external cause (=no protagonist control [NT]), then the verb is unaccusative, and otherwise it is unergative.

These generalizations predict that the **arrive** class is unaccusative, the **roll** class is usually unaccusative, and the **run** class is usually unergative.

In order to see whether such a correlation can be observed in Japanese, we first classify the verbs of motion in Japanese according to the criteria in (20).

(22) A: verbs with inherent direction

- **tuku** 'arrive'
- **iku** 'go'
- **kuru** 'come'
- **agaru** 'rise'
- **otiru** 'fall'

B: verbs of manner, with no protagonist control

- **korogaru** 'roll'
- **hazumu** 'bounce'
- **suberu** 'slide'
- **ukabu** 'float'

C: verbs of manner, with protagonist control

- **hasiru** 'run'
- **hau** 'crawl'
- **haneru** 'jump'
- **oyogu** 'swim'
- **tobu** 'fly'
- **suberu** 'slide'

The verbs belonging to group A all imply inherent direction, and some of them, such as **tuku** 'arrive', **otiru** 'fall', and **kaeru** 'return' have an inherent endpoint. The group B and group C verbs express manner of motion, but they differ with respect to the presence or absence of protagonist control over the action denoted by the verb.

The application of a syntactic diagnostic test such as NQ to verbs in each class demonstrates that the grouping in (22) corresponds to (19) in English in regard to the type of verbs. Thus, the type A and type B verbs are unaccusative while the type C verbs are unergative. This is evidenced by a syntactic diagnostic test of NQ.

(23) Group A

Gakusei-ga osoku san-nin tuita.
student-Nom late three-cl arrived
'Three students arrived late'
(24) Group B
Booru-ga kaze-de mit-tu korogatta.
ball-Nom wind-by three-cl rolled
'Three balls rolled because of the wind'

(25) Group C
a. ?*Gakusei-ga kodomo-to san-nin hasitta.
student-Nom children-with three-cl ran
'Three students ran with the children'

b. ?*Gakusei-ga kodomo-to inukaki-de san-nin oyoida.
student-Nom children-with dog paddling-by three-cl swam
'Three students swam with the children by dog paddling'

Osoku ‘late’ in (23) and kaze-de ‘by wind (because of the wind)’ in (24) are both VP-intemal adverbs and thus the NQ’s are also internal to the VP. Then, the subjects of the sentences gakusei ‘students’ and booru ‘ball’ are not in a mutual c-command relation with their respective NQ’s. However, the sentences are fine with the intended interpretations. Thus, the subjects of these sentences must have moved from the D-structure object position with which the NQ’s can maintain a mutual c-command relation. Therefore, the NQ test suggests that the verbs in (23) and (24) appear in the unaccusative syntactic configuration. The structural configurations of (25) at S-structure are the same as those in (23-24). The ungrammaticality, then, suggests that the verbs in (25) are unergative.

2.1 Mismatches in Group C Verbs
Given that the group C verbs are unergative, they should generate ungrammatical sentences when a VP-intemal NQ is predicated of the subject, as is demonstrated in (25) above. Contrary to this prediction, there are cases in which such an illicit mutual c-command relation is allowed with the group C verbs. Consider the examples in (26).

(26) a. Gakusei-ga kisi-made inukaki-de san-nin oyoida.
student-Nom shore-as far as dog paddling-by three-cl swam
'Three students swam to the shore by dog paddling'

Since oyogu and hasiru are unergative, the VP-intemal NQ’s should not be able to be predicated of the subject, but, in fact, they are. What is crucially different in (26) from (25) is that in (26) both sentences have a goal phrase, which adds a specification of inherent direction as well as an endpoint to the original meaning of the verb and makes the verb function like a group A verb. That is, the addition of a goal phrase to the verbs in group C makes them undergo a shift in their semantic class. The syntactic test of NQ clearly shows that the verbs in (26) are actually unaccusative: the subjects of the sentences in (26) are both predicated of the VP-intemal NQ’s (san-nin ‘three-cl’). Recall that this type of configuration is possible only when the verbs are unaccusative, as we have observed in (23-24) above. This provides strong evidence that the generalization 1 in (21) is relevant to Japanese as well and that the notion of inherent direction may crucially characterize unaccusativity.

A similar phenomenon can be observed in regard to the -TE IRU construction. As mentioned above, the availability of the “resultative state” interpretation is a good diagnostic for unaccusativity, as Takezawa (1989) discusses. It is predicted that the “resultative state” interpretation is observed only with group A and group B verbs, but not with group C verbs. This prediction is usually borne out, as the following examples illustrate.

(27) Ryokookyaku-ga moo ryokan-ni tuite-iru.
travelers-Nom already inn-at arrive
'The travelers have already arrived at the inn'

(28) Taiboku-ga ano hen-ni korogatte-iru.
large tree-Nom that area-at roll
'Large trees have rolled in that area'

(29) Kodomo-tati-ga umi-de oyoide-iru.
child-pl-Nom ocean-in swim
'Children are swimming in the ocean'

The unaccusative verbs in (27) and (28) both display the availability of the
"resultative state" interpretation, but the unergative verb in (29) exhibits only the progressive reading. That is, (27) describes the state in which the travelers are at the inn, which resulted from their arrival; and (28) depicts the stative condition of large trees lying down as a result of their having rolled from somewhere. By contrast, (29) lacks such a stative description of the children.

Nevertheless, when a goal phrase is added to the sentence in (29), the "resultative state" interpretation is obtained.

(30) Kodomo-tandi-ga koko-kara iti-kiro-no tokoro-made
child-pl-Nom from here to one-kilometer-Gen place-as far as moo san-nin oyoide-iru.
 already three-cl swim
'Already three children have swum one kilometer from here'

The presence of the goal phrase (koko-kara iti-kiro-no tokoro-made) 'from here as far as one kilometer' makes the sentence accessible to the "resultative state" interpretation. In this case the "resultative state" might be related to a presentational function, which is typically observed in unaccusative construction as well as locative inversion, as discussed by Bresnan & Kanerva (1989) and Levin (1990), among others. That is, (30) means that there already exist three children who have swum one kilometer from here, focusing on the existence of such children. The goal phrase in (30) functions as a delimeter of the swimming action, and accordingly, inherent direction is expressed. On semantic grounds, thus, a goal phrase in the -TE IRU construction appears to qualify unergative verbs as unaccusative. Syntactically, (30) also demonstrates that a verb of group C with a goal phrase appears in the unaccusative configuration. The VP-internal NQ san-nin 'three-cl' is construed with the subject, which is possible only in the unaccusative configuration.

In regard to the effect of the addition of a goal phrase observed in (26), it is interesting to take a closer look at possible goal phrases in Japanese. There are basically three postpositions which may indicate goal when they cooccur with a noun. The postpositions are -ni, -e, and -made.

(31) John-ga uti-ni kaetta.
John-Nom home-to returned
'John returned home'

L. Levin et al. (1988) analyze phrases such as uti-ni 'to(ward) home' in (31) as a goal phrase, and concluded that unergatives such as oyo 'swim' with a N-ni phrase, as in (34), cannot be saved unless the verb is changed to a compound verb like (35), and that the combination of manner and directed motion often requires the morphological compounding (p.14), as (35) suggests.

(32) Mary-ga watasi-no heya-te tazunete-kita.
 Mary-Nom I-Gen room-to visit-came
'Mary visited my room'

(33) Taro-ga gakkoo-made zitensya-de kita.
Taro-Nom school-as far as bicycle-by came
'Taro came to school by bicycle'

Contrary to their conclusion, I claim the two postpositions ni and e on the one hand, and made, on the other, are slightly different. According to Jorden (1987), ni indicates that the motion denoted by the verb moves to or into or onto a location while made implies the motion moves to and including a location but not beyond. Thus, made marks the endpoint of the motion much more clearly than ni. In order to change the status of a verb from unergative to unaccusative, a simple specification of direction does not always seem to be sufficient, and, for such a change to occur, a verb must necessarily have added to it the notion of the final limit as clearly as possible. Also, the suffixation of the unaccusative iku to the unergative oyo as in (35) makes the complex verb function as an unaccusative verb because iku 'go', as an unaccusative verb itself, includes a specification of inherent direction in its meaning. The syntactic test of NQ shows that the complex verb, in fact, appears in the unaccusative configuration.
The change observed in the group C verbs from unergative to unaccusative is consistent with the basic idea of lexical decomposition, which was originally observed by Talmy (1975, 1985) and was later formalized as 'lexical subordination' by Levin & Rapoport (1988). In English, the verb *float* in *The bottle floated into the cave* has two meanings; one is manner of motion and the other is directed motion. Levin & Rapoport claim that the latter meaning is derived by the operation called 'lexical subordination'. The effect of this operation can be seen in the following lexical structure of the verb *float*.

(37) a. *float: [x MOVE in-a-floating manner]*
    b. *float: [x GO TO y BY [x MOVE in-a-floating manner]]*

The structure of (37b) is derived by the application of lexical subordination to (37a). Such a lexical operation is thus attested in Japanese. Given the change of the verb *nyōgu* 'swim', for example, from unergative to unaccusative, then, the two instances of the verb *nyōgu* 'swim' can be expressed as in (38).

(38) a. *nyōgu: [x MOVE in-a-swimming-manner]*
    b. *nyōgu: [x GO TO y BY [x MOVE in-a-swimming-manner]]*

The structure in (38a) corresponds to the verb in (34), where the verb simply expresses manner of motion whereas (38b) represents the lexical structure of the verb in (26a), where the verb expresses both manner of motion and inherent direction (or, more precisely, inherent direction with a specific endpoint).

The unaccusative mismatch observed in the group C verbs is what we expect given that generalization 1 of (21) holds for Japanese verbs of motion. Furthermore, the discussion on the contrast between (26a) and (34) suggests that a strong specification of the endpoint of the motion is sometimes required for an unergative manner of motion verbs to appear in the unaccusative configuration. Thus, the notion of inherent direction as well as delimitedness, in the sense of Tenny (1987), provides a partial answer to the second point raised in (3), and plays a significant role in capturing the nature of unaccusativity.

2.2 Mismatches with the -TE ARU Construction

As briefly sketched above, the -TE ARU construction is formed by the suffixation of ARU to the gerund of a verb, describing a state resulting from the action denoted by the verb. This construction is allowed with transitive and unergative verbs, but is disallowed with unaccusatives. One of the characteristics which is inherent to this construction, but which is missing in the -TE IRU construction, is that the agent of the action is implied although it is unknown or its mentioning is avoided (Martin (1987)). Thus, it can be concluded that the -TE ARU construction requires protagonist control to be specified in the sentence. It follows, then, that the group B verbs do not appear with -TE ARU construction since, by definition, they lack protagonist control. The constraints on the construction also explain why -TE ARU cannot be formed with some unaccusative verbs which express change of state such as *kareru* 'wither', *kooru* 'freeze', and *hiiru* 'get cold'. These verbs never imply protagonist control because the change of state described by the verb happens outside human control.

Judging from the behavior of group B, we might want to conclude that lack of protagonist control is a property of unaccusatives. Before we reach the conclusion, however, there are two questions to be answered with respect to group A, since the group A verbs are also categorized as unaccusative but their behavior within the -TE ARU construction has not been fully investigated. First, the subjects of the verbs of this class are not always agentive, in which case a violation should result, given our assumptions. This prediction is borne out, as we can see in (39).

    parcel-Nom come because take-to come-please
    'A parcel has come, so please come to pick it up'
    b. *Sensei-kara-no tegami-ga tuite-arimasu.*
    teacher-from-Gen letter-Nom arrive
    'A letter from my teacher has arrived'
Neither a parcel nor a letter from a teacher can control the action denoted by the verb, and the sentences are judged as ungrammatical.

The second question is how the group A verbs, when they are interpreted as agentive, behave in the -TE ARU construction. When the verbs in group A are agentive, the degree of their ungrammaticality should not be as bad as with the group B verbs or as bad as (39) since the presence of agency is a necessary condition for the construction. The situation does not seem to be so straightforward, however, as the group A verbs appear to be divided into two slightly different classes. Verbs such as *iku ‘go’, kuru ‘come’, and *agaru ‘go up’ become better when a delimiting phrase is supplemented. By contrast, verbs like tuku ‘arrive’, kaeru ‘return’, and *wairu ‘fall’ still resist the cooccurrence with -TE ARU even with a delimiting expression. The contrast can be illustrated by the following examples.

(40) a. ?Koko-made kite-aru kara sukosi yasumimasyoo.
    ‘Since we have come thus far, let’s rest a little while’

b. ?Otoke-tati-ga sanbyaku-meetoru-no tokoro-made
    man-pl-Nom three hundred-meters-Gen place-as far as
    agatte-aru kara daizyouobu-desu.
    ‘Since the men have gone up as far as three hundred meters,
    it is/we are all right’

(41) a. *Ryokookyaku-ga Tokyo-ni tuite-aru kara watasita-wa
    travellers-Nom Tokyo-at arrive because we-Top
    kaerimasu.
    ‘Since the travellers have arrived at Tokyo, we are going home’

    Taro-Top home-to return because telephone let’s try doing
    ‘Taro is home, so let’s try calling him’

Why are the verbs belonging to the unaccusative class with the same semantic characteristics behaving contrastively? I contend that there is a subtle difference between the kuru-type and the tuku-type. The tuku-type verbs emphasize the final point of the person/object that is described. That is, reaching a destination is at issue with these verbs. Since the change of location, particularly the question of whether the subject reaches the specified final point is the main concern of these verbs, the subject is more likely to be conceived of as theme rather than agent, assuming that what undergoes a change is described as theme (cf. Gruber (1976), Jackendoff (1976)). In the kuru-type verbs, on the other hand, the direction of the motion is focused, and the agent who instigates the motion could control the direction. In such a case, the theme interpretation of the subject may be overridden by the agent interpretation, and the agent interpretation of the subject is moderately available. Therefore, I suggest that the tuku-type verbs, as reflected in their behavior in (41), for example, lack a strong specification of protagonist control. It might be plausible that protagonist control is basically missing from the kuru-type verbs as well, although it may exist conceptually (see Note 9). However, the agent interpretation of the sole argument of the verb becomes more readily available than that of tuku-type verbs, especially in certain constructions, such as the -TE ARU construction. Furthermore, (39) suggests that the theme interpretation of the sole argument of these verbs is essentially correct.

For this matter, recall that the -TE IRU construction implies no agent at all. It is interesting to note that the substitution of -TE ARU in (41) with -TE IRU makes the sentences completely acceptable with the “resultative state” interpretation.

Despite this slightly murky distinction among the group A verbs, the contrast between group A and group C is clear in regard to protagonist control and its repercussion to the -TE ARU construction. That is, without any goal phrases, which often supplement an overriding factor of the pragmatic nature, the most simple -TE ARU constructions using these verbs demonstrate that the group C verbs are much more accessible to the -TE ARU construction. Thus, *kite-aru ‘I have come’ and *tuite-aru ‘I have arrived’ are much worse than aruite-aru ‘I have walked’ and oyoide-aru ‘I have swum’. Suppose, for example, that you have to take your child to the dentist’s office but your child does not want to go. After you fail to convince him to go, you decide to take him while he is sleeping. When the child arrives at the dentist’s office, we can still describe the situation in which he has arrived by using the verb tuku. On the other hand, under the same situation, you cannot say that the child has walked or ran (to the dentist’s
office) unless the child actually undertook the walking action or running action. Thus, I believe that the contrast under discussion is attributed to the fact that with group C verbs protagonist control exists while with group A verbs protagonist control is suppressed or missing, at least in the representation relevant to syntax.

Before we close this section, I would like to discuss a potential problem with what has been argued in Section 2.1 and Section 2.2. In Section 2.1, I concluded that an unergative verb with a goal phrase can appear in the unaccusative configuration. In Section 2.2, it was shown that unaccusatives, due to their lack of protagonist control, essentially cannot occur in the -TE-ARU construction. It follows from these conclusions that an unergative with a goal phrase, which now functions as unaccusative, should not be able to appear in the -TE-ARU construction. However, this prediction is contradicted by the following sentences.

(42) Kyoo-wa kooen-made aruite-aru kara kutakuta-desu.
     today-Top park-as far as walk because dead tired-be
     ‘Since I have walked to the park, I am dead tired’

(43) Koko-made hasitte-aru kara daizyoobu-da.
     here-as far as run because all right-be
     ‘I have run up to here, I am all right’

Both aruku ‘walk’ and hasiru ‘run’ belong to group C, namely, unergative verbs. Thus, the addition of the underlined goal phrases should allow them to behave like unaccusatives. In spite of the fact that unaccusatives are disallowed in the -TE-ARU construction, the sentences (42-43) are well-formed. Recall that we have concluded on the basis of the contrast between (25) and (26) that group C verbs become unaccusative when a goal phrase is added to them. Implicit in this conclusion is that when a group C verb appears with a goal phrase, it MUST be categorized as unaccusative. This was shown with respect to the examples in (42-43). Hence, a group C verb with a goal phrase may function either as unaccusative or unergative. The other instance was seen in the -TE-ARU construction with the group A and group B verbs. It was observed that the two groups, both of which are unaccusative, are rejected in the construction because the agentive interpretation is suppressed with these verbs. We, thus, concluded that inherent direction and lack of protagonist control (which may exist conceptually) are two significant properties which point toward the characterization of unaccusativity. This conclusion is consistent with the claims made by Levin & Rappaport (1989) as well as Van Valin (1987).

As for the point in (3iii), part of the answer appears to be the nature of linking of the semantic representation onto the syntactic representation. The semantic representation may take the form of Lexical Conceptual Structure as in Hale & Keyser (1986, 1987). That is, the sole argument of an unaccusative verb is the theme argument, and it is always linked to the internal position of the predicate argument structure. Assuming that some sort of linking principles (Carter (1976), Fillmore (1968)) are valid here, lack of protagonist control inherent to unaccusative verbs makes sure such linking is carried out, deriving the syntactic
representation of (1b). Hence, unaccusative mismatches are very valuable phenomena relating to the true nature of unaccusativity.

Notes

* I would like to thank Beth Levin and Shigeru Miyagawa for their comments on an earlier version of this paper, and two anonymous JJL reviewers for clarifying some issues involved in this work.

1 For example, impersonal passivization in Dutch (Perlmutter (1978)), auxiliary selection and re-cliticization in Italian (Burzio (1986)), and resultative construction (Simpson (1983)) and locative inversion (Coopmans (1989)) in English. Also, see Grimshaw (1987).

2 For more on unaccusative mismatches, also see Levin (1985).

3 This classifier is realized as phonetically different forms such as -pon and -pon due to phonological rules.

4 As an anonymous reviewer points out to me, (7b) cannot be analyzed as object scrambling first and then subject scrambling. Such a derivation would yield the S-structure representation of (i).

5 Since -nin is not the appropriate classifier for cats or pens, the NQ's cannot be interpreted with cats in (7a) nor with pens in (7b).

6 The "resultative state" interpretation of the -TE IRU construction and a syntactic configuration. Passives, for example, pattern with unaccusative in terms of the "resultative state" interpretation. Such an observation, among others, leads Takezawa to the following generalization.

(i) The resultative interpretation can be obtained if there exists a binding relation between the subject and an internal argument of a V.[+Change].

The [+/-Change] features correspond to the parameters used in Vendler (1967), and [+Change] verbs in (i) subsume accomplishment and achievement verbs.

8 -TE is a part of the gerund form of a verb. -TE sometimes surfaces as -DE as a result of assimilation.

9 An anonymous reviewer suggests that the awkwardness of (25b) may have to do with the presence of kodomo-to 'with children' since, according to the reviewer, the improvement from (i) to (26a) is very slight. (The judgement is the reviewer's.)

(i) Gakusei-ga inukaki-de san-nin oyoida.
student-Nom dog paddling-by three-cl swam
'Three students swam by dog paddling'

He further suggests that given the analysis proposed in this paper, sentences like (i) should be as bad as (7a) and (7b) since mutual c-command does not hold in these sentences. Although I agree that (i) may not sound as bad as (7a) or (7b), it seems to me that the grammatical judgements of intransitive sentences with NQ's whose antecedent is the whole subject NP as in (i) may not be as clear-cut as in (7a) and (7b). Consider the following sentence.

(ii) ?Gakusei-ga hadasi-de san-nin hasitta.
student-Nom bare foot-by three-cl ran
'Three students ran in bare feet'

In this sentence hadasi-de 'in bare feet' is a VP-internal adjunct, and thus, the awkwardness of the sentence results from the failure to satisfy the mutual c-command requirement. On the other hand, (ii) seems better than (iii), which is structurally identical to (ii) in relevant respects.

(iii) *Gakusei-ga hadasi-de inu ya neko-to san-nin hasitta.
student-Nom bare foot-by dog and cat-with three-cl ran
'Three students ran in bare feet with dogs and cats'

There is certainly an interesting generalization to be captured between these sentences, but I will leave this for future research.

10 I assume that the postposition e has the same semantic property as ni.
11 I am not at all claiming that the agent is totally missing with the tsuku-type verbs. Needless to say, an external cause would not be able to make certain that what is described reach a specific destination. Thus, agentivity may exist conceptually but need not be represented linguistically. This issue might be related to the distinction between Lexical Conceptual Structure, advanced by Hale & Keyser (1986, 1987), and Predicate Argument Structure. The former is the conceptual representation of a verb, which encodes the lexical-semantic properties of a verb whereas the latter is the representation which is relevant to syntactic realization of the verb's argument. Given such Lexical Conceptual Structure and Predicate Argument Structure, we may want to say that agent of tsuku-type verbs appears in Lexical Conceptual Structure but not in Predicate Argument Structure.

12 I would like to thank an anonymous reviewer for clarifying this point. The reviewer also suggests to me that the addition of a traversal phrase to a group C verb makes the verb obligatorily function as unaccusative. Consider the examples in (i).

(i) a. Kodomo-ga kawa-o oyoida.
   child-Nom river-along swam
   'The child swam along the river'

   b. Kodomo-ga [v, kawa-o san-nin oyoida]
   child-Nom [river-along three-cl swam
   'Three children swam along the river'

   c. ?*Kawa-o oyoide-aru
   river-along swim
   'The river has been swum'

The addition of the traversal phrase kawa-o changes the classification of oyoide from unergative to unaccusative. This change is obligatory, as is evidenced by the grammatical NQ construction in (ib) and the ungrammatical -TE ARU construction in (ic), both of which are typically observed with unaccusative verbs.

References

In this paper we offer a synchronic analysis of the alternations that are triggered by the Japanese verbal suffixes -ta, -te, and -tari. In our analysis we show how various principles and constraints of autosegmental phonology lead to an insightful account of the morphophonemic alternations triggered by these suffixes. Our analysis avoids many of the problems of previous analyses. For example, previous analyses could only stipulate that the vowel [i] is inserted immediately before the suffix -te (as well as before -ta and -tari) when the root ends in an /s/ or a velar consonant (e.g., /kasita/ -> [kaita]). They could not provide a principled explanation why vowel epenthesis occurs only with these root-final consonants and not with other root-final consonants (e.g., /yomita/ -> [yonda], /torita/ -> [totta]). Also, previous analyses were often inelegant in trying to account for the nasalization of root-final /b/ in forms like [tonda] (from /tob+ta/).

0. Introduction

The irregularity of verbal inflection in Tokyo Japanese has been well-studied in the literature (cf. McCawley (1968), Ashworth (1976), Maeda (1979), Tabata (1983), Yoshiya (1983), Poser (1986) and others). Such irregularity is observed particularly in the verbal inflection involving past tense (or perfective) suffix -ta, gerundive suffix -te and representative suffix -tari. Several of the above mentioned works provide diachronic approaches to the problem. On the one hand, such diachronic accounts are well-motivated to explain the historical change of each verb form. On the other hand, there is no pretheoretic reason to base a synchronic analysis on historical transition in accounting for the presently existing inflected verb forms. Also, from the viewpoint of child language acquisition, a child who is learning the language would not do so on the basis of the historical change of the forms that he is acquiring. In this paper we provide a synchronic approach to the verbal conjugation in Japanese. In particular, we present an analysis within the framework of autosegmental phonology with the aim of showing how the application of certain principles and constraints within autosegmental theory allows one to capture in an insightful and non ad hoc manner the morphophonemic alternations associated with the suffixes -ta, -te, and -tari.

The organization of this paper is as follows. In the first section we present...