12 Lexical Semantics

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0 Introduction

As syntactic theories develop, more attention has been paid to lexical properties of argument-taking elements such as verbs (cf. N. Chomsky 1986b, Pesetsky 1982, Stowell 1981). A great many syntactic phenomena have been accounted for by referring to the makeup of argument structure. Argument structure, while its role in syntax is irrefutable, has increasingly been believed to be derivable from the verb's meaning. Furthermore, when the meaning of a verb is dissected, a particular meaning component of the verb is often responsible for certain syntactic behavior. One of our tasks in lexical semantics, then, is not only to represent verb meaning accurately but also to identify meaning components that may have specific relevance to syntactic phenomena.[1]

The lexicon contains phonological, morphological, semantic, and syntactic information of lexical items, but it is not necessary to specify every bit of the knowledge the speaker has about a word because some properties are predictable from others. Research has certainly verified that this holds for lexical semantics. For instance, a number of generalizations can be drawn holding for a semantically coherent set of verbs by looking at verb meaning. This is clearly exhibited in diathesis alternations where the same verb shows syntactic and semantic variants that are accompanied by a different distribution and a different array of arguments. Extensive research on diathesis alternations has revealed that some syntactic behavior of a verb's arguments and meaning specific to variants of an alternation and the types of alternation are predictable based on the semantic class of the verb (cf. Levin 1993, Levin and Rappaport Hovav 1995). This line of research is further motivated by language acquisition since it provides an answer to Plato's problem: how can a child know so much given so little? A child does not have access to all the information about all verbs existing in a given language, and yet has the ability to determine which verbs should have which pattern of arrangement among arguments.

The tight relationship between the verb's meaning and the syntactic realization of its arguments has been confirmed by experimental work on language acquisition (cf. Gropen et al. 1989, Pinker 1989). It is particularly for these reasons that issues in lexical semantics have drawn more attention in recent linguistic investigation of word meaning (cf. Bloom 1993, Gleitman and Landau 1994).

This line of research has influenced various areas in Japanese linguistics, not only the development of the lexical semantic field itself but also syntactic analyses. However, while issues surrounding argument structure have raised a tremendous amount of discussion, as is evidenced by much literature on the light verb construction, for example (cf. Dubinsky 1994, Grimshaw and Mester 1988, Y. Matsumoto 1996, Miyagawa 1989a, Tsujimura 1990a, Uchida and Nakayama 1993), a number of questions related to the exact nature of the interaction between verb meaning and syntax are still to be answered to a greater extent for Japanese. For instance, numerous questions await answers concerning how a verb's meaning, and which component of the meaning, interacts with the way in which its arguments are projected in syntax. Any coherent answer to this question would require a fine-grained analysis of verb meaning that is linguistically relevant and that leads to a well-defined verb classification.

In this chapter I will give an overview that focuses on some of the lexical semantic issues that have been dealt with in Japanese linguistics. The discussion will be centered on lexical semantic properties of verbs, particularly in their interaction with syntax. The survey given in this chapter is by no means comprehensive and deals mostly with sources written in English.[2] In section 1 I shall present a few examples from English that delineate the motivation for the investigation of word meaning in relation to syntax and language acquisition. Subsequent sections introduce several works that deal with some lexical semantic issues for Japanese. As I mentioned briefly above, the research on word meaning in Japanese has yet to be expanded to a larger extent, and I will consider potential areas for further inquiry in the last section.

1   Motivations for Research on Meaning Components

Much research has been conducted for diathesis alternations in English. This is because by examining which verbs allow a particular diathesis alternation and which verbs do not, we can isolate the meaning components for which the alternations are responsible. The relationship between diathesis alternation and verb meaning is, hence, where we can clearly observe the contribution of research on verb meaning and meaning components. Some of the examples of diathesis alternations in English are given below (cf. Levin 1993).

(1) *Locative alternation*
    a. John smeared paint on the wall.
    b. John smeared the wall with paint.

(2) *Causative/inchoative alternation*
    a. Mary broke the vase.
    b. The vase broke.

(3) *Unspecified object alternation*
    a. Bill ate a large pizza.
    b. Bill ate.

(4) *Conative alternation*
    a. Susy kicked the wall.
    b. Susy kicked at the wall.

(5) *Dative alternation*
    a. Howard gave Ann a painting.
    b. Howard gave a painting to Ann.

Diathesis alternations are important in that the verbs that allow for a particular alternation often turn out to constitute a uniform set of verbs that share a particular semantic component. In order to illustrate the relevance of diathesis alternations, let us single out the causative/inchoative alternation in English.

As the pair in (2) shows, verbs like *break* can appear either as a transitive verb or as an intransitive verb. The subject of the intransitive is characteristically identical with the object of the transitive variant. The causative/inchoative alternation is quite common in English, but is not available to just any verb. The range of data pertinent to our discussion is given below. The verbs under (c) are other members that share the same alternation behavior.

(6) *Verbs that allow the causative alternation*
    a. Mary broke the vase.
    b. The vase broke.
    c. melt, open, sink, boil, . . .

(7) *Verbs that do not allow the transitive variant*
    a.   John laughed.
    b. *The teacher laughed John.
    c.   smile, play, swim, . . .

(8) *Verbs that do not allow the intransitive variant*
    a.   My father wrote the story.
    b. *The story wrote.
    c.   cut, bake, murder, . . .

A question to be asked is whether the lexicon should have all the information as to which verbs should have the alternation, which verbs should have only the intransitive variant, and which verbs should have only the transitive variant as a lexical property of each verb. Such specification, of course, would end up with an enormous amount of listing in the lexicon, and this is where verb meaning plays a crucial role. That is, unnecessary redundancy in the lexicon can be avoided once we capture lexical semantic generalizations holding of the verbs that exhibit uniform behavior.

Levin and Rappaport Hovav (1995), for one, discuss the meaning differences that lead to the range of variation illustrated above. First, they attribute the difference between (6) and (7) to the fine-grained meanings of whether the eventuality denoted by the verb is caused externally or internally. For example, the verbs that allow the alternation, such as those in (6), all share the meaning that the eventuality denoted by the verb is caused externally. In contrast, the verbs in (7), which do not allow the transitive variant, denote an internally caused eventuality. That is, when a vase breaks, the breaking event is caused by some external force, and is not caused by inherent properties that the vase has. When a person smiles, on the other hand, the event is caused by the person's voluntary facial gesture, for instance, and not by an external force that brings about the movement of the person's face in a smiling manner. This difference in external vs. internal causation is shared by the exemplary verbs under (6c) and (7c). Hence, Levin and Rappaport Hovav conclude that the causative alternation makes reference to the verbs' fine-grained meaning difference, namely, external vs. internal causation.

It is important to investigate fine-grained meaning properties of verbs because a broad definition of verbs does not give a sharp distinction. This can be seen by a pair of verbs that have very close meaning, such as *shake* and *shudder*. Levin and Rappaport Hovav argue that despite the very similar meanings of the two verbs, only *shake* allows the causative alternation, and that this is exactly the difference that external vs. internal causation is expected to account for: *shake* denotes an externally caused eventuality while *shudder* implies an internally caused eventuality. Furthermore, among the verbs in (6), even the same verb does not always allow for the causative alternation when it can denote internal causation. For example, the verb *burn* has two senses, "consume by fire" and "emit heat," but only in the former sense does the verb allow the alternation. This is shown below.

(9)   a.   The leaves burned.
      b.   The gardener burned the leaves.

(10) a.   The fire burned.
      b.   *The campers burned the fire. (Levin and Rappaport Hovav 1995: 101)

The verb *burn* in (9) has the "consume by fire" sense. Under this interpretation, the eventuality of burning the leaves must be brought about by an external force, i.e. the gardener in this case, and hence the alternation is allowed. The

same verb in (10), in contrast, is used in the "emit heat" sense: emitting heat is internally caused by the fire as its inherent property. The causative alternation is not possible, as predicted. Thus, the external vs. internal causation can account for the difference between verbs in (6) and those in (7). We can furthermore predict whether a verb can show the alternation or not by examining the verb's meaning focusing on where causation comes from.

Fine-grained verb meaning can also explain why not all the transitive verbs that denote external causation display intransitive counterparts. For instance, both the verbs in (6) and (8) denote that the eventuality is caused externally, but only the former exhibit the alternation. Levin and Rappaport Hovav go on to argue that the fundamental meaning difference between the two groups boils down to the question of whether "the eventuality can come about spontaneously without the volitional intervention of an agent" (1995: 102). That is, the eventuality denoted by the verbs in (6) can occur without a volitional agent, as is evidenced by sentences like *The storm broke the door*, where the storm does not bear volition. The verbs in (8), on the other hand, must all take an animate, volitional agent, and by no means can they imply that the eventuality comes about spontaneously. Such restriction is observed by *His brilliance wrote the novel*.

A consequence of the semantic analysis given by Levin and Rappaport Hovav is that when a verb that belongs to (6) above has two senses and the difference between the two has to do with the presence or absence of a volitional entity that brings about the eventuality, the same verb should behave differently regarding the causative alternation depending on the sense that the verb bears. The verb *break* presents one such case. Compare the following pair.

(11) a.   John broke the door.
       b.   The storm broke the door.
       c.   The door broke.

(12) a.   John broke his promise.
       b.   *The storm broke his promise.
       c.   *His promise broke.

The eventuality described in (11) can come about spontaneously without a volitional entity, as is demonstrated by (b). Under such an interpretation, the verb *break* can participate in the alternation. The eventuality represented in (12), however, must come about with an intentional agent, as the ungrammatical sentence in (b) shows. The unacceptable intransitive variant in (c) is the result of the semantic generalization given above. Hence, not all the verbs that denote externally caused eventuality behave uniformly with respect to the causative alternation: of these only the verbs whose eventuality can occur without a volitional agent allow for the alternation.

The illustration of the causative alternation taken from Levin and Rappaport Hovav's work explicitly displays that there is no need in the lexicon for each verb to have the specification as to which diathesis alternations it can allow.

Instead, the recognition of particular meaning components resulting from fine-grained semantic analyses provides an insight into choice of alternations, given a particular set of principles that bridge the meaning components and the syntactic projection of the verb's arguments. Generalizations of the sort discussed above holding between semantically coherent classes of verbs and diathesis alternations can ultimately explain the speaker's innate knowledge about the language.

Related to the remark made immediately above, lexical semantic research of verbs is further motivated by language acquisition issues. Let us take the dative alternation as our example, as is illustrated in (5) above. Additional examples are given below.

(13)   a.   Damon sent his mother a gift.
       b.   Damon sent a gift to his mother.

(14)   a.   Sally taught the children French.
       b.   Sally taught French to the children.

(15)   a.   Kevin showed the officer the letter.
       b.   Kevin showed the letter to the officer.

It has been pointed out by many researchers, such as Green (1974), Oehrle (1976), and Stowell (1981), among others, that there is a subtle difference in meaning between the variants. The double object sentences in (a) imply that the first object actually receives the second object while the (b) variants do not necessarily assume such a possessor change. For example, (14a) implies that the children actually learned the language while (14b) does not. Gropen et al. (1989) show from their experimental work with adults and children that the semantic difference between the variants, namely possession change, is in fact psychologically real and serves as one of the criteria to determine which verbs should undergo the dative alternation. When the verb does not denote change of possession, the alternation is not available. This is why verbs like *drive* cannot show the alternation: *Mary drove the car to Paris* but not **Mary drove Paris the car*. In this ungrammatical alternation Paris cannot be the possessor of the car, and hence the double object sentence is not available.

The relevance of the semantic property in the dative alternation, i.e. possession change, is further confirmed by the kind of errors that children make. In their spontaneous speech children use the double object variant to the verbs that normally do not participate in the alternation in adult speech. For instance, *Don't say me that* (= Don't tell me that) and *You put me just bread and butter* are actual speech that children use, but in their speech, they use the verbs *say* and *put* to mean *tell* and *give*, respectively. The latter two verbs enter into the alternation in adult speech. Gropen et al. explain that even in these errors, children do follow the semantic criterion of possession change although the meanings of the verbs *say* and *put* are not as refined as those that adult speakers assume. That is, children in making these errors interpret verbs to denote possession change and hence form the double object sentences with them.

Another piece of evidence comes from adult speech in their coinage of new verbs such as *fax*, *xerox*, *bitnet*, and *e-mail*. These new verbs participate in the dative alternation.

(16) a. Mary faxed me a document.
 b. Mary faxed a document to me.

(17) a. Please xerox me the file.
 b. Please xerox the file to me.

(18) a. I will e-mail you my reply.
 b. I will e-mail my reply to you.

Even new verbs like these can alternate because they meet the semantic criterion of possession change.

In sum, the discussion of two diathesis alternations in English, exemplified in (6–8) and (13–15), has demonstrated that lexical semantics plays an important role in syntax and language acquisition and that research of the type described above is well motivated.

2   Locative Alternation

There have been a few diathesis alternations that have been investigated in Japanese. Perhaps the best described is the locative alternation, also known as the hypallage phenomenon, as discussed extensively by Kageyama (1980b) and Fukui et al. (1985). An example of the locative alternation in English has been given in (1), which is repeated below, with an additional example in (19). The Japanese examples of the alternation are given in (20–2).

 (1) a. John smeared paint on the wall.
 b. John smeared the wall with paint.

(19) a. Mary cleared dishes from the table.
 b. Mary cleared the table of dishes.

(20) a. Taroo-ga penki-o   kabe-ni nutta.
 Taro-Nom paint-Acc wall-on smeared
 "Taro smeared paint on the wall."
 b. Taroo-ga kabe-o   penki-de nutta.
 Taro-Nom wall-Acc paint-with smeared
 "Taro smeared the wall with paint."

(21) a. Hanako-ga   hana-o   heya-ni kazatta.
 Hanako-Nom flower-Acc room-in decorated
 "Hanako put flowers (to decorate) in her room."

      b.   Hanako-ga   heya-o   hana-de   kazatta.
           Hanako-Nom room-Acc flower-with decorated
           "Hanako decorated her room with flowers."

(22)   a.   Huku-ga   hako-ni tumatteiru.
           clothes-Nom box-in   is filled
           "Clothes are filled in the box."
      b.   Hako-ga huku-de   tumatteiru.
           box-Nom clothes-with is filled
           "The box is filled with clothes."

The (a) variants all have the material NP as the direct object while the location NP is marked with a pre/postposition; the (b) variants, on the other hand, have the location NP as the direct object while the material NP is marked with a pre/postposition. (22) shows that the alternation is not restricted to transitive verbs: *tumaru* "fill, clog" is an intransitive verb, and the same range of Case marking alternation is observed between the Nominative Case and the postpositions.

   There are several other characteristics besides the Case marking pattern of material and location NPs that accompany the two variants of the alternation. First, the two variants convey slightly different meanings, which have been distinguished as the "holistic" vs. "partitive" interpretations (cf. Anderson 1971, 1977, Schwartz-Norman 1976). When the location NP is the direct object, as in the (b) sentences above, the entire location is construed to be affected by the action denoted by the verb. This reading is referred to as the holistic interpretation. The other variant, namely, the (a) sentences, does not imply that the whole location is affected. This interpretation is termed as partitive. In (20b), for example, the entire wall is painted while in (20a) the wall is not necessarily covered with paint in its entirety. Similarly, in (22), the holistic interpretation is obtained in (b) while the partitive interpretation is observed in (a).

   Second, Kageyama (1980b) observes that the adverbial modification reveals the distinct patterning between the two variants. This is shown below (Kageyama 1980b: 44).

(23)   a.   Taroo-ga   penki-o   kabe-ni **usuku** nutta.
           Taro-Nom paint-Acc wall-on thin   smeared
           "Taro gave the wall a thin coat of paint."
      b.   *Taroo-ga   penki-o   kabe-ni **siroku** nutta.
           Taro-Nom paint-Acc wall-on white smeared
           "Taro smeared paint on the wall white."

(24)   a.   Taroo-ga kabe-o   penki-de   **siroku** nutta.
           Taro-Nom wall-Acc paint-with white smeared
           "Taro smeared the wall with paint white."

b.   *Taroo-ga kabe-o   penki-de **usuku** nutta.
     Taro-Nom wall-Acc paint-with thin   smeared
     "Taro gave the wall a thin coat of paint."

It is interesting to see that an adverbial modifier of a particular type is associated with a particular type of direct object: that is, the adverbial modifiers *usuku* "thin" and *siroku* "white" both are predicated of the direct object, but the former can be predicated only of a material NP, describing the manner in which the material is applied to the location, while the latter can be predicated only of a location NP, depicting the resulting state of the location. Hence, the nature of adverbial modifiers is determined by the choice between a material NP or a location NP as the direct object.

   Third, Fukui et al. (1985) remark that the locative alternation is not exhibited with a wide range of verbs in Japanese in comparison with the verbs that allow the alternation in English. A fairly large number of verbs in English that include *spray/load* verbs, *swarm* verbs, and verbs of emission allow for the alternation, but a parallel situation is not obtained in Japanese. For instance, *nuru* "smear" and *sasu* "stick" exhibit the alternation, but the verbs in (25) allow only the material object pattern with the partitive interpretation, as (26) shows.

(25)   *haru* "hang," *maku* "spray," *hanekakeru* "splash," *tumu* "load," *hirogeru* "spread," *tumiageru* "pile," . . .

(26)   a.   Susumu-ga   posutaa-o kabe-ni hatta.
            Susumu-Nom poster-Acc wall-on hung
            "Susumu hung posters on the wall."
       b.   *Susumu-ga   kabe-o   posutaa-de hatta.
            Susumu-Nom wall-Acc poster-with hung
            "Susumu hung the wall with posters."

Fukui et al. note, however, that the degree of the locative alternation can be increased by a morphological means. When the suffix *-tukusu* "exhaust" is added to some of the verbs in (25), for example, the variant that has a location NP as its direct object becomes acceptable. This is shown below.

(27)   a.   Susumu-ga   posutaa-o kabe-ni hari-tukusita.
            Susumu-Nom poster-Acc wall-on hang-exhausted
            "Susumu hung posters on the wall."
       b.   Susumu-ga   kabe-o   posutaa-de hari-tukusita.
            Susumu-Nom wall-Acc poster-with hang-exhausted
            "Susumu hung the wall with posters."

Hence, many of the Japanese verbs that potentially show the locative alternation further require a morphological supplement to make the alternation available.

Fourth, Japanese lacks the locative alternation with verbs of removing exemplified by (19) in English. Consider the following examples along with the list of other verbs that disallow the alternation.

(28)   a.   Mitiko-ga   sara-o   teeburu-kara katazuketa.
           Mitiko-Nom dish-Acc table-from   cleared
           "Mitiko cleared dishes from the table."
       b.   *Mitiko-ga   teeburu-o sara-de   katazuketa.
           Mitiko-Nom table-Acc dish-with cleared
           "Mitiko cleared the table of dishes."
       c.   Mitiko-ga   sara-o   katazuketa.
           Mitiko-Nom dishes-Acc cleared
           "Mitiko cleared dishes."
       d.   Mitiko-ga   teeburu-o katazuketa.
           Mitiko-Nom table-Acc cleared
           "Mitiko cleared the table."

(29)   *ubau* "rob," *nozoku* "expunge," *damashitoru* "con," *akeru* "empty," . . .

As (28c–d) indicate, the occurrence of direct object alone, whether a material NP or a location NP, is not precluded; rather, it is the variant with a location NP as direct object and a material NP marked with a postposition that cannot surface.

Given these characteristics, Kageyama (1980b) and Fukui et al. (1985) provide analyses with different foci: Kageyama's analysis centers on the derivation of one variant from the other while Fukui et al. investigate what semantic component triggers the locative alternation.[3] Assuming that the NPs that appear in the locative alternations bear thematic roles such as Agent and Theme, Kageyama argues that the NP marked with the Accusative Case in each variant is Theme, where Theme is understood as the entity that undergoes change of state. He further proposes an optional rule of Theme Transfer, which applies to the material object variant to derive the location object variant. The Theme Transfer and its applications to verbs of attaching and verbs of removing are taken from Kageyama (1980b: 55–6).

(30)   Theme Transfer
       $\begin{bmatrix} \text{Theme} \\ \text{X} \end{bmatrix}$ [LOC]   →   [X] $\begin{bmatrix} \text{LOC} \\ \text{Theme} \end{bmatrix}$
       (LOC is a cover symbol for Location, Goal, and Source)

(31)   a.   [Agent] $\begin{bmatrix} \text{Theme} \\ \text{Instru.} \end{bmatrix}$ [Goal]   V

           Watasi-ga penki-o   kabe-ni nuru
           I-Nom   paint-Acc wall-on smear
           "I smear paint on the wall."

b. [Agent]   [Instr.] $\begin{bmatrix} \text{Goal} \\ \text{Theme} \end{bmatrix}$ V

    Watasi-ga penki-de   kabe-o   nuru
    I-Nom   paint-with wall-Acc paint
    "I smear the wall with paint."

(32) a. [Agent]   [Theme]   [Source]   V
    Watasi-ga garakuta-o heya-kara katazukeru
    I-Nom   junk-Acc   room-from clear
    "I clear the junk from the room."

b. [Agent]   [φ] $\begin{bmatrix} \text{Source} \\ \text{Theme} \end{bmatrix}$ V

    Watasi-ga φ heya-o   katazukeru
    I-Nom   room-Acc clear
    "I clear the room of the junk."

The (b) sentences are obtained as a result of the application of the Theme Transfer to (a). The Theme Transfer strips off the Themehood of the material NP and transfers it to the location NP, thereby turning the location NP into the entity that undergoes change of state. As the comparison between (31) and (32) shows, Kageyama attributes the presence of the two variants in verbs of adding and their absence in verbs of removing to the difference in the array of thematic roles with which each verb class is associated. With verbs of adding such as *nuru* "smear," the material NP bears not only Theme but also Instrument, and after the Theme is transferred to the Goal NP, the role of Instrument is kept to be assigned to the material NP. In contrast, the material NP in verbs of removing bears only Theme, and no thematic role remains after the Theme is transferred. This is why the material NP cannot appear in the location object variant with verbs of removing.

    Setting a theoretical debate about thematic roles aside, the analysis using the rule of Theme Transfer may be problematic to certain verbs that meet the condition of the rule but do not allow the alternation. *Oku* "put," for one, is such a verb. Consider the following.

(33). a. [Agent]   [Theme] [Location] V
    Watasi-ga hon-o   tana-ni   oku
    I-Nom   book-Acc   shelf-on   put
    "I put a book on the shelf."

b. [Agent]   φ $\begin{bmatrix} \text{Location} \\ \text{Theme} \end{bmatrix}$ V

    *Watasi-ga   tana-o   oku
    I-Nom   shelf-Acc put
    "I put the shelf."

The verb *oku* "put" takes the Theme NP and the Location, and thus it should meet the condition for the Theme Transfer. The result of the rule application,

however, is ungrammatical, as (33b) shows. It may suggest, then, that the array of thematic roles that are associated with the arguments of the verb may not be sufficient for the rule of Theme Transfer to apply unless the rule application is strictly limited to verbs of attaching and verbs of removing.

Instead of focusing on the derivational relation between the two variants, Fukui et al. attempt to pursue a meaning component that would account for various types of argument distribution represented by *nuru* "smear," *haru* "hang," and *katazukeru* "clear." The relevant data are given below.

(34) a. Taroo-ga penki-o   kabe-ni nutta.
          Taro-Nom paint-Acc wall-on smeared
          "Taro smeared paint on the wall."
      b. Taroo-ga kabe-o   penki-de   nutta.
          Taro-Nom wall-Acc paint-with smeared
          "Taro smeared the wall with paint."

(35) a. Susumu-ga   posutaa-o kabe-ni hatta.
          Susumu-Nom poster-Acc wall-on hung
          "Susumu hung posters on the wall."
      b. *Susumu-ga   kabe-o   posutaa-de hatta.
          Susumu-Nom wall-Acc poster-with hung
          "Susumu hung the wall with posters."
      c. Susumu-ga   posutaa-o hatta.
          Susumu-Nom poster-Acc hung
          "Susumu hung posters."
      d. *Susumu-ga   kabe-o   hatta.
          Susumu-Nom wall-Acc hung
          "Susumu hung the wall."

(36) a. Mitiko-ga   sara-o   teeburu-kara katazuketa.
          Mitiko-Nom dish-Acc table-from   cleared
          "Mitiko cleared dishes from the table."
      b. *Mitiko-ga   teeburu-o sara-de   katazuketa.
          Mitiko-Nom table-Acc dish-with cleared
          "Mitiko cleared the table of dishes."
      c. Mitiko-ga   sara-o   katazuketa.
          Mitiko-Nom dishes-Acc cleared
          "Mitiko cleared dishes."
      d. Mitiko-ga   teeburu-o katazuketa.
          Mitiko-Nom table-Acc cleared
          "Mitiko cleared the table."

(37) a. Susumu-ga   posutaa-o kabe-ni hari-tukusita.
          Susumu-Nom poster-Acc wall-on hang-exhausted
          "Susumu hung posters on the wall."

b. Susumu-ga   kabe-o   posutaa-de hari-tukusita.
   Susumu-Nom wall-Acc poster-with hang-exhausted
   "Susumu hung the wall with posters."

The verb *nuru* "smear" in (34) is one of the few verbs that allow the locative alternation. The verb *haru* "hang" in (35), on the other hand, does not alternate and shows only the material object sentence. This verb, however, participates in the alternation when it is suffixed by *-tukusu* "exhaust," as in (37). Verbs of removing in general, as with *katazukeru* "clear" in (36), do not alternate, either. While *haru* in (35) and *katazukeru* in (36) appear to be parallel in their lack of the location object variant, they are indeed different: with *katazukeru*, the material NP and the location NP can each appear in a sentence, as is shown in (36c–d); whereas *haru* seems to block the occurrence of the location NP marked with the Accusative Case whether it is with a material NP or without it, as (35d) suggests.

Fukui et al. claim that the meaning component of "Affect" is a crucial factor to determine whether a given verb can alternate. They assume that the linguistically relevant meaning of a verb is defined at the Lexical Conceptual Structure (LCS). The LCS is a level of representation over which a rough equivalent of a dictionary meaning of a verb is stated, and it is further mapped onto the argument structure of the verb (cf. Hale and Keyser 1986). Under this assumption, the abbreviated LCSs of the three verbs in (34–7) are given below.

(38) a. *nuru*: Realize the action NURU by using the Material x & Affect y
      b. *haru*: Realize the action HARU by using the Material x
      c. *katazukeru*: KATAZUKERU x & Affect y
      d. *hari-tukusu*: Realize the action of HARU by using the Material x & Affect y

Along with the LCS representations of these verbs, they propose the following conditions for the locative alternation.

(39) a. The verb takes two arguments x, y in its LCS; and
      b. One of its argument (y) is affected by the action represented by the meaning of the verb ("Affect y").

First, the verb *nuru* "smear" has two arguments, indicated as x and y in (38), and moreover, its LCS contains the component of "Affect y." Both conditions are met, and the verb can participate in the alternation. The LCS of (38b), on the other hand, clearly shows that neither condition is satisfied with *haru* "hang." There is only one argument, x, which is why (35d) is ungrammatical: the location NP is not an argument required by the verb. Furthermore, the component "Affect y" is not a part of the meaning specification. These two situations account for the difference that *nuru* can alternate but *haru* cannot. Second, the verb *katazukeru* "clear" satisfies both conditions, having two arguments and

the "Affect *y*" clause in its LCS, and so we should expect the verb to enter into the alternation. This is not what we actually have, however, as is indicated by (36b). The specification of two arguments in the LCS of *katazukeru* is necessary in order to account for the difference between (35c–d) and (36c–d). What prevents *katazukeru* from alternating, according to Fukui et al., is that there is no Case available to *sara* "dish" in (36b). Unlike the material object with *nuru*, the argument *x* of *katazukeru* is a simple object of KATAZUKERU and does not qualify to receive the Accusative Case. Japanese is also dissimilar to English in that there is no Case like *of* that is assigned to the corresponding NP in English. Hence, Fukui et al. conclude that the alternation is blocked for the Case reason in the instance of *katazukeru*. Third, the suffixation of *-tukusu* plays a role as altering the LCS of verbs like *haru* "hang." As (38b) shows, *haru* requires only one argument in its LCS, but by suffixing *-tukusu*, the verb's LCS can be transformed into the one equivalent to the LCS of *nuru* "smear." This can be seen in (38d). Given the newly derived LCS, both conditions of (39) are met, and *hari-tukusu* participates in the alternation to the same degree as *nuru*. This explains the difference between (35) and (37). Hence, Fukui et al. attempt to capture the availability of the locative alternation with various verbs by identifying the meaning component of "Affect *y*" as a triggering factor.

The locative alternation reveals several interesting characteristics, both syntactic and semantic, and shows that it is quite conceivable to analyze verb meaning and possibly a specific meaning component as strongly linked to the availability of the alternation as we have seen above. Relevance of verb meaning is further confirmed by Kageyama's observation that a single verb that can belong to two different semantic classes displays contrasting behavior with respect to the locative alternation. To illustrate this, he uses the verb *ahureru* "overcrowd, overflow." The following are taken from Kageyama (1980b: 50–1).

(40) a. Amerika-no dooro-ni-wa nihonsei-no   kuruma-ga ahurete-iru.
          America-Gen street-on-Top Japanese-Gen car-Nom   overcrowd-be
          "Japanese cars are overcrowding American streets."
      b. Amerika-no dooro-wa nihonsei-no   kuruma-de ahurete-iru.
          America-Gen street-Top Japanese-Gen car-with   overcrowd-is
          "American streets are overcrowded with Japanese cars."

(41) a. Yokusoo-kara yu-ga   ahurete-iru.
          bathtub-from hot water-Nom overflow-is
          "Hot water is overflowing the bathtub."
      b. Yokusoo-ga (*yu-de)   ahurete-iru.
          bathtub-Nom (hot water-with) overflow-is
          "The bathtub is overflowing."

The intransitive verb *ahureru* clearly has different meanings in these two instances: the one in (40) has a meaning very close to verbs of group existence

like *swarm* (cf. Levin 1993); while the one in (41) bears the sense of substance emission like *spill*. The latter in particular can be considered as similar in meaning to verbs of removal, except that *ahureru* is an intransitive verb. Given the contrasting meanings and what we have observed with verbs of removal in Japanese, the alternation patterns in (40) and (41) are a natural consequence.

3   Unaccusativity

Unaccusativity has invited a great deal of discussion in syntax and lexical semantics ultimately centering on what makes a verb unaccusative (cf. Dubinsky 1985, 1989, Kageyama 1991, Kishimoto 1996, Miyagawa 1989a, 1989b, Terada 1990, Tsujimura 1990a, 1990c, 1991, 1994, 1996a, 1997, among many more). Unaccusative verbs, in contrast with unergative verbs, constitute a type of intransitive verb whose sole argument patterns with the direct object of transitive verbs. Some of the primary issues have revolved around the questions of whether unergative and unaccusative should have syntactic representations and whether there are semantic characteristics that determine which verbs belong to which intransitive class. It is this latter question to which lexical semantics has made a direct contribution. Attempts made in Japanese to this end are found in Jacobsen (1992), Kishimoto (1996), and Tsujimura (1991, 1994, 1996a).

The parallel patterning between the subject of an unaccusative verb and the object of a transitive verb in Japanese is often observed with some of the pairs of transitive and intransitive verbs that are morphologically related.[4] Jacobsen (1992) provides an extensive list of such verb pairs in his study of transitivity (cf. Ikegami 1988). A few examples are given below.

(42) a. Taroo-ga kabin-o kowasita.
          Taro-Nom vase-Acc broke
          "Taro broke the vase."
      b. Kabin-ga kowareta.
          vase-Nom broke
          "The vase broke."

(43) a. Yoshio-ga bataa-o tokasita.
          Yoshio-Nom butter-Acc melted
          "Yoshio melted butter."
      b. Bataa-ga toketa.
          butter-Nom melted
          "Butter melted."

(44) a. Sensei-ga siken-no hi-o kimeta.
          teacher-Nom exam-Gen date-Acc decided
          "The teacher decided the date of the exam."

b. Siken-no   hi-ga   kimatta.
exam-Gen date-Nom decided
"The date of the exam has been decided."

The range of data given above is reminiscent of the English causative alternation discussed in section 1. Japanese, however, departs from English in that the transitive and intransitive verbs have different, although morphologically related, forms. In each case in (42–44), the transitive verb in the (a) variant and the intransitive verb in the (b) variant are morphologically related, sharing the identical root. The subject of the intransitive sentences in (b) is the object of the transitive sentences in (a), as is indicated by the Case markers. In examining a large set of pairs of intransitive and transitive verbs of the sort depicted in (42–4) with respect to the characteristics inherent to intransitive variants, Jacobsen captures the generalization that the eventuality denoted by an unaccusative verb, i.e. the intransitive variant, spontaneously comes about. He explains that unaccusative verbs "express events which simply happen, apart from any agentive involvement, accompanied by some change in state of the syntactic subject" (1992: 129). Note that this semantic characteristic observed with the unaccusative variant of the morphologically related transitive–intransitive pairs in Japanese is not inconsistent with what Levin and Rappaport Hovav (1995) consider as the semantic properties that trigger the causative alternation in English briefly discussed in section 1. Recall that Levin and Rappaport Hovav claim that intransitive verbs whose eventualities are externally caused have transitive variants. They further contend that when the causation that brings about the event can be unspecified, an intransitive variant, namely an unaccusative verb, is derived. Thus, this semantic characterization of unaccusative verbs that enter into the causative alternation in English subsumes what Jacobsen describes for unaccusative verbs, namely, spontaneous change of state.

Another way of viewing spontaneous change of state is lack of agency or volitionality. It is this semantic notion of volitionality, or lack of it, that Kishimoto (1996) takes up in his semantic-based approach to unaccusativity. Kishimoto first demonstrates that deverbal nominals consisting of the suffix *-kake* "be about to, do halfway" modify the direct object of a transitive verb and the subject of an unaccusative verb, but not the subject of an unergative verb and the subject of a transitive verb. On the basis of this observation, he regards the deverbal nominalization as a diagnostic test for unaccusativity. The following paradigm summarizes his point.

(45)   *The direct object of a transitive verb*
Akatyan-ga miruku-o nonda.
baby-Nom   milk-Acc drank
"The baby drank milk."
nomi-kake-no   miruku
drink-KAKE-Gen milk
"milk, half drunk"

(46) *The subject of a transitive verb*
      *nomi-kake-no   akatyan
       drink-KAKE-Gen baby
      "a baby, almost drinking"

(47) *The subject of an unaccusative verb*
      Doa-ga   aita.
      door-Nom opened
      "The door opened."
      aki-kake-no   doa
      open(intr.)-KAKE-Gen door
      "the door, slightly ajar"

(48) *The subject of an unergative verb*
      Rannaa-ga   hasitta.
      runner-Nom ran
      "The runner ran."
      *hasiri-kake-no rannaa
      run-KAKE-Gen runner
      "the runner, almost running"

The sample lists that result from this diagnostic test are shown below (taken from Kishimoto 1996: 264–5).

(49) *Unaccusative verbs*

sinu	"die"	oboreru	"be drowned"
umareru	"be born"	nemuru	"sleep"
tissoku-suru	"smother"	furueru	"tremble"
kuruu	"go wrong"	mahi-suru	"paralyze (intr.)"
komu	"be crowded"	moeru	"burn (intr.)"
yowaru	"weaken (intr.)"	katamuku	"lean (intr.)"
naku	"cry"	korobu	"fall down"
kumoru	"get cloudy"	naoru	"cure (intr.)"

(50) *Unergative verbs*

sakebu	"shout"	hasiru	"run"
odoru	"dance"	okiru	"get up"
noboru	"climb"	asobu	"play"
ugoku	"move"	oyogu	"swim"
nigeru	"escape"	hataraku	"work"
hanasu	"talk"	hoeru	"bark"
tatakau	"battle"	tobi-komu	"dive"
tatu	"stand up"	dekakeru	"go out"

Once he classifies intransitive verbs into these two groups on the basis of the deverbal nominalization test, Kishimoto attempts to identify a meaning

component that may correlate with the unaccusative–unergative dichotomy and claims that it is the notion of volitionality that gives rise to the distinction between the two intransitive classes. On the basis of the observation that the subjects of the verbs in (49) are not agents while their counterparts in (50) are, he concludes that if the sole argument of an intransitive verb is a volitional entity, the verb is unergative; otherwise, the verb is unaccusative. Thus, lack of volitionality as a meaning component crucial to unaccusative verbs is consistent with Jacobsen's analysis of unaccusativity.

Another meaning component that may have relevance to unaccusativity is discussed in Tsujimura (1991, 1994, 1996a), where the notion of delimitedness or telicity is considered in relation to verbs of motion. Motion verbs are not homogeneous in that some are unaccusative while others are unergative, but the dichotomy seems to come from finer-grained meanings that are shared by each class. Among motion verbs, for example, those that specify inherent direction are unaccusative. Motion verbs with inherent direction include *tuku* "arrive," *kuru* "come," *iku* "go," *agaru* "rise," *otiru* "fall," and *kaeru* "return." Underlying the notion of inherent direction is a potential goal of the motion denoted by the verb. That is, motion verbs with inherent direction can be considered as telic, and this is evidenced by the pattern of adverbial modifiers in (51): the adverbial modifier of the type "in an hour" reflects the telicity of the event; while the modifier of the type "for an hour" suggests that the event is atelic. As the Numeral Quantifier (NQ) test shows, these verbs are unaccusative.[5]

(51) a.   Sono kyaku-ga   itizikan-de hoteru-ni tuita.
            that guest-Nom one hour-in hotel-at   arrived
            "That guest arrived at the hotel in an hour."
     b. *Sono kyaku-ga   itizikan-no   aida hoteru-ni tuita.
            that guest-Nom one hour-Gen for   hotel-at   arrived
            "That guest arrived at the hotel for an hour."

(52) Kyaku-ga   hoteru-ni osoku san-nin tuita.
     guests-Nom hotel-at   late   three-Cl arrived
     "Three guests arrived at the hotel late."

Motion verbs with inherent direction are sharply contrasted with motion verbs without the specification of direction. Manner of motion verbs, for example, are subsumed under the latter class. Included in manner of motion verbs are *aruku* "walk," *hasiru* "run," *oyogu* "swim," *tobu* "fly," and many more. These verbs do not denote a potential goal of the motion, and so the event is atelic. Lack of telicity is shown by the distribution of adverbial modifiers, and these verbs are unergative, as the NQ test verifies below.

(53) a. *Gakusei-ga   kooen-de itizikan-de aruita.
            student-Nom park-in   one hour-in walked
            "The student walked at the park in an hour."

b. Gakusei-ga   kooen-de itizikan-no   aida aruita.
    student-Nom park-in   one hour-Gen for   walked
    "The student walked in the park for an hour."

(54) *Gakusei-ga   kooen-de inu-to   san-nin aruita.
      student-Nom park-in   dog-with three-Cl walked
      "Three students walked with a dog in the park."

Hence, the specification of inherent direction and lack of it, which may ulti-mately lead to telicity, or delimitedness in the sense of Tenny (1987), can be claimed to contribute to the determination of unaccusativity.

  Inherent direction or telicity specified as the lexical semantic property of each verb and its connection to unaccusativity may further be supported by manner of motion verbs that appear with goal phrases. Manner of motion verbs that lack inherent direction are unergative, as we have stated above, but the addition of a goal phrase to these verbs exhibits seemingly unexpected behavior in the NQ test.

(55) ?Gakusei-ga   inu-to   kooen-made san-nin aruita.
      student-Nom dog-with park-as far as three-Cl walked
      "Three students walked to the park with a dog."

The judgment is subtle, but the improvement is recognizable between (54) and (55). It suggests that a manner of motion verb accompanied by a goal phrase can appear in the unaccusative syntactic configuration. Therefore, a strong specification of a potential goal of the motion denoted by the verb, which can be characterized as telicity or delimitedness, plays a vital role in unaccusativity. Together with volitionality discussed by Jacobsen and Kishimoto, then, these meaning components provide strong grounds in the semantic characterization of unaccusativity.[6]

4 Aspectual Properties

Aspectual properties[7] constitute an important part of verb meaning since they refer to temporal constituency internal to the eventuality denoted by a given verb. Core concepts pertinent to verb aspects are reflected on the four verb classes that Vendler (1967) and Dowty (1979) propose: state, activity, accom-plishment, and achievement. The latter three classes all refer to dynamic actions, but they can further be divided into two groups based on their telicity. Activity verbs do not imply a terminal point of the event and are characterized as atelic. In contrast, events denoted by accomplishment and achievement verbs have natural ending points and hence they are telic. Jacobsen (1992) and McClure (1994) follow the Vendler/Dowty tradition in classifying Japa-nese verbs into the four aspectually natural classes. The aspect-based verb

classification is significant since repercussions of the aspectual properties inherent to each group appear in diverse syntactic and semantic phenomena (cf. Ikegami 1985, Ogihara 1992, Soga 1983).

An example of such an interaction is observed in the verb classification that H. Kindaichi (1976a) offers. Kindaichi categorizes Japanese verbs into four classes in a slightly different manner from the Vendler/Dowty classification. They are listed in (56) with examples.

(56)   a.   *Stative:*
             aru "be," *dekiru* "can do," *hanaseru* "can speak," *mieru* "be visible,"
             yoo-suru "require"
       b.   *Continuative:*
             yomu "read," *kaku* "write," *warau* "laugh," *utau* "sing," *aruku* "walk,"
             miru "look," *nomu* "drink," *osu* "push," *hataraku* "work"
       c.   *Instantaneous:*
             sinu "die," *kieru* "turn off," *sawaru* "touch," *kimaru* "decide," *sameru*
             "wake," *hazimaru* "begin," *tootyaku-suru* "arrive"
       d.   *Type 4:*
             sobieru "tower," *sugureru* "be outstanding," *zubanukeru* "outstand-
             ing," *arihureru* "be common"

Stative verbs describe static situation with no reference to dynamic actions. Continuative verbs refer to dynamic actions that last for an unspecified length of time. Instantaneous verbs denote actions that take place instantaneously. Tape 4 verbs, under Kindaichi's system, receive a separate treatment due to their unique characteristic regarding *-te iru*, as will be discussed below.

Kindaichi's classification is solely based on whether a verb occurs in the *-te iru* form and if it does, which interpretation, progressive or resultative (or perfect), is induced.[8] Stative verbs simply do not appear in the *-te iru* form.[9] Continuative and instantaneous verbs do occur in the *-te iru* form, but the interpretations are different: *-te iru* with a continuative verb is interpreted as progressive while that with an instantaneous verb is construed as resultative. Finally Type 4 verbs are those that must appear in the *-te iru* form.[10] These characteristics with *-te iru* are exemplified in (57–60).

(57)   *Stative*
        *Taroo-ni musuko-ga at-te iru.
         Taro-Dat son-Nom   have
         "Taro has a son."

(58)   *Continuative*
        Hanako-ga   hon-o   yon-de iru. (progressive)
        Hanako-Nom book-Acc read
        "Hanako is reading a book."

(59) *Instantaneous*
Inu-ga   sin-de iru. (resultative)
dog-Nom die
"A dog has been/is dead."

(60) *Type 4*
Sono gakusei-wa totemo sugure-te iru. (cf. *sugureru/ta)
that   student-Top very   be outstanding
"That student is outstanding."

Although Kindaichi's verb classification depicted in (56) is determined by
how each verb behaves with respect to *-te iru*, the differences between stative,
continuative, and instantaneous verbs are also aspectually motivated, as is
reflected on the interpretation of *-te iru*.

   In comparing Kindaichi's classification with the Vendler/Dowty system, we
notice a great similarity between stative verbs and states as well as between
instantaneous verbs and achievements. Jacobsen (1992) notes that Kindaichi's
continuative class corresponds to Vendler/Dowty's activities and accomplish-
ments. As the examples in (56b) suggest, Kindaichi focuses on aspectual prop-
erties of verbs alone while Dowty, in particular, considers the role of direct
objects and includes them in his classification. For example, many of the
transitive verbs like *kaku* "write" in (56b) can be interpreted as either activity
or accomplishment in Dowty's system depending on the range of direct object
the verbs take. This ambiguity is indeed reflected in the interpretation of *-te
iru*. Compare the following examples.

(61) a. Titi-ga   (ima) hon-o   kai-te iru. (progressive)
          father-Nom (now) book-Acc write
          "My father is writing a book/books now."
      b. Titi-ga   (moo)   hon-o   gosatu-mo kai-te iru. (resultative)
          father-Nom (already) book-Acc five-as many as write
          "My father has already written as many as five books."

The same verb can be classified either as activity, as in (61a), or as accomplish-
ment, as in (61b), depending on the aspectual interpretation of the event in each
case. As an activity verb, *-te iru* in (61a) is interpreted as progressive; on the
other hand, in (61b), the verb is an accomplishment and the verb in the *-te iru*
form refers to the state as a result of the book-writing event. This suggests that
under Vendler/Dowty's system of Japanese verbs, too, the interpretation of *-te
iru* has a close interaction with the aspect classes: that is, activity and achieve-
ment verbs induce the progressive and resultative readings, respectively, while
accomplishment verbs can be ambiguous between the two interpretations.

   Investigations of aspectual properties of verbs further lead us to a natural
account for various linguistic phenomena. An example illustrating this comes

from deverbal nominalization with -*kake* "be about to, do halfway," which has been introduced in section 3 in connection with unaccusativity. Below, I will offer an alternative analysis to demonstrate that the notion of telicity may provide a better account for a wider scope of the phenomenon.[11]

Kishimoto (1996) proposes the rule of deverbal nominal modification, which in its essence disallows agent to be modified by a deverbal nominal. The following examples, however, show that agent can be modified by -*kake* nominalization.[12]

(62) Kaeri-kake-no   gakusei-o   hikitomete sigoto-o   tanonda.
      return-KAKE-Gen student-Acc stop   work-Acc asked
      "I stopped the student, almost going home, and asked him to do work."

(63) Tabe-kake-no   hito-made   hasi-o   oite tatiagatta.
      eat-KAKE-Gen person-even chopsticks-Acc put got up
      "Even people who were in the middle of eating put down chopsticks
      and got up."

(64) Keeki-o tukuri-kake-no   kokku-ga kyuuni   deteitta.
      cake-Acc make-KAKE-Gen cook-Nom suddenly left
      "The cook, in the middle of making a cake, suddenly left."

(65) Aruki-kake-no   akatyan-ni-wa ki-o   tukete kudasai.
      walk-KAKE-Gen baby-to-Top   attention-Acc attach please
      "Please pay attention to babies, almost walking."

The individuals denoted by the heads in the examples above, *gakusei* "student," *hito* "person," *kokku* "cook," and *akatyan* "baby," all undertake the activities volitionally, and the deverbal nominals with these heads are acceptable.

What is shared by the examples above is characterized by telicity: that is, all the eventualities involved in these examples are telic. In (64), for example, in the absence of the overtly expressed direct object, *keeki-o* "cake-Acc," the acceptability of the deverbal nominal decreases, parallel to (46). The presence of the direct object in this example plays a role as a delimiter, in the sense of Tenny (1987), explicitly specifying the telicity of the eventuality. (63), on the other hand, is not accompanied by a direct object, but the grammaticality appears to reside in a contextual information that forces the interpretation in which the direct object is understood. That is, the deverbal noun is acceptable only under the interpretation that the event of eating is telic. I will come back to (65) shortly, as this example is particularly important to demonstrate the relevance of telicity.

When an extended set of data of grammatical and ungrammatical deverbal nominals with -*kake* is examined, a large number of verbs that belong to activity verbs show a strong tendency to derive unacceptable nominals, while

accomplishment and achievement verbs generally end in acceptable ones. Compare the following.

(66) *aruki-kake-no hito   "person, halfway walking"
      *warai-kake-no hito   "person, halfway laughing"
      *odori-kake-no hito   "person, halfway dancing"
      *hasiri-kake-no hito   "person, halfway running"
      *utai-kake-no hito   "person, halfway singing"

(67) tukuri-kake-no uti   "house, halfway built"
      uti-o tukuri-kake-no hito "person, in the middle of building a house"
      kaki-kake-no hon   "book, halfway written"
      hon-o kaki-kake-no hito   "person, in the middle of writing a book"

(68) sini-kake-no hito "person, almost dying"
      kie-kake-no hi   "fire, almost being extinguished"

The three groups above correspond to activity, accomplishment, and achievement verbs, respectively. These aspectual classes and the availability of deverbal nominals lead to the generalization that grammatical nominals denote telic events while ungrammatical nominals denote atelic events. The specification of the direct objects in (67) makes it explicit that the events are to be interpreted as telic, as we have observed with (64) above. Of particular interest is the comparison between *aruki-kake-no hito* "person, halfway walking" in (66) and (65). Although the verbs in these two examples are identical, they differ in telicity. In (66), the verb *aruku* "walk" receives the most natural interpretation, namely, atelic. The same verb in (65) bears a slightly different meaning: the verb here views walking as a telic event whose endpoint refers to a steady walking stage, and the transition from a crawling stage, for instance, to the steady walking stage that babies undertake can be considered as a delimited eventuality. It is under such an interpretation of the verb that the deverbal nominal is acceptable in this example.

The role that telicity plays is further confirmed by the following.

(69) eki-made aruki-kake-no   hito
      station-to walk-KAKE-Gen person
      "person, halfway walking to the station"

The activity verb, *aruku* "walk" in this example, does not have a particular meaning that the same verb in (65) implies. That is, the verb meaning is parallel to that of the verb in the first example of (66). However, the presence of the goal phrase *eki-made* "to the station" serves as a delimiter of the action, inducing the telic interpretation. Again, once the event is regarded as telic, the deverbal nominal is acceptable.

5   Language Acquisition Experiments

Experiments on children's language behavior provide interesting testing grounds for many hypotheses proposed to account for linguistic phenomena. This is true in the area of lexical semantics, as is demonstrated by Gropen et al.'s (1989) work mentioned in section 1. Several experimental investigations on semantic properties of verbs in Japanese children's speech have confirmed that this is certainly the case in Japanese.

Rispoli (1990), for instance, examines whether aspectual distinction, especially among state, activity, accomplishment, and achievement, is made in Japanese children's use of verbs.[13] We have discussed above that some verbs cannot co-occur in the *-te iru* form while others do, and that when they do appear in the *-te iru* form, they are interpreted as either progressive or resultative. Recall that the division between the verbs that allow for the *-te iru* form and those that do not is based upon the aspectual class to which an individual verb belongs. The range of data that Rispoli presents can be interpreted to show that the aspectual classification comprising state, activity, accomplishment, and achievement is indeed reflected in the appearance of *-te iru* in children's speech. In his study children properly used the progressive *-te iru* with activities and accomplishments: examples include *motu* "hold," *hasiru* "run," and *taberu* "eat" for the former, and *suwaru* "sit down" and *ireru* "put something in" for the latter. The subjects also displayed the resultative use of *-te iru* with accomplishments, such as *kaku* "write" and *neru* "go to bed," and achievements like *tuku* "turn on," *sinu* "die," and *hairu* "go in." In contrast, stative verbs like *aru* "be" and *dekiru* "be able to," which generally do not appear with *-te iru* under either interpretation in adult speech, were not used in the *-te iru* form by children, either; instead, they appeared in the present tense. This result is consistent with the correlation between the aspectual classification of Japanese verbs and the interpretation of *-te iru*. Rispoli also notes that it is very rare for children to make errors in their association of a particular interpretation of *-te iru* and verb classes. Hence, we can conclude that children, in their use of *-te iru*, know which aspectual class each verb belongs to as a part of the verb's lexical specification.

Rispoli further discusses the question of how children might decide which aspectual class a given verb belongs to, and considers the possibility that they base their judgments on the meanings, and meaning components, of verbs. For instance, many verbs children produced refer to the motion and location of a figure. Of these, verbs of manner of motion, such as *hasiru* "run" and *odoru* "dance," as well as verbs that refer to the manner of the location of a figure, like *motu* "hold," appeared in the progressive *-te iru*. On the other hand, verbs that specify the path of a moving figure, such as *kuru* "come" and *hairu* "go in," are used in the resultative *-te iru* form. Furthermore, when children encounter verbs that are not motion verbs, such as *osieru* "teach," they may treat the verb as analogous to those like *kuru* "come" on the basis of observation

that both verbs specify delimiting points as a part of their meanings. In fact, *osieru* "teach" is found in the resultative *-te iru* in his study.

Other experiments along these lines have contributed to the investigation as to how semantic notions including animacy and volitionality play a role in children's distinction between transitive and intransitive verbs (cf. Rispoli 1987, 1989). Thus, what constitutes the meaning of a verb certainly provides potential answers to some of the questions that concern language acquisition.

6   Conclusion

We have illustrated in this chapter that proper characterization of verb meaning and identification of meaning components provide insight into a number of intriguing linguistic phenomena. Representations of fine-grained verb meanings have increasingly been examined from various theoretical perspectives within lexical decomposition (cf. Croft 1991, Dowty 1979, Jackendoff 1990, Foley and Van Valin 1984, Kageyama 1996, 1997, Y. Matsumoto 1996), and we have observed that close examination of verb meaning helps us to establish meaning-based verb classification and to identify particular meaning components that often exhibit direct correlation with certain syntactic phenomena. To this end it will be beneficial to explore diathesis alternations at a more extensive level. Furthermore, language acquisition experiments are a compelling area to confirm theoretical analyses and hypotheses. Emphasis on each of these areas would jointly lead to the elucidation of our innate knowledge of verb meaning.

In the remainder of this final section I would like to discuss what has been known as the "conflation" pattern (also referred to as "lexicalization" by J. D. McCawley 1968a and "incorporation" by Gruber 1965 and Kageyama 1980a), which Talmy (1985) uses to "refer to the representation of meanings in surface forms" (1985: 60). I will take up this issue not only because conflation patterns have direct consequences for verb meaning, but also because conflation seems to be one of the vital aspects bearing a future challenge in the pursuit of lexical properties both from a language-specific and from a typological perspective.

The best sketch of conflation in relation to Japanese may be given from motion verbs. There are a number of motion verbs, but some are different from others in the way in which meaning components such as motion, manner, path, ground, and direction are incorporated in the verb meaning. For example, verbs like *aruku* "walk," *hasiru* "run," and *oyogu* "swim" incorporate the meaning components of motion and manner, while verbs such as *iku* "go," *kuru* "come," and *agaru* "rise" conflate motion and direction. Thus, verbs under the rubric of motion verbs may differ within the language in the way meaning components are conflated. Conflation patterns may also vary across languages. English, for example, allows for the conflation of manner of motion and direction while

Japanese does not, as is demonstrated by the verb *ukabu* "float." Compare the two languages.

(70) a.   Bin-ga   hasi-no   sita-de   ukande-ita.
           bottle-Nom bridge-Gen under-at was floated
           "A bottle was floating under the bridge."
      b.   *Bin-ga   hasi-no   sita-e   ukanda.
           bottle-Nom bridge-Gen under-to floated
           "A bottle floated under the bridge."

(71) a.   The craft floated on a cushion of air.
      b.   The craft floated into the hangar on a cushion of air. (Talmy 1985:
           64)

The Japanese verb *ukabu* "float" cannot conflate manner of motion with direction. This is why the verb cannot occur with the expression that signals the direction of the motion, as is shown in (70b), though the meaning with manner of motion is good as in (70a). English, on the other hand, shows that the conflation of manner of motion and direction is allowed: (71b), where *float* displays such an example, refers to the floating manner in which the craft moves as well as the direction of the floating motion. It has been reported that French and Spanish follow the Japanese conflation pattern, disallowing the conflation of manner of motion and direction (cf. Green 1973, Levin and Rapoport 1988, Rapoport 1993, Talmy 1985).

While Japanese disallows the conflation of manner of motion and direction in the semantic representation of a single verb, it has been often observed that co-occurrence of manner and direction can be achieved by means of periphrastic expressions (cf. Yoneyama 1986, L. Levin et al. 1988, Tsujimura 1990c, 1991, 1994). This is described below.

(72) *Taroo-ga   kooen-e/ni hasitta/aruita.
       Taro-Nom park-to   ran/walked
       "Taro ran/walked to the park."

(73) Taroo-ga   kooen-e/ni hasitte/aruite-itta.
       Taro-Nom park-to   run/walk-went
       "Taro ran/walked to the park."

Direction of motion is not included in the meaning of manner of motion verbs like *hasiru* "run" and *aruku* "walk," and hence a goal phrase cannot co-occur, as (72) suggests. The addition of directed motion verbs like *iku* "go" (and also *kuru* "come") to the gerundive form of the motion verbs, however, makes it possible to represent manner of motion and direction concurrently, as in (73).

Y. Matsumoto (1996) observes, furthermore, that the conflation of the two meaning components, manner of motion and direction, is in fact found in many

compound verbs. His list includes the following (taken from Y. Matsumoto 1996: 277).

(74) kake-agaru   (run-go up)   "run-up"
      kake-noboru   (run-climb)   "run up"
      kake-oriru   (run-go down)   "run down"
      kake-mawaru   (run-go around)   "run about"

      hai-agaru   (crawl-go up)   "crawl up"
      hai-deru   (crawl-go out)   "crawl out"

      aruki-mawaru   (walk-go around) "walk around"

      hasiri-mawaru   (run-go around)   "run about"
      hasiri-saru   (run-leave)   "run away"

These compound verbs comprise a manner of motion verb as the first member and a directed motion verb as the second. Together, they form a single compound verb that conflates the two meaning components in question. As Matsumoto demonstrates, there are a number of compound verbs that exhibit similar conflation patterns. What this observation amounts to is that while, from the typological aspect, Japanese appears to belong to those languages that display a restricted range of conflation patterns, the language may employ morphological means which compensate for the restricted degree of conflation within simplex verbs. Apparently different languages in this respect, then, could turn out to share similar conflation patterns although the mechanism each language uses to realize them may vary.

   Another example suggesting that the investigation of conflation patterns may be a fruitful area for future research is again found in motion verbs. The English manner of motion verb, *walk*, is normally an intransitive verb, but can be used transitively, as in *I walked the dog*. This transitive use of *walk* conflates the causative meaning with manner of motion. So, the example can be paraphrased as *I made/had the dog walk*. This type of conflation is not observed in Japanese, where the causative meaning is expressed with the causative morpheme *-(s)ase*, as in *Inu-o aruk-ase-ta*. The same English verb, *walk*, in *I will walk you home because it's dark*, however, does not have the causative meaning, nor can it find a Japanese equivalent with the causative suffix. The interpretation of this example, namely, "I will accompany you home," can in no way be expressed by some morphological device affecting the manner of motion verb *aruku* in Japanese. This example, thus, suggests that not only the question of whether a certain conflation pattern is available in a language, but also how it is realized and to what degree it is made possible, would be of interest. Hence, further examination of conflation patterns available to Japanese as well as cross-linguistic comparisons would lead to a better understanding of the true nature of verb meaning.

NOTES

* I would like to thank Clancy Clements, Stuart Davis, and Mineharu Nakayama for their helpful comments and suggestions on earlier versions of this chapter. Special thanks go to Beth Levin and Peter Sells for discussion relevant to various issues covered here.

1 Approaches to lexical semantic representation have been divided into basically two types: they are what Levin (1995) calls "semantic role-centered" and "predicate-centered" approaches. The first represents the verb's arguments in terms of thematic roles like agent and theme, while the second approach focuses on the decomposition of the verb meaning that may involve primitives such as BECOME and CAUSE. The discussion of the two approaches is found in Levin (1995). See also Fillmore (1968) and Gruber (1965) for the former approach, and Carter (1976, 1988), Dowty (1979), Jackendoff (1983, 1990), and Pinker (1989) for the latter.

2 It goes without saying that there are a number of important works written in Japanese on lexical semantics of verbs. They include Ikegami (1981), Kageyama (1996), Morita (1994), Moriyama (1988), and Teramura (1982, 1984), to name just a few.

3 These two analyses also differ in their lexical semantic representation. Kageyama adopts the "semantic role-centered" approach while Fukui et al. assume the "predicate-centered" approach, as was mentioned in n. 1.

4 It should not be assumed that all morphologically related transitive–intransitive pairs give rise to unaccusativity. In order to recognize intransitive counterparts of such pairs as unaccusative verbs, diagnostic tests should be applied to them. For example, the intransitive verbs in (42–4) meet the diagnostic tests of Numeral Quantifiers (Miyagawa 1989a, 1989b) and/or the resultative construction (Tsujimura 1990a) to confirm their unaccusative status.

5 In the discussion below I assume that the NQ test constitutes a reliable diagnostic for unaccusativity in Japanese. According to Miyagawa (1989a, 1989b), an NP and its NQ are required to be in a mutual c-command relation. In (52) the NQ and the subject NP *kyaku* "guest" are not in a mutual c-command relation, but the sentence is grammatical. This suggests that the subject is underlyingly the direct object with which the NQ can maintain a mutual c-command relation. For details of this test, see Miyagawa (1989a, 1989b).

6 Telicity and agency are the two most frequently cited meaning components in cross-linguistic research on unaccusativity. See Van Valin (1990), for example.

7 A detailed discussion of aspect-based verbal classification and the aspectual interpretation pertinent to the *-te iru* construction is found in chapter 11 of this book. Also, see Ogihara (in press) for a recent analysis of the same topic.

8 The progressive interpretation corresponds to the progressive (be V-ing) meaning in English. The resultative (or perfect) reading

refers to the state as a result of the action denoted by the verb.

9   It should be pointed out that verbs that are normally classified as statives, such as *wakaru* "understand" and *dekiru* "can do," do appear in the *-te iru* form, as in *wakat-te iru* and *deki-te iru*, with the resultative interpretation. I agree with Yamagata (1997) in attributing this possibility to the difference between stage-level predicates and individual-level predicates in the sense of Carlson (1977) and Kratzer (1989): that is, by adding *-te iru*, stative verbs like *wakaru* and *dekiru* change their interpretations from individual-level to stage-level.

10   I am excluding the cases where Type 4 verbs appear as prenominal modifiers. In such cases, the verbs can appear in either *-te iru* form or the past tense: e.g. *sugur-te iru/ sugure-ta gakusei* "outstanding student" (cf. Kinsui 1994, Teramura 1984).

11   For a more extensive discussion of Kishimoto (1996), see Tsujimura (1997).

12   I would like to thank Masayo Iida and Yasuko Watt for providing examples (63) and (65), respectively.

13   A related work is found in Cziko and Koda (1987), which also investigates the relation between *-te iru* and aspectual properties of verbs.