Argument Structures of English Intransitive Verbs*

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This paper looks into six types of intransitive verbs in English: unergative, unaccusative, verbal passive, adjectival passive, middle and ergative. The main goal of this study is to represent argument structures of the six types of English verbs which are all different from one another. To this goal, I make use of the operations like argument suppression, argument deletion, and externalization, and the notions like event argument (Davidson 1967, Kratzer 1989), external argument and internal argument (Williams 1981, Marantz 1984). Implications of this study are: (i) We do not need to use the thematic role labels like Agent or Theme (Marantz 1984, Zubizarreta 1987, Rappaport and Levin 1988), and (ii) this research supports the absolute theory of argument structure (cf. Jackendoff 1972, Grimshaw 1990, Chung 1992, 1993). The argument structures of the six types of intransitive verbs presented here will cast light on the semantic and syntactic aspects of those constructions.

1. Introduction

Since Perlmutter (1978), it has been observed that intransitive verbs are not

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a homogeneous group. The following illustrate six types of intransitive verbs in English:

(1) a. John walked. (unergative)
    b. The speaker arrived. (unaccusative)
(2) a. The book was written by Chomsky. (verbal passive)
    b. The strike was unexpected. (adjectival passive)
    c. The girl photographs well. (middle)
    d. The government moved. (ergative)

While the verbs in (2) are intransitive verbs derived from the transitive verbs, those in (1) are intransitive verbs not derived. The purpose of this study, as a comprehensive and comparative research, is to present the argument structures of the six types of predicates in (1) and (2), which are all distinguished from one another.

In the literature, there have been some studies about the individual constructions in (1) and (2) (Wasow 1977, Bresnan 1982, Marantz 1984, Keyser and Roeper 1984, Levin and Rappaport 1986, Burzio 1986, Roberts 1987, Zubizarreta 1987, Fagan 1988, Fagan 1992, Ackema and Schoorlemmer 1995, etc.), but none of them compare all the constructions in terms of argument structure. As far as I know, nobody has examined the differences in argument structure between adjectival passives and middles, middles and ergatives, unaccusatives and ergatives. In this study, all the intransitive verb constructions, derived or non-derived, are distinguished from one another in terms of argument structure.

To represent the argument structures of the six types of intransitive verbs, I make use of the operations like argument suppression, argument deletion, and the notions such as external argument and internal argument (Williams 1981,
Marantz 1984). I also show that event argument (Davidson 1967, Higginbotham 1985, Parsons 1990, etc.) plays an important role in the argument structures of the verbs. Finally I make a distinction between argument suppression and argument deletion.

The paper is organized as follows. Section 2 is a general introduction to arguments and argument structure. Here several types of arguments such as external argument, direct argument, suppressed argument, deleted argument and event argument are discussed. Section 3 presents argument structures of the six intransitive verbs in (1) and (2). Section 4 presents some implications of this study.

2. Argument Structure

2.1. Types of Argument

A predicate describes an event or situation in which some participants are required. Let us consider the following examples:

(3) a. The student studies English.
    b. The student is sleeping.

The predicate in (3a), *study*, describes an event in which two participants are required, a person who studies, and an entity which is studied. In (3b) the predicate *sleep* requires only one participant. The required participant of the predicates is called argument. Arguments can be classified as in (4):

(4) a. obligatory argument and optional argument
Let us first consider obligatory and optional arguments. Arguments are obligatory in general,¹ but there are some arguments which are optional:

(5) a. Mary cut the apple with the knife.
    b. Mary cut the apple.

The verb cut in (5a) has three arguments, Mary, the apple, with the knife. But one argument, with the knife, can be optional as in (5b). We may call this optional argument.

Arguments are realized on, or linked to, some syntactic positions. Some argument is always realized on the subject position and some on the object position. Based on the syntactic realization, we can classify argument types as external argument and internal argument. External argument is an argument which is realized outside the maximal projection of the predicate, whereas internal argument is one realized inside the maximal projection of the predicate (Williams 1980, Chomsky 1981). Let us look at the following:

(6) a. They study English.

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¹ In general it is assumed that an argument is obligatory whereas an adjunct is optional.
In (6b) the subject *They* is an external argument and the object *English* is an internal argument; the external argument is outside the maximal projection VP and the internal argument is inside the VP. The subject argument at D-structure is an external argument, and the object argument at D-structure is an internal argument.

The structure in (6b), however, is represented somewhat differently in the recent studies (Chomsky 1995), as shown below:

In (7) the external argument appears at the specifier position of the so-called light verb \( v \) and the internal argument is within VP.

Other types of arguments are direct argument and indirect argument. This distinction is based on the appearance of prepositions; if an argument is realized
with a preposition, it is an indirect argument, and if an argument is realized without a preposition, it is a direct argument (Marantz 1984). Let us take an example:

(8) Mary put the cake on the table.

In (8) the verb *put* has three arguments: one is external argument and the other two arguments are internal arguments. One of the internal arguments is an indirect argument since it is realized with a preposition, and the other is a direct argument.

In order to distinguish the arguments, external and internal, direct and indirect, the following notations are used (Marantz 1984, Zubizarreta 1987, Rappaport and Levin 1988):

(9) put: x <y z>

In (9), the verb *put* has three arguments, x, y and z. The external argument x is outside the bracket and the internal arguments are inside, and the direct argument y is underlined, and the indirect argument is not underlined. External argument is not underlined although it is a direct argument since it is always distinguished from internal arguments. For optional arguments, one may use the parentheses, as shown in (10):

(10) a. Mary cut the apple (with the knife).

   b. cut: x <y (z)>

Arguments that we have seen so far play a role of argument syntactically. However, there is an argument which lost its syntactic status in the course of
some syntactic or morphological operation. Consider the following passivization:

(11) a. They invited the singer.
    b. The singer was invited (by them).

Sentence (11b) is a passive of (11a). The external argument *They* in (11a) appears in the *by* phrase in (11b) which does not play a role of argument and its appearance is optional. Many studies (Grimshaw 1990 among the others) argue that the external argument in (11a) is suppressed in (11b). Passivization deprives the external argument of its argument status, changing it into an adjunct. But it is observed that this suppressed argument is not dead completely in syntax.\(^2\) This suppressed argument is marked with a star in (12):

(12) invited: \(<y\>, \(*x\)"

In (12) the passive verb *invited* does not have external argument, but it has one internal argument and the suppressed argument *x*, which is also called implicit argument. This suppressed argument is in the parentheses in (12) since it appears optionally.

The suppressed argument is distinguished from the deleted argument which does not appear in the argument structure at all. We can see some argument disappear in the following middle construction:

(13) a. The movie frightened John.
    b. John frightens easily.
    c. *John frightens easily by the movie.

\(^2\) The detailed discussion of the suppressed argument will be given in Section 3.2.1.
The middle sentence in (13b) is derived from the transitive construction in (13a). In the middle formation, one argument is deleted and it cannot appear even optionally as in (13c). This deleted argument in middles will not be represented in argument structure, as shown in (14):

(14) frighten: y < >

Finally I will introduce event argument which was first discussed by Davidson (1967) and has been supported by several linguists (Higginbotham 1985, Kratzer 1989, Parsons 1990, etc.). The verb *sang* in (15) has two arguments, *The choir* and *the Marseillaise*, as in (16a). But, according to Davidson (1967), it has one more argument, event argument e, as shown in (16b):

(15) The choir sang the Marseillaise.
(16) a. sang (The choir, the Marseillaise)
    b. sang (e, The choir, the Marseillaise)

Davidson proposed event argument for action sentences. This means that stative sentences do not have event argument. Later, Kratzer (1989) argues that stage-level predicates, but not individual predicates, have event argument. Here I follow Kratzer (1989), although it is still controversial which predicates have event argument (cf. Parsons 1990, Pustejovsky 1995). From now on, I will use the following notation of argument structure which includes event argument, e, as in (17):

(17) sing: e, x <y>

3. The detailed discussion of the middle formation is given in Section 3.2.3.
In (17) the verb *sing* has three arguments, event argument e, external argument x and internal (direct) argument y. But for convenience, I will not consider event argument in counting the number of arguments. That is, I will consider the verb *sing* as a two-place predicate.\(^4\)

So far I have discussed several types of arguments: obligatory and optional arguments, external and internal arguments, direct and indirect arguments, suppressed argument, deleted argument and event argument.

In this paper I will not use the thematic role labels like Agent, Theme, and Goal. Although the labels are convenient, it is very difficult to define them clearly, as discussed by several linguists (Rappaport and Levin 1988, Grimshaw 1990, etc.). I will show how the several types of intransitive verbs can be differentiated from one another without using the thematic role labels, but with the notions discussed in this section.

### 2.2. Argument Structure Theories

It is generally assumed that arguments are hierarchically structured, not just an unordered list. That is, each argument has a hierarchical status, compared with others. This is also known as the thematic hierarchy where the thematic roles are used. The following show some versions of the thematic hierarchy:

(18) Thematic Hierarchy

a. \(<\text{Agent}, \text{Location/Source/Goal, Theme}>\) \hspace{2cm} (Jackendoff 1972)

b. \(<\text{Agent}, \text{Experiencer}, \text{Location/Source/Goal, Theme}>\) \hspace{2cm} (Grimshaw 1990)

c. \(<\text{Agent, Theme, Goal, Obliques}>\) \hspace{2cm} (Larson 1988)

d. \(<\text{Agent, Theme, Goal/Benefactive/Location}>\) \hspace{2cm} (Baker 1989)

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4. I will not discuss whether event argument is external argument or not. Some linguist like Grimshaw (1990) argues that event argument is external argument.
As shown in (18), there are some variations of the thematic hierarchy. For example, Jackendoff (1972) and Grimshaw (1990) assume that Goal is higher than Theme, whereas Larson (1988) and Baker (1989) assume that Theme is higher than Goal. I am not concerned about the status of some specific argument.

Since I do not use the thematic role labels, I do not take the hierarchies in (16) as they are. The notations I have examined in the earlier section assume some hierarchy of arguments. Consider the following argument structure:

(19) cut: x <y z>

Among the three arguments in (19), the external argument x is higher than the internal arguments, y and z, and the direct internal argument y is higher than the indirect internal argument z.\(^5\) The suppressed argument is not taken into consideration since it is assumed to have lost its argument status.

Some linguists like Grimshaw (1990) and Li (1990) assume that the status of arguments is relative. In the relative theory of argument structure, the status of an argument is determined compared with other arguments. For example, Grimshaw (1990) defines external argument as the most prominent argument in the thematic tier and aspectual tier both. One serious problem with this relative theory is that it cannot determine the argument status of a single argument since it can be either the most or least prominent. On the other hand, in the absolute theory of argument structure I am assuming here, the status of arguments is not relative, but absolute. That is, an argument has its own status or value, without being compared with others. Thus, when there is a single argument, it has its own hierarchical value. For example, it can be either external argument or

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5. Here I simply assume that the argument on the left is higher than the one on the right. This does not mean that a direct argument is always higher than an indirect argument, which is a controversial issue, as shown in (18). This is another topic to study further.
internal argument, where the former is higher than the latter. Note that the notions I use here such as external and internal argument are based on the absolute theory since their status is determined absolutely.

Based on the notions and the theory of argument structure I have presented so far, I will represent the argument structures of the six types of English intransitive verbs in section 3.

3. Argument Structures of Intransitive Verbs

As mentioned in Section 1, the six types of intransitive verbs in English are unergative, unaccusative, verbal passive, adjectival passive, middle, and ergative. The first two types, unergative and unaccusative, are non-derived intransitives, whereas the other four are derived intransitives. Let us first consider the non-derived intransitive verbs.

3.1. Unergatives and Unaccusatives

The verbs in (20) are unergative and those in (21) are unaccusative:

(20)  a. John worked.
    b. Mary smiled.

(21)  a. Today traffic is flowing more smoothly than usual.
    b. The temperature has fallen.

Semantically, the unergative sentences in (20) describe some actions initiated by

the agentive subject, whereas the unaccusative sentences in (21) describe
non-agentive situations. Thematically, the subjects of the unergatives in (20) are
Agent or Actor, whereas those in (21) are Theme. In terms of argument
structure, the unergative verbs in (20) take external argument, those in (21)
internal arguments. The argument structures of the two types of verbs are
represented as in (22), and more example verbs are illustrated in (23) and (24):

\[(22) \quad \text{a. unergative: } e, x < > \]
\[\text{b. unaccusative: } <x>\]

(23) Unergative Verbs
work, fight, play, speak, talk, smile, grin, frown, swim, walk, lie, bark

(24) Unaccusative Verbs
fall, flow, exist, happen, occur, arrive, thrive, arise, emerge, remain, seem

The unergative verbs have event argument as shown in (22a). Most of the
unaccusative verbs, but not all of them, have event argument; for example, the
verb remain is assumed not to have event argument.

The two types of argument structures are projected to the different syntactic
structures, as shown below:

\[(25) \quad \text{a. unergative}^7 \] \[\text{b. unaccusative}\]

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7. Hale and Keyser (1993) propose that unergative verbs are intrinsically transitive. They
assume that an unergative verb takes an object and this object incorporates to V, becoming
an intransitive verb on the surface.
The external argument appears on the specifier position of \( \varphi P \) in (25a) and the internal argument appears on the object position in (25b).

It seems that the distinction of the two types of intransitive verbs is based on the semantics of the verbs. But here I present evidence for the distinction. It is well documented that the suffix \(-er\) is attached to the verbs taking external argument (Fabb 1984, Sproat 1985, Rappaport Hovav and Levin 1992, Chung 1998). Then, it is predicted that the suffix is suffixed to the unergative verbs, but not to the unaccusative verbs. The following data show that this prediction is correct:

(26) barker, worker, fighter, player, speaker, talker, smiler, grinner, frowner, walker,

The base verbs of the derived \( er \) nominals in (26) take only external argument, whereas those in (27) do not. The data in (28) verifies that the suffix \(-er\) is attached to the verbs with external argument:

(28) teacher, maker, baker, driver, striker, lecturer, dryer, grinder, heater

The transitive base verbs in (28) have external argument and thus the suffix \(-er\) can be attached to the verbs. These \(-er\) data confirm that the unergative verbs have the external argument, a D-structure subject, while the unaccusative verbs have the internal argument, a D-structure object.

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8. The distinction of the two types of the intransitives made by Perlmutter (1978) was based purely on the verb meanings.

9. In Dutch, while the unergative verbs, though they are intransitive, can be passivized, the unaccusative verbs cannot.
In the next section we will see argument structures of the intransitive verbs derived from transitive verbs.

3.2. Derived Intransitive Verbs

In this section, I will show the argument structures of the four types of derived intransitive verbs: verbal passives, adjectival passives, middles and ergatives.

3.2.1. Verbal Passives

Let us consider the following verbal passives:

(29) a. Nora pushed the chair.
    b. The chair was pushed (by Nora).

In passivization, the active verb push taking two arguments in (29a) becomes a passive verb taking one argument in (29b). One property of passivization is to suppress the external argument, which is stated in (30). The change of argument structure of the verb push is illustrated in (31):

(30) Verbal Passive Formation (VPF)
    Suppress the external argument.
(31) a. push: e, x \langle y \rangle
    b. pushed: e, \langle y \rangle, (*x)

In (31a), the verb push takes two arguments, x and y, one is external and the other internal. The passive form pushed in (31b) takes only one argument y and
the external argument x is suppressed, which is represented as *x. This suppressed argument, or implicit argument, does not have the status of argument and its appearance is optional.

Although the suppressed argument in passives cannot appear at subject or object position, it does not lose its syntactic role completely. Consider the following examples:

(32) a. They sold the book [PRO to make money].  
    b. The book was sold [PRO to make money].

The antecedent of PRO in (32a) is They, the external argument of the verb sold. In the passive sentence in (32b), the antecedent of PRO is the suppressed argument They. Because of this property of the suppressed argument, controlling PRO, it is called argument-adjunct by Grimshaw (1990). 10

As we have seen above, one argument is suppressed in passivization. The suppressed argument must be external argument of the active verb. Thus, it is predicted that if a verb does not have an external argument, the verb cannot be passivized. Let us consider the following verb taking two internal arguments:

(33) a. A lamp is beside the table.  
    b. There is a lamp beside the table.  
    (34) is: <x, y>

The existential verb is takes two arguments, x and y, or the two roles, Theme and Location. Since the verb does not have external argument, it cannot be passivized.

10. Roberts (1987:30) states that the by-phrase is thematically an argument but structurally an adjunct.
We have seen that passivization involves change of argument structure, suppressing the external argument. As a result, a transitive verb becomes an intransitive verb in passivization. Passivization, however, does not always result in intransitive verbs. Let us consider the following ditransitive verb construction and its passive construction:

(35)  a. The teacher gave the child the red book.
         b. The child was given the red book.

Passivization of the three-place predicate *give* in (35a) results in a two-place predicate in (35b). This means that passivization suppresses only one argument.

### 3.2.2. Adjectival Passives

Another type of passives in English is adjectival passive. Let us consider the following examples:

(36)  a. The strike was expected.
         b. The strike was unexpected.

The passive in (36a) is a verbal passive, and the one in (36b) is an adjectival passive. The different names are due to the category of the past participle in each passive: the past participle in the verbal passive is verb and the one in the adjectival passive is adjective. That is, *expected* in (36a) is a verb, and *unexpected* in (36b) is an adjective.

Note that the marked form of the adjectival passive in (36b) is the prefix *un*-. This negative prefix which has negative meaning is attached to adjectives only. Consider the following data:
The negative prefix un- is attached to adjectives as in (37a), but it cannot be attached to verbs or nouns or prepositions as in (37b).

One caution here is that the prefix un- has another usage, the privative usage. Privative un- implies a reversal of the action specified in the verb, and one important characteristic of this usage is that it is attached to verbs only. Consider the following data:

(38) uncover, undo, unfold, uncrown, uncover, unbend, unload, untie

The meanings of the un-prefixed verbs in (38) are the reversal of the base verbs, not the negative meanings.

The two types of usage of the prefix un- can be distinguished easily when we consider its meaning. With negative meaning, the word prefixed by un- is adjective, and the one with privative meaning is verb. The passive in (36b) is an adjectival passive since the meaning of the prefix is negative and then the word prefixed by un, unexpected, is adjective.

Now let us consider the argument structure change of adjectival passive verbs. Adjectival passive formation has the following properties:11

11. Levin and Rappaport (1986:624) present the following as properties of APF:

a. Affixation of the passive morpheme -ed
b. Change of category: [+V, -N] → [+V, +N]
c. Suppression of the external role of the base verb
d. Externalization of an internal role of the base verb
e. Absorption of Case
f. Elimination of the [NP, VP] position
(39) Adjectival Passive Formation (APF)
   i) Suppress the external argument (if there is one)\textsuperscript{12}
   ii) Externalize a (direct) internal argument.

Following (39), argument structure of a typical transitive verb is changed as in (40):

\[(40) \ x <y> \Rightarrow y << >, (*)x\]

In (40) the external argument x is suppressed and the internal argument y is externalized. The suppressed argument *x in (40) may appear optionally as shown below:\textsuperscript{13}

\begin{itemize}
  \item a. elapsed time [time that has elapsed]
  \item b. a fallen leaf [a leaf that has fallen]
  \item c. a widely travelled man [a man who has travelled widely]
  \item d. a risen Christ [a Christ that has risen (from the dead)] \quad (Bresnan 1982:30)
\end{itemize}

\begin{itemize}
  \item a. *an (already) occurred event
  \item b. *(recently) left travelers
  \item c. *(newly) come packages
  \item d. *(recently) grown interest
  \item e. *a (recently) surfaced problem \quad (Pesetsky 1995:23)
\end{itemize}

Bouchard (1995) and Pesetsky (1995) suggest that the pattern in (ii) is more general and typical than that in (i).

\textsuperscript{12} In general only the verbs with external argument can be adjectival passives. However, as noted by Bresnan (1982), Levin and Rappaport (1986), Bouchard (1995) and Pesetsky (1995), there are some unaccusative verbs which undergo APF, as shown in (i) below. But there are other unaccusative verbs which do not undergo APF as in (ii).

\begin{itemize}
  \item a. elapsed time [time that has elapsed]
  \item b. a fallen leaf [a leaf that has fallen]
  \item c. a widely travelled man [a man who has travelled widely]
  \item d. a risen Christ [a Christ that has risen (from the dead)] \quad (Bresnan 1982:30)
\end{itemize}

\begin{itemize}
  \item a. *an (already) occurred event
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  \item d. *(recently) grown interest
  \item e. *a (recently) surfaced problem \quad (Pesetsky 1995:23)
\end{itemize}

Bouchard (1995) and Pesetsky (1995) suggest that the pattern in (ii) is more general and typical than that in (i).

\textsuperscript{13} Grimshaw (1990) notes that the by phrase in certain adjectival passives is obligatory:
(41) a. We were unimpressed (by his efforts).
   b. Most of the east coast remains mercifully untouched (by tourism).

The suppression approach to the external argument in APF is supported by the work by Roberts (1987), and Baker, Johnson and Roberts (1989). They claim that the morpheme -en in the passives is the suppressed external argument. If their claim is right, then the external argument is suppressed in both types of the passives since the two types of passives have the morpheme -en.14

Once we take the external argument as suppressed, the difference in argument structure change between the two passives, verbal and adjectival, is in externalization of an internal argument. This difference is repeated in (42):

(42) a. Verbal Passive Formation (VPF)
    x <y> => <y>, (*x)

b. Adjectival Passive Formation (APF)

14. However, there are some examples which seem to go against the suppression approach above. The adjectival passives cannot take the rational clause or an agentive adverb, or the agentive by phrase, which is different from the verbal passives, as shown below:

   (i ) a. *The book was unsold to make money.
   b. *The book was voluntarily unsold.
   c. *The used car was unsold by the owner.

The data above seem to indicate that the external argument of the base verb is deleted, not suppressed. If the external argument is suppressed here, then the suppressed argument can license the rational clause, the agentive phrase and the agentive by phrase, as in the verbal passives (See (32)). But this is not the case in (i). I suggest that the ungrammaticality of the sentences in (i) is related to the conflict between the agentive expressions and the stative reading of the adjectival passives. But this should be studied more.
In VPF the internal argument \( y \) remains internal, whereas in APF the internal argument is externalized. This difference in argument structure between the two types of passives results in some syntactic effects. First, a verbal passive verb does not have external argument and thus the subject position needs to be filled with some element, by movement or insertion. On the other hand, an adjectival passive verb has external argument and it is projected to the subject position. Thus, adjectival passive formation does not involve movement or insertion in syntax.

Second, as shown in (42) APF specifies that the external argument or the surface subject is an internal argument of the base verb. That is, in (42b) the internal argument \( y \) of the base verb is changed to external argument and thus it becomes the surface subject. However, the verbal passive verb in (42a), lacking external argument, does not specify which element becomes the surface subject. This implies that some element other than arguments of the base verb can be the surface subject. The effect of this contrast between VPF and APF is illustrated in the following examples:

(43) a. There was expected \( t \) to be a strike.

b. *There was unexpected \( t \) to be a strike.

In the verbal passive in (43a) the subject position of the main clause is filled by the element \( \text{there} \) which is moved from the embedded clause subject. \( \text{There} \) is not an argument of the main verb, \( \text{expect} \). This is predicted since the subject of the verbal passive need not be an argument of the verb. But this is not the case in the adjectival passive in (43b). The subject of the adjectival passive should be one argument of the base predicate. In (43b) \( \text{there} \) is not an argument of the
predicate *unexpected*. Thus the ungrammaticality of sentence (43b) is predicted when we adopt the argument structure change of the adjectival passive in (42b) (Wasow 1977, Levin and Rappaport 1986).\(^{15}\) Thus, the approach in (42) predicts that APF does not involve NP movement whereas VPF does.

Finally, I assume that VPF does not affect event argument. For instance, if a base verb has event argument, its passive verb has also the event argument, and if it does not have event argument, then its passive does not, either.\(^{16}\)

### 3.2.3. Middle Verbs

Another type of derived intransitive verbs in English is middle verbs. Middle is meant to be a voice between active and passive. Middle verb constructions are exemplified in the following:

(44)  a. The bottle breaks easily.
    b. The bread cuts easily.
    c. The car drives nicely.
    d. The knife cuts well.
    e. She photographs well.
    f. This book could sell.
    g. This type of coal does not burn very easily.
    h. This bread DOES cut.
    i. This paper DOESN'T cut.

\(^{15}\) It is predicted that long-distance movement (crossing projections of lexical predicate) is not allowed in APF, which is allowed in VPF or in the raising constructions as shown below:

i) [A ban on the imports] seems likely to be announced t, soon.

\(^{16}\) APF may affect event argument. This requires further study.
The middles take active form, not passive form, but their meaning is similar to that of passives. The middle sentences describe some property of the surface subject. For example, sentence (44a) describes the property of the bottle's being broken easily. Thus, middle sentences do not denote actions or events, but some states. The middle sentences usually take the present tense and they are ‘adorned’ with some materials (manner adverbials: (44a-e), modals: (44f), negation: (44g,i), focus: (44h, i)).

One interesting property of the middle verbs is that they always have the corresponding transitive constructions. Consider the following examples:

(45)  a. They break the bottle.  
      b. The bottle breaks easily.
(46)  a. They cut the bread.  
      b. The bread cuts easily.

The middle verbs in (b) sentences above have their corresponding transitive verbs in (a) sentences. This correlation or verb alternation indicates that middle verbs are derived from the corresponding transitive verbs, although they do not show any overt morphological change. Based on these properties, I suggest that middle formation has the three properties in (47) and the argument structure change of a typical transitive verb is represented in (48):17

(47)  Middle Formation (MF)
      i) Delete the external argument.18

18. Alternatively, one may suggest that external argument is saturated in the lexicon,
ii) Externalize an internal argument.

iii) Suppress event argument.

\[(48) \text{e, x } \langle y \rangle \Rightarrow y \langle >, (*e)\]

In MF the external argument is deleted. Here I distinguish argument deletion from argument suppression. After an argument is deleted, it does not play a role at all, whereas after an argument is suppressed, it may play a role. We have seen that passivization suppresses external argument, which is represented as \(*x\), and that the suppressed argument does play a role, controlling PRO. And the suppressed argument may appear optionally. The deleted argument in middles may not surface, as in (49), and it cannot control PRO, either, as in (50):

\[(49) \begin{align*}
\text{a. } & \ast \text{The bottle breaks easily by somebody.} \\
\text{b. } & \ast \text{The bread cuts easily by somebody.}
\end{align*}\]

\[(50) \begin{align*}
\text{a. } & \ast \text{The book sells well [PRO to make money].} \\
\text{b. } & \ast \text{The car drives nicely [PRO to avoid car accidents].}
\end{align*}\]

The properties of the deleted argument are different from those of the suppressed argument in verbal passives which may surface and can control PRO,\(^{19}\) as shown below:

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following the idea of Rizzi (1986). This is what Fagan (1988, 1992) argues for the implied agent in middles. Fagan presents the following for middle formation:

\[\begin{align*}
i ) & \text{Assign } arb \text{ to the external } \emptyset\text{-role.} \\
ii ) & \text{Externalize a (direct) } \emptyset\text{-role.}
\end{align*}\]

The argument assigned \(arb\) is not projected to syntax, but has the generic interpretation. \(^{19}\) Roberts (1987:31) notes this difference between passives and middles as “subject argument is suppressed in middles but not in passives.”
(51) a. The bottle was broken by John.
    b. The book was sold [PRO to make money].

The second property of middle verbs is externalization of an internal argument, which is the same as that of adjectival passivization. Thus, only an internal argument of the base verb, which is a transitive verb, can be the surface subject of a middle sentence. In the middle sentence the subject cannot be filled by the pleonastic element or arguments of other predicates. The externalization of an internal argument implies that MF does not involve NP movement.

One property of MF in (48) is externalization. That is, MF changes one internal argument into an external argument. In this approach, MF does not involve movement in syntax since the external argument will be mapped directly to the subject at D-structure. But some linguists assume that MF does not have externalization and thus MF involves NP movement in syntax. In this approach, the argument change can be represented as in (52):

(52) x <y> => <y>

One problem with this approach is that it cannot tell that MF does not allow long-distance movement or the insertion of the pleonastic elements it or there in the middle constructions. Note that in the VPF the empty subject position at D-structure may be filled with it or there, or some NP moved out of a deeply embedded clause. But here I will not commit myself to a particular view of the middle formation.20

The third property of MF is to suppress event argument. A middle sentence describes some property of the surface subject, not an event which requires some specific time reference. For describing properties a specific time reference is not required and the present tense is appropriate. Middles are usually in the present tense form and they do not take spatio-temporal adverbs, as shown in (53). Furthermore, middles do not appear in the progressive form or in the imperative form, as in (54):

(53) a. ?Yesterday, the mayor bribed easily, according to the newspaper.
    b. ?At yesterday's house party, the kitchen wall painted easily.
(54) a. *Bureaucrats are bribing easily.
    b. *Bribe easily, bureaucrat! (Keyser and Roeper 1984:384-385)

Aspectually, middles can be classified as statives, as proposed by Roberts (1987) and Fagan (1988, 1992). These facts indicate that middles do not have event argument.

Here, I suggest that event argument in middles is suppressed, not deleted. I suggest two pieces of indirect evidence for the suppression of event argument. First, the event argument is required for interpretation of the adverbs like easily which frequently appear in the middles. The adverb easily modifies an event, or more specifically a process of an event. For the proper interpretation of the adverb, the event argument will be required. Here we have a conflict: stative properties of the middles (property reading) do not require event argument, but the adverb requires event argument. To avoid the conflict, I suggest that event argument is suppressed, not deleted.

The second evidence for the suppression of event argument is the native speakers' intuition about the middle construction. Keyser and Roeper (1984), Roberts (1987) and Fagan (1992) note that there is an implied or understood
agent in the middles. And this implied agent is interpreted as arbitrary in reference. Let us take an example:

(55) The bottle breaks easily.

Sentence (55) describes some property of the bottle and this property is not limited to a certain actor. That is, sentence (55) means that whenever anybody breaks the bottle at any time, the bottle has the property of being broken easily. The implied agent is interpreted as ‘people in general.’ This reading of the implied agent implies some action. This implied agent or action cannot be found in the pure stative sentences as in (56):

(56) a. John is happy.
    b. John knows the rule.

The stative sentences in (56) do not have or imply an agent or action. I suggest that the implied agent or action can be derived from the suppressed event argument. Like the suppressed external argument in the passives, the suppressed event argument plays a role in some case, but it does not, in other case. 21

3.2.4. Ergative Verbs

The final type of derived intransitive verbs in English is ergative verbs. Compare the following three constructions:

21. One may argue against the suppressed event approach, pointing out that the agentivity of middles indicate that the middle verbs have a suppressed agent (or external argument), not a suppressed event. However, Rapoport (1999) claims that not all middle verbs are agentive and agentivity of middles hinges on the properties of the verbs, not on any properties of the middle construction itself. This claim supports the suppressed event approach.
(57) a. The vase was broken.
   b. The vase breaks easily.
   c. The vase broke.

Sentence (57a) is a passive, (57b) a middle, and (57c) an ergative. Ergatives differ from middles in that they don't require to be ‘adorned’ by some materials like adverbs, or modals, and that they describe an event, not a property of the surface subject, as shown in (58). And the tense of the ergatives is not limited to the present tense; they can appear in the past tense and the progressive form, as shown in (59).

(58) a. The vase broke.
   b. His life changed.
   c. The government moved.

(59) a. The ice in the lake melted last year.
   b. The clothes will soon dry in the sun.
   c. The lake is thawing fast.

One property of the ergative construction is eventive in the reading. As well as the constructions in (58), the ergative constructions below are all eventive:

(60) a. We generalized the solution.
   b. The solution generalized.

(61) a. We centralized the department.

22. Some linguists consider the ergative verbs as the unaccusative verbs. In this paper these two verbs are distinguished: the former is derived verbs and the latter non-derived ones.

23. Keyser and Roeper (1984) takes the above examples to show that ergative formation is productive in English.
b. The department centralized.

(62) a. We demagnetized the recording head.
    b. The recording head demagnetized.

(63) a. The Republicans want to Reaganize the country.
    b. The country refuses to Reaganize.  (Keyser and Roeper 1984:390)

(64) a. We floated the ship.
    b. Does the sunken ship float?

Another important property of the ergative verbs is that they have corresponding transitive constructions, as shown in (60)-(64). Thus we can assume that ergative verbs are derived from the transitive verbs without any overt morphological change.

Now we can explain the ergative formation in terms of argument structure as in (65), and (66) illustrates the argument structure change of a typical transitive verb in ergative formation:

(65) Ergative Formation (EF)

(i) Delete the external argument.

(ii) Externalize an internal argument.

(66) e, x <y> => e, y < >

24. The transitive constructions of the ergatives in (58) are as follows:

a. They broke the vase.
b. John changed his life.
c. The brave citizens moved the government.

25. Fagan (1992) presents the similar ergative formation:

i ) Delete the external θ-role.
ii ) Externalize a (direct) θ-role.
In (66) the presence of event argument indicates that the transitive verb and its derived ergative verb are eventive. Ergative formation in (65) involves two processes: deletion of the external argument and externalization of an internal argument. First, the external argument is deleted (Keyser and Roeper 1984, Fagan 1992). Consider the following examples:

(67) a. *The boat sank by the navy.
    b. *The sailor sank [PRO to save the world].

As shown in (67), the ergative construction cannot take the agentive by phrase and the rational clause. This implies that this construction does not contain the suppressed agent argument, although the ergative construction is eventive in its reading. This non-agentive reading of the ergative construction is different from that of the middle construction. The contrast of the two constructions is evident in the following:

(68) a. The boat sank all by itself.
    b. *Bureaucrats bribe easily all by themselves.

(Keyser and Roeper 1984:405)

The phrase all by itself means ‘totally without external aid.’ The meaning ‘without aid’ is compatible with the agentlessness of the ergative construction, but not with the middles.

The second process in ergative formation in (65) is externalization of an internal argument. Externalization takes place in the lexicon and thus this

26. Keyser and Roeper (1984) present the following Ergative Rule:

Agent $\Rightarrow \emptyset$
approach to ergative formation (EF) does not involve NP movement in syntax. But some linguists (Burzio 1986, among others) propose that EF does not have externalization and thus it involves movement in syntax. In this approach the argument structure change can be represented as follows:

\[(69) \quad e, x \langle y \rangle \Rightarrow e, \langle y \rangle\]

The movement approach in (69) to ergative formation has only one operation, deletion of the external argument. The internal argument y will move to subject position in syntax. This approach, however, cannot tell that EF does not allow long-distance movement or the insertion of the pleonastic elements *it* or *there*. Whether ergative formation involves externalization or not is another issue to be studied further.

### 4. Implications: Theories of Argument Structure

I have presented the argument structures of the six intransitive verbs in English. In this section, I will discuss some implications of the present study. First, let us take a look at the argument structures of the intransitive verbs discussed so far:27

\[(70) \quad \begin{align*}
    \text{a. unergative (UE):} & \quad e, x \langle \cdot \rangle \\ 
    \text{b. unaccusative (UA):} & \quad \langle x \rangle 
\end{align*}\]

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27. Among the six types of the intransitive verbs, only the two types of verbs, verbal and adjectival passives, are different from the others in the form. That is, they appear in the form *be* + *V-en*. On the other hand, the other verbs do not take any overt morphological forms.
c. verbal passive formation (VPF): \( x \prec \gamma \Rightarrow \prec \gamma, (*x) \)
d. adjectival passive formation (APF): \( x \prec \gamma \Rightarrow y \prec \>, (*x) \)
e. middle formation (MF):  
   i) e, \( x \prec \gamma \Rightarrow y \prec \>, (*e) \)
   ii) e, \( x \prec \gamma \Rightarrow \prec \gamma, (*e) \)
f. ergative formation (EF):  
   i) e, \( x \prec \gamma \Rightarrow e, y \prec \) 
   ii) e, \( x \prec \gamma \Rightarrow e, \prec \gamma \)

We can see that each type of the six intransitive verbs in (70) has an argument structure different from the others.

One thing to note is that MF and EF in (70e,f) has two representations, respectively. The issue in MF and EF is whether they involve externalization or not. When they involve externalization, they will not undergo NP movement in syntax. If they do not involve externalization, they will undergo NP movement in syntax. In this study, I do not commit myself on this issue since either approach enables us to distinguish one from the other argument structures.

The difference between UE and UA is whether the single argument is external or internal. And the difference between VPF and APF is in externalization; VPF does not involve externalization while APF does. This implies that VPF leads to NP movement in syntax, whereas APF does not. The difference between APF and MF is in external argument; in APF external argument is suppressed while in MF it is deleted. The difference between MF and EF is in event argument; in MF it is suppressed, but EF does not affect that argument. The difference between APF and EF is in the external argument. The external argument is suppressed in APF whereas it is deleted in EF.

We can see that argument suppression, argument deletion and externalization play important roles in the argument structures of the six intransitive verbs. Argument suppression takes place in both types of passives and middles; the external argument is suppressed in passives and event argument is suppressed in
middles. Argument deletion takes place in MF and EF. Externalization takes place in APF and possibly in MF and EF.

We have seen that event argument plays a role in differentiating middles from ergatives. As shown in (70e, f), MF applies to verbs with event argument, suppressing the argument. EF also applies to verbs with event argument and the event argument remains unchanged. MF and EF are different only with respect to event argument.

One important implication of this study is that we don't need to use the semantic-based thematic role labels like Agent and Theme. Although those thematic roles are convenient, it is difficult to define them clearly and thus a theory of argument structure without using them is better than a theory with them. This study has presented the argument structures of all the intransitive verbs using argument variables like x and y, and the notions, external argument and internal argument which are syntax-based.

Another implication is that this study supports the absolute theory of argument structure. The notions, external and internal argument, are based on the absolute theory since their status is determined absolutely, not relatively. The present study based on the absolute theory enables us to distinguish one intransitive verb construction from the others; The relative theory does not work for the distinction of the six types of the intransitive constructions (Grimshaw 1990, Chung 1992, 1993).

The final implication of this study is about the theory of external argument. We can observe that all argument structure changes discussed in this study are related with external argument. That is, every argument structure change involves deletion or suppression of external argument, or making an internal argument external. An external argument is to be associated with subject position, and thus it is important for any syntactic theory to determine which argument is external. If there is no external argument, then some internal
argument or some element will be filled in the subject position, by movement or insertion. This study of intransitive verb construction again reveals the important role of the external argument. Note that Di Sciullo and Williams (1987) and various works of Williams (1994, 1995) take the external argument as the head of the argument structure and use the notion in various analyses of syntactic constructions.

There are a great number of verbs in English that alternate between transitives and intransitives. All of these alternations are conditioned largely by their semantic properties or argument structures. If argument structure plays a role of the bridge between the lexicon (semantics) and syntax, then the argument structures of the six types of intransitive verbs presented here will cast light on the semantic and syntactic aspects of those constructions.

References


