

Distributional Analysis of Tense and Aspect Morphology in L2 Input with Relation to Lexical Classes of Verbs*

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Abstract

This study examines the effect of L2 input on L2 output with regard to the acquisition of verbal morphology from the perspective of an association of lexical classes of verbs with past tense and progressive morphemes. I investigated the text of twenty-one volumes of ESL textbooks developed for junior high school students in Japan, that is, L2 input, in terms of twenty-six verbs so as to find out any association of tense/ aspect morphology with lexical classes of verbs. The results showed that there was an association of progressive marking with activity verbs, which was found in L2 output of Japanese ESL learners as well; however, any association of past tense marking with telic situations could not be found, which contradicted the findings concerning L2 output in Yamazaki 1999. Therefore, it is concluded that output of Japanese learners of English has not been created only based on their L2 input in the domain of acquisition of verbal morphology.

1 Introduction

Over the last few decades, it is claimed that the development of tense and aspect morphology among second language learners is associated with lexical classes of verbs. (Andersen 1991, Bardovi-Harlig 2000, Li and Shirai 2000) Numerous attempts have been made by researchers to test the reliability of the claim and to account for the reason of the occurrence of such associations. There is, however, little agreement as to the latter, that is, the reason of the behavior of learners.

In this study, I will analyze distribution of tense and aspect morphemes in ESL textbooks used by Japanese junior high school students, from the perspective of lexical aspect of verbs to which such morphemes apply. Then I will examine whether it is possible to attribute the Japanese learners' tendency of marking tense and aspect found in Yamazaki (1999) to the effect of their L2 input. This study is intended as an examination of potential roles of input in the domain of the acquisition of tense and aspect marking in English by Japanese L2 learners.

2 Background: grammatical aspect and lexical aspect

2.1 Grammatical aspect

The term "aspect" is defined in Comrie (1976:3) as “ways of viewing the internal temporal constituency of a situation”. Although aspectual notions are realized through various ways across languages, the opposition of perfective and imperfective is generally accepted as grammatical aspect on the ground that it is realized explicitly by grammatical forms, such as verb inflections and auxiliaries. Perfective, to quote Comrie (1976:4), "looks at the situation from outside, without necessarily distinguishing any of the internal structure of the situation." On the other hand, "imperfective looks at the situation from inside, and as such is crucially concerned with the internal structure of the situation." (Comrie 1976:4) Various typological studies have revealed that grammatical aspect is realized in different languages in different ways; however, to make further investigation of the realization of grammatical aspect would take us beyond the scope of this study. Thus, I shall limit the discussion to realization of grammatical aspect in English. For English, grammatical aspect is indicated by the presence and absence of the verbal auxiliary: the perfective aspect is denoted by simple verb forms, and the imperfective aspect is denoted by the auxiliary *be+ing* (Smith 1997:170). We can say that sentence 1a is perfective and sentence 1b is imperfective.

(1)

a. Mary walked to school.

b. Mary was walking to school. Smith (1997:2)

Comrie suggests that internal structure of situations can be referred to not only by grammatical aspectual markers, but also “lexical meaning of the verb involved, or other aspectual oppositions, or other facets of the context.”(p.21) Combination of perfectivity, which can be denoted by grammatical aspectual markers, with lexical meaning of a verb, that is, lexical aspect, should be considered in order to describe situations from the viewpoint of aspect.

2.2 Lexical aspect

Lexical aspect, to echo Li and Shirai (2002:14), “refers to the semantic characteristics inherent in the lexical content of words, usually verbs or verb phrases, that are defined in terms of the temporal properties of given situations that the verbs describe.” According to Vendler’s (1976) classification, verbs can be divided into four classes: “state verbs”, “activity verbs”, “accomplishment verbs” and “achievement verbs”. Table 1 illustrates the Vendler’s classification of verbs based on the Comrie’s (1976) binary semantic features: punctual/ durative,

telic/ atelic, and dynamic/ state.

Comrie’s binary semantic features are defined as follows. First, the opposition of punctual situation and durative situation can be described as "...durativity simply refers to the fact that the given situation lasts for a certain period of time.... The opposite of durativity is punctuality, which thus means the quality of a situation that does not last in time..., one that takes place momentarily." (pp. 41-42) Secondly, Comrie explains a telic situations as "one involves a process that leads up to a well-defined terminal point, beyond which the process cannot continue."(p.45) Concerning the opposition of a telic situation and an atelic situation, the explanation by Smith (1997) would be also helpful. Smith interprets telic and atelic situations as follows: "Telic events have a change of state which constitutes the outcome, and the event is complete.... In contrast, atelic events are simply processes. They can stop at any time: there is no outcome. In other words, atelic events have arbitrary final endpoints."(p.19) Thirdly, an account of the features "dynamic" and "state" is given below: "With a state, unless something happens to change that state, then the state will continue.... With a dynamic situation, on the other hand, the situation will only continue if it is continually subject to a new input of energy" (Comrie 1976:49).

Table 1 Semantic features and lexical aspectual classes

Verb classes / Semantic features	State	Activity	Accomplishment	Achievement
Punctual	—	—	—	+
Telic	—	—	+	+
Dynamic	—	+	+	+

Cited from Andersen and Shirai (1994:134)

The four classes of verbs can be distinguished by the presence of three pairs of semantic features mentioned above. The following are examples of each lexical class of verbs:

(2)

State: own the farm, believe in ghosts...

Activity: sleep, push a cart, laugh, eat cherries...

Accomplishment: build a house, write a letter, walk to the lake...

Achievement: break a cup, define a parameter, reach the top...

Although opinions vary as to the four-way classification of lexical aspectual classes given above (Mourelatos 1981, Robison 1990, Smith 1997), I will follow this classification throughout this paper.

2.3 Other factors determining aspect

Aspect is determined by properties of subjects, objects, and adverbials, as well as by grammatical aspect and lexical aspect. For example, specificity of quantity of an object can affect telicity of a situation. In the following sentences, 3a indicates an atelic situation, while 3b indicates a telic situation.

- (3)
- a. Edward smoked cigarettes.
 - b. Edward smoked a cigarette. (Smith 1997:4)

Similarly, aspect can be determined by the quality of subject, such as its plurality, definiteness, and so forth. Let us take the following examples cited from Carlson (1981:51-54):

- (4)
- a. A guest arrived. The guest arrived. (Momentaneous situations)
 - b. Every guest arrived. (Accomplishment)
 - c. Guests arrived. (A continuous situation)
 - d. The guests arrived. All the guests arrived. (A non-continuous or iterative situation)
 - e. Some guests arrived. (Ambiguous)

In addition, adverbials have an influence on determining aspect of a sentence. For example, cardinal count adverbials, such as *twice* or *five times*, assign irregular iterativeness on a situation. (Mourelatos 1981, Yamada 1984)

With the brief account of realization of aspect in mind, let us now turn to consider studies on the acquisition of tense and aspect in the next section.

3 Studies in acquisition of tense and aspect

3.1 Studies in first language acquisition

Over past few decades, numerous studies have claimed that young children are influenced by lexical aspect in the acquisition of tense and aspect morphology. To put it more concretely, children are “sensitive to lexical aspect in the morphological encoding of past events.” (Bardovi-Harlig 2000) There are several studies confirming this claim: Antinucci and Miller, 1976; Bloom, Lifter, and Hafitz, 1980; Bronckart and Sinclair, 1973; and Weist, Wysocka,

Witkowska-Stadnik, Buczowska, and Konieczna, 1984. These lines of theory have been labeled the Aspect Before Tense or the Defective Tense Hypothesis. Antinucci and Miller (1976) gave evidence for the claim by the longitudinal analysis of utterances of one American and seven Italian children. In their speech, past events were referred to and encoded only when they were telic. Bronckart and Sinclair (1973) indicated that French children mostly described telic actions in the *passé composé* (i.e., perfective past form), and described atelic actions in the present. Bloom, Lifter, and Hafitz (1980) also showed that a two-year-old child used the English past marking including *-ed* and irregular past forms for non-durative completive events, the simple present marking *-s* for completive durative events, and the progressive marking *-ing* for durative completive events.

Antinucci and Miller (1976) and Bronckart and Sinclair (1973) explained that children tend to mark tense based on lexical aspect of each event because they have not fully developed the deictic tense system yet. Their assertions, which can be called cognitive deficiency explanation, were argued against afterwards by researchers who claimed that "the child system is simpler but not different in organization from adult: both have essential property of relating a time to an orientation point by simultaneity and sequence." (Slabakova 2001) However, the strong association of lexical aspectual classes and tense/ aspect morphemes within the domain of first language acquisition has still drawn attention as a stimulating field of study since then. Generally, the association has been captured within the theory labeled "Primacy of Aspect." Based on the findings in the field of first language acquisition, similar investigations have been conducted concerning second language acquisition.

3.2 Studies in second language acquisition

The effect of lexical aspect on the development of tense and aspect morphology has been widely discussed in the domain of second language acquisition as well as of first language acquisition. Robison (1990) analyzed English speech of a Spanish speaking man and pointed out the correlation of the past marking and punctual events, and that of the progressive marking *-ing* and durative events. Moreover, Andersen (1991) investigated the speech of two English speaking learners of Spanish to find out the developmental sequences for encoding tense and aspect with past inflection: *Preterite* forms, used for marking perfective past, appear first with punctual events, secondly with telic events, thirdly with activities, and lastly with states, whereas *Imperfect* forms, used for marking imperfective past, appear first with states, secondly with activities, thirdly with telic events and lastly with punctual events.

Besides the evidence based on the analyses of spoken data of learners in

naturalistic settings, Bardovi-Harlig (1992) gave us evidence for the correlation of the past marking and punctual events and for the correlation of the progressive marking and durative events based on the data elicited through cloze passages from the learners in classroom settings. Likewise, Bardovi-Harlig and Reynolds (1995) found that “achievement and accomplishment verbs exhibit high levels of appropriate use of simple past...”, and “the rates of appropriate use of past increased with the rise of proficiency levels” of the subjects. (pp.113-114)

The findings among the studies of second language acquisition have come to draw a hypothesis: initially, language learners tend to mark tense and aspect under strong influence of lexical classes of verbs, and then, they gradually begin to use tense and aspect makers with every class of verbs. This hypothesis can be labeled the Primacy of Aspect hypothesis, as mentioned above. In the next subsection, we will review an experimental study which tests this hypothesis in the setting of Japanese learners’ acquisition of English as a second language.

3.3 Japanese learners’ acquisition of tense and aspect in English

Yamazaki (1999) intends to examine whether Japanese learners of English are initially influenced by lexical aspect in the acquisition of tense and aspect marking with special reference to their use of the simple past tense marking. It also tries to examine the effect of proficiency level of the learners on their use of tense marking.

The experiment was carried out with 124 Japanese ESL learners. All the subjects had six years or more experience of learning English in classroom settings. They were divided into two groups according to their proficiency level. They were given short passages containing base forms of verbs and were asked to change them into appropriate forms. The experiment was designed to measure the number of appropriate uses of past tense marking in obligatory contexts. They were counted for each lexical aspectual class and for each proficiency level, and then, they were analyzed by using the ANOVA procedure.

The results showed that the Japanese learners of English showed a strong association of simple past forms with telicity of situation (i.e., accomplishment verbs and achievement verbs). In addition, it seemed that there was a correlation between progressive forms and activity verbs. Moreover, these tendencies were more prominent among the lower-level learners than among the higher-level learners. Consequently, the Primacy of Aspect hypothesis was supported by the data elicited from the Japanese learners of English. A large number of studies, as we have seen so far, have been made on elucidating the developmental sequence of acquisition. In the next section, we will review two major approaches to explaining the mechanism of such a developmental sequence: a nativist approach and a functionalist approach (Li and Shirai 2000).

4 Theoretical frameworks: nativist vs. functionalist approaches to acquisition of tense and aspect

4.1 Nativist approach

Over the last few decades, mechanism of language acquisition has been the subject of controversy. Among various examinations of children's acquisition of tense and aspect, we will review one of the most prominent proposals: "Language Bioprogram Hypothesis" (Bickerton 1981). Language Bioprogram Hypothesis advances that children are equipped with a certain innate mechanism to make specific linguistic distinctions. In the domain of aspect, the two distinctions, which are *state* and *process* and *punctual* and *non-punctual*, are innate so that children just need to find out how they are instantiated in specific forms in their target language. (Li and Shirai 2000) Considering that Bickerton (1981) uses the term "punctual" as "telic", it is assumed that the distinctions regarding dynamicity and telicity are biologically programmed in this theoretical framework.

4.2 Functionalist approach

Some researchers labeled "functionalists" argue against proposals which are based on the assumption of innateness. For example, Li and Shirai (2000:67-68) advance "the prototype account": the development of tense/ aspect marking starts with the prototype of the category, then extends to items similar to the prototype, and finally to least prototypical members. They indicate that progressive marking emerges with 'action in progress' as its prototypical meaning, first with activity verbs, and then with accomplishment verbs. According to the prototype account, this is because the prototype of progressive is associated with the feature [-telic], which applies to activities but not accomplishments. At their early stages of acquisition, children restrict their uses of progressive inflections to atelic situations. However, they gradually use the progressive marking on telic situations, which are less prototypical. Likewise, they explain the phenomena that children's early uses of the past tense inflection are mostly restricted to achievements on the ground that the prototype of the past tense morphology is associated with the feature [+telic, +punctual], which indicates achievements.

On the assumption that the prototype plays an important role in children's uses of tense and aspect inflections, it is necessary to deal with the following issue: Where do prototype come from?" (Li and Shirai 2000:68) It is suggested that prototypes are formed through learners' distributional analyses of the input language. Tables 2 and 3 serve as evidence of their claim.

Table 2 Distributional analysis of interviews of Italian speaking adults

	Telic verbs	Atelic verbs
Perfective past	97%	3%
Imperfective past	28%	72%

Leone 1990 (cited from Shirai 2002)

Table 3 Percentages of lexical aspectual classes with past tense

	state	activity	accomplishment	achievement
Children	0%	2%	0%	98%
Mothers	17%	10%	13%	60%

Shirai and Andersen 1995 (cited from Shirai 2002)

Table 2 shows the percentages of co-occurrence of each verbal morpheme and each type of verbal predicates in utterances of interviews between Italian speaking adults. It tells us that the Italian-speaking adults are very likely to apply the perfective past morpheme to telic verbs, and apply the imperfective past morpheme to atelic verbs in their speech. Thus, one can suppose that there might be such distributional bias in input for children learning Italian as their L1. Shirai (2002) assumes that the strong association of the past perfective morpheme with telic verbs in utterances of Italian speaking children is the reflection of the distributional bias found in adults' utterances. The assumption could lead to the explanation that Italian children tend to mark perfective past on telic verbs selectively based on their prototype, which is formed through distributional analyses of their input. Likewise, Table 3 indicates the percentages of co-occurrence of the past tense morpheme and each lexical class of verbs in the English exchanges of three pairs of mother and child. We can also find the strong association of the past tense morpheme and achievement verbs in the utterances of both the children and the mothers. The results here might serve as evidence for the "prototype account."

5 Present Study

5.1 Hypotheses

On the assumption that the input-based account is the case, the following hypotheses were put forward:

- 1) In the L2 input, the past tense morpheme co-occurs with telic verbs (i.e., accomplishments and achievements) more often with atelic verbs (i.e., states and activities).
- 2) In the L2 input, the progressive morphemes co-occurs with activity verbs.

5.2 Procedures

I examined the text of twenty-one volumes of ESL textbooks developed for junior high school students. Sentences containing twenty-six verbs, which were used in the analysis of Yamazaki (1999), were extracted and classified according to their tense/ aspect marking, and lexical classes of the verbs.

The words analyzed in this study were *become, build, buy, conquer, die, draw, eat, fight, get, go, have, keep, know, live, love, need, reach, see, spell, start, think, walk, want, win, work, and write*. I determined lexical aspectual classes of all the predicates based on the diagnostic tests developed by Shirai and Andersen (1995:749), which appear in (5).

(5)

Step 1: State or nonstate

Does it have a habitual interpretation in simple present?

If no---State (e.g., *I love you*)

If yes---Nonstate (e.g., *I eat bread*)→Go to step 2

Step 2: Activity or nonactivity

Does 'X is V-ing' entail 'X has V-ed' without an iterative/ habitual meaning?

In other words, if you stop in the middle of V-ing, have you done the act of V?

If yes---Activity (e.g., run)

If no---Nonactivity (e.g., run a mile) →Go to step 3

Step 3: Accomplishment or achievement

[If test (a) does not work, apply test (b) and possibly (c).]

(a) If "X-ed in Y time (e.g., *10 minutes*)," then A "X was V-ing during that time."

If yes--- Accomplishment (e.g., *He painted a picture*)

If no--- Achievement (e.g., *He noticed a picture*)

(b) Is there ambiguity with almost?

If yes--- Accomplishment (e.g., *He almost painted a picture* has two readings: he almost started to paint a picture/ he almost finished painting a picture)

If no--- Achievement (e.g., *He almost noticed a picture* has only one reading)

(c) "X will VP in Y time (e.g., *10 minutes*)" = "X will VP after Y time."

If no--- Accomplishment (e.g., *He will paint a picture in an hour* is different from *He will paint a picture after an hour*, because the former can mean that he will spend an hour painting a picture, but the latter does not.)

If yes--- Achievement (e.g., *He will start singing in two minutes* can only have one reading, which is the same as *He will start singing after two minutes*, with no other reading possible.

5.3 Results and discussion

Table 4 shows the distribution of tense/aspect marking across lexical classes of verbs. In order to test the first hypothesis, I merged the frequencies of state verbs and activity verbs, and those of accomplishment verbs and achievement verbs regarding the past morphology and the progressive morphology so that I obtained Table 5. Table 5 can be compared to Table 2 indicating the findings in Leone (1990) at the same time. Table 5 tells us that there seems to be no distributional bias concerning atelic situations and telic situations for both the past marking and the progressive marking. The results of X^2 tests for both morphemes revealed that there are no statically significant differences. The followings were the values of the X^2 tests: $X_{.05}^2(df=1)=0.425$ for the past tense marking, and $X_{.05}^2(df=1)=0.731$ for the progressive marking. Hence, the hypothesis 1 was not supported, that is, a strong association between the past tense morphology and telicity was not found in the L2 input for the Japanese ESL learners.

Table 4 The distribution of tense/ aspect marking across lexical classes of verbs

	state	activity	accomplishment	achievement	total
past	173(28.7%)	120(19.9%)	117(19.4%)	192(31.9%)	602(100%)
non-past	729(56.3%)	288(22.3%)	123(9.5%)	154(11.9%)	1294(100%)
-ing	1(1.5%)	36(53.7%)	13(19.4%)	17(25.4%)	67(100%)
perfect	10(33.3%)	9(30%)	4(13.3%)	7(23.3%)	30(100%)

Table 5 The distribution of perfective/ imperfective marking with telic/ atelic verbs

	atelic	telic
perfective(past)	293(48.7%)	309(51.3%)
imperfective(-ing)	37(55.2%)	30(44.7%)

Next, I shall test the hypothesis 2. Table 6 shows the distribution of the lexical classes of verbs for the progressive marking, which are extracted from Table 4. We can find a distributional bias regarding the progressive marking. ($X_{.01}^2(df=3)=37.7761$, $p<.01$) Therefore, the hypothesis 2 was supported, that is, a strong association between the progressive morpheme and activity verbs was

found in the L2 input for the Japanese ESL learners.

Table6 The distribution of each lexical class of verbs for the progressive marking

	state	activity	accomplishment	achievement	total
<i>-ing</i>	1(1.5%)	36(53.7%)	13(19.4%)	17(25.4%)	67(100%)

Let us summarize the findings of the present study: the L2 input for the Japanese ESL learners did not show the association of the past tense morpheme and telic verbs although it showed the association of the progressive morpheme and atelic verbs. The Japanese ESL learners, however, showed the preference of both associations: the association of the past tense morphemes and telic verbs, and that of the progressive morphemes and atelic verbs, as we have reviewed in 3.3. (Yamazaki 1999) Thus, we can assume that the Japanese learners' prototypical associations of tense/aspect morphemes and lexical classes of verbs are not simply formed through their distributional analyses of their L2 input. In other words, the prototype does not necessarily come from input.

Accordingly, it seems reasonable to suppose that there should be another possible account for the skewed distribution in language learners' output. I conceive the following three as an alternative account: prototype formation in another way, L1 transfer, and innateness; nevertheless, there is not enough evidence to decide the matter so far.

6 Conclusion

The results of the present study partially disagreed with the claim that certain correlations of tense/ aspect marking and lexical classes of verbs were built by means of language learners' distributional analyses of their input. However, it does not suggest that there is no effect of input in the domain of L2 acquisition of tense/ aspect morphology. Admitting that there is a certain effect of input, we have to explore another way of explaining the phenomena found in learner language. In addition, it is necessary to try to explain associations which are frequently used by language learners even if they do not appear frequently in input.

Here I concede several drawbacks concerning the data dealt with in this study. Obviously, the sentences which we analyzed cannot be regarded as a complete L2 input. In this sense, the observation in the present study is tentative. The effort for comparing L2 input and L2 output in a more precise way should be made. I must admit that it is quite difficult to collect L2 input for particular learners, but it

might not be impossible since the amount of input in L2 acquisition settings is less than that in L1 acquisition settings, and the former seems to be manipulated more easily than the latter. Next, it remains another issue to be challenged, that is, the reliability of classification of lexical aspect. Opinions have varied as to realization of tense and aspect for decades; especially, analysis of lexical aspectual features is controversial. Further considerations to the classification policy are to be given. Otherwise, data would give rise to ambiguous interpretations, as Slabakova (2001:111-112) points out.

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