The L2 Acquisition
of the Chinese Aspect Marking[1]

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Abstract

By analyzing corpus data, we have shown that the tendencies of restricting perfective past marking to Accomplishments and Achievements and imperfective marking to Statives and Activities as described by the Aspect Hypothesis (Shirai, 1991; Andersen & Shirai, 1996), undesirable in the acquisition of various languages, are desirable in the acquisition of a language like Chinese, because these tendencies coincide with the natural occurrence patterns of –le and –zhe. We argue that different languages may observe the same natural language principle (Bybee's Relevance Principle) in different ways, rendering the learner tendencies desirable or undesirable in the acquisition processes. Based on our new observations, we propose some modifications to the Aspect Hypothesis.

1   Introduction

In the early nineteen seventies,   researchers carried out a number of studies on first language (L1) acquisition of the tense-aspect system, and their findings show a close relationship between the use of the verbal morphology and aspectual properties of verbs/situations like [± dynamic], [± telic] and [± punctual] (Antinucci & Miller, 1976; Bloom et al., 1980; Bronckart & Sinclair, 1973; Li, 1989). Beginning L1 learners tend to restrict their use of the perfective past (simple past tense in English which indicates both past time location and perfective aspect (Smith, 1997) to telic verbs (Achievements and Accomplishments), and their use of the imperfective aspect to Activities. The same patterns have also been attested in second language (L2) acquisition (Andersen,1986, 1989, 1990; Bardovi-Harlig, 1992, 1994; Bardovi-Harlig & Bergström, 1996; Bardovi-Harlig & Reynolds, 1995; Flashner, 1989; Kaplan, 1987; Kumpf,1984; Robison, 1990; Shirai & Andersen, 1995; etc.) There widely attested developmental patterns were first referred to as the Defective Tense Hypothesis (Weist et al., 1984), and later came to be known as the Primacy of Aspect Hypothesis (Andersen, 1989; Robison 1990) or the Aspect Hypothesis (Andersen & Shrai, 1994; Robison, 1995, Shrai & Kurono, 1998). The Defective Tense Hypothesis attributes the observed patterns "to a cognitive inability of a young child to conceive of a notion of 'past event or situation'" (Andersen & Shirai, 1996, p. 560), while the Aspect Hypothesis suggests that learners primarily use verbal morphology to mark lexical aspectual distinction rather than temporal distinction. The Aspect Hypothesis as summarized in its simplest form by Andersen (2002: 79) makes the following three claims):

1) [Learners] first use past marking (e.g., English) or perfective marking (Chinese, Spanish, etc.) to achievement and accomplishment verbs, eventually extending its use to activity and [then to] stative verbs. (…)

2) In languages that encode the perfective-imperfective distinction, [a morphologically encoded] imperfective past [as in the Romance languages] appears later than perfective past, and imperfective past marking begins with

stative and activity verbs, then extends to accomplishment and achievement verbs.

3) In languages that have progressive aspect, progressive marking begins with activity verbs, then extends to accomplishment and achievement verbs. (Andersen & Shirai, 1996: 533).

In the following discussion, we will refer to the three claims of the Aspect Hypothesis as Claim 1, 2 and 3 respectively.

Various theories have been proposed to explain the "Primacy of Aspect" phenomena. Bickerton's (1981) Bioprogram Hypothesis suggests that some language properties, like state-process distinction and punctual-nonpunctual distinction, are bio-programmed and reflected in learners' early verbal morphology. On the other hand, Bybee's (1985) Relevance Principle emphasizes more on the relationship between meanings of inflections and meanings of verbs. She claims that "inflections are more naturally attached to a lexical item if the meaning of the inflection has direct relevance to the meaning of the lexical item" (cited in Andersen, 1991, p. 319). While applying Bybee's Relevance Principle to the emergence sequence of past marking, Andersen (1991) explains that "the gradual spread of past marking from punctual events to telic events and then to dynamic verbs and finally all verbs is in the direction of decreasing relevance to the meaning of the verb" (p. 319). Andersen's (1993) Congruence Principle advances a similar argument: "learners will use tense-aspect morphemes whose meaning is most similar to that of the verb". In addition to the Congruence Principle, Andersen & Shirai (1994) have also proposed the Distributional Bias Hypothesis which points out that in adult native speakers' language the perfective past inflections occur more often on Accomplishments and Achievements than on Statives and Activities. In other words, the input to learners exhibits, in relatively quantitative terms, similar distributional imbalance.

The Aspect Hypothesis has been the focus of much of the recent research and seems to have been well accepted (see Bardovi-Harlig (1999, 2000) for a general survey of literature on tense-aspect acquisition). The general assumption of the researchers along this line of research seems to be that the Aspect Hypothesis is true regardless of different L1s and L2s.

However, this general assumption is not unchallengeable when "there is a general lack of knowledge on the acquisition of non-Indo-European languages" (Bardovi-Harlig, 1999, p. 369). Most studies along this line of research have focused on the acquisition of a certain European language by native speakers of another European language. In other words, the L1s and the L2s involved in most studies are typologically similar languages. Only a few studies have involved non-European language speakers (Bardovi-Harlig, 1998; Bardovi-Harlig & Reynolds, 1995; Bayley, 1994; Giacalone Ramat & Banfi, 1990; Shirai, 1995) and even fewer studies have examined the L2 acquisition of a non-European language (Shrai, 1995; Shirai & Kurono, 1998). [2] Of these few studies, only two (Shirai, 1995; Shirai & Kurono,1998), as far as we know, have focused on the impact of typological differences on the Aspect Hypothesis. The others either have foci other than this or have investigated non-European language speakers and European language speakers indistinguishably. For instance, Bayley's study investigated 20 Chinese speakers learning English as a second language, but his focus was on how different factors conditioned variation in interlanguage tense marking. Bardove-Harlig & Reynolds (1995) included non-European language speakers in their studies, but the non-European language speakers were examined together with European language speakers indistinguishably, so the effect of typological differences could not be possibly observed.

It is very clear that more studies on typologically different L1s and L2s are needed to verify the Aspect Hypothesis and our study is just an endeavor in this respect. By analyzing corpus data produced by English speakers learning Chinese as a second language, we will show that the undesirable learner tendencies of under-using verbal morphology in the acquisition of various languages will become desirable in the acquisition of Chinese because different languages may observe a natural language principle (Bybee's Relevance Principle) in different ways.

2 The Special Features of the Chinese Aspectual System

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[2] There are of course many studies on L1 acquisition of non-European languages.

Chinese has no tense and temporal references are made with other devices, such as lexical expressions, contexts and sentence sequencing. However, Chinese has a rich aspectual system (Li & Thompson, 1981). Quite a few aspect markers contribute to the aspectual meanings of sentences. As these markers are not grammatically obligatory and their meanings and functions are quite often elusive, there is still controversy over the exact number of them and the aspectual nature of many of them. However, the status of -le, -guo, -zai and -zhe as the most important aspect markers is unquestionable (Wang, 1985). Of these four major aspect markers, -le and -zhe show more complex relationship with aspectual properties of verb/situations, so we have chosen them as the targets of our investigation (Yang, 1995).

2.1 The Special Features of -Le

-Le is a prototypical perfective aspect marker providing a completion view rather than locating an event in time. This is shown by sentence (1).

(1) wo chi-le   fan   jiu qu kan dianying.
    I   eat-Perf.[3] meal then go see movie

"I will go to see a movie after I finish my meal."
Or "I went to see a movie after I had finished my meal."

Depending on different contexts, this sentence can have interpretations of different temporal locations: future or past, but the relationship between the two events in either interpretation is the same: the event of eating the meal is completed before the event of going to see a movie.

-Le does not locate events in past, but its major function of providing an entirety view determines that it is mostly used to present past events. Despite the ostensible similarities between them, the Chinese -le displays some special properties which are not shared by the perfective past in English. The occurrence of -le is sensitive to various aspectual, syntactic and contextual factors.

Following Smith (1997) and Comrie (1976), we assume that aspectual meaning results from the interaction between two aspectual components: situation type (also referred to as lexical aspect) and viewpoint (also referred to as grammatical

aspect), the former being realized by the verb and its arguments, while the latter being signaled by a grammatical morpheme. Whereas the English simple past, a combination of past tense and perfective viewpoint, may go with situations of all types, the occurrence of -le on atelic situations, namely Statives and Activities (excluding Statives that present change of state[4]) is restricted and conditional (Li & Thompson, 1981; Lu, 1986; Tsai 2008; Wu, 2005; Yang, 1995, 1999). It seems that -le requires an endpoint to present a situation in entirety (Yang, 2011). Telic situations, namely Achievements and Accomplishments, contain inherent endpoints (outcomes or results) by definition (Smith, 1997), and there is no problem for -le to occur on them.[5]

(2) Xiaojuan xie-le   yi-feng xin.
    Xiaojuan write-Perf. one-Cl. Letter
    "Xiaojuan wrote a letter."
    (Accomplishment)

On the other hand, atelic situations do not have inherent endpoints, so -le does not usually occur on them. However, atelic situations can become bounded temporally when temporal endpoints are provided with adverbials or made clear by contexts, and whenever this is the case, -le is allowed on them as shown by (4b) and (5b) with duration adverbials, and (5c) with the verb duplicated to indicate the short duration of the event.

(3) a. *Xiaojuan **ai-le**   Mingming. (State)
        Xiaojuan love-Perf. Mingming.
        "Xiaojuan loved Mingming."
    b. Xiaojuan ai Mingming **ai-le   sannian**.
       Xiaojuan love Mingming love-Perf.3 years
       "Xiaojuan loved Mingming for 3 years."

To summarize, -le seems to require a boundary to license its presence. There are two kinds of boundaries: 1) a boundary that is inherent in a situation in the form of a result, an outcome or a change of state; and 2) a boundary that is provided by delimiting elements such as a temporal phrase (such as *sannian* "three years" in (3b); a quantity

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[3] The following abbreviations are used: Perf. = perfective marker; Imp. = imperfective marker; Exp.=experiential perfective marker; Cl. = classifier; Mod. = modifier marker.

[4] Stative verbs in Chinese may occur in sentences that present change of states. Whenever this is the case, we have "derived non-statives", or [+telic] situations (Smith, 1994). -Le is possible and necessary in derived non-statives.

[5] However, there is a special kind of Achievements, the so-called [verb+completive morpheme] verb compound, in which -le is quite often rendered unnecessary by the completive morpheme.

phrase (such as: *yici* "once") or the verb duplication mechanism (such as: *zouzou* "walk a little" in. The first type of boundary is just what is captured by the telic feature and its function has been well documented in literature on aspect. The function of the second type of boundary to close off events temporally has also been recognized in literature (Comrie, 1976; Depraetere, 1995; Depraetere & Reed, 2000; Jackendoff, 1991; Xiao & McEnery, 2004; Yang, 1995, 1999, 2011). Despite their differences, both types of boundaries license the presence of *-le* alike.

Besides the aspectual constraints on the occurrence of *-le*, there are also some syntactic, phonological, and discourse constraints on the occurrence of *-le*. These constraints and their effect on the acquisition of *-le* deserve discussion of a full-length paper, but as this is not the focus of the paper, we will not discuss them here.

2.2 The Special Features of *-Zhe*

-Zhe in Chinese is an imperfective marker, but it is neither the same as the imperfective aspect in Russian nor the same as the English progressive form. *-Zhe*, the Russian imperfective and the English progressive all provide a partial/imperfective view of a situation, but they represent three different subtypes of the imperfective aspect, emphasizing different meaning components of imperfectivity. The Russian imperfective simply presents a partial view of a situation and it is available for all types of situations (Smith, 1997, 231). The English progressive form emphasizes the on-goingness of process, so it occurs freely on all dynamic and durative situations (Activities and Accomplishments) but seldom occurs on Statives or Achievements, which do not involve process (Carlson, 1977; Smith, 1997; Vendler, 1967). [6] However, the major function of *-zhe* in Chinese is to provide a static view of a situation, so it usually occurs with homogeneous situations, which are more likely to be viewed as states, rather than with heterogeneous situations. Accomplishments consist of incremental processes leading to realization of results or outcomes (Dowty, 1977)

and Achievements emphasize the achievement of results. Both are not homogeneous and hard to be viewed as states, so *-zhe* usually does not occur on them (Yang, 1995). [7]

(4)   *Xiaojuan ying-zhe yichang bisai.
         Xiaojuan win-Imp. a-Cl.   Game
         ?"Xiaojuan is winning a game."
         (Achievement)

A special type of Accomplishments indicating placement of some objects, like *gua* "hang", *fang* "place", often occur in the so-called existential sentences with *-zhe*. These sentences present existential states resulting from the placement action rather than the placement action itself, so they should be regarded as derived Statives.

(5) qiang-shang gua-zhe   yi-fu hua
        wall-on   hang-Imp. a-Cl. painting
        "A painting hangs on the wall."

Statives and Activities are both homogeneous, and in principle both types are compatible with the meanings of *-zhe*. However, as Statives are already stative by nature, there is usually no need for *-zhe* to occur on them. *-Zhe* is necessary only when the truth of a state during a particular period of time is emphasized. As stage-level Statives are more prone to change than individual-level Statives (Smith, 1994), there are more chances for *-zhe* to occur on stage-level Statives.

-Zhe may occur more freely with Activities. Activity-*zhe* clauses do not emphasize on-going process; they mainly present a static view of an Activity like (6), or an accompanying action viewed as a concomitant state like the one in (7).

(6) wo yizhi   zai wu-li   **zuo**-zhe
        I all time at house-in sit-Imp.
     "I have been sitting in the house all the time."
        (Static view of an Activity)

(7) Ta **xiao**-zhe   zou-le   jin lai.
     He/she smile-Imp. walk-Perf. in come
     "He/she walked in smiling."
        (An Activity viewed as a concomitant
        state of an action)

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[6] A Stative or an Achievement takes the progressive form in special circumstances when the transitory nature of a Stative or the preliminary stage of achieving the result is emphasized.

[7] Accomplishments can occur in *zhe … ne* structure, a very special structure that emphasizes the unavailability of the entities preoccupied in the event. Also, for some speakers, *-zhe* may be acceptable in some Accomplishments, for example: *Ta zai xie- zhe xin* "He is writng a letter." However, the several native speakers we have consulted agree that the more natural choice would be *Ta zai xie xin* without *-zhe*.

The restricted occurrence pattern of -*zhe* has also been observed by Xiao & McEnery. (2004, p. 188). Their study of native Chinese corpora data shows that -*zhe* occurs most frequently on Activities (55.46%) and stage-level Statives (26.89%). Occasionally it also occurs on individual-level Statives (15.13%). However, it is extremely rare on Accomplishments (1.68%) and never occurs on Achievements.

2.3 The Present Study

Comparing the restricted occurrence patterns of -*le* and -*zhe* and the claims of Aspect Hypothesis, we see striking coincidences: 1) the natural occurrence of -*le* chiefly on [+telic] situations corresponds to the learners' early tendency of restricting past marking to [+telic] situations as generalized in Claim 1 of the Aspect Hypothesis; 2) the native use of -*zhe* chiefly on Activities and on some Statives coincides partially with learners' early use of the imperfective past and the progressive as described in Claim 2 and Claim 3 of the Aspect Hypothesis.

Considering the differences between Chinese and English and the coincidences between the natural occurrence patterns of -*le*, -*zhe* and learners' early tendencies, immediate questions we would like to ask are: Will the Aspect Hypothesis obtain in the acquisition of Chinese? What impact will typological differences have on the generally observed acquisition tendencies? These are the questions the present study aims to answer. By answering the questions, the study will contribute to our understanding of universal language principles and the impact of typological differences on the principles.

3. Method
3.1 Data and Participants

The data for our study were taken from the 1,300,000-word L2 Chinese Learners' Interlanguage Corpus developed by the Beijing Language and Culture University (BLCU hereafter). The corpus contains essays (free production) written by students with various first language backgrounds and of different proficiency levels (Chen, 1998).

As the Corpus encodes 23 properties, including text type, L1, semester level, topic, home country, age, etc. (Chen, 1998), we could easily limit our selection of data to narrative essays and our selection of learners to those whose L1 was English. Professor Chen at the BLCU helped us extract 15 full-text narrative essays for each of our 4 proficiency levels from the corpus.

Levels	No. of essays	Total No. of sentences	Total No. of clauses	past	present	No. of characters per sentence
Beginning	15	217	323	194	129	17
Lower Inter.	15	440	756	361	395	23
Upper Inter.	15	383	765	466	299	25.6
Advanced	15	391	710	362	348	40
Total	60	1431	2554	1383	1171	N/A

Table 1: Summary of the data information

3.2 Data Processing

To obtain a clear idea how -*le* and -*zhe* should be and are actually used by the students, we tagged and sorted out the following four types of information: 1) number of situations where -*le* or -*zhe* is required; 2) number of situations where -*le* or -*zhe* is appropriately supplied; 3) number of situations where -*le* or -*zhe* is not needed but nevertheless used (over-use); and 4) number of situations where -*le* or -*zhe* is needed but not supplied (under-use).

4.Results

Before we look at each of the two aspect markers in detail, we present the overall pattern of required –*le* and –*zhe* in our data.

	Total no. of clauses	-*le* required	-*zhe* required	Total
Present	1171	2 (0.17%)	12	14
Past	1383	232 (17%)	36 (2%)	268
Total	2554	234 (9%)	48 (1.9%)	282 (11%)

Table 2: Overall pattern of required –*le* and -*zhe*.

In sharp contrast to English and many other European languages, in which tense-aspect

marking is obligatory, only a small portion of the clauses in our data require the presence of one of the aspect markers.[8] Even for the 1383 clauses that present past situations, only 17% of them require the perfective marker –le and about 2% of them require the imperfective marker –zhe.

4.1 -Le and Aspectual Properties of Situations

Of the two aspect markers examined, -le has greater number of occurrences and the situation with -le is the most complicated, so we start our discussion with -le.

Before we look at the relationship between lexical aspect and -le, we will have a quick look at violations of syntactic, phonological and discoursal constraints on -le. We found 23 -les in syntactical environments that do not allow the presence of -le (Beginning: 5; Lower Intermediate: 6; Upper Intermediate: 8; Advanced: 4), 5 -les that violate the phonological constraints (Beginning: 1; Lower Intermediate: 1; Upper Intermediate: 2; Advanced: 1), and 7 -les that affect the flow of discourse (Beginning 1; Lower Intermediate 6). As syntactic, phonological and discoursal constraints are not the focus of the present research, we will not discuss violations of them in detail here.

-Le may indicate completion or anteriority of situations of different temporal locations, but in real language use, it is mostly found in clauses that describe past time situations. Of the 1171 present/future time clauses, only 2, an Achievement and an Activity with a provided boundary, require -le. Students appropriately provided both of the required -les. There are a few over-use cases and no cases of under-use are found in the present/future time clauses. As there is so little to say about present/future time clauses, we will focus our attention on clauses that present past time situations in the following discussion.

Before we examine the details of the relationship between situation types and -le at different levels, we will have a look at a brief summary to get some overall ideas.

Situation Types	Total	-Le Required	Appropriately. Supplied	Over-use	Under-use
Statives	475	2 (0.4%)*	2 (100%)**	10	0
Activities	195	28 (14%)	25 (89%)	9	3
Accomplishments	287	84 (30%)	75 (87%)	0	9
Achievements	305	118 (39%)	107 (90%)	0	11
Modal/Negation	121	0 (0%)	0	2	0
Total	**1383**	**232**	**209**	**21**	**23**

Table 3: Summery of the relationship between situation types and -le

Total = Total number of situations of that type in past time contexts.

*The percentage of –les required over the total number of situations.

**The percentage of appropriately supplied –les over the number of –les required.

From the table, we can make the following important observations:

1) Most of the situations that require –le are supplied with –le appropriately;
2) Over-use cases are mostly found on Statives and Activities;
3) Under-use cases are mostly found on Accomplishments and Achievements. There are also a few under-use cases on Activities.

It seems that our learners do not have serious problems with appropriately supplying the marker –le whenever it is needed. However, there are indeed some over-use and under-use cases. To see how students develop their knowledge of -le, we have a breakdown of the figures at different proficiency levels in the following table.

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[8] The other minor aspect markers are even rarer than these two.

Sit. / -le / Levels	Statives			Activity			Accomplishment			Achievement			Modal /Negative		
	RE/AS	OV	UN	RE/AS	OV	UN	RE/AS	OV	UN	RE/AS	OV	UN	RE/AS	OV	UN
Beginning	0/0	1	0	9/7 (78%)	4	2	16/12 (75%)	0	4	19/14 (74%)	0	5	0/0	1	0
L. Inter.	1/1 (100%)	5	0	6/5 (83%)	1	1	17/13 (77%)	0	4	28/24 (86%)	0	4	0/0	1	0
U. Inter.	1/1 (100%)	2	0	5/5 (100%)	1	0	22/21 (96%)	0	1	43/41 (95%)	0	2	0/0	0	0
Advanced	0/0	2	0	8/8 (100%)	3	0	29/29 (100%)	0	0	28/28 (100%)	0	0	0/0	0	0
Total	2/2	10	0	28/25	9	3	84/75	0	9	118/107	0	11	0/0	2	0

Table 4 *The relationship between situation types and -le at different levels*

RE=required; AS=appropriately supplied; OV=over-use cases; UN=under-use cases

From Table 4, we can make the following observations:

1). For States, only two –*le*s are required. Under-use is not likely. The over-use problem seems persistent. There are 2 over-use cases even at the highest level.

2). For Activities, increasingly high percentages of the required *le*s are appropriately supplied (78% ⇒ 85% ⇒ 100% ⇒ 100%). There are both under-use and over-use cases. In comparison, the problem of over-use is more persistent. Even at the highest level, there are 3 over-use cases.

3). For Accomplishments and Achievements, there is no over-use case for all levels, although there are some under-use cases at the Beginning, the Lower Intermediate and the Upper Intermediate levels. The rates of appropriate use steadily go up from the lower levels to higher levels.

4.2 Lexical Aspect and –Zhe

Much fewer *-zhe*s are used in our data. In all the 2554 clauses (including both past time and present/future time clauses), only 48 *-zhe*s are required. Of the 48 contexts that require *-zhe*, 45 are appropriately provided. There are only 3 cases when *-zhe* is needed but not supplied.

Sit. / - zhe / Levels	St.(1)		St.(2) (Exist.)		Act.		Accomp.		Achiev.		Total	
	AS	OV	AS	OV	AS	OV	AS	OV	AS	OV	AS	OV
Beginning	0	0	0	0	1	0	0	0	0	0	1	0
L. Inter.	1	0	3	0	5	0	0	2	0	0	9	2
U. Inter.	3	0	8	0	16	1	0	3	0	0	27	4
Advanced	3	0	1	0	4	0	0	0	0	0	8	0
Total	7	0	12	0	26	1	0	5	0	0	45	6

Table 5 Situation types and - *zhe*

From Table 5, we can see: 1) *-zhe* mostly occurs on Activities (26 out of 51 or 51%); 2) there are also quite a few occurrences of *-zhe* on Statives (7 out of 51 or 14%) and existential clauses (12 out of 51 or 24%), 3) the few over-use errors are mostly found on Accomplishments (5 out of 51 or 9.8%).

5 Discussion
5.1 Lack of Under-use of the Perfective Marker -Le on Statives and Activities

In our learners' interlanguage, *-le* is used mostly on Accomplishments and Achievements and only a few occurrences of *-le* are found on Activities and Statives. This pattern corresponds exactly to the universal learner tendency described by Claim 1 of the Aspect Hypothesis that learners tend to restrict perfective past marking to Achievements and Accomplishments. In the acquisition of English and many other languages, this tendency is undesirable because it leads to low suppliance of past marking on Statives and Activities when past marking is needed. However, most of the errors our L2 Chinese learners make with Statives and

Activities are just the opposite: using the perfective marker -*le* when it is not needed. In other words, the problem predicted by Claim 1 is UNDER-USE of the perfective marking on Statives and Activities and the L2 learners of Chinese display no UNDER-USE of the perfective marking on these situation types due to the fact that -*le* is usually NOT required on situations without boundaries. The learners even show a slight tendency of OVER-USING perfective marking on Statives and Activities as a result of transferring their L1 past marking pattern into the use of –*le*.

5.2 -Le and the Relevance Principle

The natural occurrence pattern of -*le* reflects a natural tendency in morphological attachment that has been formulated by Bybee (1985) as the Relevance Principle. The tense-aspect morphemes or markers are attached to verbs, which are classified into four aspectual classes according to their inherent semantic features: [±telic], [±puctual], and [±dynamic] (Smith, 1991). As Andersen (1991) pointed out, these features are closely related to the meanings of tense-aspect inflections or markers.

The perfective marker -*le* provides an entirety view of a situation, so it has the most direct relevance to [+punctual] and [+telic] situations (Achievements) because punctual and telic situations happen and finish in an instant and are therefore the most likely to be viewed in their entirety. Next to Achievements in degree of relevance to the entirety meaning are Accomplishments, which contain inherent natural endpoints and are also highly likely to be viewed in their entirety. Activities do not contain any natural outcomes or results, so they are not directly relevant to the meaning of the perfective viewpoint. However, Activities, no matter how long they last, do come to an end at a certain point of time. As this endpoint does not correspond to a natural result or outcome inherent in a situation, Smith (1997) uses the term "arbitrary temporal endpoint" to refer to it. When there is such an arbitrary temporal endpoint, an Activity can be viewed in its entirety too. Statives may last for an indefinite period of time until a change takes place, so they are the least relevant to the meaning of the perfective viewpoint. However, they can also be

viewed in their entirety when a change takes place at a certain point of time. If we view the four aspectual classes in terms of a continuum from the most relevant to the least relevant to the perfective meaning, we can obtain a scale like the one in (16). The occurrence of -*le* is naturally restricted to the relevant classes as the two solid lines indicate.
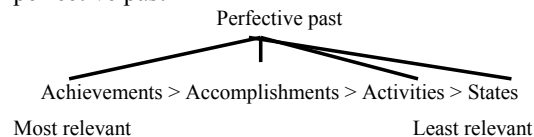
(8) Natural occurrence pattern of the Chinese perfective -*le*

-Le

Achievements > Accomplishments > Activities > States

Most relevant   ⇔   Least relevant
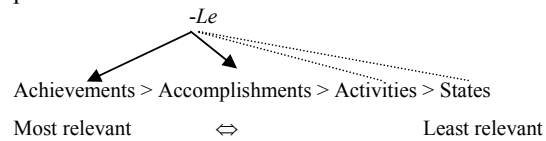
Activities and States can be made relevant to perfective marking by provided endpoints or contexts. When such is the case, the use of -*le* can be extended to Activities and Statives.

The natural occurrence pattern of -*le* seems to follow Bybee's Relevance Principle (1985) closely. If Bybee's principle is truly universal, it should be observed in other languages too. As we have mentioned, perfective meaning in English is most commonly expressed by the simple past, which may go with all types of situation to produce closed/entirety readings. How is Bybee's Relevance Principle observed in English? If we compare –*le* marked sentences in Chinese and past marked sentences in English, we cannot help but notice one big difference, that is: the English simple past indicates a past time location but –*le* does not have the function of locating a situation in time. We argue that it is this difference that leads to the differences in the occurrence patterns of –*le* and the English simple past. The past location indicated by the English simple past in fact provides an arbitrary temporal endpoint to any situation it marks. We assume that this is the reason why the perfective past can be used on verbs of all types in English:

(9) Natural occurrence pattern of the English perfective past

Perfective past

Achievements > Accomplishments > Activities > States

Most relevant   Least relevant

In other words, the Relevance Principle is also observed in English but in a different way.

Now, we can see that the natural occurrence pattern of *-le* in Chinese and the beginning learners' restricted use of perfective past described by Claim 1 reflect the same natural tendency predicted by Bybee's Relevance Principle. The crucial difference between the acquisition of the Chinese *-le* and the acquisition of the perfective past in English and many other European languages is: the spread of *-le* to Activities and Statives is conditional and subject to certain constraints in Chinese, but the expansion of the past perfective marking to the less relevant classes is obligatory in English and many other European languages. When obligatory spread is required in a language, the learners of this language, constrained by the Relevance Principle, will display under-use of the perfective past marking on Statives and Activities. Whereas in a language like Chinese, the spread of the perfective marking to Statives and Activities is conditional and exceptional, so L2 learners do not have much chance to under-use the perfective marking on these two types of situations. On the contrary, their L1 habit of using the perfective marking on Statives and Activities may be transferred into their use of *-le*, causing a totally different kind of errors: over-using the perfective marker.

5.3 -Zhe and the Relevance Principle

Open-ended ([-telic]) and [+durative] situations (Statives and Activities) are more likely to be viewed in part and are therefore more relevant to the basic meaning of the imperfective aspect. Accomplishments are [+durative] and also have relevance. Achievements are not durative and so have the least relevance. The beginning learners' tendency of restricting simple imperfective marking to Statives and Activities is direct reflection of the relevance relationship.

What is interesting is: different subtypes of the imperfective aspect reflect the relevance relationship in different ways.

(10) Natural occurrence pattern of the Chinese imperfective *-zhe*

-Zhe

States(a) States(b) Activities Accomplishments Achievements

More relevant   Less relevant   Least relevant
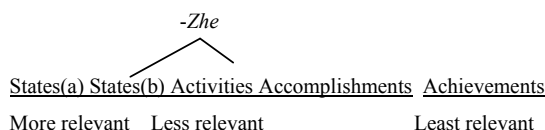
The English progressive emphasizes the on-goingness of events, so it can occur on all durative and dynamic situations, namely all Activities and Accomplishments:

(11) Natural occurrence pattern of the progressive form in English

Progressive

States   Activities   Accomplishments   Achievements

More relevant   Less relevant   Least relevant
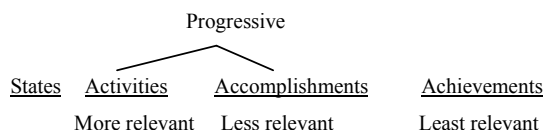
Comparing the three subtypes of the imperfective aspect, we can see that *-zhe* more strictly follows the Relevance Principle than the Russian imperfective and the English progressive.

In our data, we find that L2 Chinese learners use *-zhe* mostly on Activities and secondly on States and there are also some occurrences of the marker on Accomplishments. The learners do not extend the use of *-zhe* to Achievements.

The L2 learner's *-zhe* use pattern only partially matches the native use pattern of the marker because there is non-native use of the marker on Accomplishments and this seems to result from negative transfer of the use of the English progressive form into Chinese. The learner's use pattern is closer to the learners' early tendencies describe by Claim 2 (learners tend to restrict imperfective marking to Statives and Activities) and Claim 3 (learners tend to restrict progressive marking to Activities), with the exception of the few over-use cases on Accomplishments.

The natural occurrence pattern of *-zhe* and the learners' early tendencies of restricting the imperfective to Statives and Activities and the progressive to Activities also reflect the same natural language tendencies predicted by Bybee's Relevance Principle. The crucial difference between the acquisition of *-zhe* and the acquisition of the imperfective in Russian or the progressive in English is that the spread of *-zhe* to less relevant situations, Accomplishments and Achievements is not necessary while the expansion of the imperfective or the progressive to these two types of situations is required.

6.Conclusion

First, We have shown that a natural language principle, the Bybee's Relvevance Principle, can be observed either overtly and directly or covertly and indirectly, the occurrence pattern of the Chinese -*le* being an example of the former and the use of the English perfective past being an example of the latter. This difference may render a natural tendency (restricting perfective past marking to Accomplishments and Achievements) undesirable or desirable in the acquisition process. When it is undesirable (as in English), we observe under-use of the perfective marking on States and Activities. When it is desirable (as in Chinese), under-use is highly unlikely and we may even observe over-use of the perfective marking on Statives and Activities as a result of other factors like L1 transfer. In accordance with this finding of ours, Claim 1 of the Aspect Hypothesis can be modified into:

(13) Learners first use (perfective) past marking on Achievements and Accomplishments, eventually extending its use to Activities and Statives if the expansion is obligatory in the language being acquired.

The added "if" clause implies that languages differ in allowing or disallowing the expansion of the perfective past marking to Activities and Statives.

Second, we have also shown that different languages may have different subtypes of the imperfective viewpoint, emphasizing different meaning components of the imperfectivity (simple partial view, progressive focus, static view, etc.). The different emphases relate to the Relevance Principle in different ways. When we compare the three subtypes, we see that -*zhe* follows the Relevance Principle more closely. That is why learners' early tendencies (restricting the imperfective to Statives and Activities and the progressive to Activities) are also desirable rather than undesirable in the acquisition of -*zhe*, because it is not necessary for the use of -*zhe* to spread to Accomplishments or Achievements. In accordance with our findings, we would like to add a new claim to the original Claim 2 and Claim 3:

(14) In languages that have subcategories of the imperfective viewpoint, variations of 2 (Claim 2) and 3 (Claim 3) can be found depending on what imperfective meanings are emphasized by a particular subcategory.

Although we have made some modifications to the Aspect Hypothesis, we feel it very important to emphasize that the -*le* and -*zhe* acquisition patterns found in our study do not shake the foundation of the Aspect Hypothesis. They only show that undesirable tendencies of learners can become desirable in the acquisition of a language in which the tendencies are just what are overtly required.

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