The Encoding of Temporality in Second Language Acquisition: A Study of Mandarin Chinese-speaking ESL Learners

Li Ma

Graduate Center, City University of New York

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THE ENCODING OF TEMPORALITY IN SECOND LANGUAGE ACQUISITION:
A STUDY OF MANDARIN CHINESE-SPEAKING ESL LEARNERS

BY

LI MA

A DISSERTATION SUBMITTED TO THE GRADUATE FACULTY IN LINGUISTICS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY, THE CITY UNIVERSITY OF NEW YORK

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This manuscript has been read and accepted by the
Graduate Faculty in Linguistics in satisfaction of the
dissertation requirement for the degree of Doctor of Philosophy.

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ABSTRACT

The Encoding of Temporality in Second Language Acquisition:
A Study of Mandarin Chinese-speaking ESL Learners

By
Li Ma

Advisor: Professor William McClure

This dissertation investigates the influences of pragmatic factors, lexical devices, as well as the lexical aspectual properties of verbs on second language learners’ encoding of temporality in their target language. The pragmatic factors being investigated include a recency effect and the number of occurrences of a tense in the previous context, and the lexical devices include past-time temporal adverbials and frequency adverbs. The role of the lexical aspectual properties of verbs is checked against the Aspect Hypothesis, which states that learners will initially restrict past or perfective marking to achievement and accomplishment verbs and later gradually extend this usage to activity and stative verbs.

Unlike many previous studies, which collect data from learners of various native language backgrounds, the present study analyzes empirical data gathered solely from Mandarin Chinese-speaking ESL learners, whose native language temporality system differs dramatically from that of their target language. That is, Mandarin Chinese is a tenseless language, while English uses tense and verbal morphology to indicate temporal locations and relations.

The findings in the present study indicate that (i) a recency effect in a passage does not affect English native speakers’ or Chinese native speakers’ tense choice, (ii) both English native
speakers and Chinese native speakers show a tendency to use the duplicated tense in the previous context to mark a test item in the following discourse, (iii) past-time temporal adverbials show an obvious tense reminding effect when there is no matrix agreement, (iv) the introduction of a frequency adverb is associated with a higher usage rate of the present tense for a test item in a past-time context, but not in a present-time context, and (v) no supporting evidence for the Aspect Hypothesis is found and the inherent lexical aspectual properties of verbs do not seem to influence on learners’ tense choice.

The present study contributes to our understanding of the development of second language learners’ expression of temporal locations and relations in their target language. It also raises the question of how English native speakers and second language learners are similar to each other in language processing.
ACKNOWLEDGEMENTS

I am using this opportunity to express my gratitude to everyone who supported me throughout the course of this research project. I owe the greatest thanks to my advisor, Professor William McClure. Professor McClure introduced me to semantics and has guided me towards the investigation of second language learners’ acquisition of tense and aspect. Without his inspiring guidance and dedicated involvement in every step throughout the process, this dissertation would have never been accomplished. I have benefited greatly from his insight and invaluably constructive advice, and I truly enjoy learning from him.

I would like to express my warmest thanks to Professor Gita Martohardjono who has trained me in experimental methodology and guided me to do statistical analysis in second language acquisition. I learned a great deal from her, and I sincerely appreciate her for her generosity with time and her valuable advice. I also thank Professor Robert Fiengo for sharing his illuminating views on a number of issues related to the present study.

I show my special thanks to my friend Dr. Gerrie Nussdorf for her help in developing the test materials in this dissertation. I also thank Mr. Paul DuBois, Dr. John Martin, Dr. Gerrie Nussdorf’s friends and all other English native speakers who volunteered to provide judgment in English.

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I owe enormous thanks to my parents for their unconditional love and support. I thank my husband for his understanding and years of support. Also, I thank my son. Being a four year old kid, he was able to keep quiet while I was working on the dissertation at home.

This dissertation is dedicated to my late maternal grandmother, Xicheng Zhang. She was my first teacher in my life, and she introduced me to the beautiful world of language and music.
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CHAPTER 1

INTRODUCTION

1.1 Summary

The encoding of temporality in second language acquisition has been investigated by many researchers in a variety of linguistic frameworks. Some of them adopt the concept-oriented approach and examine the range of devices that are used by second language learners to encode the concept of temporality. These devices include pragmatic devices such as the Principle of Natural Order (PNO), lexical devices such as temporal adverbials, and grammatical devices such as verbal inflections. Other researchers focus on the functional roles of the inherent lexical aspectual properties of verbs (i.e. verbal situation types) and the distribution of verbal morphology in second language learners’ expression of temporality. Researchers along this line have observed some universal tendencies as captured by the Aspect Hypothesis (Robison, 1990; Andersen & Shirai, 1996; Shirai, 1991). One statement in the Aspect Hypothesis, which is tested in this dissertation, is that learners will initially restrict past or perfective marking to achievement and accomplishment verbs and later gradually extend this usage to activity and stative verbs. In other words, the Aspect Hypothesis is a prediction about the relationship between the distribution of tense verbal morphology and the inherent lexical aspectual properties of verbs. It holds that the emergence of verbal morphology or verbal inflections in learners’ interlanguage is largely governed by the inherent lexical aspectual property of the verb.

In this dissertation, both approaches are considered, and the functional roles of pragmatic devices and lexical devices, as well as the influence of the inherent lexical aspectual properties of verbs on second language learners’ encoding of temporality are investigated. The difference between the present study and previous studies are as follows. First, most previous studies
include learners of various native language backgrounds, but rarely are there studies of a homogeneous group of [-tense] L1 learning a [+tense] L2. The present study, however, includes solely Mandarin Chinese ([-tense] language) native speakers who learn English ([+tense]) as a second language. The second difference between the present study and previous studies is that most previous studies have relied on spontaneous methods of data collection. Story-retelling in spontaneous speech and/or writing is the most commonly used task for data collection. In contrast, the present study uses tests given under highly controlled experimental condition, and results from quantitative analyses are the basis for the evaluation of the influence of pragmatic devices, lexical devices, and the lexical aspectual properties of verbs.

The structure of this dissertation is as follows. In this chapter, I will introduce the lexical aspectual properties of verbs (i.e. situation types of verbs) in English and Mandarin Chinese as well as the temporality systems of the two languages. In chapter 2, I review studies that investigate the functional roles of pragmatic devices and lexical devices, as well as studies that test the influence of the lexical aspectual properties of verbs on the distribution of verbal morphology in learners’ encoding of temporality in a second language. In chapter 3, I present the research methodology of the present study. In chapter 4, I list research questions and hypotheses. In chapter 5, I give the results for the experiments in the present study. In chapter 6, I discuss how the results in the present study can contribute to a more nuanced understanding of second language learners’ encoding of temporality. In chapter 7, I summarize the major findings and limitations in the present study, and suggest directions for future studies on the same topic.
1.2 The inherent lexical aspectual properties of verbs in English and Mandarin Chinese

Vendler (1967) is the landmark work on the topic of the inherent lexical aspectual properties of verbs. He defines four distinct categories of verbs based on their interactions with time adverbials, tenses, and logical entailments. He distinguishes states (also called “statives” in other literature), activities, accomplishments, and achievements. These four verb types are also referred to as four situation types. Vendler begins his discussion by locating and describing the most common time schemata characterizing the use of English verbs. According to him, verbs possessing continuous tenses are processes going on in time. That is, they consist of successive phases following one another in time. Verbs of this type are subdivided into two groups: activity and accomplishment. An activity has no terminal point while an accomplishment requires a “climax,” which has to be reached if the action is to be what it is claimed to be. For instance, *run*, *write* and the like are activity verbs. *Run a mile*, however, is an accomplishment. In the sentence *John ran a mile yesterday*, the process of running also goes on in time, but it proceeds toward a logically necessary terminus, which is having run a mile in this example. Dowty (1979) points out that activity verbs allow only the *for*-phrases as adverbials, while accomplishment verbs take *in*-phrases, and only very marginally take *for*-phrases.

Verbs that do not allow continuous tenses are also subdivided into two groups: state and achievement. States last for an indefinite period of time, but they are not processes going on in time. For instance, verbs like *know* and *love* are state verbs. States, like activities, can appear as the answer of *(for) how long* questions. Achievements, on the other hand, occur at a single moment and indicate instant changes. In other words, achievements occur at a definite point of time. Examples are *arrive*, *reach*, and *win*. Verbs of achievement can appear as the answer of *at what time / moment* questions.
Vendler (1967) lists a number of examples in English that belong to each of the four situation types: states, activities, accomplishments, and achievements. Vendler (1967) claims that besides verbs like *have*, *possess* and *know*, verb phrases of the *being + adjective* structure, which show qualities also behave like states. Habits, including occupations, dispositions, abilities, and so on are also states.

Following Vendler (1967), many linguists provide similar descriptions of the semantic properties of the four verbal situation types in English, but they use different linguistic terms. Smith (1991) claims that states persist over time without change, while activities are atelic and have inherent duration and no natural endpoint consisting of a goal or an outcome. Achievements and accomplishments, according to Mourelatos (1981), can be grouped together as telic predicates, known as “events,” and achievements capture the beginning or the end of an action. Similarly, Andersen (1991) claims that an achievement can be thought of as reduced to a point. Accomplishments, on the other hand, are durative like activities and have a goal or an endpoint like achievements, according to Bardovi-Harlig (1998) and Bardovi-Harlig (1999). A summary of the semantic properties of the four lexical aspectual classes of verbs in English is provided in a table in Andersen (1991), which is repeated below as Table 1. Andersen distinguishes the four lexical aspectual classes of verbs in English based on their semantic properties of punctuality, telicity, and dynamism.

Verbs in Mandarin Chinese, likewise, can also be categorized into Vendler’s (1967) four verbal situation types: states/statives, activities, accomplishments, and achievements. Detailed analysis of each situation type is provided in Smith (1991). According to Smith, statives in Mandarin Chinese are homogeneous situations with no dynamicity or completion, e.g. *cunzai* (exist), *qian* (owe), *shuyu* (belong), *xiang* (resemble), *dengyu* (equal, be the same), etc. Stative
constructions in Mandarin Chinese include stative verbs (e.g. *cunzai* “exist”) or attributive predicates (e.g. *hen gaoxing* “very happy”). Habituals and generics are also stative. Activities are atelic, durative, and dynamic events, such as *zou* (walk), *zhao* (look for), and *xinshang* (enjoy). Accomplishments are durative telic situations consisting of a non-detachable process and outcome, such as *gai neizuo qiao* (build that bridge). Achievements in Mandarin Chinese are instantaneous changes of state. Verbs with the intrinsic features of [+telic] and [+instantaneous] form achievement constellations together with their complements. For instance, *hui* “return” and *dao* “arrive” are achievement verbs.

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Therefore, in both English and Mandarin Chinese verbs can be categorized into the four situation types: states/statives, activities, accomplishments, and achievements, and the underlying semantic properties of each situation type are the same in the two languages.

The interaction between verbal situation types and viewpoint aspects in the two languages, however, is not always the same. One example listed in Smith (1991) is that in English the imperfective viewpoint can exist in an achievement sentence, e.g. *He is winning.*
This is a marked use and the imperfective viewpoint in this English sentence focuses on the preliminary stages of the achievement. In Mandarin Chinese, however, the imperfective viewpoint cannot focus on the preliminary stages of an achievement, and there is no direct translation of progressive sentences such as *He is winning* in Mandarin Chinese.

1.3 The English and Chinese temporality systems

In contrast to the aspectual verb classes in the two languages, the English and Chinese temporality systems are quite different from each other. According to Smith (1991), temporal location in English is signaled by tense, modals, auxiliary *have*, and time adverbials. The tenses in English are inflectional past and present tenses; future time is conveyed by the modal *will* or present tense and future adverbials. There are one perfective and two imperfective viewpoints in English, and choice of viewpoint is consistent and syntactically obligatory in all tenses. The tenses in English code temporal location independent of viewpoint, while viewpoint is conveyed by independent morphemes which appear in every tense. In other words, in English both tense and viewpoint aspect are grammaticalized. They coexist in each and every sentence, but they have different functions. Smith (1991) further explains that sentences in the present tense refer to open situations except for marked uses, and the general semantic requirement on the present tense is to block the presentation of situations with endpoints. Therefore, stative sentences in the present tense, such as *Mary knows Greek*, have their normal stative interpretation, and sentences with non-stative verb constellations in the present tense, such as *Mary plays tennis*, have a derived habitual interpretation. The progressive is the main English imperfective viewpoint. It is available neutrally for non-stative sentences, and the basic use of the English progressive focuses on the internal stages of a durative, non-stative situation. Therefore, the English present
progressive and past progressive sentences present durative, non-stative situations in present and past time respectively. The perfective viewpoint is the dominant viewpoint in English, and it presents events as closed and statives as open, according to the temporal schema associated with each. For instance, *Lily swam in the pond* is a sentence with an activity verb, and the event of swimming in this sentence should be taken as terminated or completed. In contrast, the stative sentence *Sam owned three peach orchards*, is flexible in interpretation, and can be felicitously conjoined with the assertion that the state of owning three peach orchards continues or the assertion that the state of owning no longer obtains. Yang and Huang (2004) provide similar explanations of the English perfective viewpoint. They claim that English past tense sentences with a non-stative verb present the perfective viewpoint, and they give a closed reading to a situation located in the past. This means that sentences such as *John wrote a letter* should be interpreted as a situation that ended in the past. When we hear the sentence we know that the letter has already been completed, and we cannot conjoin the sentence with the assertion that *John is still writing the letter*, i.e. the same letter, without contradiction. English past tense sentences with a stative verb also have perfective viewpoint, but according to Smith (1991) and Yang and Huang (2004) such sentences present open situations and can be interpreted flexibly as either an open or closed situation. That is, stative sentences such as *John liked this book* can be felicitously conjoined with an assertion that the state continues or that it no longer obtains. In other words, the statement *John liked this book* can be grammatically conjoined either with the assertion *and he still likes it* or with the assertion *but he no longer likes it*. Therefore, as Yang and Huang (2004) point out, the simple past tense in English is actually a combination of past time location and perfective viewpoint aspect.
In contrast, Mandarin Chinese has a quite different temporality system. As Smith (1991) points out, Mandarin Chinese does not have tense, and indication of temporal location is not obligatory. Instead, the pragmatic conventions of use play an important role in the language due to the surface indeterminacy of the language. The temporal location of the event in a sentence is often conveyed by the use of a perfective or imperfective viewpoint, and there is a conventional association of the imperfective viewpoint with the present time and the perfective with past time. Adverbials and modal auxiliaries are also used to indicate temporal location in Mandarin Chinese. Similarly, Yang and Huang (2004) claim that Mandarin Chinese is a tenseless language and temporal locations of events are indicated by pragmatic devices (context clues, chronological order in narration, etc.), lexical expressions (*yesterday, last year, the next day*, etc.), or indirectly by aspect markers (i.e. viewpoint morphemes).

Both Smith (1991) and Yang and Huang (2004) point out that Mandarin Chinese has two perfective, two imperfective, and one neutral viewpoint. The two perfective morphemes are *le* (了) and *guo* (过). Smith (1991) claims that the *le* perfective is very close to the general perfective viewpoint of Universal Grammar, and English translations of *le* constructions are generally given in the past tense. Both Smith (1991) and Smith (1994) declare that the perfective *le* viewpoint presents closed non-stative situations. The *le* morpheme is also discussed in great detail by Thompson (1968). While he holds many ideas similar to Smith (1991), Thompson points out that in Chinese when the marker *le* is attached to a sentence, it indicates that the speaker has in mind the boundary between two events. The perfective morpheme *guo*, according to Smith (1991), presents a discontinuity with the present or other reference time. The discontinuity involves both temporal location and situation type. In other words, the *guo* perfective viewpoint presents a closed situation and conveys that the final state of that situation
no longer obtains. Therefore, as Smith (1991) points out, the *guo* constructions are best translated with the English perfect tense. Similarly, Matthews and Yip (1994) argue that the *guo* perfective viewpoint suggests experience or something having occurred “at least once before.”

The two imperfective viewpoints in Mandarin Chinese are *zai* (在) and *zhe* (着). Smith (1991) points out that *zai* is a typical progressive which presents an internal interval of a durative situation. *Zai* often has the connotation of activity and is associated with non-statives. *Zhe* is a marked imperfective viewpoint in Mandarin Chinese, and it presents a continuous and stable situation without regard to endpoints. In its basic meaning, *zhe* is a resultative stative, and the typical use of *zhe* is that it focuses on states of position and location, and appears neutrally with other states, so long as they can be seen as resultative. In addition, *zhe* also has an extended use which presents activities and accomplishments as static. In such cases, *zhe* focuses on the internal stages of the situations.

The neutral viewpoint exists in Mandarin Chinese, but not in English. According to Smith (1991), because viewpoint morphemes in Mandarin Chinese are syntactically optional and the surface indeterminacy of Mandarin affects the aspectual system, the neutral viewpoint is in principle always available in Mandarin Chinese. Theoretically speaking, a Chinese sentence without a viewpoint morpheme has more than one possible semantic interpretation. It has the neutral viewpoint as the default and the semantic information of the neutral viewpoint is automatically associated with the verb constellation, but in practice the possibilities in interpretation are limited for pragmatic reasons. For example, stative sentences in Mandarin Chinese generally appear without viewpoint morphemes, so they present the neutral viewpoint and an open situation. The stative sentence *Ta xihuan mao* (“she like cat” literally) is generally translated as “she likes cats.” However, if such stative sentences appear in a past tense context,
they can be taken as closed by inference. The above sentence can mean “she liked cats (in the past)” if it appears, for example, with a past-time adverbial such as “last year.”

The way Mandarin Chinese determines its temporal reference is also discussed in great detail in Lin (2003). Lin (2003) proposes that for simplex sentences without time adverbs or aspectual markers, temporal reference is correlated with grammatical viewpoint. That is, the values of covert tenses in Chinese, if they exist, can be determined by the following two selectional restrictions: (a) covert present tense must select imperfective AspP as its complement, and (b) covert past tense must select perfective AspP as its complement. In addition, the default aspect is perfective for a telic predicate and imperfective for an atelic predicate. For sentences with an aspectual marker, Lin (2003) proposes that le is not an absolute past tense marker; but rather an event realization operator; guo is an anteriority operator and the event denoted by the subordinate clause containing guo must precede the event denoted by the matrix clause. For subordinate clauses, Lin (2003) shows that temporal reference of complement clauses of verbs is basically determined by the verbal semantics of individual verbs, which may impose some temporal restriction on the temporal location of the embedded event. To be specific, Lin (2003) demonstrates that some verbs require that the event time of the subordinate clause follow that of the matrix clause, whereas some other verbs require the opposite. Still another type of verb requires that the event time of the subordinate clause overlap that of the matrix clause. There are also verbs that do not impose any constraints. As for relative clauses and temporal adverbial clauses, Lin (2003) demonstrates that many different factors such as lexical verbal semantics, referential properties of determiners, lifetime effect of noun phrases, semantic or pragmatics constraints on temporal connectives, inference rules and world knowledge, etc. interact to help
determine temporal reference. Lin’s (2003) discussion includes many examples, and his discussion and analyses indicate that there is no evidence of (covert) tenses in Mandarin Chinese.

In sum, the above comparison between English and Chinese indicates that although in both languages verbs can be categorized into the four situation types – states, activities, accomplishments, and achievements, the temporality systems in the two languages are very different. English is a tensed language where verbal inflections and viewpoint aspect are used concurrently in each sentence to indicate the temporal location of events expressed in sentences; Mandarin Chinese, however, is a tenseless language, in which aspectual markers as well as semantic and pragmatic factors play an important role in the determination of the temporal reference of events expressed in sentences.

What interests me most is how the semantic mismatch between the grammatical expression of temporality in English and Chinese affects Mandarin Chinese-speaking ESL learners’ encoding of temporality in their English interlanguage.
CHAPTER 2
PREVIOUS STUDIES

Previous studies investigating the acquisition of expressions of temporality in second language mainly use two approaches. The concept-oriented approach (von Stutterheim & Klein, 1987) examines the range of devices that are used to encode the concept of temporality. These devices include various kinds of pragmatic devices, such as the Principle of Natural Order (PNO) and implicit reference, through which the temporal component is presented covertly, as well as lexical and grammatical devices, such as temporal adverbials and verbal inflections, through which temporal reference is encoded explicitly. The other approach focuses on the functions of verbal situation types and their influence on the distribution of verbal morphology in the expression of temporality in second language acquisition. Researchers using this approach have observed some universal tendencies as captured by the Aspect Hypothesis (Robison, 1990; Andersen & Shirai, 1996; Shirai, 1991). One prediction of the Aspect Hypothesis, which is related to the present study, is that learners will initially restrict past or perfective marking to achievement and accomplishment verbs and later gradually extend this usage to activity and stative verbs.

Von Stutterheim and Klein (1987) note that second language acquisition research has for some time been concerned primarily with the emergence of specific linguistic forms, such as lexical items, grammatical morphemes, and syntactic constructions; research on other linguistic and pragmatic means, which follows the concept-oriented approach, has been neglected for a long time. However, as von Stutterheim and Klein (1987) point out, if we want to gain a proper understanding of the nature of a learner’s acquisition process (i.e., the organization of learner
languages and the way in which they develop), we also have to include conceptual categories in our investigation of how learners encode the concept of temporality.

In the following sections, I will review nine previous studies which focus on the concept-oriented approach and eight previous studies which focus on the functions of verbal situation types and their influence on the distribution of verbal morphology in the expression of temporality in second language acquisition.

2.1 Studies focusing on the concept-oriented approach

2.1.1 Studies investigating the types of devices used in learners’ temporal expression in a target language and the sequence of their appearance

Klein (1995) is a longitudinal study reported on in Dietrich, Klein, and Noyau (1995). It describes how Italian- and Punjabi-speaking uninstructed adult learners acquire the grammatical and non-grammatical strategies to express temporal relations in English. The interlanguage data is elicited through conversational interviews and oral film retell tasks, and the investigation focuses mainly on temporal reference to the past. Klein (1995) categorizes English temporal adverbials into four main types. They are temporal adverbials of position (TAP) such as now, and 3 minutes ago, duration (TAD) such as for seven hours and all week, quantity (TAQ) such as sometimes and often, and contrast (TAC) such as again and already. Compared with English, Italian has a rich system of inflectional and periphrastic verb forms, and Italian is quite similar to English with respect to the expression of temporality. Punjabi, on the other hand, has a very simple and transparent tense system. Only one verb – the postverbal copula – marks time deictically. It is an aspect-prominent language; context, adverbials and discourse principles play an important functional role in temporal reference and relations (Klein, 1995).
Klein (1995) first reports on the acquisitional development of the Italian-speaking English learners. Klein finds that all the Italian-speaking English learners begin with a simple repertoire of linguistic devices whose characteristic traits are: (i) utterances consist either of simple nouns, or of a verb with some nominal complements; and they can be completed with adverbials in initial or final position, (ii) verbs appear in the base form, which is usually the bare stem, (iii) no copula is used, and (iv) adverbials are mostly of the TAP-type although TAD and TAQ adverbs are also used. Klein (1995) calls the repertoire at this early stage the basic variety. At the further developmental stage, one of the four Italian-speaking English learners stays with the basic variety, two of them only develop to a limited extent, and only one makes considerable progress towards the English standard.

The Punjabi-speaking English learners’ developmental process shows no significant difference from the developmental process of the Italian-speaking English learners. In the first Punjabi-speaking English learner’s pre-basic variety and basic variety, the pragmatic strategies of Principle of Natural Order, temporal adverbials, and verb stems indicating the temporal boundaries of an action all play a significant role in temporal expression. In the further development stage, no abrupt change leading to a major revision of the learner’s language is observed. The second Punjabi-speaking English learner does not show any obvious difference in the developmental process from the first Punjabi-speaking English learner.

To sum up, the results of the study indicate that despite the differences between the temporality systems of Italian and Punjabi, learners of both source languages depend heavily on temporal adverbials as well as the pragmatic strategy Principle of Natural Order to express temporality in the basic variety. Verb stems indicating the temporal boundaries of an action play a significant role in learners’ temporal expression. Although some inflectional verb forms exist
in the basic variety, these forms are dysfunctional. At a further development stage, some learners fossilize their basic variety, while others strive towards the Standard and use grammatical inflections intentionally and functionally. In general, no obvious difference is found between the Italian- and Punjabi-speaking English learners. Both groups’ expression of temporality exhibits a sequence from using pragmatic devices (e.g., Principle of Natural Order) to lexical devices (e.g., temporal adverbials), and finally to grammatical devices (e.g., verbal morphology). Dietrich, Klein, and Noyau (1995) point out that the results in other longitudinal studies indicate that this sequence is actually followed by all learners despite differences between their native languages and their target languages.

Schumann (1987), by examining the expression of temporality in the basilang speech (the earliest stage of second language development) of five adult English learners, finds evidence that supports Klein (1995) and the other longitudinal studies in Dietrich, Klein, and Noyau (1995). Grammatical devices are not used functionally in basilang speech; rather, pragmatic and lexical devices play an essential role in temporal expression. Temporality is examined in Schumann (1987) from three perspectives: morphology, semantics, and pragmatics.

The first analysis (from the morphological perspective) is also called the target-like use (TLU) analysis. It examines learners’ degree of target-like use of English morphology. The results indicate that the learners generally lack verb phrase morphology and are far from expressing temporality by means of the English tense system.

The second analysis is the sentence-level semantic analysis which follows Kumpf (1981). It classifies interlanguage utterances according to (universal) categories such as completive versus non-completive action, habitual versus continuous action, and action versus state. The results of this analysis indicate that aspectual distinctions are not typical in basilang speech. For
instance, in the Chinese-speaking participant Ah Chun’s data, all the completive and habitual active verbs appear in the base form, and habitual stative verbs are either absent or in the base form. In other words, all of Ah Chun’s lexical verbs, no matter what aspectual categories they belong to, appear in the same form – the base form, while all the copulas, which are required in Standard English, are missing.

The third analysis in the study is a pragmatic analysis. As some European researchers (e.g., Klein, 1981; Dittmar, 1982; Perdue, 1984) have pointed out, temporality expressed in learner varieties can lack inflectional morphology and even verbs. To be more specific, temporal reference can be made by adverbials (e.g., now, tomorrow, always, prepositional phrases), serialization (the fixing of a temporal reference point and allowing the sequence of utterances to reflect the actual temporal order of reported events), calendric reference (e.g., dates, days of the week, month, and numbers), and implicit reference (e.g., temporal reference inferred from a particular context or situation) (Schumann, 1987). The analysis of the learner data in Schumann (1987) reveals that this list of lexical and pragmatic devices is exactly what is primarily used in basilang speech.

Schumann (1987) concludes that the study demonstrates that the verb morphology which does exist in basilang speech is not used to make aspectual or tense distinctions. Temporal reference is made only by discourse pragmatics. Verb morphology, even when it appears in basilang speech, does not interact with, support, or duplicate the work done by pragmatic or lexical devices in expressing temporality as it should in Standard English. The data in Schumann’s (1987) work reveals that the verb morphology which does exist in the basilang is unsystematic and is not used to make temporal reference. To put it another way, in learners’ interlanguage development, there is a stage prior to either aspect or tense where learners rely
solely on the pragmatic functions of adverbials, calendric expressions, sequentiality, and context (implicit reference) to express temporality (Schumann, 1987).

Véronique (1987), by analyzing narrative excerpts from seven 45-minute conversations in French between a target language (TL) speaker and Arabic and Berber-speaking illiterate (in L1 and L2) unskilled workers living in Southern France, finds that the sequence of using pragmatic and lexical devices to using grammatical devices exists not only in learners’ English interlanguage, but also in learners’ French interlanguage. The type of learners’ target language barely affects the kinds of devices learners choose to express temporality in their interlanguage.

Seven learners participated in Véronique’s (1987) study, and they are divided into three groups (low level, intermediate level, and advanced level) according to their communicative and linguistic proficiency in French. The transcripts of the learners’ speech are reviewed for passages (primarily narratives) containing reference to past events.

Véronique (1987) finds that in both of the two low-level informant’s conversation and narratives, pragmatic and lexical devices are widely used to express temporality, while the absence of verbal inflections is a typical characteristic in their production. The intermediate-level informants use anaphoric adverbial clauses, calendrical expressions, interlanguage-form verb morphology, reference to shared knowledge of the world and spatial deixis, etc. The two advanced-level informants also use pragmatic and lexical devices, but their use of target language verbal morphology is more target-like because they seem to differentiate between imparfait (imperfect) and compound past. Véronique (1987) argues that the most striking feature of these advanced-level informants is their degree of intricacy: the greater mastery of target language seems to give more flexibility to these informants with regard to the discursive principle “first happened, first mentioned” (i.e. the Principle of Natural Order).
Véronique (1987) summarizes the partially similar devices used by all the seven L2 French speakers who are placed in a similar situation. They are (i) reliance on the discursive principle “first happened, first mentioned” (i.e. Principle of Natural Order), (ii) reliance on shared knowledge of the world and asyndetic relations between clauses, (iii) use of calendrical expressions and spatial reference, (iv) use of indexical and anaphoric adverbials, and (v) use of an elementary V stem ~ (aux.) V + e verb morphology contrast. The first two are pragmatic devices, (iii) and (iv) are lexical devices, and the last one is a grammatical device. Because of low-level and intermediated-level learners’ limited mastery of the target language verbal morphology, it is expected that they will depend heavily on pragmatic devices, such as Principle of Natural Order and narrate a story through chronological order. Temporal adverbials which are lexical devices, and calendrical expressions and spatial reference are also used frequently to indicate the temporal location of an event or an activity. Advanced-level learners, because of their better control of target language verbal morphology, are freed from the use of pragmatic and lexical devices and can switch reference points in their expression of temporality in the target language.

Lee (2001) is a longitudinal study of two Korean-speaking children aged 14 years, 7 months old and 10 years, 9 months old at the time of the first data collection. Both children had received four months of schooling in the American education system when the data collection starts. Altogether, data is collected twelve times over a period of approximately thirteen months. Tasks used to elicit data in the study include a spontaneous conversation task, controlled story narration, story translation, and picture description tasks. All the tasks are designed to elicit participants’ past-time expression.
Lee (2001) finds that the two child learners in the study are barely able to mark temporality and explicitly mark structural relations by grammatical means in the early stages of language development. In the following stages, the younger child’s use of past verb forms increases over time, while the older child’s use of past verb forms increases until time 9 and then decreases from time 10 to time 12. Non-linguistic means used by the two children to encode past-time reference include discourse-pragmatic devices and both locative and temporal adverbials. The discourse-pragmatic devices used by the two children include, for instance, order of mention, scaffolded discourse, implicit reference, and contrast of two or more events. In many cases, the encoding of the past-time events is not accomplished by means of verbs marked by past tense; rather, past-time events are commonly situated in time by means of adverbials or discourse-pragmatic devices accompanied by base verb forms or other nonpast verb forms.

The comparison between the two child learners’ data shows a higher average rate of adverbials and discourse-pragmatic means in the older child’s data. The comparison between the usage rate of adverbials and the usage rate of discourse-pragmatic means in each child’s data reveals that in the beginning of the data collection, discourse-pragmatic means are used much more frequently than adverbials, but when the learners’ usage rate of adverbials becomes higher, the usage rate of discourse-pragmatic means gradually decreases. This pattern is shown in both children’s data, but it is more obvious in the younger child’s data. Thus, the data in Lee (2001) indicates that the two children rely more on discourse-pragmatic means in the earlier stage of language development and that in general adverbials appear later than discourse-pragmatic devices in language development.

Lee (2001) thus concludes that the data in the study confirms that the grammatical category of tense marking is not the only way to express past-time reference and that both
adverbials and discourse-pragmatic means are used prior to verb morphology (grammatical means) to express the temporal meaning of past time. Among the various ways to make temporal relations clear, discourse devices precede lexical ones, and these in turn precede grammatical ones. In other words, and the same as adult learners, the child learners in Lee (2001) follow the sequence from using pragmatic devices to lexical devices and finally to grammatical devices to express temporality in their target language.

2.1.2 Studies investigating the functional roles of temporal adverbials in learners’ expression of temporality in target language

The functional roles of temporal adverbials and their relationship with the usage of past-tense verbal morphology in the encoding of temporality in target language natural-order reports and reverse-order reports are discussed in Bardovi-Harlig (1992). The participants in the study are eight adult full-time students in the Intensive English Program at a U.S. university. They are native speakers of three different languages – Arabic, Japanese, and Korean. Six of them are ranked as English learners at the low beginning level, and two of them are at a higher level. These learners’ control of the target language (English) verbal morphology and the target language as a whole is at a higher level than those uninstructed adult and instructed child learners in the previously reviewed studies. The language samples which form the basis of the analysis include both oral and written texts which are about events in the past. The frequency-of-use rate of past-tense forms is calculated as the ratio of past-tense forms supplied to the number of possible past-tense forms multiplied by 100. Temporal adverbials in the study include temporal adverbs, temporal adverbial (or prepositional) phrases, calendric references, temporal adverbial clauses, temporal adverbials that function as subjects, and contrasting locatives.
Bardovi-Harlig (1992) observes that many learners in the study begin with higher adverbial-to-verb ratios, and they tend to move toward a lower native-like usage in natural-order reports. In addition, their use of time adverbials show a quantitative decrease as the accuracy of use of past-time morphology increases. Bardovi-Harlig (1992), therefore, claims that the reduced reliance on time adverbials as verbal morphology becomes more systematic and more reliable seems to be manifested in an observable decrease in the frequency of the use of adverbials; that is, when verbal morphology becomes more reliable, the information carried by the time adverbials is also carried by the verbal morphology. The improvement in the appropriate use of past-tense verbal morphology, however, is not accompanied by a sharp drop in the use of time adverbials in the study. In learners’ reverse-order reports, Bardovi-Harlig (1992) finds that although the development of verbal morphology may be a general acquisitional prerequisite for the emergence of reverse-order accounts, the development of specific verbal morphology which explicitly signals the order of events (i.e., the past perfect) is not necessarily a required condition for reporting events out of natural order. The use of adverbials in the majority of the instances or reverse-order reports in the study indicates that the functional load of the adverbials is not reduced in reverse-order reports because the reverse order is marked overtly by adverbials alone in these cases. The function of adverbials, therefore, may change from providing explicit temporal reference and cohesive devices only to overtly signaling deviations from natural order, and adverbials may be an early means for learners to report events out of chronological order.

The functions of temporal adverbials in reverse-order reports are further investigated in Bardovi-Harlig (1994). As in Bardovi-Harlig (1992), the learners are adult instructed learners in the Intensive English Program at a U.S. university. 16 learners from four language backgrounds (5 Arabic, 6 Japanese, 2 Korean, and 3 Spanish) participate in the study. The mean number of
months for data collection from each participant is 9.8 months. Journal entries are the main written language samples under investigation. Written narratives from film retell tasks, essay exams, class assignments are used when journal entries are not available. No oral data is collected or analyzed. Like previously reviewed studies, learners’ expression of temporality in past-time contexts is the focus of the study. Altogether, 103 reverse-order reports in the 430 texts are sampled. These reverse-order reports are further coded for verbal morphology and the presence of other markers.

The results of the data analysis indicate that of the 103 instances of reverse-order reports identified, 40 show no contrast in tense/aspect morphology, whereas 63 show a tense/aspect contrast. Of the 40 reverse-order reports lacking morphological contrast, 25 exhibit one single marker, 12 show two markers, and only 3 show no overt markers. These non-morphological markers include time adverbials, causal constructions signaled by because, relative clauses, and complements. Time adverbials are the most common marker of anteriority and they play a pivotal role in these reverse-order reports. Just short of half (46%) of the 40 reverse-order reports are marked by time adverbials.

Bardovi-Harlig (1994) therefore claims that when learners begin to use verbal morphology to signal the contrast between past and anterior events, they are unable to completely obviate the need for additional overt signals of deviations from chronological order, and time adverbials in this type of reverse-order reports continue to play an important role. Even when learners’ use of verbal morphology becomes more accurate and stable, learners still largely employ the functional role of time adverbials to mark reverse-order reports as deviations from chronological order. Although a high accuracy of past tense use is a necessary prerequisite for the emergence of reverse-order reports, it alone cannot (always) fulfill the duty of reporting
events out of natural order. Bardovi-Harlig (1994) concludes that in the broader perspective of the expression of temporality, a concept-oriented approach shows that the role of time adverbials is a central one; time adverbials seem to be used in various stages of interlanguage before the emergence of tense.

Yang and Huang (2004) is another study that focuses on the functional role of temporal adverbials in learners’ encoding of temporality in target language. The target language in this study is English, which is a tensed language. The participants of the study, however, are solely native speakers of Chinese, which is a tenseless language. As Yang and Huang (2004) point out, in English both tense and aspect are grammaticalized and they are not morphologically realized separately; Chinese, on the other hand, is a tenseless language and temporal locations of events are indicated by pragmatic devices (context clues, chronological order in narration, etc.), lexical expressions (yesterday, last year, the next day, etc.), or indirectly by aspect markers. The purpose of this study, therefore, is to find out how the lack of grammatical tense and the use of large numbers of temporal pragmatic and lexical devices in Chinese influence Chinese native speakers’ acquisition of the tense-aspect system in English.

Five groups (at least 30 students in each group) of Chinese ESL learners in Hong Kong participate in the study. They represent five age groups (10 year olds to 19 year olds) and five different English proficiency levels from the late beginning to the advanced. These five groups are named as P5, F1, F3, F5, and U1 respectively. The data sampled in the study are students’ written narratives about personal experience or news stories. In other words, all the data under examination are narratives of past events, and in the majority of the narratives only past tenses (mainly simple past, the past progressive, and the past perfect) are required. 500 or more coded sentences are obtained for each group. In order to find out the effect of temporal adverbials on
tense-aspect use, sentences are divided into two types. Sentences of Type (a) are those that contain temporal adverbials and sentences of Type (b) are those that contain no temporal adverbials. Temporal adverbials are categorized into five types. They are deictic temporal expressions, anaphoric adverbials, calendric temporal phrases, temporal adverbial clauses, and other temporal expressions like *in my primary school years*, etc.

Yang and Huang (2004) analyze both the usage rate and functional roles of the temporal adverbials. Yang and Huang (2004) find that learners at the lowest level P5 only show 9.7% usage rate of sentences with temporal adverbials, and most of their sentences are simple ones which describe events in chronological sequence. At the next higher level F1, correct past marking rates are higher, at 38.4% with sentences with temporal adverbials and 46.8% with sentences without temporal adverbials. Despite the fact that they still rely heavily on chronological ordering to make temporal references, they produce more complex sentences containing temporal adverbials (34.9% Type (a) sentences) and more sentences in which finite verbs in past time contexts require different past tense-aspect forms other than the simple past (4.9%). At the next three higher levels, the rates of Type (a) sentences (with temporal adverbials) range from 21.5% to 30.9%, and the overall rates of past marking grow steadily higher: 56.7% at F3, 67.5% at F5, and 82.2% at U1. Learners at the highest level U1 show fairly good command of the English tense-aspect system. They create more complex sentences involving various past tense-aspect forms which include the simple past. Yang and Huang (2004) thus claim that in the acquisition of the L2 tense-aspect system the Chinese learners largely follow the general developmental pattern of using pragmatic devices, then lexical devices and finally grammatical devices to express temporality, although their closer examination of the data reveals that no clear stages from pragmatic to lexical and to grammatical devices can be seen.
Yang and Huang’s (2004) analyses of the functions of temporal adverbials reveal that at the two lowest levels (P5 and F1), significantly fewer finite verbs in Type (a) sentences (with temporal adverbials) bear past marking than finite verbs in Type (b) sentences (without temporal adverbials), but at the three higher levels (F3, F5, and U1), the reversed pattern is observed. Yang and Huang (2004) claim that the fact that the presence of temporal adverbials leads to lower rates of past marking at the two lowest levels is clear evidence to support the argument that students of lower levels rely very much on temporal adverbials for making temporal references. At the higher three levels, the presence of higher rates of past marking in sentences with temporal adverbials is an indicator that temporal adverbials are no longer tense substitutes; instead, they become reminders for the use of verbal morphology. In other words, the functional role of temporal adverbials shifts from tense substitutes to tense reminders as learners’ target language proficiency level improves.

To summarize, all the studies reviewed indicate that temporal adverbials, as a form of lexical device, are facilitative and important in learners’ encoding of temporality in the target language. Learners have a high usage rate of temporal adverbials even when they are able to use morphological markers to indicate temporal location and contrast. In the case of Chinese-speaking ESL learners, the functional role of temporal adverbials shifts from tense substitutes for lower-level learners to tense reminder for higher-level learners.

2.1.3 Studies investigating the functional roles of frequency adverbs

Bardovi-Harlig and Reynolds (1995) provides a detailed analysis of the functional roles of frequency adverbs in the acquisition of English past tense. 182 adult ESL learners in the Intensive English Program at a U.S. university participate in the study. They represent six
proficiency levels from beginning to advanced and 15 native languages which include both Indo-European and non-Indo-European languages. A control group of 29 native speakers of American English is also included. The testing material is a cloze test. It includes 32 short passages which contain 62 test items and 26 distractors. 9 additional activity verbs and 6 state verbs in the environment of frequency adverbs are also tested. These frequency adverbs include common adverbs such as usually, everyday, and always. 2,730 learner responses to these 9 activity verbs and 6 state verbs are collected.

Bardovi-Harlig and Reynolds (1995) finds that the introduction of frequency adverbs in the environment of activity verbs causes noticeable increases in learners’ use of nonpast forms (i.e., simple present tense and base forms). In their study, learners’ usage rate of nonpast forms in the environment without frequency adverbs ranges between 1.5% and 9.4%, while in the environment with frequency adverbs the rate ranges between 7.8% and 25.9%. Likewise, the appearance of frequency adverbs in the environment of state verbs enhances the association between state verbs and the nonpast form. Therefore, Bardovi-Harlig and Reynolds (1995) reveals that in past-tense contexts no matter whether frequency adverbs occur with activities verbs or with state verbs, the use of nonpast always increases obviously.

Bardovi-Harlig and Reynolds (1995) points out this increase shows that learners do not recognize such environments as environments for the simple past, revealing another way in which the distribution of past is undergeneralized in the grammars of some learners. In other words, “these learners associate the concept of present so strongly with adverbs of frequency that this association overrides contextual cues that establish the past tense” (Bardovi-Harlig and Reynolds, 1995). It is observed in Bardovi-Harlig and Reynolds’s (1995) study that only learners
at the advanced proficiency level show approximately 80% appropriate use of past forms, revealing little effect of frequency adverbs.

The function of frequency adverbs is also investigated in Kim (1999). Unlike the participants in Bardovi-Harlig and Reynolds (1995), who represent 15 native languages, the participants in Kim’s (1995) study are from two Asian Language backgrounds only, Korean and Chinese, which are [+tense] and [-tense] respectively. Their target language is also English.

Evidence that proves that learners’ use of verb inflection is influenced by the presence of frequency adverbs in sentences is found in the cloze test. Similar to Bardovi-Harlig and Reynolds (1995), Kim (1999) analyzes learners’ past-tense morphological marking of state verbs and activity verbs with and without the presence of frequency adverbs. The results of the test indicate that the introduction of frequency adverbs appears to enhance the association of the present tense and the verbs. For instance, in both the Korean group and the Chinese group, learners’ appropriate use of the simple past with stative verbs drops slightly when frequency adverbs appear in the sentence (from 76.1% to 66.7% for the Korean group, and from 69.7% to 66.1% for the Chinese group). The simple present tense becomes the major competitor to the appropriate form of simple past, and the use of the base form also increases in both groups. The progressive form, on the other hand, is not used in the environment of frequency adverbs. In contrast to the statives, when responding to activity verbs, both the Korean and Chinese learners show a consistent use of the past with activity verbs. The usage rate of the past form reaches 80% of the time and the use of nonpast is minimal. Progressive forms are frequently associated with activity verbs with the absence of frequency adverbs, but they do not show up in activity sentences when frequency adverbs are present. Base forms and simple present often occur in learners’ response to activity sentences in the environment of frequency adverbs.
Thus, the patterns found in Kim (1999) are quite similar to the patterns found in Bardovi-Harlig and Reynolds (1995). Although learners in both studies show a relatively constant usage rate of simple past in obligatory contexts, their different responses to sentences with and without frequency adverbs reveal that they seem to be distracted by the presence of frequency adverbs. Nonpast forms (simple present tense and base forms) become the most frequently used alternative to simple past forms when frequency adverbs occur in sentences with stative or activity verbs. Kim (1999) explains that the association between the simple present tense and frequency adverbs in learners’ response is due to the habitual meaning provided by frequency adverbs. Since the past tense is usually associated with the completion of an event or situation, which contradicts the habitual meaning of a situation, the presence of frequency adverbs in a sentence may make learners show less use of the past.

To summarize, the similarities between the patterns in learners’ responses in Bardovi-Harlig and Reynolds (1995) and Kim (1999) indicate that learners’ native language does not affect the influence of frequency adverbs on learners’ response. Although the learners in Kim (1999) are all from Asian language backgrounds while the learners in Bardovi-Harlig and Reynolds (1995) include both Asian language speakers and Indo-European language speakers, the similarities in their response to frequency adverbs in sentences of the past-tense context seem to be universal. Learners tend to use more nonpast forms (simple present tense and base forms) in past-tense contexts when frequency adverbs are present.

2.2 Studies focusing on the functional roles of the inherent lexical aspectual properties of verbs and their influences on the distribution of verbal morphology in the expression of temporality in second language acquisition
Bardovi-Harlig and Reynolds (1995) presents the results of a cross-sectional investigation of the acquisition of the English simple past tense by 182 adult ESL learners in the Intensive English Program at a U.S. university. These learners are at six different proficiency levels (about 30 learners at each level) from beginning to advanced, and they represent 15 different native languages. A control group of 29 native speakers of American English is also tested. A cloze test in the form of 32 short passages is used. The passages range in length from one sentence to five sentences. 62 test items and 26 distractors are included in the 32 short passages. The numbers of test items are balanced through lexical aspectual classes. All verbs tested appear in the third person singular environment so that overt morphological marking would be obligatory in both the present and the past tenses.

Bardovi-Harlig and Reynolds (1995) finds that achievement and accomplishment verbs exhibit high levels of appropriate use of simple past even at the lowest proficiency level (Level 1: accomplishments: 73.3%; achievements: 62.4%). As early as Level 2, learners show approximately 80% appropriate use of simple past with event verbs. In contrast, activity verbs show a much lower appropriate use of simple past (Level 2: 65.1%; Levels 3-5: 53.6% - 68.3%; Level: 6: 82%). Although at the highest level (Level 6) the gap between event verbs and activity verbs for the appropriate use narrows considerably (accomplishments: 91.9%, achievements, 90.9%, activities 82%), event verbs still show slightly more than a 10% advantage. State verbs, like activity verbs, show lower rates of appropriate use of the simple past in Levels 1-3. Bardovi-Harlig and Reynolds (1995), therefore, argue that both lexical aspectual class and learners’ level of proficiency influence their use of the English simple past tense, and the ESL learners in their study undergeneralize the simple past. Learners’ strong tendency to associate simple past tense verbal morphology with achievements and accomplishments is because achievements and
accomplishments denote completed events, and the low rates of appropriate use of the simple past verbal morphology with activity and stative verbs are due to the inconsistency between the atelic property inherent in these two verbal categories and the semantic properties of punctuality and completeness associated with the simple past.

In Bardovi-Harlig and Bergström’s (1996) study, by comparing the written narratives collected from 23 ESL (English as a Second Language) learners and 23 FFL (French as a Foreign Language) learners at a U.S. university, researchers find that learners show similar patterns of distribution of tense/aspect morphology across target languages. The effects of lexical aspect on the distribution of morphology as predicted by the Aspect Hypothesis hold not only in English but also in French.

Participants in the study are instructed EFL and FFL learners. They are shown an eight-minute excerpt from the silent movie *Modern Times* and are given 35 to 50 minutes to retell the story in writing. The 23 EFL learners and 23 FFL learners whose written narratives are analyzed are then divided into four subgroups according to their rate of use of a past tense in past-time contexts (simple past or past progressive in English, passé composé or imperfect in French).

The results of the analyses show that learners do not use the past equally with all verbs. Rather, the past spreads from telic verbs (achievements and accomplishments) to activities in both English and French. For instance, in English for Group 1 (the group with the lowest rate of past marking), achievements and accomplishments show respectively 46.4% and 47.1% rate of simple past marking, while activities and statives only show 17.2% and 15% respectively. In Groups 2, 3, and 4, the rate of simple past marking with achievements is approximately 10% higher than that with accomplishments, and activities constantly show a lower rate of simple past marking than achievements and accomplishments in all four groups. Although the use of the
simple past with statives goes up from 15% (Group 1) to around 50% (Groups 2 and 3) and finally to 73.3% (Group 4), it is not until Group 4 that the rates of simple past marking for statives and for accomplishments become approximately the same (around 73%). In French, the spread of passé composé is associated with aspectual class as well. In Group 1, the effect of lexical aspect on the distribution of morphology is shown to be the strongest. In this group, the learners do not use statives with passé composé, but they show a very high usage rate of passé composé with achievements (63.4%) and accomplishment (50.0%). Then, the strong use of passé composé spreads to accomplishment in Group 2 (72.2%), followed by activities at 65.0%, and finally it spreads to activities in Group 3 (70.7%).

Ayoun and Salaberry (2008) is another study that investigates the effect of lexical aspect on the distribution of morphology in second language. Here, the 21 participants in the study are all French native speakers in senior high schools in France. They are asked to perform an English cloze task and an English free writing task (a personal narrative or a fairy tale). The cloze task targets mostly the simple past, and the number of verb tokens is not balanced because Ayoun and Salaberry (2008) believe that the authenticity of the internal cohesion of the text is more important than an artificially balanced number of tokens per aspectual category.

The results of the study reveal that although the participants’ first language French is aspectually more complex than their target language English, their rich experience of marking verbs with various verbal morphology in different contexts does not help them perform better when they are required to use appropriate past tense morphology to mark English verbs in the past tense context. The overall results from the 21 French-speaking EFL learners’ English free writing and cloze test indicate that for them the lexical aspect is a strong predictor of the use of past tense markers. For instance, in the cloze task learners’ average score on activity predicates is
only 46.72%, but they perform relatively well on telic predicates: they obtain from 90.5% to 100% on six predicates. If their scores for “correct” (76%) and “alternative correct” (10.5%) are combined together, the L2 learners’ accuracy score on telic predicates is 86.5%.

Collins (2002), by studying 70 Francophone university students enrolled in a 6-week intensive English course in Québec, Canada, finds evidence to support Ayoun and Salaberry (2008). In both studies, participants are French native speakers and the target language is English. However, because the learners in Collins (2002) study English as a second language in Canada while those in Ayoun and Salaberry (2008) study English as a foreign language in France, the learners in Collins (2002) experience relatively more target language exposure than those in Ayoun and Salaberry (2008).

Two separate studies are conducted in Collins (2002). In the first study, 70 French-speaking English learners are at Level 1 and Level 2 in an intensive English program. Students at Level 1 have limited knowledge of English, and students at Level 2 are intermediate learners of English. All 70 participants complete the 32-passage cloze task developed by Bardovi-Harlig and Reynolds (1995). 3,220 learner responses in the cloze task are analyzed.

Collins (2002) finds that the participants’ overall appropriate usage rate of simple past ranges from 20% to 91%. Collins then divides the 70 participants into 6 groups. It is clear that each group contains participants from both levels. In other words, English proficiency level determined in the placement test is not an accurate indicator of learners’ appropriate usage rate of simple past in the target language. Learners at a higher level of productive use of past tense morphology continue to be influenced by the effect of lexical aspect. In terms of the distribution of simple past across the four lexical aspectual classes, the Tukey HSD post hoc analysis in Collins (2002) indicates that the effect sizes are quite large for the comparisons between the
activity and both the accomplishment and achievement means, large for the stative and accomplishment and achievement means, and moderate for the stative/activity comparison. This result is consistent with Bardovi-Harlig and Reynolds (1995), although the two studies adopt different methods of analysis.

To sum up, by using the same material as in Bardovi-Harlig and Reynolds (1995) and by including Francophone English learners only, Collins (2002) supports Ayoun and Salaberry (2008), and proves that learners’ first language and the amount of learners’ exposure to the target language are not influential factors that can change the acquisitional sequence predicted by the Aspect Hypothesis. The effect for lexical aspect is significant in that the distribution of simple past forms is biased in favor of appropriate use with telics (accomplishments and achievements).

All of the studies reviewed so far use written data. Robison (1995), by analyzing the oral production of 26 Spanish-speaking Puerto Rican college students learning English as a foreign language, provides evidence that the acquisitional sequence as predicted by the Aspect Hypothesis holds not only in written data but also in oral data. The oral data in the study is collected by recording students in the form of 30 to 60-minute interviews.

The results of the study indicate that progressive marking in the data bears a distinct association with activities. In all four proficiency groups of the participants, activities exhibit an amplified use of progressive marking and a depressed application of other forms of morphological marking, the biased application of –ing being the most salient feature. PAST marking, on the other hand, shows a biased use with punctual events (i.e. a proper subset of Vendler’s “achievement” class) at all the proficiency levels. Robison points out that since PAST marking occurs in both anterior and non-anterior contexts, it becomes clear that PAST marks punctual events independent of temporal reference. In other words, PAST inflections are
generally more closely associated with lexical aspect, and with punctual events in particular, than with tense. When students’ English proficiency level rises, PAST marking spreads from its concentration on punctual events into the aspectual categories of durative event (i.e. “accomplishment” in Vendler’s (1967) term) and punctual activity (i.e. predicates in sentences such as “she is jumping”).

Bardovi-Harlig (1998) is another study that uses oral data to test the functional roles of the aspectual properties of verbs. The participants of the study are adult ESL learners at six proficiency levels in the U.S., and they represent native speakers of Arabic, Japanese, Korean, Mandarin, and Spanish. An eight-minute excerpt from the silent film Modern Times is shown to the learners twice, and their oral and written narratives about the story in the silent film are collected as the samples for analysis. Bardovi-Harlig (1998) compares the learners in this study on the basis of their appropriate use of past morphology rather than on their English proficiency levels. For instance, learners in Group 40 are those whose appropriate past tense usage is between 40% - 49%. Learners are ranked separately for written and oral texts.

Bardovi-Harlig (1998) finds that in the written narratives, achievements and accomplishments show the highest rate of past-tense inflection in Groups 10-30, at 32% and 31% respectively. The rates of past-tense inflection for activities and statives in this group, however, are around 20% lower, at only 9% and 11% respectively. The next higher group, Group 40, shows the highest rate of simple-past inflection on the event verbs (achievements at 48% and accomplishments at 55%), followed by activities (30%), with no progressive with states. The pattern of high use of simple past with events and lower use with activities persists at even the highest group, Group 90. Here, the rates for achievements, accomplishments, and activities are 90%, 82%, and 75% respectively. Overall, in the written narratives, the usage rates of past-tense
inflection with achievements and accomplishments are quite close with no more than 13% difference.

The oral narratives exhibit the same patterns as the written narratives. A very clear progression of past-tense use from achievements to accomplishment to activities is revealed in the oral data, and the difference between the two types of data is minor. That is, the overall rates of appropriate use of past tense in the oral data are lower than the overall rates in the written data, the use of simple past with achievements is obviously greater than the use with accomplishments (up to 30% greater) in the oral data but not in the written data, and there are more lexical statives produced in the oral narratives than in the written narratives.

In other words, despite some minor differences between the two types of narrative production (written versus oral), the general patterns found in learners’ oral and written narratives in Bardovi-Harlig (1998) support the Aspect Hypothesis. The robustness of the effect of lexical aspect holds in both the oral and written data in the study.

Lee (2001), by conducting a longitudinal study of two Korean children in the U.S., provides evidence to show that the acquisitional sequence predicted by the Aspect Hypothesis is also followed by child learners. Altogether, data is collected twelve times. At the time of the first data collection (i.e. time 1), the two children in the study are 14 years, 7 months old and 10 years, 9 months old, respectively. Both data elicitation and a spontaneous conversation task are employed. In data elicitation, story narration, story translation, and picture description tasks are used to create situations in which the participants can talk about past-time events (PTEs). The spontaneous conversation session, which follows the data elicitation session, lasts approximately 40 minutes for each participant. No topic is set for the participants’ conversation, but the
conversation is generally about the participants’ school activities, their friends, and church activities.

In terms of the relationship between lexical aspect and verb morphology, the results of the study support the claim of the Aspect Hypothesis that learners mark past tense first on achievement and accomplishment verbs. Both children apply past markers to predicates of accomplishment and achievement more than to those of state or activity. The younger child’s early use of past for accomplishment and achievement begins at 23% by token counts and 15% by type counts (i.e. at time 3) and rises to 90% by token counts and 65% by type counts (i.e. at time 12). Likewise, the older child’s use of past with accomplishment and achievement follows the same pattern. By token counts, the lowest rate 19% appears at time 1, and the highest rate 71% appears at time 9; by type counts, the lowest rate 19% also appears at time 1, and the highest rate 42% appears at time 12.

The spread of past marking to activity and state predicates which is predicted by the Aspect Hypothesis is also observed. For the older child, by token counts, with state predicates, the rate of past marking is under 17% from time 1 to time 7, and then the rate gradually increases to 43% at time 12. By type counts, however, the older child’s past marking with state remains at a lower frequency (highest 30% at time 11). The older child’s past marking to activity predicates is under 7% from time 1 to time 5, and the rate also gradually increases over time. By token counts, the highest rate 37% appears at time 8, and by type counts the highest rate 26% appears also at time 8. The younger child’s use of past for state predicates remains under 6% by both token and type counts until time 6, and then increases to 83% by token counts and 44% by type counts. The younger child’s use of past with activity predicates remains low between 4% and
21% until time 10, and then it shows a sharp increase at time 12 (66%). The type analysis, however, shows the rate is only 38% at time 12.

To sum up, in Lee’s (2001) study both children apply past markers to predicates of accomplishment and achievement more than to those of state or activity. With the progress of their English ability, the spread of past marking to activity and state predicates is observed in their English production. This phenomenon is consistent with the prediction of the Aspect Hypothesis.

In the majority of the studies reviewed so far, English is the target language. The only exception is in Bardovi-Harlig and Bergström’s (1996) study in which the written narratives by 23 FFL (French as a Foreign Language) learners are analyzed. It should be noticed that as learners’ target language, both English and French are Indo-European languages. Does the Aspect Hypothesis still hold when the target language is a non-Indo-European language? According to Shirai and Kurono’s (1998) study of the acquisition of tense-aspect marking in Japanese as a second language (JSL), the answer to this question is “yes.”

Two experiments are conducted in Shirai and Kurono’s (1998) study. Both aim at testing the validity of the Aspect Hypothesis in second language learners’ Japanese interlanguage. To be more specific, the researchers intend to find out if there are strong associations between achievement verbs and the past marker (-ta), as well as between activity verbs and the durative imperfective marker (-te i-) in JSL learners’ interlanguage. Since only Experiment 1 is closely related to my present study, I will discuss the findings in Experiment 1 only.

The participants in Experiment 1 are three Chinese adult learners of Japanese as a second language (JSL) in an intensive program at a Japanese university. The data in the study is collected in a recording studio at the university, using a regular audio-cassette tape recorder.
Each interview is about 60 minutes long, and includes topics about the present, past and future. The researchers code all the verb tokens with –ta or –te i- morphology used by the learners and the interviewer for their morphological forms (i.e., –ta or –te i-) and inherent aspectual values (state, activity, accomplishment, and achievement), and then they quantitatively analyze these using the CLAN program (MacWhinney, 1995).

The results from Experiment 1 show a pattern consistent with the Aspect Hypothesis. Among all the three learners, the pattern shown in learner C’s data is the most consistent with the Aspect Hypothesis: 92% of her use of –ta (past) is with achievement verbs, and 62% of her use of –te i- (imperfective) is with activity verbs. The other two learners use the past marker –ta most often with achievement (72% and 69% respectively), but use only 46% and 58% of –te i-morphology with activity verbs.

The data from the three Japanese non-native speakers (NNs) is also compared with the percentages from two Japanese native speakers (NSs). The results show that the Chinese JSL learners in Experiment 1 tend to restrict their use of verbal morphology in the direction predicted by the Aspect Hypothesis. That is, their use of the past marker and the imperfective marker is skewed toward achievement verbs and activity verbs, respectively, in comparison to native speakers’ use, which attach –ta and –te i- more evenly. For instance, the learners attach 78% of the past inflection –ta to achievement verbs, while the two native speakers do so with rates of only 54% and 52%, respectively.

Thus, Shirai and Kurono’s (1998) study of the acquisition of tense-aspect marking in JSL extends the applicability of the Aspect Hypothesis to a non-Indo-European language. The results of the study suggest that the tendency predicted in the Aspect Hypothesis not only fits the
acquisition of typologically similar languages (English, French, and Spanish), but also fits the acquisition of typologically different languages.

To summarize, all six studies reviewed find supporting evidence for the Aspect Hypothesis. Some studies analyze written data, some analyze oral data, and some analyze both. Most of the written and oral data in these studies is collected through oral interview and story-retelling. Despite the differences between learners’ native languages and between their target languages, they are all found to apply past or perfective marking to achievement and accomplishment verbs more than activity and stative verbs when their target language proficiency level is low, and they are also found to gradually extend this usage to activity and stative verbs when their target language proficiency level becomes higher.
CHAPTER 3
METHODOLOGY OF THE PRESENT STUDY

3.1 Introduction

In previous studies, supporting evidence is found for the functional and facilitative roles of pragmatic devices (e.g. contextual cues) and lexical devices (e.g. temporal adverbials) in learners’ encoding of temporality in second language acquisition. Additionally, the inherent lexical aspectual property of a verb is found to affect second language learners’ use of verbal morphology in the way that is predicted by the Aspect Hypothesis.

However, despite the seemingly clear evidence that these studies have found, most of them have relied on spontaneous methods of data collection. Interview and story-retelling in spontaneous speech/writing are the most commonly used tasks for data collection. In my opinion, in order for us to make strong claims concerning the functional roles of linguistic devices in expressing temporality in learner grammar, tests with more controlled methods of data collection and quantitative data analyses are strongly required. Instead of using spontaneous methods, the present study, adopts tests given under highly controlled experimental condition, and the significance of linguistic devices in learners’ responses is checked by statistical tests.

The second language learners of English in the present study are solely native speakers of Mandarin Chinese, which is a tenseless language, and which largely uses pragmatic devices, lexical devices, semantic relations between events, world knowledge, and so on to indicate and interpret temporal relations between events. The present research program addresses two major questions. How does the semantic mismatch between the grammatical encoding of temporality in English and Chinese affects Mandarin Chinese-speaking ESL learners’ expression of temporality
in their English interlanguage? And, what are the functional roles of pragmatic devices, lexical devices, and inherent lexical aspectual properties of verbs to these learners?

3.2 Research Method

3.2.1 Participants

In this study, data from two Chinese experimental groups and an English control group is analyzed. One group of English native speakers serves as a volunteer group. The English volunteer group is included in the present study to help develop the test materials. See sections 3.2.2.3 and 3.2.4 for details.

The two Chinese experimental groups together consist of 22 male and 18 female adult Chinese native speakers, who learn English as a second language in New York, U.S.A. The English control group consists of 10 males and 10 females, while the English volunteer group consists of 5 males and 5 females. All of them are adult American English native speakers in New York, U.S.A.

All of the Chinese participants in the experimental groups are Mandarin Chinese native speakers, and all of them have finished their high school education in Mainland China before the experiments in the present study. The 30 English native speakers in the present study all speak American English as their native language, and none of them speaks an Asian language as a native language. Such languages include, for instance, Mandarin Chinese, Cantonese, Japanese, Korean, Vietnamese, Malaysian, and Thai. Although there are a few English native speakers in the control group who know a little Mandarin Chinese, their Chinese proficiency level is only at the novice level. In other words, the English control group and volunteer group do not include bilingual native speakers of English and an Asian language, nor do these two groups contain
intermediate-level or advanced-level Asian language learners.

At the time of data collection, all participants have received higher education. The Chinese participants in the experimental groups include current undergraduate and graduate students, as well as students who are in the intermediate-level and advanced-level classes in the English Language Institute at Queens College of the City University of New York. In the English control group, besides current undergraduate and graduate students, there are a few participants who have already graduated and received their graduate degrees. In the English volunteer group, all of the participants have received higher education in the United States, and among them many have graduate degrees. All of the participants in the two Chinese experimental groups and the English control group are between the age of 18 and 30 and they are from various fields of study, such as physics, history, psychology, biology, biochemistry, accounting, law, and economics. The ages of the participants in the English volunteer group range between 18 and 80, and participants in this group represent more age groups than participants in the English control group. These English volunteers are from various disciplines of study as well.

3.2.2 Test materials and tasks
3.2.2.1 English proficiency test

A 13-minute listening test is used to assess the Chinese participants’ general English proficiency. This test is a revised version of the Michigan English Language Assessment Battery, i.e. BELAB. It involves 45 multiple choice questions. For each question, participants listen to a short statement or question, and then read three options of answers provided on a test paper, and mark the one they think is correct. Below is an example:
(1) Was that a good movie you saw?
   a. Yes, it is.
   b. Yes, it was.
   c. Yes, I have.

Here, the correct answer is “b,” because the speaker asks about a past event.

The purpose of the English proficiency test is to test participants’ general English comprehension ability and grammatical accuracy. This effective but non-time consuming independent measure of proficiency is intentionally chosen, because the cloze test in the present study is both long and demanding.

The results of the English proficiency test are used to divide the Mandarin Chinese-speaking ESL learners into two experimental groups. Learners whose correct answers count for 84% or higher in the test are classified into the higher level group, and those who score lower than 84% are classified into the lower level group. The result of the classification is that each of the two Chinese experimental groups contains 20 learners. In the Chinese High group, learners’ scores range from 84% to 100%. In the Chinese Low group, learners’ scores range from 46.70% to 82.20%, and among them three learners score lower than 60% (i.e. 57.70%, 48.80% and 46.70% respectively).

3.2.2.2 Questionnaire

All the Mandarin Chinese-speaking ESL learners in the present study take a 5-minute questionnaire, and provide information about their language background, English language
learning experience, language used at home and work, etc. A copy of the questionnaire is found in Appendix A.

3.2.2.3 Cloze test

A cloze test, which is a strictly controlled written production test, is used in the present study, and it is divided into two sessions with 36 short passages in each session. Each short passage contains two parts. The first part includes either two short simple sentences, or one complex sentence in the format of a matrix sentence followed by its embedded clause. The second part of each passage is a simple sentence, and the test item is the predicate of the simple sentence.

All verbs used and tested in the cloze test appear in the third person singular environment so that overt morphological marking is obligatory in both the present and the past tenses. Verbs such as put, whose present and past tense forms are the same orthographically and phonologically, are excluded from the examination, and are not used as test items in the cloze test.

The base form of a test item is provided in the parentheses after the blank in the second part of each passage. Participants are asked to fill in the blank with the correct verb form of the test item. In some passages, the simple sentence in the second part contains a frequency adverb or a past-time temporal adverbial. Sentences (2) and (3) below are two examples of the passages in the cloze test.

Examples:
Both of the two kids felt very hungry and both wanted the pancake. The mother ________ (to divide) the pancake into two pieces for the kids.

John cares a lot about his wife who came back home late. John often ________ (to drive) his wife to her office in cold winter.

In example (2), the first part of the passage contains two simple sentences. Both of these two simple sentences are in the past tense. In the second part of the passage, the test item divide is an achievement verb. Participants are asked to fill in the blank with the correct form of the verb divide.

In example (3), the first part of the passage is a complex sentence. The matrix clause of the complex sentence is in the present tense, and the embedded clause is in the past tense. In the second part of the passage, the test item drive is an activity verb and it appears together with the frequency adverb often. Participants are asked to give the correct form of the verb drive.

The cloze test in the present study is a computer-based test. Participants read passages projected on a computer screen, and write down their answers on a paper answer sheet. Each participant takes the cloze test on an individual computer, and passages in the cloze test are presented to them as PowerPoint slides. On each slide, there is one passage which stays on the screen for up to 40 seconds. Participants are required to write down their answers within 40 seconds. After 40 seconds, the passage on the screen disappears and a new slide with a new passage appears. Participants are allowed to click the mouse or the enter key within 40 seconds to advance to a new slide, but they are not allowed to move backward to check or change their answers to previous questions. The purpose of setting a time limit for each question and disallowing double-checking is to guarantee that the answers provided by the participants are
their spontaneous responses, rather than the results of grammar checking.

The 72 short passages in the cloze test are divided into two 30 minute sessions with 36 passages in each session. One example and three exercises are given to participants for practice before they start the real test. There is a 10-minute break for participants between the two sessions. This is to reduce mistakes made by participants due to the fatigue caused by the time pressure during the cloze test.

The 72 passages in the cloze test are divided into 12 types, with each type represented by 6 passages. Among the 6 passages in each type, three use activity verbs as the test items, and the other three use achievement verbs as the test items. Each passage in the cloze test has two parts. The first part contains either two simple sentences or one complex sentence in the format of a matrix clause followed by its embedded clause. The tenses used in the first part of each passage are either two present tenses, or two past tenses, or one present tense and one past tense in either order. The second part of each passage is a simple sentence with a test item as the predicate. The test item appears in its base form in parentheses after a blank. In Type 3 and Type 7, a frequency adverb, such as sometimes, appears before or after the test item in the second part of a passage. In Type 4 and Type 8, a past-time temporal adverbial, such as last year, appears before or after the test item in the second part of a passage. The test item in the passages of all other types appears alone without a frequency adverb or a past-time temporal adverbial. The grammatically correct tense choice for a test item in all the 72 passages in the cloze test is in either the present or past tense, except in Type 4 and Type 8 where the past tense is mandatory because of the existence of a past-time temporal adverbial with a test item. However, in order for the research

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1 The researcher accidentally includes only 2 passages with activity verbs as test items and 4 passages with achievement verbs as the test items in Type 2.
questions in the present study to be tested effectively, all the passages of Types 1, 3, 4, 6, 8, 9, and 12 are targeted to have the past tense as the preferred tense choice by English native speakers, and all the passages of Types 2, 5, 7, 10, and 11 are targeted to have the present tense as the preferred tense. 10 English native speakers with U.S. higher education background volunteered to do the cloze test. The researcher screened their tense choices for each test item in the 72 passages. Only passages whose targeted preferred tense choice matches the tense choice made by the majority of the 10 English volunteers are kept in the cloze test. All other passages are revised and then re-tested with the 10 English volunteers, and the version with the targeted preferred tense choice matching the preferred tense choice made by the 10 English volunteers is used as the final version of a passage in the cloze test. Below are four examples of passages in the cloze test. Detailed information about the 12 types of passages is provided in Table 2 in the following text, and all 72 passages of the 12 types are provided in Appendix B.

Examples:

(4) Mary cleaned her brother’s bedroom which smells like cigarettes. Mary _________ (to mop) the floor of her brother’s bedroom with a lot of detergent.

[Type 1: past – present – past (test item: activity verb)]

(5) Mary got lost in the small town and she became very nervous. A nice lady in the street _________ (to point) out the right direction to her.

[Type 12: past – past – past (test item: achievement verb)]

2 The 10 English volunteers agree with each other on the preferred tense choice for a test item the vast majority of the time.
(6) The teacher feels very angry at Tom who talked loudly on his cell phone in class. Tome often \underline{_________} (to bother) other people in class.

[Type 7: present – past – present with a frequency adverb (test item: activity verb)]

(7) The boss feels very happy with John who, by himself, did three men’s jobs. The boss \underline{_________} (to raise) John’s salary \textit{last week}.

[Type 8: present – past – past with a past-time temporal adverbial (test item: achievement verb)]

In order to disguise the purpose of the test, the 72 passages in the cloze test are randomized so that examples of the same passage type do not appear consecutively. There are no fillers.
Table 2
12 Types of the 72 passages in the Cloze Test

<table>
<thead>
<tr>
<th>Passage</th>
<th>The 1\textsuperscript{st} Part of a Passage</th>
<th>The 2\textsuperscript{nd} Part of a Passage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types</td>
<td>The tense used in the 1\textsuperscript{st} simple sentence or the matrix clause</td>
<td>The tense used in the 2\textsuperscript{nd} simple sentence or the embedded clause</td>
</tr>
<tr>
<td>1</td>
<td>past</td>
<td>present</td>
</tr>
<tr>
<td>2</td>
<td>past</td>
<td>present</td>
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<tr>
<td>3</td>
<td>past</td>
<td>present</td>
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<td>4</td>
<td>past</td>
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<td>5</td>
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<td>8</td>
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<td>12</td>
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<td>past</td>
</tr>
</tbody>
</table>
3.2.3 Procedures

In order to avoid any vocabulary effects and comprehension difficulties caused by social or cultural issues appearing in the passages of the cloze test, the researcher checked everything with the ten English volunteers before the data collection in order to confirm that the judgments were consistent and there was no unexpected weirdness in the passages.

For the two experimental groups, all the Chinese participants are asked to read and fill out the consent form first. They have the option to choose between the English version and the Chinese version of the consent form. Next, they are asked to fill out a form that asks for name, gender, current or highest education level, field of study, and contact information. Third, they are given the English proficiency test, and then the cloze test. All the participants do the first section of the cloze test before the second section. A questionnaire about their English language learning experience is given to the participants at the end of the data collection.

The English control group is given the same set of the tests using the same procedures, except that the participants in the English control group do not take the English proficiency test and do not do the questionnaire about their English learning experience.

3.2.4 Scoring

In the cloze test, the targeted tense choice for each test item was determined based on the preferred tense choice of the 10 English volunteers who were consulted during the development of the test. Throughout this dissertation, the preferred tense choice of the 10 volunteers is also referred to as the “targeted tense choice” or “predicted tense choice.” For each experiment, the responses from the two Chinese experimental groups and from the English control group are compared with the targeted tense choice. Each response is given a score of 1 or 0. A score of 1 is
given to a response which matches the 10 English volunteers’ preferred tense choice (i.e. the targeted tense choice), and a score of 0 is given to a response which does not match.

Incorrectly regularized past tense forms such as *thinksed*, if any, are coded as past forms. Verbs in present tense with spelling mistakes such as *moppes*, if any, are coded as present forms. Verbs in future tense, such as *will visit* and *is going to visit*, if any, are coded as non-past forms, and are given the score of 1 when the targeted tense choice for the test item is the present tense. Verbs in the present perfect form such as *has waited*, and verbs with the optative verb *should*, such as *should go*, if any, are coded as non-applicable, and are not included in the analysis. For each passage type, the sum of each participant’s responses scoring 1 is calculated. Analysis of Variance (ANOVA) tests are performed to test the research hypotheses. These results are presented in Chapter 5 and discussed in Chapter 6.
4.1 Research questions

The general question the present study intends to address is how the mismatch between the grammatical encoding of temporality in English and Chinese affects Mandarin Chinese-speaking ESL learners’ expression of temporality in their English interlanguage. In particular, this study intends to investigate the functional roles of pragmatic devices and lexical devices, as well as the influence of the inherent lexical aspeclual properties of verbs (i.e. verbal situation types) on Chinese speakers’ encoding of temporality in their target language English.

The following are the research questions that guide the present investigation:

(1) Does recency affect Mandarin Chinese-speaking ESL learners’ choice of tense morphology? In other words, does the Chinese speakers’ habit of relying on previous context to indicate temporality in their native language lead them to depend on the tense in the closest context to decide which tense to use in the following text?

(2) Does the number of occurrences of a tense in the previous context affect Mandarin Chinese-speaking ESL learners’ choice of tense in the following text? In other words, if a tense (e.g. present tense) appears more often than another tense (e.g. past tense) in the previous context, then in the following text do Mandarin Chinese-speaking ESL learners tend to use the tense that appears more often?

(3) Are past-time temporal adverbials (e.g. last Christmas) tense reminders to Mandarin Chinese-speaking ESL learners? If they are, how strong is the tense reminding effect?
(4) Does the appearance of a frequency adverb (e.g. *often*) in a sentence lead to a higher usage rate of present tense in learners’ response?

(5) Does the inherent lexical aspectual properties of verbs (i.e., verbal situation types) influence Mandarin Chinese-speaking ESL learners’ use of verbal morphology in their encoding of temporality in their target language English? In other words, are their responses to activity verbs and to achievement verbs different from each other?

4.2 Research hypotheses

4.2.1 Research hypothesis 1

A recency effect is hypothesized to affect Mandarin Chinese-speaking ESL learners’ tense usage in their L2 production. A recency effect is a pragmatic issue, based on the fact that Chinese speakers have a habit of relying on the previous context to indicate temporality in their native language. In passages where English native speakers’ preferred tense choice for a test item is the same as the tense used in the immediate preceding context, there is a possible recency effect. This would be reflected in the tendency of Chinese learners of English to mark a test item with the same tense used in the immediately preceding context. In contrast, a recency effect is not possible in a passage where English native speakers’ preferred tense choice for a test item is not the same as the tense used in the immediate preceding context.

In the cloze test, passage Types 1, 5, 9 and 11 test for a recency effect, but passage Types 2, 6, 10, and 12 do not. Below are two examples. The targeted tense choice for a test item is provided in the blank, and the expected answer from Mandarin Chinese-speaking ESL learners is provided under each passage. All examples of the passages in the cloze test will appear in this format hereafter.
Examples:

(8) Mary had an appointment with Dr. Smith whom her health insurance plan covers as an in-network doctor. Mary visited (to visit) Dr. Smith because of her ear infection.

Expected answer from Chinese participants: visits [Type 1]

(9) Peter recommended his Russian tutor to his grandma who wants to learn Russian. Peter’s Russian tutor speaks (to speak) pure, fluent Russian.

Expected answer from Chinese participants: speaks [Type 2]

The passage type of example (8) is Type 1: past – present – past. The targeted tense choice for the test item visit is the past tense, but the tense used in the previous adjacent clause whom her health insurance plan covers as an in-network doctor is the present tense. To the degree that Chinese participants incorrectly answer with present tense speaks, a recency effect is affirmed.

The passage type of example (9) is Type 2: past – present – present. The targeted tense choice for the test item speak is the present tense, and the tense used in the previous adjacent clause who wants to learn Russian is also the present tense. Since the expected preferred answer and its preceding verb are both in the present tense, a recency effect cannot be affirmed from this kind of example.

In order to make the results of ANOVA tests obvious, passages that may illustrate the recency effect are combined together (i.e. Types 1, 5, 9 and 11) and named Type A, and passages that may not illustrate the recency effect are combined together (i.e. Types 2, 6, 10, and 12) and named Type B. That is,
Type A = Type 1 + Type 5 + Type 9 + Type 11

Type B = Type 2 + Type 6 + Type 10 + Type 12

Chart 1: Tense Usage in Passages of Type A

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Tense used in the matrix clause or the 1st simple sentence</th>
<th>Tense used in the embedded clause or the 2nd simple sentence</th>
<th>Targeted tense choice for a test item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>past</td>
<td>present</td>
<td>past</td>
</tr>
<tr>
<td>Type 5</td>
<td>present</td>
<td>past</td>
<td>present</td>
</tr>
<tr>
<td>Type 9</td>
<td>present</td>
<td>present</td>
<td>past</td>
</tr>
<tr>
<td>Type 11</td>
<td>past</td>
<td>past</td>
<td>present</td>
</tr>
</tbody>
</table>

Chart 2: Tense Usage in Passages of Type B

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Tense used in the matrix clause or the 1st simple sentence</th>
<th>Tense used in the embedded clause or the 2nd simple sentence</th>
<th>Targeted tense choice for a test item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 2</td>
<td>past</td>
<td>present</td>
<td>present</td>
</tr>
<tr>
<td>Type 6</td>
<td>present</td>
<td>past</td>
<td>past</td>
</tr>
<tr>
<td>Type 10</td>
<td>present</td>
<td>present</td>
<td>present</td>
</tr>
<tr>
<td>Type 12</td>
<td>past</td>
<td>past</td>
<td>past</td>
</tr>
</tbody>
</table>

Because of Chinese speakers’ habit of relying on previous context to indicate temporality in their native language, the Chinese-speaking ESL learners in the present study are hypothesized to be affected by a recency effect in their L2 production. If so, in their responses to passages in the cloze test, their usage rate of the targeted tense choice should be lower in Type A and higher
in Type B. In Type A, recency will lead the Chinese speakers to make errors. In Type B, it will reinforce the correct response. In other words, recency matters if learners tend to use the same tense used in the immediately preceding context when determining the test response. This effect is also hypothesized to have a stronger influence on lower level learners than on higher level learners.

To illustrate, if recency matters then the Mandarin Chinese-speaking ESL learners should present a high usage rate of the present tense in both examples (8) and (9). In these examples, the verbs appearing immediately before the test items are in the present tense: covers and wants respectively. However, the targeted tense choices for the test items are the past tense and the present tense respectively: visited in (8) and speaks in (9). If recency matters, it is predicted that Mandarin Chinese-speaking ESL learners as a whole should have a high production rate of the present tense form in both (8) and (9), incorrectly in (8) and correctly in (9). Also, the production rate of the present tense form visits in (8), which is the non-preferred tense form used by English native speakers, should be higher in the lower level Chinese ESL learners’ responses than in the higher level learners’ responses.

4.2.2 Research hypothesis 2

The number of occurrences of a tense in the previous context is hypothesized to affect a Mandarin Chinese-speaking ESL learner’s tense choice for a test item in the following text. These learners are hypothesized to mark a test item with the tense duplicated from the previous context. Test items are therefore grouped according to whether the tenses of verbs in the passage context are the same or different.
In passages of Type 1, the tenses used before a test item are one past tense and one present tense. In passages of Type 5, the tenses used before a test item are one present tense and one past tense. In other words, in both Type 1 and Type 5 the present tense and the past tense have an equal number of occurrences (i.e. one time each) in the context before a test item. Passages of Type 1 and Type 5 are therefore combined together and named Type C.

In passages of Type 9, however, the present tense appears two times and the past tense appears zero times before a test item. In passages of Type 11, the past tense appears two times and the present tense appears zero times before a test item. In other words, in both Type 9 and Type 11, one tense occurs more often than another tense in the context prior to a test item. Passage of Types 9 and Type 11 are therefore combined together, and named Type D. That is,

Type C = Type 1 + Type 5
Type D = Type 9 + Type 11

Chart 3: Tense Usage in Passages of Type C

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Tense used in the matrix clause or the 1st simple sentence</th>
<th>Tense used in the embedded clause or the 2nd simple sentence</th>
<th>Targeted tense choice for a test item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>past</td>
<td>present</td>
<td>past</td>
</tr>
<tr>
<td>Type 5</td>
<td>present</td>
<td>past</td>
<td>present</td>
</tr>
</tbody>
</table>
Chart 4: Tense Usage in Passages of Type D

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Tense used in the matrix clause or the 1st simple sentence</th>
<th>Tense used in the embedded clause or the 2nd simple sentence</th>
<th>Targeted tense choice for a test item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 9</td>
<td>present</td>
<td>present</td>
<td>past</td>
</tr>
<tr>
<td>Type 11</td>
<td>past</td>
<td>past</td>
<td>present</td>
</tr>
</tbody>
</table>

Despite the fact that passages of Type C (i.e. Type 1 plus Type 5) are different from passage of Type D (i.e. Type 9 plus Type 11) in terms of the number of occurrences of a certain tense in the context prior to a test item, the targeted tense choices for the test items are the same: the past tense for Type 1 and Type 9, and the present tense for Type 5 and Type 11. In addition, the tenses used in the 2nd part of each passage of Type 1 and Type 9 are the same: both use the present tense. Likewise, the tenses used in the 2nd part of each passage of Type 5 and Type 11 are also the same: both use the past tense. What is more, matrix agreement appears in Type C, but not in Type D. In the present study, matrix agreement is considered to exist when the tense of the first verb in a passage (i.e. the matrix verb or the verb of the first simple sentence) is the same as the targeted tense choice for the test item (i.e. the third verb in a passage). Participants’ responses for passages of Type C and for Type D are therefore compared with each other.

Passages of Type 2 and Type 6 are also combined together, and named Type E. As in Type C, two different tenses (i.e. one present tense and one past tense) are used in the context prior to a test item in Type E. Likewise, passages of Type 10 and Type 12 are combined together, and named Type F. In Type F, the same tense appears two times in the context prior to a test item.

In Type E (i.e. Type 6 plus Type 2) and Type F (i.e. Type 12 plus Type 10), the targeted tense choices are the same: the past tense for Type 6 and Type 12, and the present tense for Type
2 and Type 10. In addition, the tenses used in the 2nd part of each passage of Type 6 and Type 12 are the same: both use the past tense. Likewise, the tenses used in the 2nd part of each passage of Type 2 and Type 10 are also the same: both use the present tense. Also, matrix agreement exists in Type F, but not in Type E. Participants’ responses for passages of Type E and Type F are therefore compared with each other. That is,

Type E = Type 2 + Type 6
Type F = Type 10 + Type 12

Chart 5: Tense Usage in Passages of Type E

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Tense used in the matrix clause or the 1st simple sentence</th>
<th>Tense used in the embedded clause or the 2nd simple sentence</th>
<th>Targeted tense choice for a test item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 6</td>
<td>present</td>
<td>past</td>
<td>past</td>
</tr>
<tr>
<td>Type 2</td>
<td>past</td>
<td>present</td>
<td>present</td>
</tr>
</tbody>
</table>

Chart 6: Tense Usage in Passages of Type F

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Tense used in the matrix clause or the 1st simple sentence</th>
<th>Tense used in the embedded clause or the 2nd simple sentence</th>
<th>Targeted tense choice for a test item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 12</td>
<td>past</td>
<td>past</td>
<td>past</td>
</tr>
<tr>
<td>Type 10</td>
<td>present</td>
<td>present</td>
<td>present</td>
</tr>
</tbody>
</table>

In the present study, the number of occurrences of a tense in the previous context is hypothesized to affect Mandarin Chinese-speaking ESL learners’ tense choice in the following text. These learners are predicted to have a tendency to mark a test item simply by duplicating
the tense in the previous context. If this is true, the usage rate of the targeted tense choices should
be lower in Type D (where one tense is strongly predicted) than in Type C (where the context
contains both past and present), but higher in Type F (where all three verbs are marked with the
same tense) than in Type E (where the context contains both past and present, although a recency
effect might also be present). In other words, learners should have more trouble with passages
where the targeted tense choice for a test item is different from the duplicated tense in the
previous context (Type D), but less trouble with passages where the targeted tense choice for a
test item is the same as the duplicated tense used in the previous context (Type F). These
tendencies are hypothesized to be stronger in the lower level Mandarin Chinese-speaking ESL
learners’ responses than in the higher level learners’ responses.

For instance, in the following two examples, Example (10) is of Type C, and Example
(11) is of Type D. In each of these two passages, the targeted tense choice for a test item is the
present tense: *speaks* in (10) and *runs* in (11). However, in the context prior to the test item, the
past tense is used two times in (11), but only once in (10). If the number of occurrences of a
tense in the previous context affects Mandarin Chinese-speaking ESL learners’ tense choice in
the following text, and learners tend to mark a test item with the tense duplicated in the previous
context, then learners should have a lower usage rate of the targeted tense choice, i.e. the present
tense, in Example (11). That is, they should have more difficulty with examples like (11) in
comparison to examples like (10).

Examples:

(10) Peter knows the owner of this restaurant who hired waiters with different language
backgrounds. Every waiter in this restaurant *speaks* (to speak) at least two languages. [Type C]
Expected answer from Chinese-speaking ESL learners: speaks / spoke

(11) Paul trained a lot for the marathon in which he participated. Paul runs (to run) for good health. [Type D]

Expected answer from Chinese-speaking ESL learners: ran

Likewise, in example (12) of Type E and example (13) of Type F, the targeted tense choice for the test item in each passage is the past tense: solved in (12) and pointed in (13). However, in the context prior to the test item, the past tense is used two times in (13), but only once in (12). If the number of occurrences of a tense in the previous context matters, and learners tend to mark a test item with the tense duplicated in the previous context, then learners should have a higher usage rate of the targeted tense choice, i.e. the past tense, in examples such as (13) when compared to examples such as (12).

Examples:

(12) Sam has a very good impression of Peter who worked in Sam’s company. Peter solved (to solve) many problems in Sam’s company quickly and effectively. [Type E]

Expected answer from Chinese-speaking ESL learners: solves/solved

(13) Mary got lost in the small town and she became very nervous. A nice lady in the street pointed (to point) out the right direction to her. [Type F]

Expected answer from Chinese-speaking ESL learners: pointed
In addition, in both of the above pairs of examples, learners at the lower English proficiency level are expected to have a lower usage rate of the targeted tense choices in their responses than learners at the higher level.

4.2.3 Research hypothesis 3

Past-time temporal adverbials are hypothesized to be tense reminders for Mandarin Chinese-speaking ESL learners.

In the present study, passages of Type 1 and passages of Type 4 are compared with each other. In both types, in the first part of a passage, the first verb is in the past tense and the second verb is in the present tense. The targeted tense choice for all test items is the past tense. In addition, matrix agreement exists in both Type 1 and Type 4. The only difference between passages of these two types is that a past-time temporal adverbial appears with the test items in Type 4. Type 1 test items do not have a temporal adverbial. See Chart 7 for details.

Passages of Type 6 and passages of Type 8 are also compared with each other. In the first part of a passage, the first verb is in the present tense and the second verb is in the past tense. Again, the targeted tense choice for all test items is the past tense. However, matrix agreement does not exist in either Type 6 or Type 8. The only difference between passages of these two types is that a past-time temporal adverbial appears with the test item in Type 8. Type 6 test items do not have a temporal adverbial. See Chart 8 for details.

Past-time temporal adverbials are hypothesized to be tense reminders for Mandarin Chinese-speaking ESL learners. If so, learners should have less difficulty with the examples of Type 4 when compared with the examples of Type 1. Likewise, the examples of Type 8 should be easier than the examples of Type 6. To put it another way, past-time temporal adverbials are
tense reminders if the absence of a past-time temporal adverbial versus the presence of a past-time temporal adverbial results in more difficulty in the past. This reminding effect is also hypothesized to be stronger for learners at the lower English proficiency level than to those at the higher level.

Chart 7: Tense Usage in Passages of Type 1 and Type 4

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Condition Type</th>
<th>Tense used in the matrix clause or the 1st simple sentence</th>
<th>Tense used in the embedded clause or the 2nd simple sentence</th>
<th>Targeted tense choice for a test item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>without a past-time temporal adverbial</td>
<td>past</td>
<td>present</td>
<td>past</td>
</tr>
<tr>
<td>Type 4</td>
<td>with a past-time temporal adverbial</td>
<td>past</td>
<td>present</td>
<td>past</td>
</tr>
</tbody>
</table>

Chart 8: Tense Usage in Passages of Type 6 and Type 8

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Condition Type</th>
<th>Tense used in the matrix clause or the 1st simple sentence</th>
<th>Tense used in the embedded clause or the 2nd simple sentence</th>
<th>Targeted tense choice for a test item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 6</td>
<td>without a past-time temporal adverbial</td>
<td>present</td>
<td>past</td>
<td>past</td>
</tr>
<tr>
<td>Type 8</td>
<td>with a past-time temporal adverbial</td>
<td>present</td>
<td>past</td>
<td>past</td>
</tr>
</tbody>
</table>

To illustrate, compare Example (14) with Example (15), and also compare Example (16) with Example (17). Examples (14) and (16) are of Type 1 and Type 6 respectively, in which no
past-time temporal adverbial appears with the test item. Examples (15) and (17) are of Type 4 and Type 8 respectively, in which a past-time temporal adverbial appears with the test item. In all the four examples, a past tense form is the targeted tense choice. They are *mopped, wiped, waited* and *walked / was walking* respectively. In examples (15) and (17), *last night* and *before the accident* are past-time temporal adverbials. If past-time temporal adverbials have a tense reminding effect, then Mandarin Chinese-speaking ESL learners as a whole should have less difficulty with (15) than with (14), and also with (17) than with (16).

Examples:

(14) Mary cleaned her brother’s bedroom which smells like cigarettes. Mary *mopped* (to mop) the floor of her brother’s bedroom with a lot of detergent. [Type 1]

Expected answer from Chinese-speaking ESL learners: mops/mopped

(15) John moved into his new apartment which has a shiny wood floor. John *wiped* (to wipe) the floor with a new mop last night. [Type 4]

Expected answer from Chinese-speaking ESL learners: wiped

(16) Mary loves this singer who became famous in the 1990’s. She *waited* (to wait) for five hours outside of his hotel for his signature. [Type 6]

Expected answer from Chinese-speaking ESL learners: waits/waited

(17) Sam describes to me the car accident which injured an old man. The old man *walked/was walking* (to walk) across the street before the accident. [Type 8]
Expected answer from Chinese-speaking ESL learners: walked/was walking

4.2.4 Research hypothesis 4

The appearance of a frequency adverb (e.g. *often*) in a sentence is hypothesized to lead to an increased usage rate of the present tense in Mandarin Chinese-speaking ESL learners’ English interlanguage.

Passages of Type 1 and Type 3 are compared with each other. In both types, the targeted tense choice for a test item is the past tense, and the two tenses used in the previous context are the past tense and the present tense, and in this order. The only difference between these two types is that a frequency adverb appears with the test items in Type 3, but not in Type 1. See Chart 9 for details.

Passages of Type 5 and Type 7 are also compared with each other. In both types, the targeted tense choice for a test item is the present tense, and the two tenses used in the previous context are the present tense and the past tense, and in this order. Again, the only difference between these two types is that a frequency adverb appears with the test items in Type 7, but not in Type 5. See Chart 10 for details.

Chart 9: Tense Usage in Passages of Type 1 and Type 3

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Condition Type</th>
<th>Tense used in the matrix clause or the 1st simple sentence</th>
<th>Tense used in the embedded clause or the 2nd simple sentence</th>
<th>Targeted tense choice for a test item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>without a frequency adverb</td>
<td>past</td>
<td>present</td>
<td>past</td>
</tr>
<tr>
<td>Type 3</td>
<td>with a frequency adverb</td>
<td>past</td>
<td>present</td>
<td>past</td>
</tr>
</tbody>
</table>
If the appearance of a frequency adverb leads to a higher usage rate of the present tense in the learners’ responses, then learners should have more difficulty with examples of Type 3 when compared to examples of Type 1, and but less difficulty with examples of Type 7 than with examples of Type 5. In other words, the appearance of a frequency adverb versus the lack of a frequency adverb should result in more difficulty in the past but less difficulty in the present. In the following examples, if the hypothesis holds, learners should have more difficulty with Example (19) than with Example (18). Likewise for Example (20) (more difficult) and Example (21) (less difficult).

Examples:

(18) Peter called Mary who lives alone in her dormitory on campus. On the phone, Peter reminded (to remind) Mary to send her mother a gift for Mother’s Day. [Type 1]
Expected answer from Chinese-speaking ESL learners: reminds/reminded

(19) The man gave a speech which contains long, boring explanations for simple questions. Helen often interrupted (to interrupt) the man with harsh questions. [Type 3]
Expected answer from Chinese-speaking ESL learners: interrupts

(20) John shows a lot of appreciation to his mother who turned him into a strong healthy guy. John’s mother accepts (to accept) John’s appreciation with great pleasure. [Type 5]

Expected answer from Chinese-speaking ESL learners: accepts/accepted

(21) John carries his girlfriend who fell off the horse on his back. The horse often injures (to injure) inexperienced horse riders. [Type 7]

Expected answer from Chinese-speaking ESL learners: injures

4.2.5 Research hypothesis 5

Mandarin Chinese-speaking ESL learners are predicted to follow the Aspect Hypothesis. In other words, it is hypothesized that the inherent lexical aspectual properties of verbs (i.e. verbal situation types) influence Mandarin Chinese-speaking ESL learners’ use of verbal morphology in their encoding of temporality in the target language. Their responses to activity verbs and to achievement verbs are therefore predicted to be different from each other.

The first three passages of Types 5, 10, and 11 are combined together, and named Type G. The first three passages of Types 6, 9, and 12 are also combined together, and named Type H. In both Type G and Type H, the test items are activity verbs. However, the targeted tense choice for a test item is the present tense in Type G, but the past tense in Type H. Similarly, the last three passages of Types 5, 10, and 11 are combined together, and named Type I. The last three passage of Types 6, 9, and 12 are also combined together, and named Type J. In both Type I and Type J,
the test items are achievement verbs. However, the targeted tense choice for a test item is the present tense in Type I, but the past tense in Type J. See Charts 11, 12, 13, and 14 for details.

Type G = passages with activity verbs as test items in Type 5, Type 10, and Type 11
Type H = passages with activity verbs as test items in Types 6, Type 9, and Type 12
Type I = passages with achievement verbs as test items in Type 5, Type 10, and Type 11
Type J = passages with achievement verbs as test items in Types 6, Type 9, and Type 12

![Chart 11: Tense Usage in Passages of Type G](image)

![Chart 12: Tense Usage in Passages of Type H](image)
Chart 13: Tense Usage in Passages of Type I

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Aspectual properties of test items</th>
<th>Tense used in the matrix clause or the 1st simple sentence</th>
<th>Tense used in the embedded clause or the 2nd simple sentence</th>
<th>Targeted tense choice for a test item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 5</td>
<td>achievement</td>
<td>present</td>
<td>past</td>
<td>present</td>
</tr>
<tr>
<td>Type 10</td>
<td>achievement</td>
<td>present</td>
<td>present</td>
<td>present</td>
</tr>
<tr>
<td>Type 11</td>
<td>achievement</td>
<td>past</td>
<td>past</td>
<td>present</td>
</tr>
</tbody>
</table>

Chart 14: Tense Usage in Passages of Type J

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Aspectual properties of test items</th>
<th>Tense used in the matrix clause or the 1st simple sentence</th>
<th>Tense used in the embedded clause or the 2nd simple sentence</th>
<th>Targeted tense choice for a test item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 6</td>
<td>achievement</td>
<td>present</td>
<td>past</td>
<td>past</td>
</tr>
<tr>
<td>Type 9</td>
<td>achievement</td>
<td>present</td>
<td>present</td>
<td>past</td>
</tr>
<tr>
<td>Type 12</td>
<td>achievement</td>
<td>past</td>
<td>past</td>
<td>past</td>
</tr>
</tbody>
</table>

If the inherent lexical aspectual properties of verbs (i.e. verbal situation types) influence the second language learners’ use of verbal morphology in the way that is predicted by the Aspect Hypothesis, learners should have a high usage rate of the present tense in both Type G and Type H, a high usage rate of the past tense in both Type I and Type J, but a higher usage rate of the present tense in Type G than in Type I, and a higher usage rate of the past tense in Type J than in Type H. In other words, the Aspect Hypothesis is corroborated if (i) learners tend to use the present tense to mark activity verbs, and the past tense to mark achievement verbs, and (ii) learners have a higher usage rate of the present tense to mark activity verbs than achievement verbs, and a higher usage rate of the past tense to mark achievement verbs than activity verbs.
To illustrate, examples (22), (23), (24), and (25) are of Types G, H, I, and J respectively. In both examples (22) and (23), an activity verb is a test item: *work* and *decorate* respectively. In both examples (24) and (25), an achievement verb is a test item: *charge* and *destroy* respectively. If the Aspect Hypothesis holds, and learners initially restrict past or perfective marking to achievement and accomplishment verbs and later gradually extend this usage to activity and stative verbs, then in the present study the learners’ usage rate of the past tense should be high with the two achievement verbs in examples (24) and (25), but low with the two activity verbs in examples (22) and (23). In other words, their usage rate of the non-past tense (i.e. the present tense) should be high with the two activity verbs in examples (22) and (23).

Additionally, because the targeted tense choices for the activity verb *work* in example (22) and for the achievement verb *charge* in example (24) are both the present tense, if the Aspect Hypothesis holds, the Mandarin Chinese-speaking ESL learners in the present study should show a higher usage rate of the present tense with the activity verb *work* in example (22) than with the achievement verb *charge* in example (24). Likewise, because the targeted tense choices for the activity verb *decorate* in example (23) and for the achievement verb *destroy* in example (25) are both the past tense, if the Aspect Hypothesis holds, the Mandarin Chinese-speaking ESL learners in the present study should show a higher usage rate of the past tense with the achievement verb *destroy* in example (25) than with the activity verb *decorate* in example (23).

Examples:

(22) The boss likes the new cashier who just left for the day. The cashier *works* (to work) part-time in the store. [Type G]

Expected answer from Chinese-speaking ESL learners: *works*
(23) Everybody knows Helen loved roses. Helen even decorated (to decorate) the garage with $200 worth of roses. [Type H]

Expected answer from Chinese-speaking ESL learners: decorates

(24) Mary has an appointment with Dr. Smith who cured her heart disease. Dr. Smith charges (to charge) lower price for patients without health insurance. [Type I]

Expected answer from Chinese-speaking ESL learners: charged

(25) Mary remembers the flooding which seriously affected her town. The flooding destroyed (to destroy) many places, including the playground near Mary’s house. [Type J]

Expected answer from Chinese-speaking ESL learners: destroyed
CHAPTER 5
RESULTS OF THE PRESENT STUDY

5.1 Influence of the recency effect

The recency effect of the previous context is hypothesized to influence Mandarin Chinese-speaking ESL learners’ tense choice in the following text. If this is true, learners should tend to use the same tense that is used in the immediately preceding sentence or clause to mark the test item in the following text. In other words, in order for a recency effect to be corroborated, Mandarin Chinese-speaking ESL learners as a whole would have to align the tense of a test item with the tense of the verb that immediately precedes it. In addition, this particular effect is expected to be stronger in the case of Chinese lower level ESL learners than in the case of Chinese higher level ESL learners.

In order to test for such an effect, responses for passages of Type A and Type B are compared and analyzed (i.e. Experiment 1). Type A is the combination of Types 1, 5, 9, and 11. To the degree that a recency effect exists, it will create difficulty for the correct interpretation of passages of Type A. That is, in passages of Type A, there is a mismatch between the targeted tense choice and the tense of the immediately preceding context verb. Type B is the combination of Types 2, 6, 10, and 12. In passages of Type B, the targeted tense choice is identical to the tense of the immediately preceding context verb. (See section 4.2.1 for details). If a recency effect influences learners’ tense choice, and Mandarin Chinese-speaking ESL learners tend to align the tense of a test item with the tense that immediately precedes it, then the usage rate of the targeted tense choice should be lower in Type A in comparison to Type B.
Table 3 below summarizes the three proficiency groups’ usage rate of the targeted tense choice in Type A and Type B.

Table 3: Usage Rate of the Targeted Tense Choices in the Three Proficiency Groups’ Responses in Type A and Type B

(Results from Experiment 1)

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Condition Type</th>
<th>Usage Rate of the Targeted Tense Choices</th>
<th>Chinese High Group</th>
<th>Chinese Low Group</th>
<th>English Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A</td>
<td>no recency effect possible</td>
<td>Mean Number</td>
<td>21.4</td>
<td>17.6</td>
<td>20.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
<td>1.7146</td>
<td>4.2474</td>
<td>2.6810</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>89.17%</td>
<td>73.33%</td>
<td>86.46%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
<td>0.0714</td>
<td>0.1770</td>
<td>0.1117</td>
</tr>
<tr>
<td>Type B</td>
<td>recency effect possible</td>
<td>Mean Number</td>
<td>20.35</td>
<td>16.75</td>
<td>21.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
<td>2.4140</td>
<td>2.7726</td>
<td>2.0069</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>84.79%</td>
<td>69.79%</td>
<td>88.13%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
<td>0.1006</td>
<td>0.1155</td>
<td>0.0836</td>
</tr>
</tbody>
</table>

As we can see in Table 3, in response to both Type A and Type B passages, the Chinese Low group consistently scores lower than the Chinese High group and the English control group. The Chinese High group, on the other hand, always scores similarly to the English control group in response to both passage types. Importantly, despite the proficiency difference, the usage rate of the targeted tense choices in all cases presented by all three test groups is always above a
mean of 69%, which is well above chance (i.e. 50%). In addition, within each of the three proficiency groups, the usage rates of the targeted tense choices in Type A and Type B passages always differ minimally. In other words, despite the proficiency difference, all test groups treat the two types identically.

In order to determine whether the difference between participants’ responses to passages with and without tense agreement between the context and response verbs is statistically significant, a two-way Analysis of Variance (ANOVA) test is conducted to examine the effect of proficiency and passage type. The results indicate that the main effect of proficiency is significant, F (2, 114) = 23.232, p = .000. The results from a Bonferroni Post Hoc Test on proficiency further indicate that there is a significant proficiency difference between the English control group and the Chinese Low group (p = .000), as well as between the Chinese High group and the Chinese Low group (p = .000). However, there is no significant proficiency difference between the English control group and the Chinese High group (p = 1.000). That is, with respect to English proficiency, the Chinese Low group shows a significant difference from the other two groups.

The effect of passage type, however, is not significant according to the results from the ANOVA test, F (1, 114) = .935, p = .336. That is, despite the significant English proficiency difference, Mandarin Chinese-speaking ESL learners in the two experimental groups as well as English native speakers in the control group do not treat passages of Type A and passages of Type B as two different passage types. This means that despite the difference between the two passage types, and the potential for a difference related to the tense agreement or lack of agreement between the context and response verbs, there is no evidence of a recency effect.
Furthermore, the results from the ANOVA test show that there is no statistically significant interaction between the effects of passage type and proficiency, $F (2, 114) = .770, p = .465$. That is, the absence of a recency effect on participants’ tense choice is the same for all the three proficiency groups.

In summary, the test results of Experiment 1 reveal that, despite the lack of tense in Chinese language and despite Chinese speakers’ habit of relying on previous context to indicate temporality in their native language, the two Chinese experimental groups in the present study are similar to the English control group in that they are not sensitive to the potential for a recency effect. That is, the tense of the immediately preceding context verb has no influence on the tense of the response verb. The only difference between the two Chinese experimental groups is their English proficiency. In response to both Type A passages and Type B passages, the Chinese Low group has a consistently lower usage rate of the targeted tense choices than the English control group, while the responses from the Chinese High group are not statistically different from the English control group.

5.2 The influence of the number of occurrences of a tense in the previous context

The number of occurrences of a tense in the previous context is hypothesized to affect learners’ tense choice in the following text. If this is true, then in passages where a tense (e.g. present tense) appears more often than another tense (e.g. past tense) in the previous context, Mandarin Chinese-speaking ESL learners should tend to choose the tense (i.e. the duplicated tense in the previous context) to mark the test item in the following text.

To test for such an effect, passages of Type C and Type D are compared with each other (i.e. Experiment 2). Type C is the combination of Type 1 and Type 5, and Type D is the
combination of Type 9 and Type 11. Passages of Type D have tense duplication in the previous context, but passages of Type C do not. See section 4.2.2 for details. In each of the passages of Type C, the targeted tense choice is the same as the duplicated tense in the previous context, and the targeted tense choices for Type C (i.e. Type 1 plus Type 5) and for Type D (i.e. Type 9 plus Type 11) are the same. That is, in Type 1 and Type 9 the targeted tense choice is the past tense, while in Type 5 and Type 11 the targeted tense choice is the present tense. If the number of occurrences of a tense in the previous context matters, and learners tend to mark a test item with the duplicated tense from the previous context, then the usage rate of the targeted tense choices in learners’ responses should be higher in Type C than in Type D.

Table 4 below summarizes the three proficiency groups’ usage rates of the targeted tense choices in passages of Type C and Type D.

Table 4 shows that in both Type C and Type D, the Chinese Low group consistently achieves scores that are much lower than the Chinese High group and the English control group, while the Chinese High group always achieves scores similar to the English control group. In terms of the difference between participants’ responses to Type C and to Type D, each of the three proficiency groups presents a lower usage rate of the targeted tense choices in Type D than in Type C.

In order to determine whether the difference between the participants’ responses to passages with and without tense duplication in the previous context is statistically significant, a two-way Analysis of Variance (ANOVA) test is conducted to examine the effect of proficiency and passage type. The test result indicates that the main effect of proficiency is significant, \( F (2, 114) = 11.707, p = .000 \). That is, there is significant proficiency difference among the three participating groups. The results from a Bonferroni Post Hoc Test on proficiency further reveal
that, in response to the existence or absence of tense duplication in the previous context, there is a significant English proficiency difference between the English control group and the Chinese Low group \((p = .001)\), as well as between the Chinese High group and the Chinese Low group \((p = .000)\). However, there is no significant difference between the English control group and the Chinese High group \((p = 1.000)\). That is, with respect to English proficiency, the Chinese Low group shows a significant difference from the other two groups.

Table 4: Usage Rate of the Targeted Tense Choices in the Three Proficiency Groups’ Responses in Type C and Type D

(Results from Experiment 2)

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Condition Type</th>
<th>Usage Rate of the Targeted Tense Choices</th>
<th>Chinese High Group</th>
<th>Chinese Low Group</th>
<th>English Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type C</td>
<td>without tense duplication</td>
<td>Mean Number</td>
<td>11.25</td>
<td>10</td>
<td>11.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
<td>0.6982</td>
<td>1.8166</td>
<td>1.0536</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>93.75%</td>
<td>83.33%</td>
<td>94.17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
<td>0.0582</td>
<td>0.1514</td>
<td>0.0878</td>
</tr>
<tr>
<td>Type D</td>
<td>with tense duplication</td>
<td>Mean Number</td>
<td>10.15</td>
<td>7.6</td>
<td>9.45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
<td>1.2757</td>
<td>3.0397</td>
<td>2.0851</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>84.58%</td>
<td>63.33%</td>
<td>78.75%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
<td>0.1063</td>
<td>0.2533</td>
<td>0.1738</td>
</tr>
</tbody>
</table>
The results from the ANOVA test also show that the effect of passage type is significant, F (1, 114) = 27.039, p = .000. Learners in the Chinese High group and Chinese Low group as well as English native speakers in the control group all treat passages with and without tense duplication in the previous context as two different types of passages. In other words, for all three proficiency groups, the number of occurrences of a tense in the previous context affects participants’ tense choice for a test item in the following text.\(^3\)

The ANOVA test also indicates that there is no statistically significant interaction between the effect of passage type and proficiency, F (2, 114) = 1.207, p = .303. This means that, with respect to tense choice, the three proficiency groups are equally influenced by the effect of tense duplication in the previous context.

In the present study, there are also passages where the targeted tense choice for a test item is the same as the duplicated tense in the previous context. These are the passages of Type 10 and Type 12. Passages of these two types are hereby combined together, and named Type F. Likewise, passages of Type 2 and Type 6 are also combined together, and named Type E. Passages of Type E do not have tense duplication in the previous context. The targeted tense choices for Type E and Type F, however, are the same. That is, in Type 6 and Type 12 the targeted tense choice is the past tense, while in Type 2 and Type 10 the targeted tense choice is the present tense. See section 4.2.2 for details. In order to test the effect of tense duplication in the previous context, passages of Type E and Type F are compared with each other (i.e. Experiment 3). If the number of occurrences of a tense in the previous context matters, and

\(^3\) In response to Type D, the English control group only shows 78.75% usage rate of the targeted tense choice. This low usage rate may be caused because the targeted tense choice for a test item is the 10 English volunteers’ preferred tense choice, not the grammatically correct tense choice. Refer back to section 3.2.4 for details of how the targeted tense choice was determined.
learners tend to mark a test item with the duplicated tense in the previous context, then the usage rate of the targeted tense choices should be higher in Type F than in Type E.

Table 5 below summarizes the three proficiency groups’ usage rate of the targeted tense choices in Type E and Type F.

Table 5: Usage Rate of the Targeted Tense Choices in the Three Proficiency Groups’ Responses in Type E and Type F (Results from Experiment 3)

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Condition Type</th>
<th>Usage Rate of the Targeted Tense Choices</th>
<th>Chinese High Group</th>
<th>Chinese Low Group</th>
<th>English Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type E</td>
<td>without tense duplication</td>
<td>Mean Number</td>
<td>8.95</td>
<td>6.9</td>
<td>9.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
<td>1.7457</td>
<td>2.0469</td>
<td>1.4967</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>74.58%</td>
<td>57.50%</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
<td>0.1455</td>
<td>0.1706</td>
<td>0.1247</td>
</tr>
<tr>
<td>Type F</td>
<td>with tense duplication</td>
<td>Mean Number</td>
<td>11.4</td>
<td>9.85</td>
<td>11.55</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
<td>1.0198</td>
<td>1.6210</td>
<td>0.6690</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>95%</td>
<td>82.08%</td>
<td>96.25%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
<td>0.0850</td>
<td>0.1351</td>
<td>0.0557</td>
</tr>
</tbody>
</table>

As can be seen, in response to each of the two passage types, the Chinese High group and the English control group achieve a similar high usage rate of the targeted tense choices, but the Chinese Low group achieves much lower scores. Table 5 also reveals that each of the three
proficiency groups achieves a much higher usage rate of the targeted tense choices in Type F than in Type E.

In order to determine whether the difference between participants’ responses to passages with and without tense duplication in the previous context is statistically significant, a two-way Analysis of Variance (ANOVA) test is conducted to examine the effect of proficiency and passage type. The test results indicate that the main effect of proficiency is significant, $F(2, 114) = 23.036, p = .000$. That is, there is a significant proficiency difference among the three test groups. The results from a Bonferroni Post Hoc Test on proficiency further reveal that there is a significant proficiency difference between the English control group and the Chinese Low group ($p = .000$), as well as between the Chinese High group and the Chinese Low group ($p = .000$), but there is no significant difference between the English control group and the Chinese High group ($p = .747$). Therefore, the Chinese Low group again shows lower English proficiency than the other two groups.

The results from the ANOVA test also indicate that the effect of passage type is significant, $F(1, 114) = 75.514, p = .000$. The learners in the Chinese High group and the Chinese Low group, as well as English native speakers in the control group all treat passages with and without tense duplication in the previous context as two different types of passages. In other words, the number of occurrences of a tense in the previous context affects participants’ tense choice for the test item in the following text.

Furthermore, the results of the ANOVA test indicate that there is no statistically significant interaction between the effects of passage type and proficiency, $F(2, 114) = 1.048, p = .354$. This means that, with respect to tense choice, the effect of the number of occurrences of a tense in the previous context has the same influence on the three proficiency groups.
To sum up, in order to test if the number of occurrences of a tense in the previous context affects Mandarin Chinese-speaking ESL learners’ tense choice in the following text, two experiments are conducted. In the first experiment (i.e. Experiment 2), the targeted tense choice is different from the duplicated tense in the previous context. In the second experiment (i.e. Experiment 3), the targeted tense choice is the same as the duplicated tense in the previous context. The results from the two experiments are consistent. Participants treat passages with and without tense duplication in the previous context as two different types of passages. No matter whether or not the targeted tense choice is the same as the duplicated tense in the previous context, participants always tend to use the tense that is duplicated in the previous context. This pattern is found not only in the Chinese-speaking ESL learners’ data, but also found in the English native speakers’ data.4

5.3 The tense reminding effect of past-time temporal adverbials

Experiments 4 and 5 are performed in order to test for the existence of the tense reminding effect of past-time temporal adverbials. In Experiment 4, participants’ responses to passages of Type 1 and Type 4 are compared. Matrix agreement exists in Types 1 and 4. In Experiment 5, participants’ responses to passages of Type 6 and Type 8 are compared. Matrix agreement is absent in Types 6 and 8.

In terms of tense usage, in each experiment the two passage types have exactly the same structure (i.e. past – present – past in Types 1 and 4, and present – past – past in Types 6 and 8). The past tense is the targeted tense choice in all four passage types. The only difference between

4 The tense duplication in the previous context may be considered a stronger version of Experiment 1, that is, the duplicated tense may result in a recency effect.
the two passage types in each experiment is that a past-time temporal adverbial appears together with a test item in one passage type, but not in the other. In particular, past-time adverbials appear in Types 4 and 8 but not in Types 1 and 6. See section 4.2.3 for details.

Based on the results of previous researchers, past-time temporal adverbials in the present study are hypothesized to be tense reminders. If this is true, then the absence of a past-time temporal adverbial versus the presence of a past-time temporal adverbial should result in more difficulty in the past. In Experiments 4 and 5, in order to test the hypothesis, the usage rate of the targeted tense choice, i.e. the past tense, in the participants’ responses is calculated. The hypothesis is confirmed if the past tense is used more frequently in Type 4 than in Type 1, and more frequently in Type 8 than in Type 6.

Table 6 below summarizes the three proficiency groups’ usage rate of the targeted tense choice, i.e. the past tense, in Type 1 and Type 4, where matrix agreement exists.

Table 6 reveals that, in response to passages of Type 4 which contain past-time temporal adverbials, Chinese-speaking ESL learners at both levels achieve scores similar to the English native speakers in the control group. Each of the three proficiency groups presents a higher than 94% usage rate of the targeted tense choice (i.e. the same as the 10 English volunteers’ preferred tense). In response to passages of Type 1, which do not contain past-time temporal adverbials, the mean percentages of the usage rate of the targeted tense choice from the three proficiency groups are still high, although they range from 80% to 98%.

In order to determine whether the difference between the participants’ responses to passages with and without a past-time temporal adverbial is statistically significant, a two-way Analysis of Variance (ANOVA) test is conducted to examine the effect of proficiency and
passage type. The test results indicate that the main effect of proficiency is significant, $F (2, 114) = 9.651, p = .000$. That is, there is significant proficiency difference among the three test groups.

Table 6: Usage Rate of the Targeted Tens Choice in the Three Proficiency Groups’ Responses in Type 1 and Type 4

(Results from Experiment 4)

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Condition Type</th>
<th>Targeted Tense Choice</th>
<th>Usage Rate of the Targeted Tense Choice</th>
<th>Chinese High Group</th>
<th>Chinese Low Group</th>
<th>English Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>without a past-time temporal adverbial with the matrix agreement</td>
<td>past tense</td>
<td>Mean Number</td>
<td>5.7</td>
<td>4.85</td>
<td>5.85</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.4583</td>
<td>1.4586</td>
<td>0.3571</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>95%</td>
<td>80.83%</td>
<td>97.50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.0764</td>
<td>0.2431</td>
<td>0.0595</td>
</tr>
<tr>
<td>Type 4</td>
<td>with a past-time temporal adverbial with the matrix agreement</td>
<td>past tense</td>
<td>Mean Number</td>
<td>5.95</td>
<td>5.65</td>
<td>5.95</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.2179</td>
<td>0.6538</td>
<td>0.2179</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>99.17%</td>
<td>94.17%</td>
<td>99.17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.0363</td>
<td>0.1090</td>
<td>0.0363</td>
</tr>
</tbody>
</table>

The ANOVA test also indicates that the effect of passage type is significant, $F (1, 114) = 8.411, p = .004$. Across the board, all three of the proficiency groups treat passages with and without a past-time temporal adverbial as different types of passages. The existence or absence of a past-time temporal adverbial in a passage is a factor affecting the participants’ responses. Moreover, the ANOVA test result regarding the interaction between proficiency and passage
type reveals that there is a marginal interaction between the two factors, $F(2, 114) = 2.592, p = .079$. That is, the tense reminding effect of past-time temporal adverbials works for certain groups but not for others. In order to determine which proficiency group(s) is/are affected by the existence or absence of a past-time temporal adverbial, a Bonferroni Post Hoc Test on proficiency is performed. The results indicate that there is a significant difference between the English control group and the Chinese Low group ($p = .000$), as well as between the Chinese High group and the Chinese Low group ($p = .002$). However, there is no significant difference between the English control group and the Chinese High group ($p = 1.000$). Therefore, the tense reminding effect of past-time temporal adverbials works for the Chinese Low group, but not for the English control group or the Chinese High group.

The second experiment, i.e. Experiment 5, which compares passages of Type 6 and Type 8 also tests the tense reminding effect of past-time temporal adverbials. Each passage of Type 8 contains a past-time temporal adverbial, but this is not the case in passages of Type 6. The matrix agreement is absent in both passage types.

Table 7 below summarizes the three proficiency groups’ usage rate of the targeted tense choice, i.e. the past tense, in Type 6 and Type 8.

As we can see, the English native speakers’ usage rates of the targeted tense choice, i.e. the past tense, in Type 6 and in Type 8 are both over a mean of 94%, and there is only a minor difference between the two mean percentages. Turning to the Chinese speakers, the Chinese High group and the Chinese Low group both present a higher mean percentage of the usage rate of the targeted tense choice, i.e. the past tense, in Type 8 (i.e. passages with a past-time temporal adverbial) than in Type 6 (i.e. passages without a past-time temporal adverbial). In addition, in response to each of the two passage types, there appears to be a proficiency difference, with the
highest score in the English control group, the lowest score in the Chinese Low group, and the middle score in the Chinese High group.

Table 7: Usage Rate of the Targeted Tense Choice in the Three Proficiency Groups’ Responses in Type 6 and Type 8
(Results from Experiment 5)

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Condition Type</th>
<th>Targeted Tense Choice</th>
<th>Usage Rate of the Targeted Tense Choice</th>
<th>Chinese High Group</th>
<th>Chinese Low Group</th>
<th>English Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 6</td>
<td>without a past-time temporal adverbial without the matrix agreement</td>
<td>past tense</td>
<td>Mean Number</td>
<td>4.70</td>
<td>4.05</td>
<td>5.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>1.0536</td>
<td>1.3219</td>
<td>0.5723</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>78.33%</td>
<td>67.50%</td>
<td>94.17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.1756</td>
<td>0.2203</td>
<td>0.0954</td>
</tr>
<tr>
<td>Type 8</td>
<td>with a past-time temporal adverbial without the matrix agreement</td>
<td>past tense</td>
<td>Mean Number</td>
<td>5.75</td>
<td>5.25</td>
<td>5.90</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.5362</td>
<td>1.1779</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>95.83%</td>
<td>87.50%</td>
<td>98.33%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.0893</td>
<td>0.1963</td>
<td>0.0500</td>
</tr>
</tbody>
</table>

In order to determine whether the difference between the participants’ responses to passages with and without a past-time temporal adverbial is statistically significant in this experiment, a two-way Analysis of Variance (ANOVA) test is conducted to examine the effect of proficiency and passage type. The test results indicate that the main effect of proficiency is significant, F (2, 114) = 14.576, p = .000. That is, there is a significant proficiency difference
between and among the three test groups. The effect of passage type is also significant, $F(1, 114) = 23.990, p = .000$. All three proficiency groups treat passages with and without a past-time temporal adverbial as different types of passages. The ANOVA test results also indicate that, in terms of the interaction between proficiency and passage type, there is a marginal interaction between the two factors, $F(2, 114) = 3.004, p = .054$. That is, the tense reminding effect of past-time temporal adverbials varies according to participants’ English proficiency. In order to determine which proficiency group(s) is/are affected by the tense reminding effect of past-time temporal adverbials, a Bonferroni Post Hoc Test on proficiency is performed. The results indicate that there is a significant difference between all three groups. That is, there is a significant difference between the English control group and the Chinese Low group ($p = .000$), between the Chinese High group and the Chinese Low group ($p = .020$), and between the English control group and the Chinese High group ($p = .028$). In other words, past-time temporal adverbials have a tense reminding effect for both the Chinese Low group and the Chinese High group, but not for the English control group in this experiment, where there is no matrix agreement.

To sum up, in order to test for the tense reminding effect of past-time temporal adverbials, two experiments are performed. In Experiment 4, matrix agreement exists in both passage types. In each passage, the tense of the first verb and the 10 English volunteers’ preferred tense (i.e. the same as the targeted tense) of the test item are both the past tense. In Experiment 5, matrix agreement is absent. In each passage, the first verb appears in the present tense, while the test item has the preferred tense choice of the past by the 10 English volunteers (i.e. the same as the targeted tense). The results of the ANOVA tests indicate that in both experiments, all three proficiency groups treat passages with and without a past-time temporal adverbial as two
different passage types. However, the tense reminding effect does not affect the English control group’s responses in either experiment; it affects the Chinese Low group’s responses in both experiments, and it affects the Chinese High group’s responses in Experiment 5 only.

5.4 The influence of frequency adverbs

Based on the results of previous studies, frequency adverbs are hypothesized to lead to a higher usage rate of the present tense in learners’ responses. If this is true, then the appearance of a frequency adverb versus the lack of a frequency adverb should result in more difficulty in the past and less difficulty in the present. Two experiments, i.e. Experiments 6 and 7, are conducted to test this hypothesis.

The first experiment, i.e. Experiment 6, compares passages of Type 1 and Type 3. In terms of tense usage, passages of these two types have exactly the same structure: past – present – past (test item). The targeted tense choice is the past tense for both types. The only difference between these two types is that the test item each of the passages of Type 3 includes a frequency adverb, while all of the passages of Type 1 do not. See section 4.2.4 for details.

Table 8 below summarizes the three proficiency groups’ usage rate of the targeted tense choice, i.e. the past tense, in Type 1 and Type 3.

Table 8 reveals that, in response to both passage types, the Chinese Low group always uses the targeted tense choice, i.e. the past tense, at a rate lower than the other two groups. The Chinese High group, on the other hand, uses the targeted tense choice, i.e. the past tense, similarly to the English control group. In addition, each of the three proficiency groups uses the targeted tense choice in Type 1 passages (i.e. passages without frequency adverbs) than in Type 3 passages (i.e. passages with frequency adverbs).
Table 8: Usage Rate of the Targeted Tense Choice in the Three Proficiency Groups’ Responses in Type 1 and Type 3

(Results from Experiment 6)

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Condition Type</th>
<th>Targeted Tense Choice</th>
<th>Usage Rate of the Targeted Tense Choice</th>
<th>Chinese High Group</th>
<th>Chinese Low Group</th>
<th>English Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>without a frequency adverb</td>
<td>past tense</td>
<td>Mean Number</td>
<td>5.70</td>
<td>4.85</td>
<td>5.85</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.4583</td>
<td>1.4586</td>
<td>0.3571</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>95%</td>
<td>80.83%</td>
<td>97.50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.0764</td>
<td>0.2431</td>
<td>0.0595</td>
</tr>
<tr>
<td>Type 3</td>
<td>with a frequency adverb</td>
<td>past tense</td>
<td>Mean Number</td>
<td>4.7</td>
<td>2.35</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>1.2689</td>
<td>1.6815</td>
<td>1.2610</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>78.33%</td>
<td>39.17%</td>
<td>68.33%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.2115</td>
<td>0.2803</td>
<td>0.2101</td>
</tr>
</tbody>
</table>

In order to determine whether the difference between the participants’ responses to passages with and without a frequency adverb is statistically significant in this experiment, a two-way Analysis of Variance (ANOVA) test is conducted to examine the effect of proficiency and passage type. The test results indicate that the main effect of proficiency is significant, $F (2, 114) = 20.141, p = .000$. This means that there is a significant proficiency difference among the three test groups. The effect of passage type is also significant, $F (1, 114) = 61.665, p = .000$. Chinese-speaking ESL learners in the two experimental groups as well as English native speakers in the control group treat passages with and without a frequency adverb as different
types of passages. The result of the ANOVA test result also indicates that the interaction between proficiency and passage type is significant, F (2, 114) = 3.775, p = .026. That is, the influence of the frequency adverbs on participants’ responses varies according to their English proficiency. In order to determine which proficiency group(s) is/are affected by the existence of a frequency adverb in a passage, a Bonferroni Post Hoc Test on proficiency is performed. The results indicate that there is a significant difference between the English control group and the Chinese Low group (p = .000), as well as between the Chinese High group and the Chinese Low group (p = .000). However, the difference between the English control group and the Chinese High group is not significant (p = 1.000). This means that, in this experiment where a past tense verb form is expected in a passage with a frequency adverb, the frequency adverb has the same degree of influence on the English control group and the Chinese High group. However, the Chinese Low group responds to frequency adverbs in a very different way.

The second experiment, i.e. Experiment 7, also tests the influence of frequency adverbs. That is, participants’ responses to passages of Type 5 and Type 7 are compared with each other. However, unlike the test items in Experiment 6, for which the targeted tense choice is the past tense, the test items in Experiment 7 are targeted to be preferably marked by present tense verbal morphology by English native speakers. Specifically, in this experiment, passages of Type 5 and Type 7 have exactly the same structure: present – past – present (test item), and the only difference between the two types of passages is that each of the passages of Type 7 includes a frequency, while all of the passage of Type 5 do not. See section 4.2.4 for details.

Table 9 below summarizes the three proficiency groups’ usage rate of the targeted tense choice, i.e. the present tense, in Type 5 and Type 7. As we can see in Table 9, each of the three
proficiency groups achieves a mean percentage of around 90% for the passages in both Type 5 and Type 7.

Table 9: Usage Rate of the Targeted Tense Choice in the Three Proficiency Groups’ Responses in Type 5 and Type 7
(Results from Experiment 7)

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Condition Type</th>
<th>Targeted Tense Choice</th>
<th>Usage Rate of the Targeted Tense Choice</th>
<th>Chinese High Group</th>
<th>Chinese Low Group</th>
<th>English Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 5</td>
<td>without a frequency adverb</td>
<td>present tense</td>
<td>Mean Number</td>
<td>5.55</td>
<td>5.15</td>
<td>5.45</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.5895</td>
<td>0.9631</td>
<td>0.9206</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>92.50%</td>
<td>85.83%</td>
<td>90.83%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.0983</td>
<td>0.1605</td>
<td>0.1534</td>
</tr>
<tr>
<td>Type 7</td>
<td>with a frequency adverb</td>
<td>present tense</td>
<td>Mean Number</td>
<td>5.85</td>
<td>5.65</td>
<td>5.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.3571</td>
<td>0.7263</td>
<td>1.1079</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>97.50%</td>
<td>94.17%</td>
<td>94.17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.0595</td>
<td>0.1211</td>
<td>0.1846</td>
</tr>
</tbody>
</table>

In order to determine whether the difference between participants’ responses to passages with and without a frequency adverb is statistically significant in this experiment, a two-way Analysis of Variance (ANOVA) test is conducted to examine the effect of proficiency and passage type. The test results indicate that the main effect of proficiency is not significant, F (2, 114) = 1.281, p = .282. This means that in terms of proficiency there is no significant difference
among the three test groups. In contrast, the effect of passage type is significant, $F (1, 114) = 4.744, p = .031$. Participants in all the three groups treat passages with and without a frequency adverb as different types of passages. There is no statistically significant interaction between proficiency and passage type, $F (2, 114) = .332, p = .718$. That is, the effect of having a frequency adverb does not vary according to the participants’ proficiency levels. The results of a Bonferroni Post Hoc Test on proficiency further indicates that, in response to passages with and without a frequency adverb in a present tense context, the three proficiency groups do differ in their level of proficiency. There is a no significant difference between the English control group and the Chinese Low group ($p = 1.000$), between the Chinese High group and the Chinese Low group ($p = .337$), or between the English control group and the Chinese High group ($p = 1.000$).

To sum up, two experiments are conducted to test the effect of frequency adverbs. In the first experiment, i.e. Experiment 6, the targeted tense choice for a test item is the past tense. In the second experiment, i.e. Experiment 7, the targeted tense choice for a test item is the present tense. The appearance of a frequency adverb with a test item in a past time context leads to a reduced usage rate of the past tense in the Chinese Low group’s responses, and this makes them different from the Chinese High group and the English control group. However, in the second experiment, when the test item is expected to appear in the present tense with a frequency adverb, the Chinese Low group performs equally well as the other two groups. That is, there is no statistically significant difference between them and the other two groups in terms of their proficiency.
5.5 The influence of the inherent lexical aspectual properties of verbs

Scholars investigating the distribution of verbal morphology have observed some universal tendencies as captured by the Aspect Hypothesis (Robinson, 1990; Andersen & Shirai, 1996; Shirai, 1991). One claim of the Aspect Hypothesis is that learners will initially restrict past or perfective marking to achievement and accomplishment verbs before gradually extending this usage to activity and stative verbs. In other words, learners treat verbs differently according to their inherent lexical aspectual properties.

In the present study, the first three passages in Type 5, Type 10, and Type 11 are combined together and named Type G, and the first three passages in Type 6, Type 9, and Type 12 are combined together and named Type H. In both Type G and Type H, the test items are activity verbs, but the targeted tense choice for test items is the present tense in Type G and the past tense in Type H. In addition, the last three passages in Type 5, Type 10, and Type 11 are combined together and named Type I, and the last three passages in Type 6, Type 9, and Type 12 are combined together and named Type J. In both Type I and Type J, the test items are achievement verbs, but the targeted tense choice for test items is the present tense in Type I and the past tense in Type J. See section 4.2.5 for details.

If the inherent lexical aspectual properties of verbs influence the second language learners’ choice of verbal morphology in the way that is predicted in the Aspect Hypothesis, learners should tend to use the present tense with the passages in both Type G and Type H, and tend to use the past tense with the passages in both Type I and Type J. Additionally, they should be more likely to use the present tense with Type G passages when compared to Type I passages, and they should tend to use the past tense with Type J passages when compared to Type H passages. In other words, the Aspect Hypothesis is corroborated if (i) learners tend to use the
present tense to mark activity verbs and the past tense to mark achievement verbs, and (ii) learners prefer to mark activities in the present tense when compared to achievements and prefer to mark achievements in the past tense when compared to activities.

Table 10 below summarizes the three proficiency groups’ usage rates of the targeted tense choices in the passages in Type G and Type H.

Table 10: Usage Rate of the Targeted Tense Choices in the Three Proficiency Groups’ Responses in Passages of Type G and Type H

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Targeted Tense Choice</th>
<th>Aspectual Properties of Test Items</th>
<th>Usage Rate of the Targeted Tense Choice</th>
<th>Chinese High Group</th>
<th>Chinese Low Group</th>
<th>English Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type G</td>
<td>present tense</td>
<td>activity</td>
<td>Mean Number SD</td>
<td>8.3</td>
<td>6.8</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage SD</td>
<td>92.22%</td>
<td>75.56%</td>
<td>81.11%</td>
</tr>
<tr>
<td>Type H</td>
<td>past tense</td>
<td>activity</td>
<td>Mean Number SD</td>
<td>8</td>
<td>6.65</td>
<td>8.55</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage SD</td>
<td>88.89%</td>
<td>73.89%</td>
<td>95%</td>
</tr>
</tbody>
</table>

As we can see, in both Type G and Type H, where the test items are activity verbs, participants’ usage rate of the targeted tense choice is always above 70%. To be specific, in response to Type G, where activity verbs are targeted to be preferably marked by present tense
verbal morphology by English native speakers, the three proficiency groups’ usage rate of the present tense varies between 75% and 93%. Likewise, in response to Type H, where activity verbs are targeted to be preferably marked by past tense verbal morphology by English native speakers, the three proficiency groups’ usage rate of the past tense varies between 73% and 95%. In other words, the three groups only use the present tense or non-past tense to mark activity verbs in Type H only 5% to 27% of the time. Each of the three proficiency groups strongly tends to use the present tense to mark the activity verbs in Type G and strongly tends to use the past tense to mark the activity verbs in Type H. Moreover, the usage rate of the targeted tense choice in Type G and in Type H is always well above chance (i.e. 50%).

Table 11 summarizes the three proficiency groups’ usage rates of the targeted tense choices in Type I and Type J.

As we can see, in both Type I and Type J, where the test items are achievement verbs, participants’ usage rate of the targeted tense choice is always above 70%, which is well above chance (i.e. 50%). Although the Chinese High group, the Chinese Low group, and the English control groups’ rates of using past tense verbal morphology to mark Type J achievement verbs are 83.89%, 76.67%, and 93.89%, respectively, they also have a similarly high rate of using the present tense to mark the achievements in Type I: 88.33%, 70%, and 86.67% respectively. In other words, their rates of usage of the past tense in Type I are only 11.67%, 30%, and 13.33% respectively. Again, contrary to what is predicted in the Aspect Hypothesis, the past tense is not always the dominant tense to mark achievement verbs in learners’ responses.
Table 11: Usage Rate of the Targeted Tense Choices in the Three Proficiency Groups’ Responses in Passages of Type I and Type J

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Targeted Tense Choice</th>
<th>Aspectual Properties of Test Items</th>
<th>Usage Rate of the Targeted Tense Choice</th>
<th>Chinese High Group</th>
<th>Chinese Low Group</th>
<th>English Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I</td>
<td>present tense</td>
<td>achievement</td>
<td>Mean Number</td>
<td>7.95</td>
<td>6.3</td>
<td>7.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>1.0235</td>
<td>1.0050</td>
<td>1.3638</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>88.33%</td>
<td>70%</td>
<td>86.67%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.1137</td>
<td>0.1117</td>
<td>0.1515</td>
</tr>
<tr>
<td>Type J</td>
<td>past tense</td>
<td>achievement</td>
<td>Mean Number</td>
<td>7.55</td>
<td>6.9</td>
<td>8.45</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>1.0235</td>
<td>1.5780</td>
<td>0.8047</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>83.89%</td>
<td>76.67%</td>
<td>93.89%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.1137</td>
<td>0.1753</td>
<td>0.0894</td>
</tr>
</tbody>
</table>

To further test the influence of the inherent lexical aspectual properties of verbs on learners’ tense choice, passages of Type G and Type I are compared with each other (i.e. Experiment 8). In both types, the present tense is the targeted tense choice, but the test items in the two passage types differ in their inherent lexical aspectual properties: activity verbs in Type G and achievement verbs in Type I. In addition, passages of Type H and Type J are compared with each other (i.e. Experiment 9). In both types, the past tense is the targeted tense choice, but test items are activity verbs in Type H and achievement verbs in Type J.

Table 12 below summarizes the three proficiency groups’ usage rate of the targeted tense choice, i.e. the present tense, in Type G and Type I. If learners follow the Aspect Hypothesis and
strongly associate past tense verbal morphology with achievement verbs, then in the present tense context one might expect more difficulties with achievement verbs (i.e. Type I) than with activity verbs (i.e. Type G).

Table 12 reveals that in both Type G and Type I the scores in the responses from the Chinese High group and the English control group are always higher than the scores from the Chinese Low group. That being said, within each proficiency group, the comparison between participants’ responses to Type G and Type I indicates that each group’s response to the two passages types is always of less than 10% difference in mean percentage.

Table 12: Usage Rate of the Targeted Tense Choice in the Three Proficiency Groups’ Responses in Passages of Type G and Type I

(Results from Experiment 8)

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Targeted Tense Choice</th>
<th>Aspectual Properties of Test Items</th>
<th>Usage Rate of the Targeted Tense Choice</th>
<th>Chinese High Group Mean Number</th>
<th>Chinese High Group SD</th>
<th>Chinese High Group Mean Percentage</th>
<th>Chinese Low Group Mean Number</th>
<th>Chinese Low Group SD</th>
<th>Chinese Low Group Mean Percentage</th>
<th>English Control Group Mean Number</th>
<th>English Control Group SD</th>
<th>English Control Group Mean Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type G</td>
<td>present tense</td>
<td>activity</td>
<td>Mean Number</td>
<td>8.3</td>
<td>0.9539</td>
<td>92.22%</td>
<td>6.8</td>
<td>1.6912</td>
<td>75.56%</td>
<td>7.3</td>
<td>1.6763</td>
<td>81.11%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type I</td>
<td>present tense</td>
<td>achievement</td>
<td>Mean Number</td>
<td>7.95</td>
<td>1.0488</td>
<td>83.33%</td>
<td>6.3</td>
<td>1.8241</td>
<td>70%</td>
<td>7.8</td>
<td>0.7399</td>
<td>86.67%</td>
</tr>
</tbody>
</table>
In order to determine whether the difference between participants’ responses to Type G and to Type I is statistically significant, a two-way Analysis of Variance (ANOVA) test is conducted to examine the effect of proficiency and passage types. The test results indicate that the main effect of proficiency is significant, F (2, 114) = 13.796, p = .000. That is, in this experiment there is a significant proficiency difference among the three test groups. The effect of passage type, however, is not significant, F (1, 114) = .222, p = .639. The Mandarin Chinese-speaking ESL learners in the two experimental groups and the English native speakers in the control group do not treat passages of Type G and Type I as different types of passages. There is no significant interaction between proficiency and passage type, F (2, 114) = 1.579, p = .211. This means that the effect of passage type is the same on the three proficiency groups. The English control group as well as the two Chinese experimental groups do not treat the passages with activity verbs and the passages with achievement verbs in present tense context as different types of passages. The difference between the aspectual properties of the test items does not lead to a biased usage of a particular tense in participants’ responses. The only difference among the three test groups is their proficiency. The results from a Bonferroni Post Hoc Test on proficiency indicate that in this experiment there is no significant proficiency difference between the Chinese High group and the English control group (p = .182), but there is a significant difference between the Chinese Low group and the English control group (p = .004) as well as between the Chinese Low group and the Chinese High group (p = .000). In other words, the Chinese High group is similar to the English control group in proficiency, while the Chinese Low group is different. In conclusion, the general results from Experiment 8 do not support the Aspect Hypothesis.

Table 13 summarizes the three proficiency groups’ usage rate of the targeted tense choice, i.e. the past tense, in Type H and Type J. If learners follow the Aspect Hypothesis and strongly
associate past tense verbal morphology with achievement verbs, then in a past tense context more difficulties might be expected to appear with activity verbs (i.e. Type H) than with achievement verbs (i.e. Type J).

Table 13: Usage Rate of the Targeted Tense Choice in the Three Proficiency Groups’ Responses in Passages of Type H and Type J

(Results from Experiment 9)

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Targeted Tense Choice</th>
<th>Aspectual Properties of Test Items</th>
<th>Usage Rate of the Targeted Tense Choice</th>
<th>Chinese High Group</th>
<th>Chinese Low Group</th>
<th>English Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type H</td>
<td>past tense</td>
<td>activity</td>
<td>Mean Number</td>
<td>8</td>
<td>6.65</td>
<td>8.55</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>1.0488</td>
<td>1.8241</td>
<td>0.7399</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>88.89%</td>
<td>73.89%</td>
<td>95%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.1165</td>
<td>0.2027</td>
<td>0.0822</td>
</tr>
<tr>
<td>Type J</td>
<td>past tense</td>
<td>achievement</td>
<td>Mean Number</td>
<td>7.55</td>
<td>6.9</td>
<td>8.45</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>1.0235</td>
<td>1.5780</td>
<td>0.8047</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Percentage</td>
<td>83.89%</td>
<td>76.67%</td>
<td>93.89%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td>0.1137</td>
<td>0.1753</td>
<td>0.0894</td>
</tr>
</tbody>
</table>

Table 13 reveals that in both Type H and Type J, the usage rate of the targeted tense choice, i.e. the past tense, is between 80% and 89% in the responses from the Chinese High group, between 70% and 79% from the Chinese Low group, and between 90% and 99% from the
English control group. The difference of the past tense usage rate between Type H and Type J is within 5% in each of the three proficiency groups’ responses.

In order to determine whether the difference between participants’ responses to Type H and to Type J is statistically significant, a two-way Analysis of Variance (ANOVA) test is conducted to examine the effect of proficiency and passage types. The test results indicate that the main effect of proficiency is significant, $F(2, 114) = 18.673, p = .000$. That is, in this experiment there is a significant proficiency difference among the three test groups. The effect of passage type, again, is not significant, $F(1, 114) = .187, p = .667$. The Mandarin Chinese-speaking ESL learners in the two experimental groups and the English native speakers in the control group do not treat passages of Type H and Type J as different types of passages. There is no significant interaction between proficiency and passage type, $F(2, 114) = .762, p = .469$. This means that the effect of passage type is the same for all three proficiency groups. The English control group as well as the two Chinese experimental groups do not treat passages with activity verbs and passages with achievement verbs in a past tense context as different types of passages. As is found in Experiment 8, in this experiment the difference between the aspectual properties of the test items does not lead to a biased usage of a particular tense in participants’ responses. The only difference among the three test groups is again their proficiency. The results from a Bonferroni Post Hoc Test on proficiency indicate that in this experiment there is a significant proficiency difference between the Chinese High group and the English control group ($p = .036$), between the Chinese Low group and the English control group ($p = .000$), as well as between the Chinese Low group and the Chinese High group ($p = .002$). In other words, although both the Chinese High group and the Chinese Low group treat passages of Type H and Type J as the same
type of passages, both groups have a lower proficiency than the English control group. Again, the general results from Experiment 9 do not support the Aspect Hypothesis.
6.1 Recency Effect

The existence or not of a recency effect is a pragmatic issue. In the present study, Mandarin Chinese-speaking ESL learners are predicted to distinguish passages with a possible recency effect from those without a possible recency effect. That is, an effect based on the content of the previous context is hypothesized to affect Mandarin Chinese-speaking ESL learners’ tense choice for a test item found in the following text. Specifically, if a recency effect exists, Mandarin Chinese-speaking ESL learners are expected to achieve scores that are lower than the control group English native speakers when responding to passages where the targeted tense choice for a test item differs from the tense used in the immediate preceding sentence or clause. If no difference is found, there is no evidence of a recency effect. In contrast, the Mandarin Chinese-speaking ESL learners are expected to achieve scores similar to the control group English native speakers when responding to passages where the targeted tense choice for a test item is the same as the tense used in the immediate preceding sentence or clause. In such an example, no recency effect is even possible.

This hypothesis is based on the fact that in the learners’ native language, Mandarin Chinese, tense is not a grammatical feature, verbal inflections do not exist (Smith, 1991), and temporal locations of eventualities are conveyed via lexical expressions, aspect markers, and pragmatic devices such as context clues and chronological order in narration (Yang and Huang, 2004). In Mandarin Chinese, verbal inflections such as -ed and -ing do not exist. Instead, Mandarin Chinese uses lexical expressions such as zuotian “yesterday”, mingnian “next year”,
and aspectual markers such as *le* and *guo* to indicate the temporal locations of the events expressed in sentences. There are also Chinese sentences where these grammatical and lexical elements do not exist at all. In order to determine the temporal locations of the events expressed in those sentences, one needs to resort to the previous context, because it is usually the case that sentences in the previous context establish a time frame for the discourse. Verbal semantic constraints, inherent temporal relationships between actions, world knowledge, distinctions of time, etc. are also important factors in the determination of the temporal location of an eventuality in a Chinese sentence (Lin, 2003).

To test for the influence of a recency effect, Experiment 1, which compares passages with the potential for a recency effect (Type A) and passages without such a potential (Type B), is performed. If a recency effect influences Mandarin Chinese-speaking ESL learners’ tense choice, then learners should perform better in Type B (no effect) passages than in Type A (possible effect) passages.

The results of Experiment 1 do not support the hypothesis. Although the main effect of proficiency is significant, $F (2, 114) = 23.232$, $p = .000$, and there is a significant difference between the English control group and the Chinese Low group ($p = .000$), as well as between the Chinese High group and the Chinese Low group ($p = .000$), the effect of passage type is not significant, $F (1, 114) = .935$, $p = .336$, and no statistically significant interaction between the effects of passage type and proficiency is found, $F (2, 114) = .770$, $p = .465$. These results indicate that the influence of a recency effect, to the degree that such an effect might exist, is the same for all three proficiency groups, and none of the three groups treats passages with a potential recency effect (Type A) and passages without a potential recency effect (Type B) as different types of passages. Each of the three groups performs equally well in response to both
Type A and Type B passages. The only thing that makes the Chinese Low group different from the other two groups is its lower English proficiency. While the Chinese High group and the English control group achieve a mean of around 85% on both Type A and Type B passages, the Chinese Low group only achieves around 70% on both types of passages. In conclusion, the hypothesis that a recency effect affects Mandarin Chinese-speaking ESL learners’ responses is not supported by the results of the experiment.

A possible explanation for these results is that the Mandarin Chinese-speaking ESL learners in the present study are not beginning learners of English and their knowledge of tense, verbal semantic constraints, inherent temporal relationship between actions, world knowledge, distinctions of time, etc. overrides recency. Although, unlike English, tense is not a grammatical feature in Mandarin Chinese and distinctions of times are not directly encoded by verbal inflections, time distinctions do exist in Mandarin Chinese. In Chinese sentences where grammatical elements such as aspecectual markers (e.g. le and guo) and lexical expressions of time (e.g. zuotian “yesterday” and mingnian “next year”) do not exist, pragmatic devices such as contextual clues come into play. Although in Mandarin Chinese it is often the case that the previous context sets up a time frame for the following discourse, and in order to determine the temporal locations of the events expressed in a discourse, one often needs to resort to the previous context, none of this means that one must always interpret the temporal location of an event to be in the same time frame of the event in the most recent context. That is, the preceding verb is but one factor in helping determine the correct temporal frame for a given predicate. There are many other pragmatic issues that need to be taken into consideration as well.

As Lin (2003) points out, the temporal reference of Chinese sentences seems to be determined by individual verbal semantics, inference rules, independently motivated pragmatics
or semantics constraints, the semantics of noun phrases, and even world knowledge, etc. One example Lin (2003) provides with regards to semantics constraints is that different verb types may impose different constraints on the temporal locations of the events denoted by complement clauses of verbs. According to Lin (2003), there are four different types of verbal semantic constraints. Some verbs require the event time of the subordinate clause to follow that of the matrix clause, some verbs require the opposite, some verbs require the two event times to overlap each other, and some verbs do not impose any constraint. One example Lin (2003) illustrates is a complement clause with the verb qiangpuo “force” or jianyi “suggest” as the main verb in the matrix clause. I repeat it here as Example (26) below.

Example (26):

Ta qingpuo/jianyi wo kao daxue

He force/suggest I take-exam university

“He forced me to/suggested that I take the entrance exam for college.”

Lin (2003) points out that in this example the meaning of the verb qiangpuo “force” can be defined in such a way that the embedded event follows the event of forcing or suggestion. Taking the college entrance exam can be in the past or in the future as long as it does not precede the time of forcing or making the suggestion.

In the cloze test of the present study, each of the test items appears as one single verb in a simple sentence; however, this simple sentence always appears after two other simple sentences or after one complex sentence in the previous context. That is, a single passage consists of three simple sentences or one complex sentence plus one simple sentence. Although the language
under discussion is English, and English is different from Chinese in many ways, the existence of verbal semantic constraints is not Chinese specific, but rather language universal. I propose that although the test items in the present study are in English, not in Chinese, and although test items are not examined in complement clauses, verbal semantic constraints can still play a role in the determination of the temporal locations of the events expressed by the test items. In order for the three simple sentences or in order for one complex sentence plus one simple sentence in each passage together to form continuous and meaningful text, there must be certain inherent temporal relation that the verbs in the previous context impose upon the test item in the following discourse.

Example (27) below is a passage in the cloze test, and it is of passage Type A. The targeted tense choice is the past tense (i.e. *mopped*), while the tense that immediately precedes the test item is the present tense (i.e. *smells*).

Example (27):
Mary cleaned her brother’s bedroom which smells like cigarettes. Mary ________ (to mop) the floor of her brother’s bedroom with a lot of detergent.

In this example, the matrix clause in the previous context *Mary cleaned her brother’s bedroom* entails that the action of cleaning the bedroom took place before the speech time. In the sentence with the test item, Mary’s mopping of the floor of her brother’s bedroom is just one action in the cleaning process. The inherent temporal relation between the action of cleaning the bedroom and the action of mopping the floor of the bedroom requires that there must be an overlap of the time of the two actions and that the action of mopping the floor of the bedroom
must end at or before the ending point of the action of cleaning the bedroom. Since the matrix clause in the previous context already indicates that the cleaning process ended in the past, the action of mopping the floor must also have ended in the past. Turning to the embedded clause, *smells like cigarettes* in the previous context is a generic description of the bedroom and has no inherent temporal relationship with the cleaning process. The results of the cloze test indicate that, in response to Example (27), except for one participant in the Chinese Low group, all the English native speakers and all other Chinese participants choose to use the past tense form *mopped* as the response. In other words, even Chinese participants in the Chinese Low group are not distracted by the present tense that immediately precedes the test item. In short, Chinese participants as a whole do not unconditionally choose to use the tense in the most recent previous context to mark the test item in the following discourse. As a result, they do not respond significantly differently from the English native speakers in the control group.

As already noted, in the present study all of the Mandarin Chinese-speaking ESL learners, including the learners in the Chinese Low group, are adults who have finished their high school education in China. That is, all of them are highly proficient Chinese native speakers. While learning their native language, they have acquired the language universal knowledge of verbal semantic constraints, inherent temporal relationship between actions, world knowledge, distinctions of time, etc. When they are tested on their second language English, they are able to apply these kinds of knowledge to their second language study. They have the ability not to be distracted by the tense in the most recent previous context, and they also have the ability to decide which previous sentence is related to the test item in the following context. In other words, their knowledge of tense, verbal semantic constrains, inherent temporal relationship between actions, world knowledge, distinctions of time, etc. overrides recency.
6.2 The influence of the number of occurrences of a tense in the previous context

In the present study, the number of occurrences of a tense in the previous context is hypothesized to influence Mandarin Chinese-speaking ESL learners’ tense choice for the test item in the following text. Learners are predicted to have a tendency to choose the tense that is duplicated in the previous context to mark the test item in the following discourse. This effect may also be considered a stronger version of Experiment 1, that is, the duplicated tense may yet result in a recency effect.

In order to test for such an effect, two experiments (i.e. Experiment 2 and Experiment 3) are conducted. The results of the Analysis of Variance (ANOVA) test and the Bonferroni Post Hoc Tests indicate that test results from the two experiments are consistent. In both experiments, the main effect of proficiency is significant, $F(2, 114) = 11.707, p = .000$ in Experiment 2 and $F(2, 114) = 23.036, p = .000$ in Experiment 3. In response to each passage type, the Chinese Low group always achieves a much lower mean percentage score than the Chinese High group and the English control group. These differences are proved to be statistically significant by the result of a Bonferroni Post Hoc Test. In Experiment 2, $p = .001$ between the English control group and the Chinese Low group, and $p = .000$ between the Chinese High group and the Chinese Low group. In Experiment 3, $p = .000$ between the English control group and the Chinese Low group, and $p = .000$ between the Chinese High group and the Chinese Low group. The difference in proficiency between the English control group and the Chinese High group is not statistically significant, $p = 1.000$ in Experiment 2 and $p = .747$ in Experiment 3. The effect of passage type, on the other hand, is significant in both experiments, $F(1, 114) = 27.039, p = .000$ in Experiment 2 and $F(1, 114) = 75.514, p = .000$ in Experiment 3. I return to this below. Finally, the results from the ANOVA tests indicate that there is no statistically significant interaction between the
effect of passage type and proficiency, $F(2, 114) = 1.207, p = .303$ in Experiment 2 and $F(2, 114) = 1.048, p = .354$ in Experiment 3. What these results mean is that, in both experiments, not only the two Chinese learner groups but also the English control group treat passages with and without tense duplication in the previous context as different types of passages. The effect of passage type on participants’ choice of tense for a test item in the following discourse is positive for all the three proficiency groups.

Table 4: Usage Rate of the Targeted Tense Choices in the Three Proficiency Groups’ Responses in Type C and Type D (Results from Experiment 2)

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Condition Type</th>
<th>Usage Rate of the Targeted Tense Choice</th>
<th>Chinese High Group</th>
<th>Chinese Low Group</th>
<th>English Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type C</td>
<td>without tense duplication</td>
<td>Mean Number SD</td>
<td>11.25 0.6982</td>
<td>10 1.8166</td>
<td>11.3 1.0536</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean Percentage SD</td>
<td>93.75% 0.0582</td>
<td>83.33% 0.1514</td>
<td>94.17% 0.0878</td>
</tr>
<tr>
<td>Type D</td>
<td>with tense duplication</td>
<td>Mean Number SD</td>
<td>10.15 1.2757</td>
<td>7.6 3.0397</td>
<td>9.45 2.0851</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean Percentage SD</td>
<td>84.58% 0.1063</td>
<td>63.33% 0.2533</td>
<td>78.75% 0.1738</td>
</tr>
</tbody>
</table>

Table 5: Usage Rate of the Targeted Tense Choices in the Three Proficiency Groups’ Responses in Type E and Type F (Results from Experiment 3)

<table>
<thead>
<tr>
<th>Passage Type</th>
<th>Condition Type</th>
<th>Usage Rate of the Targeted Tense Choice</th>
<th>Chinese High Group</th>
<th>Chinese Low Group</th>
<th>English Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type E</td>
<td>without tense duplication</td>
<td>Mean Number SD</td>
<td>8.95 1.7457</td>
<td>6.9 2.0469</td>
<td>9.6 1.4967</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean Percentage SD</td>
<td>74.58% 0.1455</td>
<td>57.50% 0.1706</td>
<td>80% 0.1247</td>
</tr>
<tr>
<td>Type F</td>
<td>with tense duplication</td>
<td>Mean Number SD</td>
<td>11.4 1.0198</td>
<td>9.85 1.6210</td>
<td>11.55 0.6690</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean Number SD</td>
<td>95% 0.0850</td>
<td>82.08% 0.1351</td>
<td>96.25% 0.0557</td>
</tr>
</tbody>
</table>
As Table 4 and Table 5 reveal, when the targeted tense choice is different from the tense duplicated in the previous context, all three proficiency groups achieve lower scores in Type D passages (i.e. passages with tense duplication in the previous context) than in Type C passages (i.e. passages without tense duplication in the previous context). In contrast, when the targeted tense choice is the same as the duplicated tense in the previous context all three proficiency groups achieve higher scores in Type F passages (i.e. passages with tense duplication in the previous context) than in Type E passages (i.e. passages without tense duplication in the previous context). That is, Mandarin Chinese-speaking ESL learners always show a tendency to use the tense that is duplicated in the previous context, regardless of whether or not the targeted tense choice is the same as the duplicated tense. This matches the research hypothesis and may also give some support to the idea of a recency effect. The number of occurrences of a tense in the previous context influences Mandarin Chinese-speaking ESL learners’ choice of tense for a test item in the following discourse.

However, what is unexpected is that this pattern is found not only with the Mandarin Chinese-speaking ESL learners’ responses, but also in the responses from the English native speakers in the control group. This may due to the fact that the influence of the repeated occurrences of a tense in the previous context on the tense choice in the following discourse is not just an issue in language acquisition; it may have an effect in language usage as well. In each passage of the cloze test, there are two parts. The first part contains two simple sentences or one complex sentence. The second part is a simple sentence and the test item is the predicate of this sentence. In order for the sentences in a passage to form a continuous and coherent discourse, there must be some semantic relationship, in particular some temporal relationship, between the various sentences. In principle, there are three possible relations between the event referred to in
the test sentence, i.e. the last sentence, and the events referred to by the previous sentences or clauses. That is, the temporal location of the last event precedes, follows, or overlaps the temporal location of the previous events. Empirically, if the two events in the previous two sentences or clauses fall into the same time frame, in order to make a coherent discourse, language users might show a tendency to use the same tense to continue the text unless there are some clear semantic or pragmatic reasons that stop them from doing so. For example, the topic of the following text might be different from the topic in the previous context. To put it in another way, there might be a tendency for all language users and not just for language learners to make the time of a following event follow or overlap the time of any previous events.

As Table 4 reveals, in Experiment 2 English native speakers’ and Mandarin Chinese-speaking ESL learners’ mean percentage scores in Type D passages (i.e. passages with tense duplication) are relatively high. In other words, their usage rates of the tense that is different from the tense duplicated in the previous context is relatively high. However, when these usage rates are compared with the results with Type C passages, (i.e. passages without tense duplication), the usage rates in Type D passages appear to be significantly lower. This is because in Type D passages, where tense duplication exists in the previous context, from 15% to 36% answers are the same as the duplicated tense and therefore different from the targeted tense choice. In contrast, in Type C passages, where tense duplication is not a factor, only 6% to 17% of the answers differ from the targeted tense choice. Parallel results obtain in Experiment 3. The existence of tense duplication in Type F passages seems to result in a significantly higher usage rate of the targeted tense choice, as the targeted tense choice is the same as the tense duplicated in the previous context. In summary, as language users, English native speakers are like English learners in that they treat passages with and without tense duplication in the previous context as
different types of passages. They show the tendency to mark the test item in the final sentence of a passage with the tense that is found duplicated in the previous context. In other words, this phenomenon is not unique in the process of acquiring a second language, but it is to some degree a general pattern followed by all language users, including native speakers of a language.

6.3 The functional roles of past-time temporal adverbials

Past-time temporal adverbials are hypothesized to be tense reminders for Mandarin Chinese-speaking ESL learners. Moreover, this tense reminding effect is predicted to be stronger for Mandarin Chinese-speaking ESL learners at the lower English proficiency level than for those at the higher English proficiency level. If this is true, then the lack of a past-time temporal adverbial versus the presence of a past-time temporal adverbial should result in more difficulty in the past, and this pattern should be more obvious in the responses from the Chinese Low group when compared to the responses from the Chinese High group.

In order to test for such an effect, two experiments (i.e. Experiment 4 and Experiment 5) are conducted. In Experiment 4 passages of Type 1 and Type 4 are compared with each other, and in Experiment 5 passages of Type 6 and Type 8 are compared with each other. In terms of the matrix agreement, such an agreement exists in Type 1 and Type 4 passages, but not in Type 6 and Type 8 passages. In terms of tense usage, each pair of passages has the same structure. The only difference between the two passage types in each pair is that a past-time temporal adverbial appears together with a test item in one passage type, but not in the other. That is, Type 4 passages and Type 8 passages include a past-time adverbial while Type 1 passages and Type 6 passages do not. However, the targeted tense choice for all test items in the four passage types is the past tense. In order for the hypothesis to be corroborated, Mandarin Chinese-speaking ESL
learners should have less difficulty in Type 4 passages and Type 8 passages relative to their difficulty in Type 1 passages and Type 6 passages.

The results indicate that in both experiments no matter whether or not a past-time temporal adverbial appears together with a test item, English native speakers always use the targeted tense choice, i.e. the past tense, over 94% of the time. The Chinese Low group, however, shows a different pattern. This group’s English proficiency level is significantly different from the proficiency level of the English control group in both experiments, $p = .000$ in both experiments. The rate at which Chinese-speaking ESL learners in the Low use the targeted tense choice, i.e. the past tense, is linked to the presence or absence of the past-time temporal adverbial. In passage types where the test item includes a past-time temporal adverbial, the past tense is used significantly more often than in the passage types where the test item does not include such an adverbial. The differences in usage rate are as great as 13.34% in Experiment 4 and 20% in Experiment 5. The results of the ANOVA tests and the Bonferroni Post Hoc Tests on proficiency prove that they are statistically significant. The Chinese High group, on the other hand, reveals a more complicated pattern. In Experiment 4, the Chinese High group uses the targeted tense choice, i.e. the past tense, in both Type 1 passages and Type 4 passages more than 94% of the time. Moreover, the results of the Bonferroni Post Hoc Tests on proficiency prove that there is no statistically significant difference between the English control group and the Chinese High group ($p = 1.000$). In Experiment 5, however, the Chinese High group uses the targeted tense choice, i.e. the past tense, in Type 8 passages (i.e. passages with past-time temporal adverbials) 17.5% than in Type 6 passages (i.e. passages without past-time temporal adverbials). In terms of proficiency, the results of the Bonferroni Post Hoc Tests reveal that the Chinese High group is significantly different from the English control group in Experiment 5 ($p = .028$). In terms of the effect of
passage type, the results of the ANOVA tests indicate that in both experiments the effect of passage type is significant, and there is a marginal interaction between proficiency and passage type. In other words, in both experiments all three proficiency groups treat passages with and without a past-time temporal adverbial as different passage types. In Experiment 4 the tense reminding effect of past-time temporal adverbials works only for the Chinese Low group, but in Experiment 5 it works both for the Chinese Low group and the Chinese High group. Therefore, the research hypothesis is corroborated by the test results from Experiments 4 and 5. Past-time temporal adverbials have a tense reminding effect, and it affects the Chinese-speaking ESL learners at the lower English proficiency level more than it affects the Chinese-speaking ESL learners at the higher English proficiency level. What is somewhat unexpected in the experiments is that the Chinese High group is not affected at all by the tense reminding effect of past-time temporal adverbials in Experiment 4, but it is obviously affected in Experiment 5.

The above results are consistent with the results found in previous studies which investigate the functional roles of temporal adverbials in second language learners’ expression of temporal locations and relations in their target language. Dietrich, Klein, and Noyau (1995), for example, point out that all language learners follow the sequence of using pragmatic devices (e.g. Principle of Natural Order) lexical devices (e.g. temporal adverbials), and finally grammatical devices (e.g. verbal morphology) in their expression of temporality, regardless of any differences between their native and second languages and despite the fact that they are learning different target languages. In other words, second language learners in general rely on pragmatic devices and lexical devices to indicate temporal locations and relations in their target language before their target language verbal morphology becomes more systematic. Temporal adverbials, as a type of lexical device, play an important role in learners’ expression of temporality. This claim is
confirmed and supported by the results from many previous studies, such as Klein (1995), Schumann (1987), Véronique (1987), Lee (2001), Bardovi-Harlig (1992), Bardovi-Harlig (1994), and Yang and Huang (2004).

In the present study, Mandarin Chinese-speaking ESL learners at the lower level and at the higher level are contrasted with each other. Like learners from other native language backgrounds, the learners in the present study follow the general sequence of using pragmatic devices, lexical devices, and finally grammatical devices to express temporality in their target language. Although in the present study learners at both proficiency levels are instructed learners who have passed the beginning stage of English study, the lower-level learners’ control of the target language verbal morphology and the target language as a whole is at a lower level than the learners at the higher level. This explains why in both Experiments 4 and 5 learners in the Chinese Low group use the targeted tense choice, i.e. the past tense, more frequently in response to passages with past-time temporal adverbials than to passages without past-time temporal adverbials. In contrast, this pattern is found in the Chinese High group’s responses only in Experiment 5, and not in Experiment 4. In other words, the tense reminding effect of temporal adverbials exists, and this effect is stronger to the Chinese Low group than to the Chinese High group because the two learner groups are at different target language development stages.

The fact that the Chinese High group performs differently from the English control group and performs much better in response to passages with temporal adverbials than to passages without temporal adverbials in Experiment 5 may be for the following reasons. First, although learners in the Chinese High group are at a higher level of English language development than the learners in the Chinese Low group, their overall control of English verbal morphology has still not reached the level of English native speakers. As Bardovi-Harlig (1992) and Bardovi-
Harlig (1994) find, adult instructed ESL learners at university level use temporal adverbials at a high rate even when they are able to use morphological markers to indicate temporal location and temporal contrast. In the present study, all the ESL learners in the Chinese High group have received their college education in the U.S., and many of them are graduate students. However, when compared with English native speakers, the influence of temporal adverbials on their tense choice is still observable. In the analysis of Bardovi-Harlig (1992), many learners are found to begin with higher adverbial-to-verb ratios, tending to move toward a lower native-like usage over time. Their use of past-tense morphology is also found to increase over time as the usage of temporal adverbials gradually decreases. The improvement in the appropriate use of past-tense morphology is not, however, accompanied by a sharp drop in the use of time adverbials. To put it another way, this improvement is a gradual procedure. In addition, the data collected in Bardovi-Harlig (1992) also shows the use of temporal adverbials in the majority of the instances of reverse-order reports. The function of temporal adverbials in reverse-order reports is further investigated in Bardovi-Harlig (1994). The results of the data analysis indicate that temporal adverbials are the most common marker of anteriority, playing a pivotal role in these reverse-order reports. In short, by analyzing data collected from full-time students in the Intensive English Programs at several universities, Bardovi-Harlig (1992) and Bardovi-Harlig (1994) find evidence that ESL learners at a higher English proficiency level continue to be affected by the functional roles of temporal adverbials in an observable way. The findings from Experiments 4 and 5 in the present study confirm the validity of the claims drawn from the experiments in Bardovi-Harlig (1992) and Bardovi-Harlig (1994). The reason why the Chinese High group performs differently from the English Control group and performs much better in response to passages with temporal adverbials than to passages without temporal adverbials in Experiment 5
is that, compared with English native speakers, these high level ESL learners are still influenced by the existence, and in particular the tense reminding effect, of the past-time temporal adverbials in the test passages.

The second reason that may explain why the Chinese High group performs differently from the English control group and why the Chinese High group performs much better in response to passages with past-time temporal adverbials than to passages without past-time temporal adverbials in Experiment 5 is that in the present study the ESL learners are native speakers of Mandarin Chinese, which is a tenseless language and in which temporal locations of events are indicated by pragmatic devices (e.g. context clues), lexical devices (e.g. temporal adverbials), or indirectly by aspect markers (e.g. le and guo) (Yang and Huang, 2004; Smith, 1991; etc.). Although the use of pragmatic devices, lexical devices, and finally grammatical devices to encode temporality is a general sequence followed by all language learners, in the present study the participants’ native language habit of relying on pragmatic and lexical devices to indicate temporality may reinforce their natural tendency to use such devices, and, in particular past-time temporal adverbials, to indicate or to remind themselves to use past-time verbal morphology to indicate past.

In Yang and Huang (2004), five groups (with at least 30 students in each group) of Chinese native speakers aging from 10 years old to 19 years old participate in the study. Their written narratives about personal experience or news stories and which require the usage of past tenses are analyzed. Yang and Huang (2004) find that although in general the Chinese speaking English learners in the study follow the already discussed sequence of language development, the shift from one stage to the next stage is very slow. In the data collected, researchers find the coexistence of a good rate of overall past tense marking (44%) along with a large number of
pragmatic and lexical devices in their learners’ English production. In addition, Yang and Huang (2004) also find that due to the lack of grammatical tense and the heavy reliance on pragmatic and lexical devices to make temporal reference in Chinese, and due to the mismatch between the ways of expressing temporality in Chinese and English, the Chinese-speaking English learners in their study quite often ignore the necessity to mark aspect or tense. To them, contextual clues and lexical expression provide enough temporal information. This explains why in Experiment 5 of the present study the Chinese High group shows a significantly lower usage rate of past tense than English native speakers do in passages which do not contain past-time temporal adverbials. For a given passage, the past tense appearing in the previous context provides a contextual clue, and this may lead the learners in the Chinese High group to ignore, and in many cases, I believe, forget the necessity to use the past tense verbal morphology on the test item in the following discourse. This same explanation can be applied to the Chinese Low group, which presents a lower and statistically more significant past tense usage rate when compared to the English control group in both Experiments 4 and 5.

The third reason for why the Chinese High group performs differently from the English Control group and for why the Chinese High group performs much better in response to passages with past-time temporal adverbials than to passages without past-time temporal adverbials in Experiment 5 is the tense reminding effect of past-time temporal adverbials. In their study, Yang and Huang (2004) find that the presence of temporal adverbials leads to lower rates of past marking at the two lowest levels. Their study indicates that lower level students rely very much on temporal adverbials, using them as substitutes for tense, while at the higher levels the presence of higher rates of past marking in sentences with temporal adverbials is an indicator that temporal adverbials become reminders for the use of verbal morphology.
In the present study, all of the Chinese participants, including those in the Chinese Low group, are instructed ESL learners at the college level. Since they are not beginning English learners as those in Yang and Huang’s (2004) study, they have passed the stage of using past-time temporal adverbials as tense substitutes. Instead, they use them as tense reminders. However, because the participants in the Chinese Low group are at a lower English proficiency level than those in the Chinese High group, the tense reminding effect of past-time temporal adverbials is stronger for them than for the participants in the Chinese High group. This explains why the usage rate of past tense in passages with past-time temporal adverbials is higher than the usage rate of past tense in passages without past-time temporal adverbials in the Chinese Low group’s production in both Experiments 4 and 5, while this pattern is found only in the Chinese High group’s production in Experiment 5. English native speakers, by comparison, are not affected by the presence or absence of past-time temporal adverbials, and there is no statistically significant influence of the tense reminding effect of past-time temporal adverbials on English native speakers’ production.

The last issue that needs to be explained in Experiments 4 and 5 is why past-time temporal adverbials have a statistically significant tense reminding effect for the Chinese High group in Experiment 5 but not in Experiment 4. I propose that this is due to the existence of matrix agreement in Experiment 4 but not in Experiment 5. In each passage, there are three verbs. The first verb is the predicate of the matrix clause or the simple sentence, which appears at the beginning of a passage. The third verb is the test item. In each passage in Experiment 4, the tense of the first verb is the same as the targeted tense choice for the test item, i.e. both are in the past tense. I call this matrix agreement. In contrast, in each passage in Experiment 5, the tense for the first verb is the present tense while the targeted tense choice for the test item is the past tense.
Therefore, matrix agreement does not exist. In each passage, there are two factors that affect participants’ choice of tense for the test item. They are the existence/absence of matrix agreement and the existence/absence of a past-time temporal adverbial. In other words, the question is whether the matrix agreement or the tense reminding effect of past-time temporal adverbials imposes a stronger impact on participants’ choice of tense for a test item. I propose that the matrix agreement has a stronger impact on the Chinese High group. As Lin (2003) discusses in his analysis of temporal reference of Chinese relative clauses, a possible answer to the question of how the temporal reference of Chinese relative clauses is determined is that temporal reference of a relative clause is determined by a higher clause that dominates it. I propose that although the test items in the present study do not appear in relative clauses and the language under discussion is English not Chinese, in terms of semantic relations the matrix clause or the simple sentence appearing at the beginning of a passage dominates the simple clause that contains the test item. The temporal reference of the test item is therefore determined by the temporal location of the verb in this first clause / sentence. To the Chinese High group, the impact of matrix agreement on participants’ tense choice for a test item is stronger than the tense reminding effect of past-time temporal adverbials. Therefore, in Experiment 4, when matrix agreement exists, the Chinese High group follows the tense in the matrix clause / simple sentence, and the tense reminding effect of past-time temporal adverbials is not observable. In contrast, in Experiment 5 when matrix agreement does not exist, clear evidence for the tense reminding effect of past-time temporal adverbials for the Chinese High group becomes present.

The Chinese Low group is also subject to the effect of matrix agreement. However, because the participants in the Chinese Low group are at a lower target language development stage than those in the Chinese High group, they are more sensitive to lexical devices than to
verbal morphology. As a result, past-time temporal adverbials have a stronger influence on the Chinese Low group than the matrix agreement. Therefore, in both Experiments 4 and 5, the Chinese Low group shows clear evidence of the influence of past-time temporal adverbials, while the influence of the matrix agreement is not obvious.

6.4 The functional roles of frequency adverbs

Based on the results of previous studies (i.e. Bardovi-Harlig and Reynolds, 1995; Kim, 1995), it is hypothesized that frequency adverbs are associated with a higher usage rate of the present tense in learners’ responses. Moreover, this effect is stronger for learners at a lower proficiency level when compared to those at a higher proficiency level. If this is true, then the appearance of a frequency adverb versus the absence of a frequency adverb should result in more difficulty in the past and less difficulty in the present. At the same time, this pattern should be more obvious in responses from the Chinese Low group than in responses from the Chinese High group.

To test for such an effect, two experiments (i.e. Experiment 6 and Experiment 7) are conducted. In Experiment 6, passages of Type 1 and Type 3 are compared with each other, and the targeted tense choice is the past tense. In Experiment 7 passages of Type 5 and Type 7 are compared with each other, and the targeted tense choice is the present tense. In terms of tense usage, in each pair the two passage types have the same pattern: past – present – past (test item) in Types 1 and 3, and present – past – present (test item) in Types 5 and 7. The only difference between the two passage types in each pair is that a frequency adverb appears together with a test item in one passage type, but not in the other. In order for the hypothesis to be corroborated, Mandarin Chinese-speaking ESL learners should have more difficulty with Type 3 than with
Type 1 because the targeted tense choice for both types is in the past tense, but Type 3 passages include a frequency adverbial. In contrast, the learners should have less difficulty with Type 7 than with Type 5 because the targeted tense choice for both types is in the present tense, but Type 7 passages include a frequency adverbial. Another way to consider the results is that the rate of mismatches between learners’ responses and the targeted tense choices should be higher in Experiment 6 than in Experiment 7.

The test results reveal that in both experiments the effect of passage type is significant, $F(1, 114) = 61.665, p = .000$ in Experiment 6 and $F(1, 114) = 4.744, p = .031$ in Experiment 7. That is, in each experiment all the participants treat the passages with and without frequency adverbs as different passage types. However, the interaction between proficiency and passage type is significant only in Experiment 6, $F(2, 114) = 3.775, p = .026$, and not in Experiment 7, $F(2, 114) = .332, p = .718$. This means that in Experiment 6 the influence of the frequency adverbs on participants’ responses varies according to their English proficiency, while in Experiment 7 this influence is the same for all the three proficiency groups. As we can see in Table 9, in Experiment 6 where the targeted tense choice for all test items is the past tense, all three proficiency groups score much higher in Type 1 (i.e. passages without a frequency adverb) than in Type 3 (i.e. passages with a frequency adverb). This difference is statistically much larger for the Chinese Low group (41.66% difference) than for the Chinese High group (16.67% difference) and the English control group (29.19% difference). In terms of proficiency, there is no significant difference between the Chinese High group and the English control group ($p = 1.000$), but there is a difference with the Chinese Low group, which scores much lower than the other two groups in all cases. Experiment 7, on the other hand, reveals that in the case where the targeted tense choice for a test item is the present tense, although the effect of passage type is
significant and participants in all three groups treat passages with and without frequency adverbs as different passages types, the effect of a frequency adverb is the same for all three proficiency groups. There is no statistically significant proficiency difference among the three groups, F (2,114) = 1.281, p = .282. Both the Chinese High group and the Chinese Low group perform as well as the English control group. Each group achieves a mean percentage of around 90% correct in both Type 5 and Type 7 passages. Within each group the difference in mean percentage between their responses to Type 5 and Type 7 passages is always within a 10% range of variation.

Therefore, the results from Experiments 6 and 7 validate the research hypothesis. The occurrence of a frequency adverb is associated with a higher usage rate of present tense. Moreover, a frequency adverb causes more difficulty with the past tense and less difficulty with the present tense. These results are consistent with the results found in previous studies, and the experiments conducted in the present study are supplementary to previous research.

In Bardovi-Harlig and Reynolds (1995), 2,730 learner responses to 9 activity verbs and 6 stative verbs in the environment of a frequency adverb are analyzed. Results indicate that in a past tense context, no matter whether the frequency adverb occurs with an activity verb or a stative verb, the use of the nonpast increases obviously. Bardovi-Harlig and Reynolds (1995) argue that this increase shows that learners do not recognize an environment with a frequency adverb as an environment for the simple past. They conclude that the distribution of the past is undergeneralized in the grammars of some learners. For these learners, the concept of present is so strongly associated with frequency adverbs that this association overrides (other) contextual cues that establish a past tense context.
Kim (1999) is a similar study. Learners’ past-tense morphological marking of stative verbs and activity verbs with and without the presence of frequency adverbs is analyzed. Kim (1999) finds that the introduction of a frequency adverb appears to enhance the association of the present tense and the verbs. In the learners’ responses to activity sentences in the environment of a frequency adverb, base forms and the simple present occur often. In contrast to activity verbs, the learners’ appropriate use of the simple past with stative verbs drops when a frequency adverb appears in the sentence. In such an environment, the simple present becomes the major competitor to the appropriate form of the simple past, while the use of the base form also increases.

In sum, the results from Bardovi-Harlig and Reynolds (1995) and Kim (1999) are very similar. Both studies find that nonpast forms (i.e. simple present tense and base forms) become the most frequently used alternative to simple past forms when a frequency adverb occurs in a sentence with stative or activity verbs. Kim (1999) proposes that the habitual meaning triggered by the frequency adverb causes the association between the simple present tense and frequency adverbs. Since the past tense is usually associated with the completion of an event or the conclusion of a situation, rather than with a habitual meaning, the presence of a frequency adverb in a sentence may lead leaners to use the past less.

The results of the present study are fully consistent with the results of Bardovi-Harlig and Reynolds (1995) and Kim (1999). All of these studies find that the introduction of a frequency adverb in a past tense context enhances the occurrence of nonpast forms and verbs. The explanations provided in Bardovi-Harlig and Reynolds (1995) and Kim (1999) can be used to explain the difference between the Chinese Low group and the other groups in the present study. That is, learners in the Chinese Low group are distracted by the existence of a frequency adverb
in a past tense context. They undergeneralize the distribution of the past and strongly associate the concept of present with frequency adverbs due to the habitual meaning triggered by such adverbs.

What is new in the present study is that in Bardovi-Harlig and Reynolds (1995) and Kim (1999), all verbs are tested in a past tense context only. In the present study, verbs are tested in both past and present tense contexts. Interestingly, in the present tense context, the Chinese Low group is found to perform as well as the other two groups in response to passages, whether or not they include frequency adverbs. This further confirms the validity of Bardovi-Harlig and Reynolds’s (1995) claim that some learners strongly associate the concept of present with frequency adverbs and Kim’s (1999) explanation that the habitual meaning provided by frequency adverbs contributes to such an association.

What is also new in the present study is that, with respect to the functional roles of frequency adverbs, activity verbs and stative verbs are the only two verb types studied in Bardovi-Harlig and Reynolds (1995) and Kim (1999). In the present study, a new verb type, achievement verbs, is also included. While the present study does not categorize activity verbs and achievement verbs into distinct groups, the overall results indicate that the introduction of achievement verbs does not influence the association between nonpast forms and frequency adverbs. In other words, the present study proves that some learners’ strong association between the nonpast and frequency adverbs and their undergeneralization of the past tense is a more general phenomenon than has been found in previous studies. The results found in the present study suggest that the frequency adverb effect is stronger than the verb class effect predicted by the aspect hypothesis (if such an effect even exists).
A third point that is new in the present study is that in Bardovi-Harlig and Reynolds (1995) and Kim (1999), only second language learners are found to associate the nonpast with frequency adverbs. In the present study, however, English native speakers are found to follow this pattern as well. The results from Experiment 6 in the present study reveal that the English control group as well as the other two Chinese groups distinguish passages with frequency adverbs from passages without frequency adverbs. In a past tense context, each of the three proficiency groups shows a statistically significant lower usage rate of the past tense in passages with frequency adverbs than in passages without them. In terms of the difference in the treatment of these two types of passages, there is no statistically significant difference between the Chinese High group and the English control group, but the Chinese Low group exhibits a statistically significant difference. Their association between the nonpast and frequency adverbs is statistically much stronger than the association found in the results of the other two groups. Therefore, while previous studies find this association to be a phenomenon in language acquisition, the present study provides evidence that the association between frequency adverbs and present also exists in language usage and that it might be universal in language processing. As argued for in Kim (1999), this might be due to the habitual meaning associated with adverbs of frequency. What makes lower level second language learners different from English native speakers is that they overextend the applicability of the rule of associating nonpast with frequency adverbs.

6.5 The influence of the inherent lexical aspectual properties of verbs

Based on the results from the previously reviewed studies, the Mandarin Chinese-speaking ESL learners in the present study are hypothesized to follow the acquisitional sequence
predicted by the Aspect Hypothesis (Robinson, 1990; Anderson & Shirai, 1996; Shirai, 1991), and treat verbs differently according to their inherent lexical aspecual properties. That is, learners will initially restrict past or perfective marking to achievement and accomplishment verbs and later gradually extend this usage to activity and stative verbs. If this is true, then in the cloze test of the present study (i) learners should tend to use the present tense to mark activity verbs and the past tense to mark achievement verbs, and (ii) learners should have a higher usage rate of the present tense to mark activity verbs than achievement verbs, and a higher usage rate of the past tense to mark achievement verbs than activity verbs.

In order to test the validity of the Aspect Hypothesis, participants’ responses to passages of Type G and Type H are analyzed. In both of these passage types, the test items are activity verbs, but the targeted tense choice is the present tense in Type G and the past tense in Type H. In order for the Aspect Hypothesis to be corroborated, learners’ usage rate of the present tense should be very high in both Type G and higher than expected in Type H. Participants’ responses to passages of Type I and Type J are also analyzed. In both of these passage types, the test items are achievement verbs, but the targeted tense choice is the present tense in Type I and the past tense in Type J. In order for the Aspect Hypothesis to be corroborated, learners’ usage rate of the past tense should be higher than expected in Type I and very high in Type J.

The results from the analysis of participants’ responses to the two pairs of passage types do not support the Aspect Hypothesis. In response to each of the four passage types, each of the three proficiency groups presents uses the targeted tense choice over 70% of the time. In other words, the Mandarin Chinese-speaking ESL learners in both experimental groups perform the same as English native speakers, and do not display a biased usage of the present tense to mark activity verbs or a biased usage of the past tense to mark achievement verbs. The only difference
among the three groups is their proficiency. While the usage rate of the targeted tense choice in the Chinese Low group ranges from 70% to 77%, the usage rate in the Chinese High group and the English control group ranges from 80% to 95%.

In the present study, passages of Type G and Type I are also compared with each other (i.e. Experiment 8). In both of these types, the targeted tense choice for all of the test items is the present tense, but the test items are activity verbs in Type G and achievement verbs in Type I. In order for the Aspect Hypothesis to be corroborated, the learners’ usage rate of the targeted tense choice, i.e. the present tense, should be higher in Type G than in Type I. Likewise, passages of Type H and Type J are compared with each other (i.e. Experiment 9). In both of these types, the targeted tense choice for all of the test items is the past tense, but the test items are activity verbs in Type H and achievement verbs in Type J. In order for the Aspect Hypothesis to be corroborated, the learners’ usage rate of the targeted tense choice, i.e. the past tense, should be higher in Type J than in Type H.

The ANOVA test results from the two experiments do not support the Aspect Hypothesis. In both experiments, the effect of passage type is not significant, $p = .639$ in Experiment 8 and $p = .667$ in Experiment 9. This means that in neither the present tense context nor the past tense context do the two Chinese experimental groups and the English control group treat passages with activity verbs and passages with achievement verbs as different passage types. There is no significant interaction between proficiency and passage type in both experiments, $p = .211$ in Experiment 8 and $p = .469$ in Experiment 9. In other words, the effect of passage type is the same on the three proficiency groups in both experiments. The only difference among the three groups is their proficiency, $p = .000$ in both experiments. In both experiments, the Chinese Low
group always shows statistically significant lower proficiency than the other two groups, while the other two groups behave quite similarly to each other.

Therefore, the results in the present study are not consistent with the Aspect Hypothesis, which predicts that learners will initially restrict past or perfective marking to achievement and accomplishment verbs and later gradually extend this usage to activity and stative verbs. In other words, the prediction of the Aspect Hypothesis that in the process of language acquisition learners initially treat verbs differently according to their inherent lexical aspectual properties is not supported. The results from the present study are not consistent with the findings in studies which provide evidence supporting the Aspect Hypothesis (e.g. Bardovi-Harlig and Reynolds, 1995; Bardovi-Harlig, 1998; Collins, 2002; Ayoun and Salaberry, 2008).

One factor that may lead to the difference between the present study and previous studies is the research methods adopted. Most previous studies rely only on spontaneous methods of data collection. In Robinson (1995), oral data is collected by recording students in the form of 30 to 60-minute interviews. In Shirai and Kurono (1998), learners are interviewed and their oral data is collected in a recording studio, using a regular audio-cassette tape recorder. In Bardovi-Harlig (1998), learners’ oral and written data is elicited from a film-retelling task. In Kim (1999), a cloze-type written test, a picture-prompted storytelling, and a film-prompted story telling task are given to learners. In Lee (2001), story narration, story translation, picture description tasks, and spontaneous conversation tasks are used. In Bardovi-Harlig and Bergström (1996) learners are shown an eight-minute excerpt from the silent movie Modern Times and their written narratives about the story in the movie are analyzed. Spontaneous methods of data collection may provide second language learners the opportunity to intentionally avoid the usage of certain vocabulary and grammatical structures in their production of the target language. In other words, researcher
using spontaneous methods of data collection are testing the Aspect Hypothesis only with verbs that the learners are already familiar with. How the inherent lexical aspectual properties of verbs influence learners’ application of tense verbal morphology on verbs can only be revealed in a limited way.

In contrast, the present study uses a very controlled method of data collection. Each participant is given a computer-based cloze test on an individual computer. There is a 40-seconds time limit for participants to respond to each passage in the cloze test, and participants are not allowed to move backward to check or change their answers to previous questions. In addition, all of the passages in the cloze test are in the same format. That is, there are two sentences in each passage, and the test item always appears as the predicate in the second sentence, which is a simple sentence. This controlled method of data collection gives participants unbiased conditions to present how the inherent lexical aspectual properties of a verb might influence the choice of tense. The number of verbs from different aspectual classes is controlled, and participants are unable to avoid verbs with which they are possibly less familiar. In other words, in comparison with previous studies, the present study tests the possible validity of the Aspect Hypothesis in a much more controlled way.

In some previous studies, although a cloze task is also adopted, it is not highly controlled. For example, in Ayoun and Salaberry (2008), the number of verb tokens in their cloze task is not balanced. In both Bardovi-Harlig and Reynolds (1995) and Collins (2002), the same cloze test is used (the one developed by Bardovi-Harlig and Reynolds (1995)). However, this cloze test is in the form of 32 short passages which range in length from one sentence to five sentences. In other words, in this cloze test a test item may appear with or without previous context, with or without following context, or it may appear without any context at all. According to existing research
findings concerning the functional roles of past-time temporal adverbials and frequency adverbs, discussed in sections 5.3 and 5.4, tensed expressions found in a previous context do affect the learners’ choice of tense morphology in the following discourse. Therefore, the learners’ choice of tense morphology in Bardovi-Harlig and Reynolds (1995) and Collins (2002) may be affected by more than the inherent lexical aspectual properties of the verbs. Their tense choice may more or less be affected by the tensed expressions appearing before or after the verbs.

What is also new in the present study is that in previous studies verbs of different lexical aspectual properties are compared in a past tense context only, while in the present study verbs of two different lexical aspectual classes, i.e. activity verbs and achievement verbs, are compared not only in a past tense context, but also in a present tense context. In addition, the association between present tense verbal morphology and activity verbs and the association between past tense verbal morphology and achievement verbs are examined in a new way. That is, activity verbs in present and past tense contexts are compared with each other. Likewise, achievement verbs in present and past tense contexts are compared with each other. In other words, the present study adopts a variety of new methods to test the Aspect Hypothesis.

Finally, another new characteristic of the present study is that its conclusions are based on results from statistical tests, i.e. the Analysis of Variance tests (ANOVA). In contrast, in most previous studies, claims and discussions are based mainly on the learners’ usage rate of certain forms in terms of percentages. In general, this is a much less accurate way of calculation.

To sum up, the present study differs from previous studies in that it adopts a much more careful method of data collection, uses highly controlled cloze tests, uses new methods to test the Aspect Hypothesis, and examines the applicability of the Aspect Hypothesis using a more accurate method of data analysis. When the Aspect Hypothesis is examined under these
conditions, Mandarin Chinese-speaking ESL learners are found not to display a bias when applying tense morphology to verbs with specific lexical aspectual properties, that is to say, the Aspect Hypothesis is not supported.
The present study analyzes empirical evidence to assess the functional roles of the following factors in Mandarin Chinese-speaking ESL learners’ encoding of temporality in their target language, English. These factors are (i) a recency effect, (ii) the number of occurrences of a given tense in the previous context, (iii) the presence of past-time temporal adverbials, (iv) the presence of frequency adverbs, and (v) the inherent lexical aspectual properties of verbs. The findings in the present study indicate that:

1. Despite Chinese-speaking ESL learners’ first language habit of depending on previous context to express temporal locations and relations, the existence/absence of a recency effect based on the previous context does not affect their tense choice for a test item in the following discourse. This may be due to the fact that the learners in the present study are highly proficient Chinese native speakers, and their knowledge of tense, verbal semantic constrains, inherent temporal relationship between actions, world knowledge, and distinctions of time, etc. overrides recency.

2. The number of occurrences of a tense in the previous context influences Mandarin Chinese-speaking ESL learners’ and English native speakers’ tense choice for a test item in the following discourse. Both groups show a tendency to use the tense duplicated in the previous context to mark the test item in the following discourse. This finding indicates that the appearance of this tendency is not a unique phenomenon in language acquisition, but it is a general pattern followed by all language users, including native speakers of a language.
(3) Past-time temporal adverbials are found to be facilitative in Mandarin Chinese-speaking ESL learners’ encoding of past time. Their tense reminding effect is found to have a stronger influence on Mandarin Chinese-speaking ESL learners at the low English proficiency level than on those at the high English proficiency level. The English native speakers in the control group, however, are not affected by the tense reminding effect of past-time temporal adverbials. These findings are consistent with the findings in previous studies on the same topic. The three proficiency groups’ different reactions to the existence/absence of past-time temporal adverbials may be due to the different language development stages they are at. The existence/absence of matrix agreement in passages may also lead to learners’ different reactions to passages with/without past-time temporal adverbials.

(4) The introduction of frequency adverbs is found to be associated with a higher usage rate of the present tense, and to cause more difficulty in a past tense context. These results are consistent with the results from previous studies. Low level Mandarin Chinese-speaking ESL learners undergeneralize the distribution of past and strongly associate the concept of present with frequency adverbs due to the habitual meaning provided by frequency adverbs. What is new in the present study is that the association between frequency adverbs and nonpast forms is found not only in learners’ data, but also in English native speakers’ data. This finding provides evidence that this association exists not only in language acquisition, but also in language usage, and it might be universal in language processing. What makes lower level second language learners different from English native speakers is that they overextend the applicability of the rule of associating nonpast forms with frequency adverbs.

(5) No evidence is found to support the Aspect Hypothesis, which predicts that learners will initially restrict past or perfective marking to achievement and accomplishment verbs and
later gradually extend this usage to activity and stative verbs. In other words, the prediction of the Aspect Hypothesis that in the process of language acquisition learners initially treat verbs differently according to their inherent lexical aspectual properties is not supported in the present study. This finding is contrary to the findings discovered in many previous studies, which support the Aspect Hypothesis. The factor that leads to the difference may be the different research methods adopted. While most previous studies adopt spontaneous methods of data collection, the present study uses highly controlled experiments.

The present study contributes to our understanding of the development of second language learners’ expression of temporal locations and relations in their target language by gathering empirical evidence from a population of learners whose native language differs dramatically from their target language in how temporality is expressed. That is, in the present study, the learners’ native language, Mandarin Chinese, lacks tense and verbal morphology. Pragmatic devices, lexical expressions, aspect markers, lexical verbal semantics, inference rules, and world knowledge, etc. are heavily relied upon to encode temporality. In contrast, in the learners’ second language, English, temporal location is signaled by tense, as well as modals, auxiliary *have*, and time adverbials. The tenses in English are inflectional past and present tenses; future time is conveyed by the modal *will* or present tense and future adverbials.

The findings of the present study address the question of how the mismatch between the grammatical encoding of temporality in a learner’s native language and their second language affects their use of second language tense verbal morphology to express temporal locations and relations in a variety of well-defined linguistic conditions. They also give insight into the process of how a language is acquired.
The results from the experiments in the present study also reveal two interesting phenomena that are not mentioned in previous studies. That is, English native speakers are like second language learners in that they tend to mark a test item in the following discourse with the tense duplicated from the previous context, and they also tend to associate frequency adverbs with nonpast forms. Researchers in previous studies only report the existence of these phenomena in second language learners’ data, assuming that they are solely phenomena in language acquisition. The present study, however, reveals that these phenomena are natural in language usage and processing, rather than special cases in language acquisition. However, because of the focus of the present study, a more thorough analysis on this topic cannot be done. Further studies on the similarities between first language users’ and second language learners’ reaction to some linguistic elements in the encoding of tense/aspect information in a target language are suggested in order to enhance our understanding of how temporality is encoded in human language processing.

Despite the contributions of the present study, the following limitations must also be acknowledged. First, the size of the population in the present study is relatively small. There are only 20 participants in each of the three proficiency groups. In order to make stronger claims about the functional roles of the five factors discussed in the present study, further studies with a larger number of participants are needed. Second, there are a limited number of passages in each of the twelve passage types. That is, there are only three passages with activity verbs and three passages with achievement verbs in each passage type. Future studies with more passages in each passage type are suggested in order to make more general claims about the influences of the linguistic elements discussed in the present study.
APPENDICES

Appendix A: Questionnaire

Participant Number: __________

Questionnaire

1. What is your native / first language? If you are a native speaker of more than one language, please list all the languages that you speak.

2. Do you know other languages?

   If yes, how long have you studied those languages?

   Did you study those languages in school? If not, how did you study those languages?

   Please rate your proficiency in those languages (i.e. low, intermediate, or advanced).

3. What language(s) do you speak at home and at work?

4. Do you watch TV shows in your native language(s) at home? If yes, for how long everyday?

5. Do you watch English TV shows at home? If yes, for how long everyday?

6. Do you read English books / articles everyday?

   If yes, what type (i.e. textbooks, newspapers, novels, journal articles, poems, etc.)?

   How long do you read those books everyday?

7. Do people around you (i.e. family members, roommates, neighbors etc.) speak English most of the time in daily life?
Appendix B: 72 passages of the 12 passage types in the cloze test

Type 1:

11. John danced a cha cha dance in Ms. Brown’s class. She has been teaching John dancing for two years. Ms. Brown ________ (to applaud) John’s big improvement in dancing a cha cha.

12. Sam talked rudely to Peter who sits right next to the door of the classroom. Sam ________ (to yell) at Peter in front of all the students in the classroom.

13. Mary cleaned her brother’s bedroom which smells like cigarettes. Mary ________ (to mop) the floor of her brother’s bedroom with a lot of detergent.

14. Peter called Mary who lives alone in her dormitory on campus. On the phone, Peter ________ (to remind) Mary to send her mother a gift for Mother’s Day.

15. The police caught the robber who lives twelve blocks away from the bank. The police ________ (to receive) a phone call about the robber’s whereabouts from the robber’s sister.

16. Mary had an appointment with Dr. Smith whom her health insurance plan covers as an in-network doctor. Mary ________ (to visit) Dr. Smith because of her ear infection.

Type 2:

21. Sam edited a book which includes stories from around the world. One story in the book ________ (to tell) people interesting traditions in India.

22. Peter recommended his Russian tutor to his grandma who wants to learn Russian. Peter’s Russian tutor ________ (to speak) pure, fluent Russian.

23. The dentist did a full-mouth x-ray for the man who has four big cavities in his mouth. The man ________ (to eat) a lot of sweet food in the late evening.

24. The professor handed out an exercise sheet on chapter 4 which focuses on questions in Russian. The professor ________ (to make) the course materials easier by giving exercises.

25. John left a message with the secretary who works part time in the afternoon at the dean’s office. The secretary ________ (to come) to the office late in the afternoon.

26. Tom bought a new stove which looks better than his old stove. His new stove ________ (to give) off a lot of heat.
Type 3:

31. All afternoon, Peter scolded Daniel, who loves playing video games. Daniel repeatedly ____________ (to argue) about his rights.

32. All summer long, Mary’s brother blamed her for breaking his computer which contains many important files. Mary sometimes ____________ (to cry) over her brother’s harsh words.

33. Alice gave a presentation at a conference which focuses on teaching methods. At the conference, Alice sometimes ______ (to speak) in Spanish and other times in English.

34. Helen had lunch with her father in a restaurant. Her father worries a lot about her health. At the table, he often ____________ (to warn) her about smoking cigarettes.

35. The little boy took a long bath which he likes warm. The mother sometimes ____________ (to add) more warm water into the tub.

36. The man gave a speech which contains long, boring explanations for simple questions. Helen often ____________ (to interrupt) the man with harsh questions.

Type 4:

41. John moved into his new apartment which has a shiny wood floor. John ____________ (to wipe) the floor with a new mop last night.

42. The robber grabbed Mary’s very expensive looking necklace which she wears for social events. Mary ____________ (to scream) loudly for police after the robbery.

43. Peter left home with a parcel, which contains some Christmas gifts. Peter ____________ (to mail) the parcel to his parents in a nearby post office yesterday afternoon.

44. The teacher reviewed the exercises on Lesson 5, which talks about the differences between questions in English and Chinese. The teacher ____________ (to skip) two easy exercises in yesterday’s class.

45. Sam dated Mary who plays the violin at “Dreaming Orchestra.” Sam ____________ (to invite) Mary to an opera last Saturday.

46. John’ mother hired a new tutor for John because he has a lot of difficulty studying math. The new tutor ____________ (to create) some simple but effective exercises for John after last Saturday’s tutoring session.
Type 5:

51. The boss likes the new cashier who just left for the day. The cashier ____________ (to work) part-time in the store.

52. Peter knows the owner of this restaurant who hired waiters with different language backgrounds. Every waiter in this restaurant ____________ (to speak) at least two languages.

53. Sam enjoys the movie which he saw five times with his girlfriend. The movie ____________ (to show) a world with friendship, love, and hope.

54. Mary has an appointment with Dr. Smith who cured her heart disease. Dr. Smith ____________ (to charge) lower price for patients without health insurance.

55. John shows a lot of appreciation to his mother who turned him into a strong healthy guy. John’s mother ____________ (to accept) John’s appreciation with great pleasure.

56. John likes the book which he bought from his school bookstore. His school bookstore ____________ (to provide) a 2% discount to all students in his school.

Type 6:

61. Everyone in the department misses John who transferred to another school. John generously ____________ (to help) everybody in the department.

62. Mary loves this singer who became famous in the 1990’s. She ____________ (to wait) for five hours outside of his hotel for his signature.

63. Everybody knows Helen loved roses. Helen even ____________ (to decorate) the garage with $200 worth of roses.

64. Mary talks to John who worked in the same office as Mary. The boss ____________ (to promote) John to a higher position because of his expertise in data analysis.

65. Sam has a very good impression of Peter who worked in Sam’s company. Peter ____________ (to solve) many problems in Sam’s company quickly and effectively.

66. Mary remembers the flooding which seriously affected her town. The flooding ____________ (to destroy) many places, including the playground near Mary’s house.
Type 7:

71. John cares a lot about his wife who came back home late. John often __________ (to drive) his wife to her office in cold winter.

72. Mary puts on the new silk dress which her mother mailed to her as a gift. Mary sometimes __________ (to wear) a silk dress at work.

73. The teacher feels very angry at Tom who talked loudly on his cell phone in class. Tom often __________ (to bother) other people in class.

74. John walks to the museum with his mother who just came to New York. The museum sometimes __________ (to give) out free tickets to people on weekends.

75. John carries his girlfriend who fell off the horse on his back. The horse often __________ (to injure) inexperienced horse riders.

76. Mary no longer likes clothing of this brand which she spent a lot of money on. This brand’s color sometimes __________ (to fade) easily.

Type 8:

81. Sam describes to me the car accident which injured an old man. The old man __________ (to walk) across the street before the accident.

82. John watches the movie with his uncle who played the part of the spy in the movie. John’s uncle __________ (to work) with the director of this movie several times before this movie.

83. Peter attends the music school where he received $5,000 financial aid. Peter __________ (to practice) singing the new song ten times yesterday.

84. Mary works on her dissertation which she started thinking about earnestly. She __________ (to finish) the first draft last semester.

85. The boss feels very happy with John who, by himself, did three men’s jobs. The boss __________ (to raise) John’s salary last week.

86. The little boy reads the book with his new teacher who taught in a daycare center. The boy __________ (to recognize) very few English words before his new teacher’s arrival.
Type 9:

91. The professor points out a big mistake which appears in John’s paper. John ______________ (to write) his paper without thinking carefully.

92. Mary believes that Peter dislikes her. Peter ______________ (to yell) at her for not closing that door.

93. The little boy likes this particular brand of juice which tastes sweeter. He ______________ (to drink) almost all the juice in this big cup.

94. Helen owns a sunny apartment which faces east. Helen ______________ (to inherit) the apartment from her grandparents.

95. Peter drives a very old car which makes loud noises. Peter ______________ (to purchase) this old second-hand car from his neighbor.

96. Peter lies in bed for the whole day because his leg hurts. Peter ______________ (to ignore) his doctor’s warning about the pain.

Type 10:

101. John does a research project with his wife who also works at the language lab. Researches of this type ______________ (to analyze) monkeys’ inability in learning a human language.

102. Helen washes the blue dress which has white decorations on it. Helen ______________ (to wear) a blue dress to all parties.

103. John studies Chinese calligraphy with Ms. Li who teaches many Chinese classes at the school. John ______________ (to follow) Ms. Li’s directions in writing Chinese calligraphy closely.

104. Peter works for a company which has many offices around the world. Peter ______________ (to move) to new places with different cultures.

105. John cleans up emails in his email box whenever he finds twenty junk emails in his inbox. John ______________ (to remove) junk emails without reading them.

106. Sam works in a hospital emergency room on Saturday and attends classes on Sunday. Sam ______________ (to decline) party invitations on weekends.
Type 11:

111. John wrote an article which got published in this journal. The journal ____________ (to discuss) issues concerning environmental protection.

112. The scientists finished the research under the leadership of a new supervisor who graduated from Queens College. This type of research ____________ (to help) in developing course materials for special education.

113. Paul trained a lot for the marathon in which he participated. Paul ____________ (to run) for good health.

114. Mary looked for a great bargain on shoes in the mall. She eventually got one pair of boots for $30. Mary ____________ (to buy) discounted things because of her bad financial condition.

115. Peter got admitted to the college which he applied for with the famous writer’s recommendation letter. The college ____________ (to accept) students under 16 years old.

116. Sam took the medicine which his doctor prescribed. The medicine ____________ (to reduce) patients’ pain with few side-effects.

Type 12:

121. Peter won the competition which took place in this school. Peter ____________ (to answer) each test question carefully.

122. Sam argued angrily with Helen who annoyed a lot of people in the neighborhood. Helen ____________ (to yell) at Sam with her sharp voice.

123. Sam saw a lot of smoke from the house and firefighters came. The house ____________ (to burn) with a strong smell.

124. Mary got lost in the small town and she became very nervous. A nice lady in the street ____________ (to point) out the right direction to her.

125. John called Mary who worked as a substitute teacher in his school. Mary ____________ (to receive) John’s party invitation with pleasure.

126. Both of the two kids felt very hungry and both wanted the pancake. The mother ____________ (to divide) the pancake into two pieces for the kids.
BIBLIOGRAPHY


