Second Language Acquisition of Temporal Meanings Without Tense Morphology: The Case of *zai* and *le* in Mandarin Chinese

Xiaolong Lu *

University of Hawai'i at Mānoa, United States

Abstract

This study replicates Slabakova's (2015) research by conducting temporal interpretation choice test, the goal is to examine whether learners of Chinese could interpret temporal meanings without tense morphology. The aspectual morphemes *zai* and *le* are chosen as case study, and three revised hypotheses are proposed based on form-meaning mapping approach (DeKeyser, 2005). Forty bilingual native speakers, 40 CHN 201 learners, and 40 CHN 301 learners with English as their native language took this test. The test results indicate that the data of native speakers of Chinese can basically support the first two hypotheses, but cannot support the third one. Similarly, the data from all the learners can support the first two hypotheses but cannot support the third one. The match between learners' and native speakers' performances on the test is also discussed.

Keywords: temporal interpretation; aspectual morphemes; form-meaning mapping; Chinese

INTRODUCTION

Tense is a category that expresses time reference with reference to the moment of speaking (Comrie, 1976). The second language acquisition of tense has long been studied since 1990s. (Bardovi-Harlig, 1994, 1995, 2000; Dietrich et al., 1995; Rohde, 1996; Shirai et al., 1998; Salaberry et al., 2002; Wulff et al., 2009; Slabakova, 2015). It is acknowledged that Mandarin Chinese does not mark past, present, or future with dedicated morphemes, but the native English of the learners does. For example, the -ed in English is argued to be a perfective (aspect marker) and a past (tense marker) at the same time, so the sentences like "John kicked the ball" can be interpreted as either a completed event or a past event. In contrast, it seems that Mandarin Chinese does not allow a dedicated inflection to mark past but a time expression is needed. A case mentioned by Slabakova (2015) is "*Zhāngsān* (3rd person singular) 1989 *nián* (year) *zhù* (live) *zài* (at) *zhèr* (here)", meaning that Zhangsan lived here in 1989. In this regard, the past tense in Chinese is usually indicated by the time expression instead of inflection, and the same goes for the present or future tense.

---

* Correspondence: Xiaolong Lu, Email: xlu6@hawaii.edu

LITERATURE REVIEW

Theoretical underpinning

In this study I also adopt the form-meaning mapping approach proposed by DeKeyser (2005), it argues that the transparency of form–meaning relationships should be at the heart of linguistic difficulty. So, it is considered to be "difficult to learn a grammatical meaning when transparency of form-meaning relationships is lacking" (p. 3).

Problem of Slabakova's study (2015)

In Slabakova's experimental study, she adopts the deictic pattern, which is formulated by Smith and Erbaugh (2005, p. 715):

a. Unbounded situations are located in the present.

b. Bounded events are located in the past.

She argues that there exists a universal deictic pattern, whereby unbounded situations are located in the present and bounded events are located in the past. (Smith & Erbaugh, 2005).

Therefore, her three predictions are:

H1. Native speakers of Chinese will obey the deictic principle and will choose the interpretations predicted by it.

H2. Learners of Chinese are expected to behave in one of two ways:

a) If learners' behavior closely follows that of bilingual native speakers, then such findings point to the operation of the universal deictic principle in second language comprehension.

b) If, on the other hand, learners diverge considerably from the native performance, such findings support the contention that one-meaning-to-many-expressions learning situations are challenging in second language acquisition (cf. De Keyser, 2005).

However, the problem of Slabakova's study rests in her findings that did not fully support the deictic principle, on the grounds that part of her data cannot show the exact tendency predicted by the deictic principle. For example, in Figure 2 of her article, the interpretation of bare states by native speakers could reach 50.70% in present choice, but the both choice could be reached for 44.30%. In this regard, there is no obvious gap between past choice and present choice, which is not consistent with the present interpretation predicted by the deictic principle. Additionally, in Figure 4, the interpretation of RVC plus accomplishments by intermediate learners only reaches 35.20% in the past choice, but the percentage for the present choice is 38.40%. Therefore, this group of participants seem not to obey the deictic principle which predicts that the RVC plus accomplishments as bounded events should be interpreted as past tense.

New hypothesis and research question

In Slabakova's (2015) research, it is emphasized that "the behavior of native speakers is important in the present experiment for one more reason: They provided the input to

which the Mandarin learners are exposed. In order to acquire the expressions of Chinese temporality, learners have to track the narrative context, the discourse cues, the lexical and viewpoint aspect cues as provided by Chinese native speakers and teachers. (p. 299)"
In this respect, the performance of native speakers in her research can reflect the relationship between potential choice and different conditions. Her data shows that if the aspectual morphemes of Chinese indicate perfective, the percentage of being interpreted as past is 92.1% for the whole sentence containing RVC+viewpoint *le* construction, for example. And if the aspectual morphemes of Chinese indicate imperfective, the ratio of being understood as present is 92.9% for the whole sentence containing *zai*, for instance. Also, if the aspectual morphemes of Chinese indicate nothing, the percentage of being interpreted as either present or past (both) is 44.3% for the whole sentence containing bare states, for example.

Therefore, the motivation of my revised hypotheses hinges on theoretical basis and Slabakova's research data, and three revised hypotheses are formulated as follows:

H1. If the aspectual morphemes of Chinese indicate perfective, then the whole sentence tends to be interpreted as past;

H2. If the aspectual morphemes of Chinese indicate imperfective, then the whole sentence tends to be interpreted as present;

H3. If the aspectual morphemes of Chinese indicate nothing, then the whole sentence tends to be interpreted as either present or past;

Here comes my three research questions:

(1) Did the performance of Chinese native speakers support my hypothesis?

(2) Did the performance of learners match the performance of Chinese native speakers?

(3) Did the performance of learners support my hypothesis?

In order to answer these questions, a Chinese test is needed to examine whether my collected data could support the above three hypotheses.

METHOD

Participants

To avoid misunderstanding of all the provided sentences, all the words used are from *Integrated Chinese 1* (elementary level) and *Integrated Chinese 2* (intermediate level). I recruited 80 learners of Chinese as participants. Their proficiency levels are mainly intermediate like CHN 201 (40 persons) and near-advanced like CHN 301 (40 persons). The learners of Chinese in elementary levels are excluded because the difficulty of words or sentence structures in my designed questions is higher than their levels. Another 40 native speakers of Chinese who are bilingual (English L2) are needed to compare with learners as well, and they were all stayed in China since their childhoods.

Procedure

I designed the temporal interpretation choice task in this study. This test is only available to the Mandarin-native and English-native participants in the local place. Invitations to

participants were distributed in Chinese CHN 201 and 301 classes at one American university through personal connections. Firstly, participants need to carefully read the confidentiality agreement and sign on the forms. Then, participants need to report their background information (L1 language and years of learning Chinese) before doing their tests. Their answers are told to be anonymous. All the tests are conducted at home, but it is suggested that participants should carefully treat every question and spend about 10 to 15 minutes finishing their tests. The $5 as benefit will be given to each participant after the test.

Materials

There is one paper and pencil test with confidentiality agreement form attached in this study. The temporal interpretation choice task include 27 test sentences (9 conditions $\times$ 3 questions = 27 questions), which are presented by using Chinese characters and Pinyin, and English sentences are used as interpretive options. The first option is a past interpretation, the second comes with a present interpretation, the third one is always Both, the last one is always Neither.

Goal

To find out whether intermediate classroom learners of Chinese (CHN 201-301) will be able to adequately comprehend the temporal reference of sentences in isolation, without context and without adverbials.

Sample Design

Instructions: You only need to figure out the TENSE for each sentence and make your single choice. Please carefully treat every question. Suggested time: 10-15 minutes.

Sample question in the temporal interpretation choice task:

<div align="center">

tā chī le zhōng guó cài

他 吃 了 中　　国 菜。

</div>

      A. <u>He ate Chinese food.</u>

      B. He eats Chinese food.

      C. Both A and B are possible.

      D. Neither A and B is possible.

In the above test sample, the expected interpretation is the underlined choice. This question is to test whether learners could interpret one of the nine conditions: viewpoint aspect *le* + activity, because when the aspect marker *le* is used with activity verbs like *chi* 'eat', the V+*le* pattern indicates a completed activity, the tense should be the past. The other eight conditions with their expected interpretations include: bare states (present or past), bare activities (present or past), accomplishments+*zai* (present), achievement+ viewpoint *le* (past), RVC+accomplishment (present or past), viewpoint aspect *le* +accomplishment (past), RVC+viewpoint *le* (past), viewpoint aspect *zai*+activity

(present), achievements+ viewpoint *le* (past). These 9 conditions as well as designed questions can be seen in Appendix.

Coding

There is no absolutely right or wrong answer for each question in the test, but the performances by Chinese native speakers can serve as reference. If these natives could reach the same choice for above 10%, that means that the choice is reliable and native speakers show a tendency to interpret temporal meanings. The same goes for learners of Chinese in different levels.

RESULTS

Since this task offered participants four temporal interpretations to choose from, the results are in the form of choices, labeled Past, Present, Both, and Neither for short. Choice percentage will be considered in terms of performances by participants in this task.

Table 1. Percentage choice of bare states

Participants Percentage Choice	Native speakers (n=40)	CHN 201 (n=40)	CHN 301 (n=40)
Past A	6/ 120 (4.8%)	0/ 120	0
Present B	57 / 120 (47.6%)	104/ 120 (86.7%)	32/ 120 (26.7%)
Both C	57 / 120 (47.6%)	16/ 120 (13.3%)	88/ 120 (73.3%)
Neither D	0	0	0

From Table 1 we can see that most of performances by learners from two different proficiency levels cannot actually match the performances by native speakers. For example, 47.6% of native speakers tend to choose B and C as their major interpretations, but the highest percentage of performances (86.7%) by learners in CHN 201 do not actually match native speakers who choose B as one of their primary interpretations. Similarly, for learners in CHN 301, the ratio of their performances (73.3%) are not consistent with native speakers who choose C (both) as one of their primary interpretations (47.6%). The only similarity is that none of these groups chooses D as their interpretations in the test.

Table 2. Percentage choice of bare activities

Participants Percentage Choice	Native speakers (n=40)	CHN 201 (n=40)	CHN 301 (n=40)
Past A	0	0	0
Present B	102 / 120 (85.7%)	108/ 120 (90%)	80/ 120 (66.7%)
Both C	11/ 120 (9.2%)	12/ 120 (10%)	40/ 120 (33.3%)
Neither D	7/ 120 (5.1%)	0	0

It is observed from Table 2 that the performances of learners of Chinese can partially match native speakers'. In group of native speakers, for example, the highest percentage of choice is B (85.7%) which is close to the highest percentage (90%) of choice in CHN 201 group. On the contrary, 66.7% of CHN 301 learners as the majority share B interpretations, the data is quite different from native speakers' (85.7%). It has also been

noticed that none of these groups tends to interpret target sentences as past tense, the A choice.

Table 3. Percentage choice of accomplishments+*zai*

Participants Percentage Choice	Native speakers (n=40)	CHN 201 (n=40)	CHN 301 (n=40)
Past A	0	0	0
Present B	57/ 120 (47.6%)	116/ 120 (96.6%)	88/ 120 (73.3%)
Both C	57/ 120 (47.6%)	0	24/ 120 (20%)
Neither D	6/ 120 (4.8%)	4/ 120 (3.4%)	8/ 120 (6.7%)

The data in Table 3 indicates that the performances of learners of Chinese cannot generally match the performances of native speakers. For instance, the highest percentage for the performances of native speakers is 47.6%, which is shared by both B choice and C choice. However, 96.6% of learners from CHN 201 choose B as their major interpretations, the data is quite different from native speakers' (47.6%). The same goes for CHN 301 learners, 73.3% of these learners share B interpretation, their data is therefore different from native speakers' (47.6%). Noticeably, only the data from D choice shows that all groups seem not to interpret target sentences as neither present nor past tense.

Table 4. Percentage choice of achievement+Viewpoint *le*

Participants Percentage Choice	Native speakers (n=40)	CHN 201 (n=40)	CHN 301 (n=40)
Past A	97/ 120 (80.9%)	112/ 120 (93.2%)	104/ 120 (86.6%)
Present B	0	0	0
Both C	17/ 120 (14.2%)	4/ 120 (3.4%)	16/ 120 (13.4%)
Neither D	6/ 120 (4.9%)	4/ 120 (3.4%)	0

The data in Table 4 shows that the performances of learners of Chinese can basically match the performance of native speakers. For example, the data signifies that the percentage of A choice (past) made by the native speakers is the biggest one (80.9%), which is not far from the percentage (93.2%) of CHN 201 learners who choose A as their primary interpretations. Also, 86.6% of learners from CHN 301 share A interpretation, which basically meets the tendency shown in native speakers (80.9%). It is worthwhile to point out that all the groups show no present interpretation as shown in the B choice, and they all have small percentage of C and D choices as well.

Table 5. Percentage choice of RVC+accomplishment

Participants Percentage Choice	Native speakers (n=40)	CHN 201 (n=40)	CHN 301 (n=40)
Past A	81/ 120 (66.6%)	68/ 120 (56.6%)	16/ 120 (13.4%)
Present B	5/ 120 (4.8%)	32/ 120 (26.7%)	24/ 120 (20%)
Both C	5/ 120 (4.8%)	8/ 120 (6.7%)	32/ 120 (26.6%)
Neither D	29/ 120 (23.8%)	12/ 120 (10%)	48/ 120 (40%)

The data in Table 5 manifests that the performances of learners of Chinese cannot generally match the performances of native speakers. For example, the percentage of performances by native speakers is a lion's share (66.6%), which is a little close to the highest percentage (56.6%) of performances by CHN 201 learners. However, most of learners (40%) from CHN 301 share D interpretation, the data is quite different from the percentage (23.8% for D) shown in native speakers. What's more, the percentage of B choice is also divergent between native speakers (4.8%) and learners (26.7% for CHN 201 and 20% for CHN 301).

Table 6. Percentage choice of viewpoint aspect *le*+accomplishment

Participants Percentage Choice	Native speakers (n=40)	CHN 201 (n=40)	CHN 301 (n=40)
Past A	120/ 120 (100%)	116/ 120 (96.6%)	96/ 120 (80%)
Present B	0	0	0
Both C	0	4/ 120 (3.4%)	24/ 120 (20%)
Neither D	0	0	0

The data in Table 6 indicates that the performances of learners of Chinese can basically match the performances of native speakers. Take native speakers for example, the percentage of their A choice is a perfect 100%, which is quite close to the percentage (96.6%) of CHN 201 learners who choose A as their interpretations. Likewise, 80% of learners from CHN 301 share A interpretation, which meets the tendency shown in native speakers (100%). Moreover, it seems that none of these groups choose B and D as their interpretations.

Table 7. Percentage choice of RVC+viewpoint *le*

Participants Percentage Choice	Native speakers (n=40)	CHN 201 (n=40)	CHN 301 (n=40)
Past A	91/ 120 (76.2%)	108/ 120 (90%)	112/ 120 (93.3%)
Present B	0	0	0
Both C	0	0	0
Neither D	29/ 120 (23.8%)	12/ 120 (10%)	8/ 120 (6.7%)

The data in Table 7 shows that the performances of learners of Chinese can basically match the performances of native speakers. For native speakers, the highest percentage (76.2%) of their A choice is a little close to the ratio (90%) of CHN 201 learners'. In similar fashion, 93.3% of learners from CHN 301 share A interpretation, which meets the tendency shown in native speakers (76.2%). In the end, it is commonly found that none of these groups choose B and C as their interpretations.

Table 8. Percentage choice of viewpoint aspect *zai*+activity

Participants Percentage Choice	Native speakers (n=40)	CHN 201 (n=40)	CHN 301 (n=40)
Past A	0	4/ 120 (3.4%)	0
Present B	51/ 120 (42.8%)	108/ 120 (90%)	96/ 120 (80%)
Both C	69/ 120 (57.2%)	0	24/ 120 (20%)
Neither D	0	8/ 120 (6.6%)	0

The data in Table 8 tells that the performances of learners of Chinese cannot actually match the performances of native speakers. For example, the highest percentage of performances by native speakers reaches 57.2% (C choice), however, CHN 201 learners did not actually show any C interpretation and CHN 301 learners only showed 20% for C choice. In this regard, there is a big difference between learners' performances and native speakers' in terms of C choice. The data also signifies that 90% of learners from CHN 201 choose B as their interpretations, which is not quite consistent with native speakers (42.8%). In addition, 80% of learners from CHN 301 share B interpretation, which cannot meet the tendency (C choice) shown in native speakers as well.

Table 9. Percentage choice of viewpoint aspect *le*+activity

Participants Percentage Choice	Native speakers (n=40)	CHN 201 (n=40)	CHN 301 (n=40)
Past A	97/ 120 (80.9%)	112/ 120 (93.2%)	96/ 120 (80%)
Present B	6/ 120 (4.8%)	0	0
Both C	0	4/ 120 (3.4%)	24/ 120 (20%)
Neither D	17/ 120 (14.3%)	4/ 120 (3.4%)	0

The data in Table 9 shows that the performances of learners of Chinese can basically match the performances of native speakers. For instance, the percentage of A choice made by native speakers is a lion's share (up to 80.9%), which is not very far from the percentage (93.2%) of A choice shown in CHN 201 learners. In the same way, 80% of learners from CHN 301 share A interpretation, which meets the tendency shown in native speakers (80.9%). It is worth pointing out that almost all the groups show no present interpretations, except for one case in the group of native speakers.

Let's finally make a table to summarize the match between learners' and native speakers' data in terms of these nine conditions.

(CNS: Chinese native speakers; CHL: CHN 201+301 learners; C1: Condition 1 as shown in Table 1, C2: Condition 2 as shown in Table 2.)

Table 10. Match between learners and NS performances

Condition Match Participants	C1	C2	C3	C4	C5	C6	C7	C8	C9
CNS CHL	No Match	Partially Match	No Match	Match	No Match	Match	Match	No Match	Match

As illustrated from Table 10, the good match between learners and Chinese native speakers can be only seen in condition 4, 6, 7 and 9. Condition 2 is a case showing that learners' performance can partially match native speakers', and no match is found in the rest of conditions.

The percentage of choices made by learners and native speakers in nine conditions is shown below:
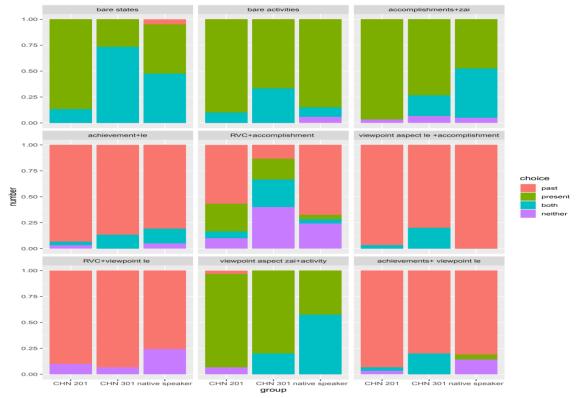
Figure 1. Percentage of choices made by learners and native speakers

DISCUSSION

As previously stated, the objective of this experimental study was to find out whether American learners of Mandarin Chinese will be able to fully comprehend the temporal reference of sentences in isolation and in context, in the absence of dedicated temporal morphology.

Let's interpret the results in 3.7 first. From Table 1 we know that firstly, the performance of Chinese native speakers can partially support the H3. It is predicted that if the aspectual morphemes of Chinese indicate nothing, then the whole sentence tends to be interpreted as either present or past. The data shows that 47.6% of native speakers tend to choose C (both) as their interpretations, this coincides with the H3 prediction. However, 47.6% of native speakers choose B (present) as their interpretations, which is not consistent with H3 prediction. Secondly, the performances of learners can partially support H3. The percentage of their present interpretation (B) could reach 86.7% when these learners are from CHN 201, this cannot meet the H3 prediction which tells the choice C is the expected answer. In contrast, the percentage of their both interpretation (C) could reach 73.3% in CHN 301 learners, this reflects the match between their actual performances and the expected C choice.

Table 2 shows that firstly, the performances of native speakers cannot support H3. According to the H3 prediction, choice C (both) should be the interpretation. However, the data tells that the ratio of C choice is only 9.5%. Also, the performances of learners of Chinese cannot support H3 either. Because the possibility of C choice in CHN 201 is only

10% in CHN 201 and 33.3% in CHN 301, the majority of their interpretations focus on B choice.

The data in Table 3 indicates that the performances of native speakers can partially support H2. According to the H2 prediction, choice B (present) should be the expected interpretation. For the performances of native speakers, the percentage of B choice is 47.6% but the ratio of C choice is also 47.6%. This is to say that native speakers sometimes could interpret target sentences as present or past, not just as present alone. Besides, the performances of learners of Chinese can fully support H2. The possibility of B choice in CHN 201 is up to 96.6% in CHN 201 and 73.3% in CHN 301, so the majority of learners' interpretations focus on B choice, the present tense.

Table 4 tells us that firstly, the performances of native speakers can fully support H1. According to the H1 prediction, choice A (past) should be the interpretation. The data shows that the percentage of A choice is up to 80.9%, which counts for the biggest part. Also, the performances of learners of Chinese can fully support H1. The possibility of A choice in CHN 201 is 93.2% in CHN 201and 86.6% in CHN 301, so the majority of their interpretations focus on A choice. This is to say that in most cases learners could interpret target sentences as past tense.

The data in Table 5 manifests that firstly, the performances of native speakers cannot actually support H3. According to the H3 prediction, choice C (both) should be the interpretation. However, the percentage of C choice is only 4.8%, this means that native speakers might not interpret target sentences as either present or past very often. Moreover, the performances of learners of Chinese cannot support H3 at all. The reason is that the probability of C choice in CHN 201 is only 6.7% in CHN 201 and 26.6% in CHN 301, and the majority of CHN 201 and CHN 301 learners' interpretations focus on A choice and D choice, respectively. This is to say that mostly learners may not interpret target sentences as both tenses.

The data in Table 6 indicates that the performances of native speakers can fully support H1. According to the H1 prediction, choice A (past) should be the interpretation. The percentage of A choice (100%) well reflects native speakers' trends in their interpretations. Furthermore, the performances of learners of Chinese can fully support H1. Because the possibility of A choice in CHN 201 is 96.6% in CHN 201 and 80% in CHN 301, this is to say that in most cases learners could interpret target sentences as past tense.

From Table 7 we know that the performances of native speakers can basically support H1. According to the H1 prediction, choice A (past) should be the interpretation. The data shows that the percentage of A choice is up to 76.2%, this indicates that the majority of native speakers choose past tense as their interpretations.What's more, the performances of learners of Chinese can fully support H1 as well. The possibility of A choice in CHN 201 is 90% in CHN 201 and 93.3% in CHN 301, this means that most learners tend to interpret target sentences as past tense.

Table 8 tells that the performances of native speakers can partially support H2. According to the H2 prediction, choice B (present) should be the interpretation. However, the data

shows that the percentage of B choice is only 42.8% which is the second biggest percentage in this group, it is hard to prove that native speakers could interpret target sentences as present tense.

In contrast, the performances of learners of Chinese can fully support H2. The probability of B choice in CHN 201 is up to 90% in CHN 201 and 80% in CHN 301, this is to tell that the majority of their interpretations focus on present tense.

As we can see from Table 9, the performances of native speakers can almost support H1. According to the H1 prediction, choice A (past) should be the interpretation. The data tells that the percentage of A choice is the highest one (80.9%), meaning that most of native speakers could understand the target sentences as past tense. By the same token, the performances of learners of Chinese can fully support H1. Because the possibility of A choice in CHN 201 is 93.2% in CHN 201 and 80% in CHN 301, this means that the majority of their interpretations focus on A choice, the past tense.

Based on previous analysis, a table can be made to summarize different conditions regarding the match between performances of native speakers and hypothesis, between the performances of learners and hypothesis. Details can be shown below:

Table 11. Match between hypotheses, native speakers and learners

Participants Match Hypotheses	Native speakers (N=40)	CHN 201 learners (N=40)	CHN 301 learners (N=40)
Condition 1: H3 (bare states)	Partially support	Cannot support	Support
Condition 2: H3 (bare activity)	Cannot support	Cannot support	Cannot support
Condition 3: H2 (accomplishment+*zai*)	Partially support	Support	Support
Condition 4: H1 (achievement+*le*)	Support	Support	Support
Condition 5: H3 (RVC+accomplishment)	Cannot support	Cannot support	Cannot support
Condition 6: H1 (*le*+accomplishment)	Support	Support	Support
Condition 7: H1 (RVC+*le*)	Support	Support	Support
Condition 8: H2 (*zai*+activity)	Partially support	Support	Support
Condition 9: H1 (*le*+activity)	Support	Support	Support

In the beginning, from above we know that in general, the data from native speakers of Chinese in the test can fully support H1, evidences can be shown in condition 4, 6, 7, and 9, this demonstrates that Chinese native speakers tend to interpret the sentences containing perfective markers *le* as past tense. And, the data from native speakers can partially support H2 as shown in condition 3 and 8, this means that sometimes Chinese native speakers interpret sentences involving imperfective marker *zai* as present tense but sometimes do not. On the contrary, the data from native speakers cannot fully support

H3 as shown in condition 1, 2, and 5, this reveals that most of the time Chinese native speakers interpret sentences without any perfective and imperfective markers as neither present nor past, or simply present, or simply past.

Then, it is also observed that the overall data from CHN 201 learners in the test can fully support H1, evidences can be found in condition 4, 6, 7, and 9, this demonstrates that CHN 201 learners tend to interpret the sentences containing perfective markers *le* as past tense. And, the data from these learners can fully support H2 as shown in condition 3 and 8, this means that these learners usually interpret sentences involving imperfective marker *zai* as present tense. In contrast, the data from these learners cannot actually support H3 as shown in condition 1, 2, and 5, this reveals that most of the time CHN 201 learners interpret sentences without any perfective and imperfective markers as neither present nor past, or simply present, or simply past.

Furthermore, as illustrated in the above table, the data from CHN 301 learners in the test can fully support H1, evidences can be shown in condition 4, 6, 7, and 9, this proves that CHN 301 learners tend to interpret the sentences containing perfective markers *le* as past tense as well. And, the data from these learners can fully support H2 as shown in condition 3 and 8, this means that in most cases these learners interpret sentences involving imperfective marker *zai* as present tense. By contrast, the data from these learners cannot support H3 as indicated in condition 2 and 5, but it seems that H3 is only supported in condition 1. This reveals that in limited cases CHN 301 learners interpret sentences without any perfective and imperfective markers as either present or past, but most of the cases could show the interpretation of these learners as neither present nor past, or simply present, or simply past.

Finally, as Table 10 shows, the good match between learners and Chinese native speakers' performances can be embodied in four conditions, such as condition 4 (achievement+Viewpoint *le*), condition 6 (viewpoint aspect *le*+accomplishment), condition 7 (RVC+viewpoint *le*) and condition 9 (viewpoint aspect *le*+activity). The partial match is found in condition 2 (bare activities), but other conditions cannot reflect the match between learners and native speakers. This indicates that only in the conditions containing the viewpoint aspect *le*, the native judgments and learner choices tend to be consistent.

CONCLUSION

In this research I examine the acquisition of temporal meanings without tense morphology in Chinese, two aspectual morphemes (*zai* and *le*) are chosen as case study. Based on Slabakova's study (2015), I propose three revised hypotheses and aim to test the learners' interpretation of the temporal reference of Chinese sentences in isolation, without context and without adverbials. A temporal interpretation choice test is conducted among participants from classes ranging from intermediate to advanced levels, the data from native speakers is also compared with learners' after the test.

For my first research question, the result shows that the data from native speakers of Chinese can fully support H1, can partially support H2, but cannot actually support H3. Regarding my second research question, the result reveals that the good match between

learners and Chinese native speakers can be only seen in several conditions containing the viewpoint aspect *le*, the partial match is found in one condition containing bare activities, other conditions cannot reflect the match between learners and native speakers' performances. In terms of my third research question, the result signifies that (a) the data from CHN 201 learners can fully support H1 and H2, but cannot support H3; (b) the data from CHN 301 learners can fully support H1 and H2, but can hardly support H3. All in all, the data from all the learners in the test can actually support H1 and H2 but cannot support H3, it is safe to say that H3 does not work very well for both native speakers and learners of Chinese.

The limitations of my study need to be considered as well: (a) several sentences in my test design are not acceptable based on language intuition from native speakers. For instance, *ta* (3rd person singular) *da* (play) *le* (prefective marker) *qiu* (ball), this sentence is not complete so more information should be added after this sentence; (b) the test only requires participants to do as their take-home assignments, participants probably refer to some resources for answers or ask someone else for help. In this respect, their performances on this test might not be reflected very accurately. Future test will require participants to sit in a room with a controlled time; (c) the test form can be also improved, since the paper and pencil test allows participants to check previous questions easily. By using screenshot instead, participants will be exposed to each question at one time, in this sense, they cannot check back to get some clues from questions containing the similar conditions; (d) learners' backgrounds are a little more complicated, which could more or less affect the test result. For instance, there are three CHN 201 participants whose L1 backgrounds are Vietnamese, Spanish, and English plus Chinese (bilingual), respectively. Moreover, there is two CHN 301 participants whose L1 background is Burmese and another one is Spanish. Further study will focus on participants who unanimously have L1 English L2 Chinese backgrounds, in order to obtain a more reliable result.

It is believed that this replication study will pave the way for further investigation of L2 acquisition of temporal meanings in Chinese and beyond.

REFERENCES

Bardovi-Harlig, K. (1994). Reverse order reports and the acquisition of tense: Beyond the principle of chronological order. *Language learning*, 44(2), 243-282.

Bardovi-Harlig, K., & Reynolds, D. W. (1995). The role of lexical aspect in the acquisition of tense and aspect. *TESOL Quarterly*, 29(1), 107-131.

Bardovi-Harlig, K. (2000). Tense and aspect in second language acquisition: form, meaning, and use. *Language Learning: A Journal of Research in Language Studies*, 50, 1.

Comrie, B. (1976). *Aspect: An introduction to the study of verbal aspect and related problems* (Vol. 2). Cambridge university press.

DeKeyser, R. (2005). What makes learning second language grammar difficult? A review of issues. *Language Learning*, 55, 1–25.

Dietrich, R., Klein, W., & Noyau, C. (1995). *The acquisition of temporality in a second language* (Vol. 7). John Benjamins Publishing.

Rohde, A. (1996). The aspect hypothesis and the emergence of tense distinctions in naturalistic L2 acquisition. *Linguistics*, 34(5), 1115-1138.

Salaberry, M. R., & Shirai, Y. (Eds.). (2002). *The L2 Acquisition of Tense Aspect Morphology* (Vol. 27). John Benjamins Publishing.

Shirai, Y., & Kurono, A. (1998). The acquisition of Tense-Aspect marking in Japanese as a second language. *Language learning*, 48(2), 279-244.

Slabakova, R. (2015). Acquiring temporal meanings without tense morphology: The case of L2 Mandarin Chinese. *The Modern Language Journal*, *99*(2), 283-307.

Smith, C., & Erbaugh, M. (2005). Temporal interpretation in Mandarin Chinese. *Linguistics*, 43, 713– 756.

Wulff, S., Ellis, N. C., Römer, U., Bardovi–harlig, K., & Leblanc, C. J. (2009). The acquisition of tense–aspect: Converging evidence from corpora and telicity ratings. *The Modern Language Journal*, 93(3), 354-369.

APPENDIX

Condition	Number of questions	Example	Expected interpretation
Bare states	3	Wang Laoshi feichang **gaoxing** Wang teacher very happy 'Teacher Wang is very happy.' Li Laoshi hen **piaoliang** Li teacher very pretty 'Teacher Li is very pretty.' Xiao Gao feichang **mang** Xiao Gao very busy 'Xiao Gao is very busy.'	Present or Past
Bare activities	3	Ta **he** kafei he drink coffee 'He drinks coffee.' Ta **da** lanqiu He play basketball 'He plays basketball.' Wo **chang** yingwen ge I sing English song 'I sing English songs.'	Present or Past
Accomplishments +*zai*	3	Xiao Wang **zai kan yi-ge dianying** Xiao Wang Asp watch one movie 'Xiao Wang is watching a movie.' Wang Peng **zai da yi-ge dianhua** Wang Peng Asp make one phone.call 'Wang Peng is making a phone call.' Xiao Yin **zai he yi-bei cha** Xiao Yin Asp drink one-cup tea 'Xiao Yin is drinking a cup of tea.'	Present
Achievements+ Viewpoint *le*	3	Ta **diao le** ta-de zhaopian He drop Asp his picture 'He dropped his picture.' Ta **diu le** ta-de shu He lose Asp his book 'He lost his book.'	Past

	Wo **wang le** ta-de shengri I forget Asp her birthday 'I forgot her homework.'		
RVC+accomplishment	3	Ta **da-po huaping** He break vase 'He broke the vase.' Wo **he-wan cha** I drink-finish tea 'I drank the tea.' Ta **chi-wan dangao** He eat-finish cake 'He ate the cake.'	Past or Present
6. Viewpoint aspect *le* + accomplishment	3	Ta he **le yi-ping kele** He drink Asp one-bottle coke 'He drank a bottle of coke.' Ta da **le yi-ge dianhua** He make Asp one phone.call 'He made a phone call.' Ta du **le yi-ben shu** He read Asp one book 'He read a book.'	Past
7. RVC+viewpoint *le*	3	Wo **kan-wan-le** dianshi I watch-finish-Asp TV 'I watched TV.' Ta **he-wan-le** niunai He drink-finish-Asp milk 'He drank the milk.' Wo **chi-wan-le** wanfan I eat-finish-Asp dinner 'I ate the dinner.'	Past
8. Viewpoint aspect *zai*+activity	3	Ta **zai kanshu** he Asp read.book 'He is reading a book.' Ta **zai changge** he Asp sing.songs 'He is singing songs.' Wo **zai tiaowu** I Asp dance 'I am dancing.'	Present
9. viewpoint aspect *le* + activity	3	Ta **chi le zhongguocai** he eat Asp Chinese.food 'He ate the Chinese food.' Ta **chang le ge** he sing Asp song 'He sang the song.' Ta **da le qiu** he play Asp ball 'He played the ball.'	Past