# Developmental Stages in Chinese: The Case of Chinese Heritage Speakers

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**Abstract**

The Topic Hypothesis posits that Chinese language learners progress through a developmental sequence comprising five stages (Gao, 2009; Wang, 2011), which includes the Object-Subject-Verb (OSV) structure at stage 4 and the *ba*-construct at stage 5. According to this hypothesis, learners typically master the OSV structure before acquiring the *ba*-construction. However, the *ba*-construction is notably more prevalent in Chinese discourse than the OSV structure. Consequently, extensive exposure to the more commonly used structure may result in a developmental trajectory diverging from the predictions of the Topic Hypothesis. The present study identified evidence from two heritage speakers of Chinese supporting the potential deviation from the predictions of the Topic Hypothesis.

**Keywords:** *Processability Theory, Topic Hypothesis, Language Teaching*

## [1]Introduction

Lexical Functional Grammar (Bresnan, 2001; Kaplan & Bresnan, 1982) describes three distinct and parallel levels of language structures: argument structure, functional structure, and constituent structure. Argument structure delineates universal roles such as agent, experiencer, locative, or patient. Constituent structure comprises fundamental units of a sentence, e.g., verb phrases and noun phrases. Functional structure encompasses language-specific units like

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subjects and objects, serving as the bridge between argument and constituent structures (Pienemann, 2007).

Drawing from Lexical Functional Grammar (Bresnan, 2001; Kaplan & Bresnan, 1982), Pienemann, Di Biase, and Kawaguchi (2005) introduced the Topic Hypothesis (TH), an "extension" of the Processability Theory (PT, Pienemann, 1989; Pienemann, 2005), an eminent second language acquisition theory (Zhang, 2020) that posits language learners would produce and comprehend linguistic structures that their current processing stage can handle. Accordingly, the TH makes specific developmental predictions based on the interplay between functional and constituent structures. Within LFG, TOPIC constitutes a grammatical function, typically occupied by the subject in the initial position of a canonical structure (e.g., SVO in Chinese). Pienemann (2007) suggests that non-canonical structures impose greater cognitive demands due to the distinction between the grammatical functions of Topic and Subject, resulting in linguistic non-linearity. Given that processing non-canonical structures incur higher cognitive costs compared to canonical ones, the production of non-canonical structures should be constrained by processability capacity. When applying these processing constraints to learners of Chinese, the TH predicts several sequential stages of Chinese grammar acquisition, which will be explained in detail below. This prediction has been tested in various FL classroom settings (e.g., Gao, 2009; Wang, 2011; Zhang, 2007; Zhang, 2014) where grammars are taught in a sequential fashion. However, to my best knowledge, the hypothesis has not yet been tested in a naturalistic language learning setting (Zhang, 2021), in which teaching and curriculum are not involved. Instead, language acquisition relies heavily on inputs and interactions that are not pre-determined, which may or may not match the internal developmental *curriculum* pre-set by PT and TH. The current study aims to examine if the prediction of TH holds in the naturalistic setting, where the higher stage grammar *ba-*construction is highly frequent as compared to the lower stage grammar.

**Topic Hypothesis and Chinese**

Li and Thompson (1981) suggested that Chinese is a topic-prominent language: "the description of Mandarin [Chinese] must also include the element 'topic'" (p.15). Accordingly, the topic of a sentence refers to the subject matter of a sentence it addresses, typically introduced at the beginning of the sentence. They state that it "always refers to something about which the speaker assumes the person listening to the utterance has some knowledge" (p.15). Chafe (1976) elaborated that the topic establishes the temporal, spatial, or personal framework for a sentence, while the rest of the sentence functions as the comment, providing details about the topic.

Li and Thompson (1981) further noted that the syntax or word order of a sentence in Chinese is primarily governed by semantic information rather than grammatical function. Indeed, it has been argued that "the grammatical meaning of Subject and predicate in a Chinese sentence is topic and comment, rather than actor and action" (Chao, 1968, p.69). To illustrate this concept, Example 1 below demonstrates an NP+NP+verb+NP structure, a unique arrangement containing two subjects.

**Example 1**

| na | pingguo | wo | | xue | pi | le |
|----|---------|-----|----|-----|-----|-----|
| 那 | 苹果 | 我 | | 削 | 皮 | 了 |
| that | apple | I | | peel | skin | ASP(aspect marker) |

I have peeled the apple.

    Describing Example 1 using the actor-action approach proves challenging; instead, the sentence is more aptly described using the topic-comment orientation. The initial NP "pingguo, apple" serves as the topic of the sentence, with the remainder of the sentence detailing what happened to the topic. This topic-comment approach is widely adopted in analyzing Chinese syntax (Li & Thompson, 1981).

    Given the significance of the topic in Chinese, it usually occupies the initial position in a sentence. In fact, this initial position often reflects the focus of the sentence, with the specific semantic information varying based on the speaker's intent. In other words, different sentence constituents—such as the subject, object, or adverbial phrase—can take the initial position (serving as the topic) to emphasize the element that the speaker wants to highlight for the listener. This topic-prominent feature of Chinese grants the language a flexible word order. A recent study by Liu, Di Biase, and Kawaguchi (2023) tested the predictions of L2 learning based on LFG by tracking the L2 Chinese development of three adult beginning learners of Chinese over a year-long period. The study found supporting evidence to confirm a predictable L2 Chinese development trajectory. Connecting the feature of Chinese to the Topic Hypothesis, Zhang (2007) formulated four L2 developmental stages of Chinese syntax as depicted below (see Figure 1. Stage 1 is not given in the figure because it does not pertain to sentence-level processing): (1) The second stage involves the canonical SVO structure, the most prominent structure in Chinese. In this developmental stage, learners of Chinese are capable of processing and producing SVO sentences. (2) The third stage involves the ADJ.+SVO structure, in which the initial sentence position is taken up by an adverbial phrase such as a time phrase or a locative phrase. (3) The fourth stage pertains to the OSV stage, at which learners can locate the object to a sentence's initial position. (4) The fifth stage, the *ba*-construction stage, was formulated by Gao (2009) and Wang (2011). At this stage, the Topic is still the object. But the object is moved between Subject and Verb.

**Figure 1**

*Topic Hypothesis Hierarchy in Chinese*

**(1) Stage 2: TOP = SUBJ: TOP_{subj} V(O)**

| | e.g. | Zoe | ate | an apple. |
|--|------|-----|-----|-----------|
| | | &#124; | &#124; | &#124; |
| | TOP=SUBJ | | V | OBJ |

**(2) Stage 3: TOP = ADJ(unct): TOP_{adj} SV(O)**

| | e.g. | Yesterday | Zoe | ate | an apple. |
|--|------|-----------|-----|-----|-----------|
| | | &#124; | &#124; | &#124; | &#124; |
| | TOP=ADJ | SUBJ | | V | OBJ |

**(3) Stage 4: TOP = OBJ: TOP_{obj} SV**

| | e.g. | An apple, | Zoe | ate. |
|--|------|-----------|-----|------|
| | | &#124; | &#124; | &#124; |
| | TOP=OBJ | SUBJ | V | |

**(4) Stage 5: TOP = ba+OBJ: S*ba*OV**

|  | Zoe | *ba* | an apple | ate |
|---|---|---|---|---|
| e.g. | &#124; | | &#124; | &#124; |
| | SUBJ | | TOP=OBJ | V |

The *ba*-construction represents a special case of object fronting in Chinese. Bender (2000) viewed the *ba*-construction as a topic-comment structure and treated the *ba*-NP as the Topic and the *ba*-VP as the complement of the predicate. According to LFG, the *ba*-construction involves the movement of the object to the preverbal position. Inversion of the predicate and the object calls for feature unification, which generates information exchange between the object and the predicate at the sentence level.

How the *ba*-construction is regarded as the fifth stage structure is explained by Bender (2000), who views the *ba*-construction as a topic-comment structure. Example 2 and Figure 2 describe how the *ba*-NP as the Topic is realized through "the functional control of the f-structure" using LFG (Bender, 2000, p. 127):

**Example 2**

| ta | ba | | wan | | dapo | le |
|---|---|---|---|---|---|---|
| 他 | 把 | | 碗 | | 打破 | 了 |
| ta | ba | | bowl | | break | ASP |

He broke the bowl.

Bender treated the ba-NP as the topic, with the ba-VP acting as the complement of the predicate. In LFG, the *ba*-construction involves moving the object to a preverbal position. This inversion of the predicate and object requires feature unification, which requires information exchange between the object and the predicate at the sentence level. As illustrated in Figure 2, the *ba*-NP is both the object and the topic, serving as the complement of the verb. Gao (2009) explains that the information exchange occurring in the *ba*-construction represents a second stage of the S-procedure, specifically, the stage that demands information exchange between clauses. In essence, the inversion of the object and predicate in the *ba*-construction necessitates information exchange within the sentence: "further development of grammatical functions consolidates the constituent boundaries within a sentence and allows information exchange between internal constituents" (Gao, 2009, p.162).

**Figure 2**

*The F-Structure of the Ba-Construction*
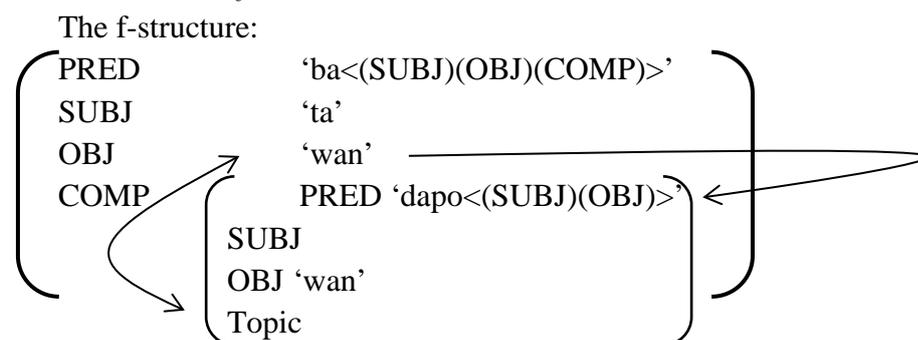
The f-structure:

Gao (2009) and Wang (2011) presented empirical evidence indicating that learners typically acquire stage 4 OSV structure, while mastering the *ba*-construction occurs at Stage 5 (Table 1). Per the PT, proficiency in *ba*-construction presupposes competence in OSV structure for L2 Chinese learners.

**Table 1**

*An Extension of L2 Chinese Developmental Stages* (Gao (2009) and Wang (2011))

| Stages | Processing Procedure | Information Exchange | Syntax |
|---|---|---|---|
| 5 | S-bar procedure | Main and sub-clause | *The ba-construction* |
| 4 | S-procedure | Inter-phrasal information | Topicalization: OSV, SOV |
| 3 | Phrasal procedure | Phrasal information | XP SV(O): adv-fronting *Adverbial* *Subordinate clause* *Wh-adverbial* |
| 2 | Category procedure | Lexical morphology | Canonical SV(O): *Declarative* *interrogative* |
| 1 | Word /Lemma | Words | Formulaic expressions |

**Purpose**

According to Gao (2009) and Wang (2011), learners of Chinese follow a developmental path that consists of 5 stages (Figure 1 and Table 1). Following this path, learners would first acquire stage 4 OSV structure and then stage 5 *ba*-construction. However, *ba*-construction is more common in Chinese compared to OSV structure (Li & Thompson, 1981). Ellis (2002) underscores the significance of input frequency in L2 acquisition. If PT holds true, external factors like input frequency, which are non-cognitive, should not influence the developmental sequence of L2. However, if input frequency does play a role, it could impact the trajectory of L2 grammar development. This study aims to investigate whether individuals exist who can adeptly process *ba*-construction without proficiency in OSV grammar. Such cases may manifest among heritage Chinese speakers, as they often lack formal L2 instruction yet are exposed to abundant L2 inputs in their environment, which promote implicit knowledge (Ellis, 2002). The research question associated with the main goal of the study is:

**RQ1:** Are there learners of Chinese who can process *ba*-construction without proficiency in OSV grammar?

**Method**

*Participants*

Six heritage Chinese speakers were recruited to participate in the study. Their dominant language was English. They could speak some Chinese. They also had a large Chinese vocabulary. Among the six participants, only two heritage Chinese speakers qualified for the current study based on the pre-test result, which determined that these two speakers could not process or produce OSV structure. The detail of the pre-test is given below.

*Instruments*

The study employed five tasks: a timed grammaticality judgment task (GJT) gauging implicit grammar knowledge by having participants judge sentence correctness, three speech

production tasks (described below) designed to capture spontaneous language use, aligning with Pienemann's (1998) emphasis on spontaneous production as the most valid way to test his theory, and a final interview.

### The timed grammaticality judgment task

Administered orally, the GJT featured 60 sentences spanning Stage 2 to Stage 4 grammar structures (with 20 sentences per stage), alongside thirty ungrammatical sentences and twenty distracter sentences. Sentences were randomly presented, and participants were asked to decide within three seconds whether each sentence was acceptable or not. Since it is a timed task, this task was intended to measure the implicit knowledge (Ellis, 2005).

### The elicited imitation task

The elicited imitation task contained 82 sentences (48 SVO sentences, 12 Adj.+SVO structure sentences, 12 OSV structure sentences, 10 *ba*-construction sentences). Participants listened to blocks of three consecutive sentences, with the target structures (*ba*-construction, OSV, and Adj.+SVO) incorporated in the middle sentence. After each block, a question about the content of the three sentences was asked to reduce the likelihood of participants memorizing the sentences. Following this, participants were asked to repeat all three sentences from the block. All EI sentences underwent validation by five native Chinese speakers, affirming their effectiveness in reproducing target structures.

### The cartoon description task

Five short silent clips from a Tom & Jerry cartoon were selected, each lasting approximately one minute. Participants watched each clip two times before describing the cartoon. To encourage spontaneous speech, questions or hints were provided if participants produced a limited number of sentences. Some of these questions or hints were "What did you see?", "What did Jerry do?", and "Can you talk a little bit more about what Tom did?".

### The question & answer task

Participants responded to five to ten questions posed in English to avoid comprehension issues. Both the cartoon description task and the Q&A task elicited spontaneous speech (Pienemann, 1998). Although the elicited imitation task may be debated for its validity in measuring spontaneous performance, it was employed in the Teachability study conducted by Y. Zhang (2007).

### The final interview

A final interview was developed to ask the participants' attitudes towards the study. The goal was to evaluate how they learned Chinese in the past and how they felt about the instruction procedures in the study. Some of these questions included: What have you learned in the study? Could you describe the concept of topicalization in Chinese? Have you learned these concepts before?

*Procedure*

At T1, Participants took all four tests, including the elicited imitation task, the Q&A task, the cartoon description task, and the timed GJT in the pre-test. The elicited imitation task included sentences with Adj.+SVO, OSV, and *ba*-constructions to evaluate the participants' ability to process the OSV structure and *ba*-constructions. After completing the elicited imitation task, participants engaged in a Q&A activity that required them to describe a process. Following the Q&A, they provided a description of a cartoon.

After the pre-test, learners qualified for this study were given a teaching session targeting the concept of topicalization in OSV and the *ba*-construction. The instructor used Systemic Theoretical Instruction (Gal'perin, 1970; Gal'perin, 1992; Lantolf, 2011) to introduce the concept of topicalization. STI has been found to be very effective in teaching Chinese (Ai, 2021; Kao, 2023).

To implement STI, participants were first given the cognitive learning tool called the Schema for the Orienting Basis of Action (SCOBA). These SCOBAs involved animated presentations of the conception of topicalization in Chinese to emphasize the topics that are fronted. Afterward, the participants were asked to verbally describe the concepts and practice topicalization through various learning activities. Given their relatively large vocabulary size, the participants practiced the target grammar structures in free talks, process descriptions, translation exercises, cartoon descriptions, etc.

One week after the first session, participants took a post-test to assess their ability to produce the OSV structure. One month after the post-test, they completed a delayed post-test designed to elicit both the OSV structure and the *ba*-construction. After the delayed post-test, the final interview was conducted.

## Results

*The Grammaticality Judgment Tasks*

Tables 2 and 3 present the results of the GJT. Both participants rejected 83% of the ungrammatical sentences. This high accuracy rate indicates that their Chinese proficiency was quite advanced. Both participants indicated in the final interview that they received no formal training and they learned Chinese through daily conversation.

Cathy accepted all 20 SVO sentences as grammatical, while Evan judged 18 SVO sentences as grammatical, suggesting that the SVO structure is integrated into their grammar. Cathy also accepted 12 Adj.+SVO sentences, and Evan accepted 14, indicating that the accuracy rates for these structures, although not very high, were above chance. This suggests that the Adj.+SVO structure is processable, though it may not be highly systematic in their grammar.

**Table 2**

*GJT Results of Cathy*

| Topic Hypoth | Structure | n | Acc % | Accep | unaccep | Unanw | Acc% | accep | unaccep | unanw |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Pre-test (T1) | | | Delayed post-test (T4) | | | |
| 4 Top=Obj | OSV | 20 | 10% | 2 | 18 | 0 | 100 | 20 | 0 | 0 |
| 3 top=Adj. | Adj. SVO | 20 | 60% | 12 | 8 | 0 | 100 | 20 | 0 | 0 |
| 2 top=Subj. | SVO | 20 | 100% | 20 | 0 | 0 | 100 | 20 | 0 | 0 |
| ungrammati | | 30 | 83% | 5 | 25 | 0 | 90 | 3 | 27 | 0 |

**Table 3**

*GJT Results of Evan*

| Topic Hypoth | Structure | n | Acc% | Accep | Unaccep | Unanw | Acc % | accep | unaccep | unanw |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Pre-test (T1) | | | Delayed post-test (T4) | | | |
| 4 Top=Obj | OSV | 20 | 15% | 3 | 17 | 0 | 65 | 13 | 7 | 0 |
| 3 top=Adj. | Adj. SVO | 20 | 70% | 14 | 6 | 0 | 80 | 16 | 4 | 0 |
| 2 top=Subj. | SVO | 20 | 90% | 18 | 2 | 0 | 90 | 18 | 2 | 0 |
| ungrammati | | 30 | 83% | 4 | 25 | 1 | 90 | 2 | 27 | 1 |

Tables 2 and 3 also present the results of the GJT task from the delayed post-test. Compared to the pre-test, the OSV structure was deemed grammatically acceptable by these learners. Cathy considered all the OSV and Adj.+SVO sentences to be grammatically acceptable, marking a significant increase in her accuracy rate. Evan accepted 13 OSV sentences. Although this accuracy rate was not particularly high, it was well above chance and significantly improved from the pre-test results. The instruction systematically taught the concept of topicalization, which not only facilitated the participants' understanding of OSV grammar but also helped consolidate their implicit knowledge of structures like Adj.+SVO. A further discussion of this issue will be provided in the discussion section.

**The Spontaneous Speech Production Tasks**

*The pre-test result: ba-construction was produced without OSV being produced*

In the elicited imitation task in the pre-test (Table 4 and Table 5), Evan reproduced 13 Adj.+SVO sentences, and Cathy reproduced 6 Adj.+SVO sentences, suggesting that the Adj.+SVO structure was processable. However, both learners could not produce OSV structure as they could not reproduce any OSV structure in the elicited imitation task. Neither did the two participants produce any OSV sentence in the other two spontaneous speech production tasks in the pre-test. Excerpt 1 and Excerpt 2 gave some example sentences produced by Cathy and Evan.

**Excerpt 1, Cathy's speech in the EI (pre-test):**
The interlocutor read three sentences:

lǐ lǎo shī       lái       wǒ jiā

李老师       来       我家

Mr. Li       come       my house

Mr. Li came to my house.


wǒ    lǐ lǎo shī    hěn    le jiě

我，李老师    很    了解

I    Mr. Li    very    know

Mr. Li knew me well.

tā   zhī dào   wǒ   xǐ huān   shū

他   知道   我   喜欢   书

He   know   I   like   book

He knew that I like books.


Cathy repeated after a question:


lǐ lǎo shī       lái       wǒ jiā

李老师       来       我家

Mr. Li       come       my house.

Mr. Li visits my house.


tā      zhī dào   wǒ   xǐhuān      shū

他      知道    我   喜欢      书

He      know     I   like      books

He knows I like books.


wǒ men      le jiě , tā      zhīdào   wǒmen     xǐhuān      shū

我们      了解，他    知道   我们     喜欢      书

We      know, he    know   we      like      books

As we all know, he knows we like books.


**Excerpt 2, Evan's speech in the EI (pre-test):**
The interlocutor read three sentences:

tiān qì      jīn tiān      hěn hǎo

天气      今天      很好

Weather      today      nice

The weather today is nice.

wǒ jiā   xiǎo lǐ          bú       rèn shí

我家    小李          不       认识

home   Xiao Li       not      know

Xiao Li doesn't know the way to my home

 

wǒ       hé       tā       lái

我       和       他       来

I        and     he      come

I come with him.

 

Evan repeated after a question

 

 jīn tiān        tiān qì        hěn hǎo

今天            天气           很好

Today          weather       nice

The weather today is nice.

 

wǒ       bú       rèn shí xiǎo …xiǎo zhāng

我       不       认识    小…   小张

I        not      know   Xiao… Xiao Zhang

I do not know Xiao Zhang.

 

wǒ       bú       rèn shí          tā

我       不       认识             他

I        not      know            him

I don't know him.

 

In the cartoon description task of the pre-test, the two participants produced a number of sentences with *ba*-construction. Excerpt 3 and Excerpt 4 provided evidence to suggest that Cathy and Evan could process and produce *ba*-construction.

**Excerpt 3, Cathy's ba-construction sentences in the cartoon description task (pre-test):**

 tā       bǎ       zhǐ zhāng      ná chū lái

他       把       纸张            拿出来

He       ba      paper          take out

He took out the paper.

 

How to say "open"?（the interlocutor provided the word "打开"）

tā  bǎ   zhǐ zhāng   dǎ kāi

他 把 纸张        打开

He  ba   paper  open

He opened the paper.

| xiǎo lǎo shǔ | bǎ | mào zǐ | fàng shàng | ….fàng shàng | tā de tóu |
|---|---|---|---|---|---|
| 小老鼠 | 把 | 帽子 | 放上 | …. 放上 | 他的头 |
| Little mouse | ba | cap | put | … put | on his head |

The little mouse put a cap on his head.

| tā | bǎ | diàn huà | ná le qǐ lái |
|---|---|---|---|
| 他 | 把 | 电话 | 拿了起来 |
| He | ba | phone | pick up |

He picked up the phone.

**Excerpt 4, Evan's *ba*-construction sentences in the cartoon description task (pre-test):**

| nà gè lǎo shǔ | bǎ | nàgèmāo de | niú nǎi | gěi le | xiǎo lǎo shǔ |
|---|---|---|---|---|---|
| 那个老鼠 | 把 | 那个猫的 | 牛奶 | 给了 | 小老鼠 |
| That mouse | ba | that cat's | milk | gave | the little mouse |

That mouse gave the cat's milk to the little mouse.

| tā | bǎ | pán zǐ | fàng dào | zhuō zǐ shàng miàn |
|---|---|---|---|---|
| 她 | 把 | 盘子 | 放到 | 桌子上面 |
| She | ba | plates | put | on the table |

She put the plates onto the table.

Results of the pretest indicated that the *ba*-construction was part of the participants' grammatical knowledge system. To confirm this, spontaneous language production tasks were administered, providing supporting evidence. Tables 4 and 5 present the number of sentences produced in each task. Both participants demonstrated the ability to produce *ba*-constructions across all three spontaneous tasks. Cathy reproduced 7 *ba*-construction sentences in the elicited imitation task and 23 in the combined Q&A and cartoon description tasks. Evan reproduced 8 *ba*-construction sentences in the elicited imitation task and 32 in the other two spontaneous speech production tasks. Excerpts 5 and 6 provide example *ba*-construction sentences produced by Cathy and Evan, respectively.

**Excerpt 5, Cathy's *ba*-construction sentences in the pre-test:**
In the elicited imitation task, the interlocutor read three sentences:

| wǒ | mǎi le | hěn duō | dōng xī |
|---|---|---|---|
| 我 | 买了 | 很多 | 东西 |
| I | bought | a lot of | things |

I have bought a lot of things.

| wǒ | bǎ | qián | dōu | yòng wán le |
|---|---|---|---|---|

我　　　把　　　钱　　　都　　　用完了

I　　　ba　　　money all　　use up.

I ran out of my money.

wǒ　　　bú néng　　　mǎi dōng xī le

我　　　不能　　　　买东西了

I　　　can't　　　　buy things.

I can't buy anything else any more.

Cathy responded after a question:

wǒ　　　mǎi　　hěn duō　　　dōng xī le

我　　　买　　很多　　　　东西了

I　　　bought a lot of　　　things

I have bought a lot of things.

wǒ　　　bǎ　　qián　　dōu　　yòng wán le

我　　　把　　钱　　　都　　用完了

I　　　ba　　money all　　use up.

I ran out of my money.

wǒ　　　bú kě yǐ　　　mǎi dōng xī le

我　　　不可以　　　买东西了

I　　　can't　　　　buy things

I can't buy anything else any more.

Interlocutor asked, can you describe how to wash the face?

Cathy responded,

wǒ　　　bǎ　　shuǐ　　zhu kāi le

我　　　把　　水　　　煮开了

I　　　ba　　water　boil

I boiled water.

wǒ　　　bǎ　　máo jīn　　fàng　　shuǐ　　lǐ biān

我　　　把　　毛巾　　　放　　　水　　里边

I　　　ba　　towel　　　put　　water　into

I put the towel into water.

wǒ　　yòng　　máo jīn　　xǐ　　　　wǒ de liǎn

我　　用　　毛巾　　　洗　　　　我的脸

I　　use　　towe　　　wash　　my face

I used a towel to wash my face.

**Excerpt 6, Evan's *ba*-construction sentences in the pre-test:**
The interlocutor read three sentences:

| nǐ | xiān | qù | xǐ zǎo |
|---|---|---|---|
| 你 | 先 | 去 | 洗澡 |
| You | first | go | shower |

You go to take a shower first.

| rán hòu | | nǐ | bǎ | yī fú | fàng | xǐ yī jī | | xǐ | gàn jìng |
|---|---|---|---|---|---|---|---|---|---|
| 然后 | | 你 | 把 | 衣服 | 放 | 洗衣机 | | 洗 | 干净 |
| Then | | you | ba | clothes | put | washing machine | | wash | clean |

Then you put the clothes into the washing machine to get them cleaned.

| nǐ | jiù | | kě yǐ | hǎo hǎo | xiū xī le |
|---|---|---|---|---|---|
| 你 | 就 | | 可以 | 好好 | 休息了 |
| You | | | can | good | take a rest. |

You can take a good rest.

Evan responded after a question:

| nǐ | xiān | qù | xǐ zǎo |
|---|---|---|---|
| 你 | 先 | 去 | 洗澡 |
| You | first | go | shower |

You take a shower first.

| rán hòu | bǎ | yī fú | fàng | zài xǐ yī jī | xǐ | gàn jìng |
|---|---|---|---|---|---|---|
| 然后 | 把 | 衣服 | 放 | 在洗衣机 | 洗 | 干净 |
| Then | ba | clothes | put | washing machine | wash | clean |

Then you put the clothes into the washing machine to get them cleaned.

| nǐ | cái | zuò wán |
|---|---|---|
| 你 | 才 | 做完 |
| You | then | finish |

Then you finished?

Interlocutor asked, how do you cook an egg?
Evan responded,

| bǎ | nà gè jī dàn | zá kāi le |
|---|---|---|
| 把 | 那个鸡蛋 | 砸开了 |
| Ba | the egg | broke |

Break the egg

| yào | bǎ | nà gè yóu | fàng | zài | nàgè pán zǐ | shàng miàn |
|---|---|---|---|---|---|---|
| 要 | 把 | 那个油 | 放 | 在 | 那个盘子 | 上面 |
| need ba | | the oil | put | | the plate | onto |

Put the oil in the plate

During the instructional session, when asked about the grammaticality of OSV structure, both participants deemed it ungrammatical and reported no prior exposure to it. This evidence suggested they couldn't process OSV structures. However, they produced *ba*-construction sentences without difficulty. This phenomenon contradicted the hierarchical developmental stages predicted by Gao (2009) and Wang (2011).

*The post-test results: both ba-construction and OSV structure were produced*
One week after an instructional session on topicalization, a post-test eliciting OSV and *ba*-construction was administered. Results showed both participants could now process OSV structures, producing both OSV and *ba*-constructions in all spontaneous speech production tasks.

Tables 3 and 4 summarized the number of sentences produced in each task. In the elicited imitation task, Cathy produced 22 OSV sentences (exceeding the total OSV sentences in the task due to counting answers to questions) and 8 *ba*-construction sentences, while in the other two tasks combined, she produced 16 OSV and 6 *ba*-construction sentences. Evan's production differed, with 4 OSV and 9 *ba*-construction sentences in the elicited imitation task, and 14 each of OSV and *ba*-construction sentences in the other two tasks combined. Examples of these sentences are provided in Excerpts 7-10. These results from both heritage speakers indicate that OSV structures became processable after instruction, while *ba*-construction grammar was preserved throughout the study.

**Excerpt 7, Cathy's OSV and *ba*-construction sentences in the EI task (post-test):**
The interlocutor read three sentences:

| xiǎo wáng | yào lái | wǒ jiā | zuò kè |
|---|---|---|---|
| 小王 | 要来 | 我家 | 做客, |
| Xiao Wang | will come | my house | as a guest |

Xiao Wang is coming to my house as a guest.

| cài | xiǎo wáng | huì | xiān mǎi |
|---|---|---|---|
| 菜 | 小王 | 会 | 先买 |
| Vegetables | Xiao Wang | will | buy |

Xiao Wang will buy some vegetables.

| wǒ men | shí me | dōu | bú yòng | zhǔn bèi |
|---|---|---|---|---|
| 我们 | 什么 | 都 | 不用 | 准备 |
| We | anything | | not | prepare |

We don't need to prepare anything.

Cathy responded after a question

| xiǎo wáng | lái | wǒ jiā |
|---|---|---|
| 小王 | 来 | 我家 |
| Xiao Wang | come | my house |

Xiao Wang came to my house.

| err….cài | tā | yǐ jīng | mǎi le |
|---|---|---|---|
| err….菜 | 他 | 已经 | 买了 |
| vegetables | he | already | bought |

He has already bought some vegetables.

| wǒmen | búyào | zhǔnbèi | dōngxī |
|---|---|---|---|
| 我们 | 不要 | 准备 | 东西 |
| We | no need | prepare | things. |

We don't need to prepare anything.

The interlocutor read three sentences:

| wǒ | huí dào | jiā |
|---|---|---|
| 我 | 回到 | 家 |
| I | go back | home |

I went back home.

| mā mā | bǎ | yīn lè | dōu | guān le |
|---|---|---|---|---|
| 妈妈 | 把 | 音乐 | 都 | 关了 |
| Mother | ba | music | | turn off |

Mother turned the radio off.

| tā | kāi shǐ | hé wǒ | shuō huà |
|---|---|---|---|
| 她 | 开始 | 和我 | 说话 |
| She | begin | with me | talk |

She began to talk to me.

Cathy responded after answering a question

| wǒ | huí dào | jiā le |
|---|---|---|
| 我 | 回到 | 家了 |
| I | arrived | home |

I went back home.

| mā mā | bǎ | yīn lè | guān le |
|---|---|---|---|
| 妈妈 | 把 | 音乐 | 关了 |
| Mother | ba | music | turn off |

Mother turned the radio off.

wǒ hé mā mā    kāi shǐ  shuō huà le

我和妈妈        开始    说话了

I and mother      begin   talk

Mother and I began to talk.

Interlocutor asked, what do you eat for dinner every day?

ròu          wǒ      tiān tiān      chī

肉            我      天天          吃

Meat         I       every day      eat

I have meat every day.

Interlocutor asked, Where do you drink coffee and tea?

Cathy responded,

kā fēi  wǒ    zài kā fēi guǎn        hē

咖啡  我      在咖啡馆              喝

Coffee  I      in the coffee shop      drink

I drank coffee in the coffee shop.

chá          wǒ        zài jiā        hē

茶            我        在家          喝

Tea          I         at home                drink

I drank some tea at home.

**Excerpt 8, Cathy's *ba*-construction (post-test):**
Interlocutor asked, how do you fry an egg?
Cathy responded,
nǐ  bǎ  jī dàn  dǎ pò

你  把  鸡蛋  打破

You  ba  egg    broken
You break the egg
nǐ  bǎ  guō  fàng  huǒ lú  shàng miàn

你  把  锅    放  火炉  上面

You  ba  pan  put stove    onto
You put the pan on the stove

**Excerpt 9, Evan's OSV and *ba*-construction sentences in the EI task (post-test):**
The interlocutor read three sentences:
wǒ    mǎi le        shū

我        买了          书

I          bought        book
I bought a book

dì tú　　wǒ　　　　　zài xué xiào　mǎi le

地图　　我　　　　　在学校　　　买了

Map　　I　　　　　　at school　　bought

I bought a map in the school.

wǒ men jīn tiān　　　shàng kè

我们　　今天　　　　上课

We　　today　　　　have classes.

We have classes today.

Evan responded after answering a question

wǒ　　　yǐ jīng　　　mǎi le　　　shū

我　　　已经　　　　买了　　　　书

I　　　already　　　bought　　　books

I have already bought some books.

dì tú　　wǒ　　　　　yě　　mǎi le

地图　　我　　　　　也　　买了

Map　　I　　　　　　also　bought

I also bought a map.

wǒ　　　kě yǐ　qù shàng kè le

我　　　可以　去上课了

I　　　can　　go to class

I'm ready to go the class.

The interlocutor read three sentences:

míng tiān　　　yào　　shàng xué

明天　　　　　要　　上学

Tomorrow　　　need　　go to school

(We) need to go to school tomorrow.

nǐ　　　bǎ　　shū　　dōu　　fàng　zài shū bāo lǐ

你　　　把　　书　　都　　　放　　在书包里

You　ba　　books　　　also　　put　　the bag into

You put the books into the bag.

wǒ men　　　　zǎo　　　　yī xiē　　shuì jiào

我们　　　　　早　　　　　一些　　睡觉

We　　　　　earlier　　　a little bit　sleep

We should go to bed a little bit earlier.

Evan responded after answering a question

wǒ men  míng tiān      yào      shàng xué

我们      明天          要        上学

We        tomorrow    need    go to school.

We need to go to school tomorrow.


nǐ      bǎ        nǐ de shū      fàng    zài nǐ de shū bāo lǐ miàn

你    把          你的书          放      在你的书包    里面

You  ba          your books    put      the bag          into

You put all your books into a bag.

wǒ men  kě yǐ  zǎo      yī diǎn  shuì

我们      可以  早        一点      睡

We        can    earlier  a little  sleep

We can go to bed earlier.


**Excerpt 10, Evan's OSV and *ba*-construction (post-test):**
Interlocutor asked, what do you drink every day?


Evan responded,
shuǐ      wǒ      měi tiān      hē

水        我      每天          喝

Water    I      every day      drink

I drink water every day.


Interlocutor asked, what kind of movies do you like?
Evan responded,


dòng zuò diàn yǐng    wǒ      fēi cháng      xǐ huān

动作电影                我      非常          喜欢

Action movie            I      very            like

I like action movies very much.


Interlocutor asked, how do you make a cup of coffee?
Evan responded,


wǒ bǎ    nàgèbēizǐ  fàng le      zài wēibōlú lǐmiàn    kǎo    5 fèn zhōng

我 把    那个杯子 放了        在微波炉里面        烤      5分钟

I  ba    that cup    put          microwave  into      bake  5 minutes

I put that cup in the microwave to bake for five minutes.

*The delayed post-test: both ba-construction and OSV structure were preserved*

The delayed post-test, administered one month after the initial post-test, demonstrated that both participants had preserved their ability to produce OSV structures freely, while also maintaining their proficiency with *ba*-constructions. This indicates that learners did not confuse the two structures. Tables 3 and 4 present the production data: In the elicited imitation task, Cathy produced 25 OSV sentences (notably using many in question responses) and 6 *ba*-construction sentences, while in the Q&A and cartoon description tasks combined, she produced 4 OSV and 12 *ba*-construction sentences. Evan's results showed a similar pattern: 8 OSV and 11 *ba*-construction sentences in the elicited imitation task, and 4 OSV and 16 *ba*-construction sentences in the other two tasks combined. Excerpts 11 and 12 provide examples illustrating the well-preserved nature of both OSV and *ba*-construction in the participants' language production.

**Excerpt 11, Cathy's OSV and *ba*-construction sentences (delayed post-test):**

The interlocutor read three sentences:

bà bà    qù nián        sòng le        wǒ      yī běn shū

爸爸    去年          送了          我      一本书

Dad    last year      gave            me    a book

Dad gave me a book last year.

nà běn shū      wǒ      dú le    10 biàn

那本书          我      读了    10遍

That book      I        read    10 times

I have read that books ten times.

wǒ      hěn    xǐ huān        nà shū

我      很      喜欢            那书

I      very    like            that book.

I like that book.


Cathy responded after a question

bà bà    qù nián   sòng le     wǒ      yī běn shū

爸爸    去年    送了        我    一本书

Dad    last year   gave        me    a book.

Dad gave me a book last year.

nà běn shū    wǒ        dú le          shí biàn

那本书        我        读了          十遍

That book      I        read            10 times

I have read that books for ten times.


nà běn shū        wǒ    hěn        xǐ huān

那本书          我    很        喜欢

That book      I    very        like

I like that book.

The interlocutor read three sentences:

bà bà    qǐ chuáng le

爸爸    起床了

Dad    got up

Dad got up.

mā mā    bǎ    zǎo cān    zuò hǎo le

妈妈    把    早餐    做好了

Mum    ba    breakfast    prepare

Mum has prepared breakfast.

bà bà    mā mā yī qǐ    chī    zǎo cān

爸爸    妈妈 一起    吃    早餐

Dad    mum    together. eat    breakfast

Dad and Mum had breakfast together.


Cathy responded after answering a question

bà bà    qǐ chuáng le

爸爸    起床了

Dad    got up.

Dad got up.


mā mā    bǎ    zǎo cān    zuò le

妈妈    把    早餐    做了

Mum    ba    breakfast.    prepare

Mum has prepared breakfast.


bà bà hé mā mā  yī qǐ    chī    zǎo cān

爸爸和妈妈    一起    吃    早餐

Dad and  mum    together    eat    breakfast

Dad and Mum had breakfast together.


Interlocutor asked, what is your favorite food?

Cathy responded,

jiā cháng cài    wǒ    zuì    xǐ huān

家常菜    我    最    喜欢

Home-made cuisine  I   most   like

I like home mad cuisine the most.


Cathy described the scene in the cartoon.


tā    kàn jiàn    jú zǐ,    bǎ    jú zǐ    dōu    chī diào le

他　看见　　橘子，把　橘子　都　　吃掉了

He　saw　　　orange,　ba orange all　eaten

He saw the oranges and ate all of them.


**Excerpt 12, Evan's OSV and *ba*-construction sentences (delayed post-test):**

The interlocutor read three sentences:

mā mā　　　　qù le　　　gōng zuò

妈妈　　　　　去了　　　工作

Mum　　　　go to　　　work.

Mum went to work.

fàn　　wǒ men xiān　zhǔ le

饭　　我们　先　煮了

Rice　　we　　first　cook

We prepare rice first.

mā mā　huí lái jiù néng　　chī fàn

妈妈　回来　就能　　　吃饭

Mum　return　can　　　eat

We can eat when mum is back.

Evan responded after answering a question

mā mā　qù　　　　gōng zuò

妈妈　去　　　　工作

Mum　go to　　　work

Mum went to work.

fàn　　wǒ men　　yǐ jīng　zuò hǎo le

饭　　我们　　已经　做好了

Rice　　we　　already　cook

We have prepared rice.

mā mā　huílái　yǐhòu　wǒmen　jiùkěyǐ　　chī fàn

妈妈　回来　以后　我们　就可以　　吃饭

Mum　return after　we　　can　　　　eat

When Mum's back, we can have dinner then.


The interlocutor read three sentences:

wǒ jiā　　yǒu　　　pí jiǔ

我家　　有　　　啤酒

My home　have　　beer

We have some beer at home.

nǐ　　　kě yǐ　　bǎ　　pí jiǔ　dōu　hē le

你　　　可以　　把　　啤酒　都　喝了

You　　can　　　ba　　beer　all　drink

You can drink up all the beer

| dàn shì | nǐ | bú yào | hē | qì shuǐ |
|---|---|---|---|---|
| 但是 | 你 | 不要 | 喝 | 汽水 |
| But | you | don't | drink | beverage |

But you don't drink beverage.

Evan responded after answering a question

| nǐ | kě yǐ | bǎ | pí jiǔ | hē wán |
|---|---|---|---|---|
| 你 | 可以 | 把 | 啤酒 | 喝完 |
| You | can | ba | beer | drink |

You can finish all beer.

| dàn shì | bú … bú yào | hē | qì shuǐ |
|---|---|---|---|
| 但是 | 不… 不要 | 喝 | 汽水 |
| But | not. don't | drink | beverage |

Don't drink beverage.

| kā fēi | wǒ | zài kā fēi guǎn | hē |
|---|---|---|---|
| 咖啡 | 我 | 在咖啡馆 | 喝 |
| Coffee | I | at the coffee shop | drink |

I drank coffee at the coffee shop.

Interlocutor asked, can you describe how to borrow a book from the library?

Evan responded,

| … jiù | bǎ | nà gè shū … shū | gěi | yī gè tú shū guǎn rén |
|---|---|---|---|---|
| … 就 | 把 | 那个书 … 书 | 给 | 一个图书馆人 |
| … then | ba | the book… book | give | a librarian |

Give the book to a librarian.


In sum, the delayed post-test that was carried out more than one and a half months after the post-test provided evidence to demonstrate that the OSV structure was processable and it was well preserved.


**Table 4**

*Spontaneous Responses (Cathy)*

| | Topic Hypoth | Structure | Pre-test (T1) | post-test (T2) | delayed post-test (T3) |
|---|---|---|---|---|---|
| Elicit imitation | 5 Ba stru | Ba-construct | 7 | 8 | 6 |
| | 4 Top=Obj. | OSV | - | 22 | 25 |
| | 3 top=Adj. | Adj. +SVO | 4 | 10 | 17 |
| | 2 top=Subj. | SVO | 41 | 48 | 57 |
| Q&A | 5 Ba stru | Ba-construct | 10 | 3 | 8 |
| | 4 Top=Obj. | OSV | 0 | 7 | 4 |
| | 3 top=Adj. | Adj. +SVO | 0 | 6 | 6 |
| | 2 top=Subj. | SVO | 12 | 6 | 18 |
| | 5 Ba stru | Ba-construct | 13 | 3 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| Cartoon Description | 4 Top=Obj. | OSV | 0 | 9 | 0 |
| | 3 top=Adj. | Adj. +SVO | 0 | 4 | 0 |
| | 2 top=Subj. | SVO | 16 | 14 | 14 |
| SUM | 5 Ba stru | Ba-construct | 30 | 14 | 18 |
| | 4 Top=Obj. | OSV | 0 | 38 | 29 |
| | 3 top=Adj. | Adj. +SVO | 4 | 20 | 23 |
| | 2 top=Subj. | SVO | 69 | 68 | 89 |

**Table 5**

*Spontaneous Responses (Evan)*

| | Topic Hypoth | Structure | Pre-test (T1) | post-test (T2) | delayed post-test (T3) |
|---|---|---|---|---|---|
| Elicit imitation | 5 Ba stru | Ba-construct | 8 | 9 | 11 |
| | 4 Top=Obj. | OSV | - | 4 | 8 |
| | 3 top=Adj. | Adj. +SVO | 7 | 3 | 8 |
| | 2 top=Subj. | SVO | 57 | 52 | 49 |
| Q&A | 5 Ba stru | Ba-construct | 4 | 12 | 9 |
| | 4 Top=Obj. | OSV | 0 | 14 | 4 |
| | 3 top=Adj. | Adj. +SVO | 0 | 3 | 2 |
| | 2 top=Subj. | SVO | 25 | 36 | 62 |
| Cartoon Description | 5 Ba stru | Ba-construct | 10 | 2 | 7 |
| | 4 Top=Obj. | OSV | 0 | 0 | 0 |
| | 3 top=Adj. | Adj. +SVO | 0 | 0 | 0 |
| | 2 top=Subj. | SVO | 21 | 29 | 13 |
| SUM | 5 Ba stru | Ba-construct | 22 | 23 | 27 |
| | 4 Top=Obj. | OSV | 0 | 18 | 12 |
| | 3 top=Adj. | Adj. +SVO | 7 | 6 | 10 |
| | 2 top=Subj. | SVO | 103 | 117 | 124 |

**Discussion**

According to the results of the pre-test, the two participants demonstrated proficiency in processing and producing the SVO structure and the Adj.+SVO structure. However, they exhibited difficulty in processing the OSV structure. First, the GJT task showed that the OSV was not in their grammar, despite the evidence showing that both SVO structure and Adj.+SVO structure were processable. Both participants rejected a majority of OSV sentences (>85%). Although the rejection rate was not 100%, it was very high enough to suggest that the participants did not regard OSV as grammatical (the rejection rate of ungrammatical sentences was 83%, lower than the rejection rate of OSV). Another critical evidence comes from the elicited imitation task. But participants failed to reproduce the OSV structure in this task, despite that they were able to reproduce both SVO and Adj.+SVO structure. Other spontaneous production tasks also showed that the two heritage speakers lacked the OSV structure in grammar but capable of processing Adj.+SVO structure.

Interestingly, despite missing OSV, both heritage speakers were capable of producing the *ba*-construction, a Stage 5 structure that was found to be typically processed only after mastering Stage 4 OSV structure according to Gao (2009) and Wang (2011). In the elicited

imitation task, both participants were able to reproduce the *ba*-construction consistently as Cathy generated 7 *ba*-construction and Evan 8 *ba*-construction sentences. In cartoon description tasks,

Thus, the findings of this study suggest the possibility of skipping a stage in a naturalistic setting. Since no intervention occurred prior to the pre-test, these results offer additional counter-evidence to Processability Theory (Zhang, 2014; Zhang, 2021; Zhang & Lantolf, 2014; Lantolf & Zhang, 2015), as stage-skipping can occur without intervention. This phenomenon may be partially attributed to the frequency effect of different sentence types in daily conversation.

SVO is considered the canonical word order in Chinese due to its prevalence (Li & Thompson, 1981; Gao, 2009; Wang, 2011; Zhang, 2007). SOV structures, including many *ba*-constructions, are also common, while OSV structures are comparatively rare. The *ba*-construction, in particular, occurs frequently in daily conversation, unlike OSV sentences (Li & Thompson, 1981). For heritage speakers who rely on implicit learning mechanisms, this frequency distribution becomes crucial. Frequency and saliency have long been recognized as critical factors in language learning (Ellis, 2002; Tomasello, 2005). Limited exposure to less common structures like OSV can impede the implicit learning mechanism's ability to assess their acceptability, as implicit learning heavily depends on input frequency (Ellis, 2002). Conversely, the high frequency of the *ba*-construction in Chinese likely significantly influenced its acquisition by the two heritage speakers in this study.

The mechanism of the acquisition suggests that knowledge of the *ba*-construction was implicit (Ellis, 2002), which was supported by evidence in the timed GJT and the spontaneous production tasks. Although it was not possible to collect participants' daily conversations preceding the study, examining child language corpora to assess how frequency impacts language development could offer insights into why stage-skipping occurs in naturalistic learning environments.

Comparing the pre-test and post-test results, instruction effectively conveyed the concept of topicalization (also see Ai, 2021). This concept was systematically integrated into the declarative memory system (Paradis, 2009), which supports explicitly learned knowledge. In the meantime, extensive practice advocated by STI to promote the development of implicit knowledge could consolidate and reinforce the explicitly learned grammar. The delayed post-test served as a crucial mechanism for evaluating how effectively explicitly learned grammar knowledge was retained. The fact that OSV could processed in the delayed post-test suggests that STI was highly effective in teaching L2 grammar.

Before concluding, it is useful to discuss a comment regarding stage-skipping, which was associated with morpheme and syntax development within the PT framework. According to Lenzing (personal communication), our learners might not have skipped a stage because they might have acquired a lower-stage morpheme, which acted as a prerequisite for acquiring the *ba*-construction. In other words, the processability of Stage 4 morphemes allowed our learners to acquire the *ba*-construction without OSV. However, in the PT paradigm, it is not exactly clear why and how a morpheme at stage 4 may bootstrap syntax at stage 5 while syntax at stage 4 is missing. Dyson (2009) noted that for two of her ESL learners, syntactic features emerged before morphological features at the same stage. Bonilla (2012) reported similar findings regarding Spanish syntax and morphology. These findings suggest that morphological

development does not necessarily facilitate syntax development. In sum, the fact that our learners were able to process classifiers on the pre-test does not make a strong case against our finding about skipping a PT stage.

**Limitations**

One limitation of this study is related to the elicited imitation (EI) task. Using the EI task to assess the grammar knowledge of beginning Chinese learners can be time-consuming. The task places a high cognitive load on participants, as it requires both comprehension and production, which may lead to boredom and fatigue. The EI task was administered at several points during the study—specifically, during the pretest, post-tests, and the delayed post-test. Although the task content differed across these time points, there is still the possibility of a practice effect. Including a control group that undergoes the EI tasks four times would be valuable for determining whether a practice effect was indeed present. Despite this limitation, the presence of a practice effect does not invalidate the major finding regarding the violation of the developmental trajectory, which was made largely based on the results of the pre-test.

**Conclusion**

A key finding of this study is that two heritage speakers of Chinese were able to process and produce the ba-construction without having the OSV structure in their linguistic system. These speakers had not received formal training in Chinese and acquired the *ba*-construction through everyday communication. This suggests that they learned the *ba*-construction implicitly, relying on unconscious mechanisms rather than explicit instruction.

Despite their ability to produce accurate *ba*-construction sentences, the speakers could not articulate the construction's function, indicating that their knowledge was primarily procedural and not declarative. In a follow-up interview, both participants confirmed that they were unfamiliar with the OSV structure prior to the study. Additionally, they reported that learning the OSV structure felt unnatural and awkward. Regarding the *ba*-construction, one participant stated that she did not understand its function until after receiving explicit instruction.

According to Processability Theory (PT), the frequency of a grammatical structure is not the primary factor in determining the developmental order, as frequency is not supposed to override PT's processing constraints. However, the two heritage speakers in the current study seem to provide counterevidence to Pienemann's claims. They could process and produce the highly frequent *ba*-construction while the OSV structure was absent from their grammatical systems.

Nevertheless, this study did not offer direct evidence to prove that the frequency of a grammatical structure can override processability constraints. While it is reasonable to hypothesize, as suggested by Ellis (2002), that frequency can influence L2 grammar acquisition, empirical studies are still necessary to evaluate how the frequency of the OSV structure and the *ba*-construction may relate to the developmental sequence of Chinese grammar. For instance, longitudinal studies using child language corpora could be valuable. Such research could examine the relationship between input frequency and the emergence of

grammatical structures, potentially explaining why the *ba*-construction may emerge before the OSV structure due to input frequency.[2]

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## Ethics Declarations

## Competing Interests

No, there are no conflicting interests.

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## References

Ai, H. (2021). A Concept-based Approach to the Instruction of the Chinese ba-construction. *Language & Sociocultural Theory*, *7*(1), 1-32. https://doi.org/10.1558/lst.38768

Bender, E. (2000). The syntax of Mandarin Bǎ: Reconsidering the verbal analysis. *Journal of East Asian Linguistics*, *9*(2), 105-145. https://doi.org/10.1023/A:1008348224800

Bresnan, J. (2001). *Lexical-functional syntax*. Blackwell.

Bonilla, C. L. (2012). Testing Processability Theory in L2 Spanish: Can readiness or markedness predict development? [Unpublished doctoral dissertation]. University of Pittsburgh.

Chafe, W. (1976). Giveness, contrastiveness, definiteness, subjects, topics, and point of view. In C. Li (Ed.), *Subject and topic* (pp. 25-55). Academic Press.

Chao, Y. (1968). *A grammar of spoken Chinese*. University of California Press.

Dyson, B. (2009). Processability theory and the role of morphology in English as a second language development: A longitudinal study. *Second language research*, *25*(3), 355-376. https://doi.org/10.1177/0267658309104578

Ellis, N. C. (2002). Frequency effects in language processing: A review with implications for theories of implicit and explicit language acquisition. *Studies in Second Language Acquisition, 24*(2), 143-188. https://doi.org/10.1017/S0272263102002024

Ellis, R. (2005). Measuring implicit and explicit knowledge of a second language: A psychometric study. *Studies in Second Language Acquisition*, *27*(2), 141-172. https://doi.org/10.1017/S0272263105050096

Kao, Y. T. (2023). Empowering preservice English teachers with language assessment literacy concepts and practices: Application of Vygotskian concept-based language instruction. *The Modern Language Journal*, *107*(S1), 68-94. https://doi.org/10.1111/modl.12818

Kaplan, R., & Bresnan, J. (1982). Lexical-functional grammar: A formal system for grammatical representation. In J. Bresnan (Eds), *The mental representation of grammatical relations* (pp.173-281). The MIT Press.

Gal'perin, P. I. (1970). An experimental study in the formation of mental actions. In E. Stones (Eds), *Reading in educational psychology: Learning and teaching* (pp.142-154). Barnes and Noble, Inc.

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[2] Excerpts and examples in the study were taken from the author's unpublished dissertation available online: https://www.proquest.com/docview/1846123376?pqorigsite=gscholar&fromopenview=true&sourcetype=Dissertations%20&%20Theses

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Gal'perin, P. I. (1992). Stage-by-stage formation as a method of psychological investigation. *Journal of Russian and Eastern European Psychology*, *30*(4), 60-80. https://doi.org/10.2753/RPO1061-0405300460

Gao, X. (2009). *Noun phrase morphemes and topic development in L2 Mandarin Chinese: A processability perspective*. Lambert Academic Publishing.

Lantolf, J. P. (2011). Integrating sociocultural theory and cognitive linguistics in the second language classroom. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (Vol. 2) (pp. 303-318). Routledge.

Lantolf, J. P., & Zhang, X. (2015). Response to Pienemann's critique of Zhang and Lantolf (2015). *Language Learning*, *65*(3), 752-760. https://doi.org/10.1111/lang.12122

Li, C. N., & Thompson, S. A. (1989). *Mandarin Chinese: A functional reference grammar*. University of California Press.

Liu, B., Di Biase, B., & Kawaguchi, S. (2023). The development of lexical mapping in Chinese L2: the mapping of multiple arguments, passive and causative structures. In S. Kawaguchi, B. Di Biase, & Y. Yamaguchi (Eds.), *Processability and Language Acquisition in the Asia-Pacific Region* (pp. 63-90). John Benjamins https://doi.org/10.1075/palart.9.03liu

Paradis, M. (2004). *A neurolinguistic theory of bilingualism*. John Benjamins. https://doi.org/10.1075/sibil.18

Pienemann, M. (1989). Is language teachable? Psycholinguistic experiments and hypotheses. *Applied Linguistics, 10*(1), 52-79. https://doi.org/10.1093/applin/10.1.52

Pienemann, M. (1998). *Language processing and second language development: Processability theory.* John Benjamins. https://doi.org/10.1075/sibil.15

Pienemann, M. (2005). An introduction to processability theory. In M. Pienemann (Eds), *Crosslinguistic aspects of processability theory* (pp.1-60). John Benjamins. https://doi.org/10.1075/sibil.30.03pie

Pienemann, M. (2007). Processability theory. In B. VanPatten & J. Williams (Eds.), *Theories in second language acquisition* (pp. 137-154). Erlbaum.

Pienemann, M., Di Biase, B., & Kawaguchi, S. (2005). Extending processability theory. In M. Pienemann (Ed.), *Cross-linguistic aspect of processability theory* (pp. 199-251). John Benjamins. https://doi.org/10.1075/sibil.30.09pie

Tomasello, M. (2005). Constructing a language: A usage-based theory of language acquisition. Harvard university press. https://doi.org/10.2307/j.ctv26070v8

Wang, X. (2011). *Grammatical development among Chinese L2 learners: From a processability account* [Unpublished doctoral dissertation]. Newcastle University.

Zhang, X. (2014). *The teachability hypothesis and concept-based instruction: Topicalization in Chinese as a second language* [Unpublished doctoral dissertation]. The Pennsylvania State University.

Zhang, X. (2020). A bibliometric analysis of second language acquisition between 1997 and 2018. *Studies in Second Language Acquisition*, *42*(1), 199-222. https://doi.org/10.1017/S0272263119000573

Zhang, X. (2021). Testing the Topic Hypothesis: A Concept-based Teaching Study. *Language & Sociocultural Theory*, *7*(1), 87-122. https://doi.org/10.1558/lst.37716

Zhang, X., & Lantolf, J. P. (2015). Natural or artificial: Is the route of L2 development teachable? *Language Learning, 65*, 152-180. https://doi.org/10.1111/lang.12094

Zhang, Y. (2007). Testing the Topic Hypothesis: The L2 acquisition of Chinese syntax. In F. Mansouri (Eds.), *Second language acquisition research: Theory-construction and testing* (pp. 145-171). Cambridge Scholars Publishing.