

Phase Impenetrability Condition and the Acquisition of Unaccusatives, Object-Raising Ba-Constructions and Passives in Mandarin-Speaking Children

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1. Introduction

To account for the universally observed delay of passives in child language acquisition, based on Chomsky's (2001) the Phase Impenetrability Condition (PIC), Wexler (2004, 2007) proposed the Universal Phase Requirement (UPR), claiming that young children take all vP's to define strong phases in such a way that the internal argument from inside the domain of the phase head cannot move out of the phase since the movement is blocked by Chomsky's (2001) PIC.

The present study consists of two large-sample experiments on the acquisition of unaccusatives, object-raising Ba-constructions and passives of 812 Mandarin-speaking children, in an attempt to see if PIC and UPR work and how they should work in the area of acquisition.

Our experiment results show that there is an apparent delay in the acquisition of passives compared with that of unaccusatives and Ba-constructions for Mandarin-speaking children. The acquisition fact is suggestive of a specific definition of phase for Chomsky's PIC as follows: a vP with agent externally merged at its Spec is a phase but a vP without an externally merged agent is not. The movement of the internal argument in unaccusatives is out of a vP without agent, and the movement of the internal argument in Ba-constructions takes place within a vP with agent, but the movement of the internal argument in passives (*bei*-constructions of long passives) is out of a vP with an externally merged agent Spec. Under the phase specification as formulated above, UPR is able to account for the delay of passives in young Mandarin-speaking children given that the movement of internal argument in passives is blocked by PIC before the vP phase is weakened or defected as in adult grammar.

2. Experiments

All the materials used in the experiments are instances of the movement of internal argument (IA), which are: (A) IA movement in unaccusatives, (B) IA movement in Ba-constructions, and (C) IA movement in passives. We conducted two experiments on 812 Mandarin-speaking child subjects, ranging from 02;01 to 06;11, with the mean age being 04;25, from Shijiazhuang, the capital city of Hebei Province, China.

Experiment 1 was a comprehension task of two-choice sentence-picture matching. There were altogether eight sentence-picture pairs in the experiment. In each pair, two elicitation questions, one in the form of passive, the other in the form of Ba-construction, were presented together with two pictures to the subjects. For example, the experimenter showed the subject a picture about a dog biting a cat, another picture about a cat biting a dog. One of the elicitation questions contained a Chinese passive sentence like “*zai na-zhang hua li, xiaomao bei xiaogou yao le?*”(Which picture is about a cat being bitten by a dog?), the other a Ba-construction like “*zai na-zhang huali, xiaomao ba xiaogou yao le?*” (Which picture is about a cat has got the dog bitten?). The arguments involved in both elicitations

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were reversible between the external theta-role and the internal theta-role to avoid pragmatic bias. The task of the child subject was to point at the picture he/she thought matching the theta-role assignment represented in the elicitation questions. There were altogether 8 tasks like this.

Experiment 2 was a production task. The experiment materials included 5 testing scenarios in the form of elicitation questions, embedded in two different contexts: (i) unaccusative-inducing context and (ii) passive-inducing context. The unaccusative-inducing context was created to be “patient-prominent” and to introduce two-choice sentence-picture matching tasks, which were most likely to prime unaccusative predicates.

In the passive-inducing context of our experiment, we designed two elicitation questions based on two agent-sensitive scenarios, each consisting of three pictures. For example, in one of the scenarios about a stolen TV set, one picture depicted a TV set on a table in a living room. The second one was about a burglar-like figure leaving the room at the door with the TV set in his arms. The third one was the same as the first picture but with the TV set gone. The experimenter started conversation with the child subject by saying something about the first two pictures in the TV set scenario like “Look at the TV set on the table. Look, a thief is holding the TV set and is about to leave”, and then asked the child subject about the third picture by saying something like “*dianshiji ne?*” (What’s happened to the TV set?).

The child subject was expected to respond in the form of passive construction like “(*dianshiji*) *bei xiaotou tou-zou-le*” (The TV set has been taken away by the thief) or unaccusative constructions like “(*dianshiji*) *gei tou-zou-le*” (The TV set has been stolen away.) or “(*dianshiji*) *bei tou-zou-le*” There were altogether 5 sets of elicitations like this.

3. Results

The result of the comprehension task in Experiment 1 is shown in Table 1:

Table 1: Match Rate in Comprehension in Unaccusative-inducing Context

	2 year olds	3 year olds	4 year olds	5 year olds and up
Unaccusatives	97%	90%	91%	97%
Ba-constructions	31%	65%	88%	94%
Passives	4%	21%	35%	41%

As shown in this table, it is apparent that the use of unaccusatives in all the age groups is predominant, with few occurrences of passives in the youngest group of 2 year olds, some occurrences of passives in 3 year olds and 4 year olds, and an early occurrence of Ba-construction of big percentage in 2 year olds and up. It clearly indicates that the children in the youngest age group of 2 year olds almost have no problems at all in understanding Chinese unaccusatives while having big problems with the understanding of passives. In the age group of 2 year olds, the match rate for unaccusative is as high as 97% but that for passives is as low as 4%. Even for the group of 5 year olds and up, the match rate of passives is only about 41%. This may serve as a firm piece of evidence showing that compared with the unaccusatives and Ba-constructions, the acquisition of passives is delayed. The small decrease in unaccusatives seen from 2 year olds to 3 and 4 year olds may be attributed to the identification of the picture content rather than syntactic structures.

The results of the production tasks are shown in Table 2 and Table 3 below:

Table 2: Percentage in Production in Unaccusative-inducing Context

	2 year olds	3 year olds	4 year olds	5 year olds and up
Unaccusatives	97%	90%	91%	97%
Ba-constructions	3%	9%	4%	3%
Passives	0%	1%	1%	1%

As shown in this table, unaccusatives productions are just as easy to induce and remain predominant as in comprehension. The percentage of the production of Ba-construction is slightly higher than that of passives. The lower percentage in Ba-constructions and passives is no relevant given the unaccusative-inducing contexts.

Table 3: Percentage in Production in Passive-inducing Context

	2 year olds	3 year olds	4 year olds	5 year olds and up
Unaccusatives	69%	50%	26%	27%
Ba-constructions	0%	48%	70%	71%
Passives	31%	48%	70%	72%

As is shown in this table, there is a decrease in the use of unaccusatives from 69% in 2 year olds to 50% in 3 year olds and to 26% in 4 year olds, 27% in 5 year olds and up, and at the same time a dramatic increase in the use of passives from 31% in 2 year olds to 48% & in 3 year olds and then to 70% in 4 year olds and 72% in 5 year olds and up. Even in the passive-inducing situation, there are still 28% of the 5 year olds and up who have difficulties in producing passives. However, if we compare the percentage between the production of unaccusative-inducing context and that of passive-inducing context, we may readily find that production of unaccusatives is earlier and easier than production of passives throughout all the age groups.

The acquisition data in both comprehension tasks and production tasks provides firm evidence for the universality of passives delay in young children.

4. Discussion

Now, let us see if we can accommodate these findings in Wexler's PIC-based UPR account for delay of passives, starting with one of our interesting findings of the passive morpheme –like element *gei* (Shi, 1997) in the data. The frequency of this *gei* in our data is very high. It is found in a pre-verb position in the unaccusatives, Ba-constructions and the so-called “long passives” and “short passives”. Thus, we assume that all Chinese Ba-constructions and passives are derived from unaccusatives. Since *bei* in the long passives can alternate with *rang*, *jiao*, *gei* but *bei* in short passives can alternate only with *gei*, we come to realize that the so-called “short passives” are not passives as claimed in Huang (1999) but unaccusatives or “derived unaccusative”. Given that Ba-constructions and passives are derived from unaccusatives, we will proceed to see how unaccusatives are derived in Chinese as the prerequisite for the derivation of Ba-constructions and passives.

In accordance with Chomsky's (1995) derivation of unaccusatives, the derivation of a Chinese unaccusatives may be captured as follows: the internal argument from the domain of the vP phase, i.e VP, first moves to the Spec of the vP phase, and then moves up to Spec of vP, which is the edge of the vP phase. It can be seen that the two movements involved are the PIC irrelevant since nothing in the alleged vP phase domain has moved out the phase.

However, in Chomsky's formulation of PIC, the phases, at least the vP phase, are all full-fledged with the Spec of vP present even when no element is externally merged. But if we adopt the purely derivational approach in MP rather than the representational approach in GB syntax, the Spec of vP will not be there per se for external argument in unaccusatives before the internal argument (i.e. the subject of the unaccusative) raises, following the unaccusative configuration proposed by Chomsky (2001). Recall that in a numeration for unaccusatives there is simply no external argument (agent) whatsoever. We are led to the need for further specifying the definition of phase as follows: a vP is not a phase if it is without Spec resulted from external merge.

Therefore, the fact that the unaccusatives are represented as grammatical for both adults and young children suggests that they both know the movement of the internal argument from inside VP to outside of vP does not violate PIC, given the specification phase stated above. If this is true, both young children and adults are endowed with the knowledge about what PIC is, and PIC works

following the specified definition instead of the original definition of vP in Chomsky's (2001) PIC and Wexler's (2004, 2007) UPR.

Now, let us turn to the derivation of Ba-constructions. Assuming that the functional item Ba appears in T performing two syntactic functions: one is to inherit the Tense Agree-feature (Nominative Case assignor) from C as is generally assumed, the other is to serve as an accusative Case marker as argued in Jun Tian (2003), this Ba would behave as something like a transitive verb with Tense, assigning a Nominative Case to its subject and an accusative Case to its object. The movements involved in forming a Ba-construction would include the movement of the internal argument from inside the domain of the vP phase to Spec of the vP phase, and the movement of the external argument from the edge Spec of vP. Notice that there is a difference between the vP phase in unaccusatives and that in Ba-constructions. According to our specification of the vP phase, the vP phase in unaccusatives, without Spec is not a phase whereas the vP phase in a Ba-construction is a phase with the obligatory presence of an externally merged Spec agent. However, none of these movements involved in the derivation of Ba-constructions is relevant to PIC or UPR since no element from the vP phase domain moves up across the edge of the vP phase. Even if the vP is defined as strong for young children according to UPR, the movements are not in the realm of its constraints. It seems that a UPR account for the smooth acquisition of both unaccusatives and Ba-constructions is in order. Young children share the same knowledge about the strength of the vP phase and no maturation process is observed in the syntactic areas of unaccusatives and Ba-constructions. Also notice that the lower percentage in Ba-constructions does not mean that the comprehension or production of Ba-constructions is more difficult than that of unaccusatives, since all the questions we presented to the subjects were questions about the internal argument and Ba-constructions with the obligatory presence of the external argument are not the appropriate responses for questions about the internal argument.

Now, let us move to the derivation and acquisition of Chinese passives. How passives in Mandarin Chinese are generated has been a controversial issue over the syntactic status of the functional element of *bei* in the circle of Chinese grammarians. Generally speaking, there are three different approaches: In one approach, *bei* is treated as a verb taking a VP complement (Tang, 1999), in another approach, *bei* is treated as C head taking a clause complement (Huang, 1999); in the third approach, *bei* is treated as a preposition similar to the *by* in the *by*-phrase in English passives. In our present discussion, the preposition approach can be immediately rejected since the *bei*-phrase, unlike the optional *by*-phrase in English, is obligatorily required in Mandarin Chinese passives. Thus, the complementation approaches are favored. Since our definition of Chinese passives is limited to the traditional long passives, i.e. passives with agent, we prefer Huang's approach taking *bei* as a C head taking a TP complement.

Under this approach, the basic derivation steps can be stated as follows: (i) the internal argument merged with an unaccusative verb at the complement position of VP; (ii) then the VP merged with a *v*, giving rise to a vP without Spec; (iii) then, the vP without Spec merged with an external argument, yielding a full-fledged vP with Spec, turning it into a phase, according to our specification of vP phase; (iv) then, T merged with the vP phase without Spec, giving rise to TP, and C (*bei*) merged with the TP; (v) triggered by the Edge-feature of the C head, the internal argument started to move from the domain of the vP phase, which is defective for adults but strong for young children, across the edge of the vP phase up to the Spec of CP without being able to stop over at the intermediate Spec-vP, since it is occupied by the copy (t) of the external argument.

Apparently, in the derivation of passives, the movement of the internal argument is from the inside of the domain of the phase head *v*, i.e. VP across the edge of the vP phase. When the vP phase is defective as in the adult grammar, the movement of the internal argument in passives respects PIC, but when the vP phase remains strong in the acquisition process of young children as is claimed in UPR, the movement violates PIC.

In sum, from these three derivations we can find that the IA movement in all the three cases (unaccusatives, Ba-constructions and passives) start from the impenetrable domain VP headed by the phase head. However, in Ba-constructions the IA movement is phase-internal, i.e. the target position

for this movement is the Spec-vP rather than outside of the phase, thus PIC is respected. In unaccusatives, the IA movement is out of the phase. However, if phase is redefined as full-fledged phase with Spec, then the IA movement can be licensed by PIC. In passives, the IA movement is out of a full-fledged phase and targets for a position external to the phase, a violation of PIC. All these PIC accounts suggest that the Mandarin-speaking children in our experiment have the knowledge that can be expressed in terms of PIC with our specification of what constitutes a vP phase, and that they are programmed to perform in production and comprehension correspondingly, thus lending a straightforward support for Wexler's UPR, which claims that for premature children, vP is defined as a strong phase. The acquisition of passives is delayed because the vP remains a strong before it becomes weakened or defected as in adults. The maturation sees a process in which the strong vP phase gets weakened or defected.

5. Conclusion

Our experiments in assessing the production and comprehension of unaccusatives, Ba-constructions and passives of Mandarin-speaking children show that the universal nature of delay in passives is evidenced in Mandarin Chinese. The delay in passives and the punctuality in unaccusatives and Ba-constructions can be nicely attributed to PIC, with a technical modification of the definition of vP phase. Thus, PIC-based UPR affords a maturation account for these acquisition phenomena by claiming that young children are born with the definition of vP as a strong phase and the awareness that PIC should be respected. The maturation process is one in which PIC can be salvaged by weakening or defecting the strong phase of vP so that the IA movement in passives is licensed as the Faculty of Language grows in a child.

The study also suggests a specified definition of vP phase for PIC and UPR to work, that is to say, a vP is a phase if it is full-fledged with an externally merged Spec, and that the traditionally so-called short passives are not passives at all but unaccusatives.

In term of syntactic contributions, the present study provides some empirical evidence supporting Huang's (1999) analysis of the syntactic status of the functional element *bei*, Shi's (1997) treatment of *gei* as a passive morpheme-like element and Jun's (2003) identification of Ba as an unaccusative Case marker.

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