

The Effect of Subject Person on English Auxiliary Movement: Evidence from Early L2 Learners

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1. Introduction

In this paper, I examine preschool-aged Korean-English sequential bilingual children, who are first language (L1) speakers of Korean and early second language (L2) learners of English. The study shows an effect of person, [PRS], in the lack or presence of subject auxiliary inversion (SAI) in English wh-questions by K-E children, and a four-stage progression of acquisition of SAI. To account for this empirical data within a generative theoretical framework, I propose the Person Feature Auxiliary Movement (PFAM) Hypothesis, which makes predictions about what auxiliary will appear in C position based on [PRS]. I will argue that the patterns seen in the experimental findings of this study can be accounted for through the PFAM Hypothesis, allowing us to argue that despite surface forms that do not exhibit auxiliaries in C, K-E bilingual children have competence of T-to-C movement even at the earliest stages.

SAI, or T-to-C movement, has been found to be problematic for L1 learners of English (de Villiers, 1991; Erreich, 1984), as well as for L2 learners (Lee, 2008; Spada & Lightbown, 1999). One of the challenges and goals of SAI acquisition research has been to identify the stages of wh-question acquisition, and pinpoint a predictor for the presence or lack of SAI in child language. Some researchers have proposed that SAI is acquired piecemeal based on question type and negation (Klima & Bellugi, 1966; Radford, 1994). Others propose learners acquire SAI for argument wh-questions before adjunct questions (de Villiers, 1991; Erreich, 1984; Stromswold, 1990). Lee (2008) also found evidence of such asymmetry in adult L2 learners of English whose L1 is Korean. Another related question is whether T-to-C movement is available from an early age. Klima and Bellugi (1966) and Radford (1994) advocated a delay in the acquisition of question formation and inversion based on evidence from early wh-questions. Others, including Klee (1985) and Stromswold (1990) argued against the idea of a delay in acquisition of inversion, arguing that there is not enough evidence to posit a special stage when kids have acquired auxiliaries but do not invert it.

Preliminary study of K-E bilingual children by the author showed that while non-inversion was quite apparent, there was no indication that question type, negation, nor argument versus adjunct distinction predicts the use and development of SAI. Instead, the data suggested a pattern in which first and second person wh-questions had SAI, but third person questions lack movement. This gives rise to the question of [PRS] as a possible predictor for K-E children's use of SAI in English wh-questions. Interestingly, Korean is unlike English in that does not mark verbs for the [PRS] feature, i.e. the verb remains unchanged regardless of whether the subject is first, second, or third person. It is possible that if an effect of [PRS] is seen for SAI in K-E children, it may be due to lack of this feature in the L1. Additionally, analysis of such data should be able to disambiguate whether K-E children have T-to-C movement from the earliest stages of development, or whether this operation is acquire in later stages. From these ideas, we derive the following research questions for the present study:

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- (1)
 - a. Does [PRS] play a significant role in the presence or absence of inversion in wh-questions with *do* and *be*?
 - b. What are the stages of inversion acquisition by L1 Korean-L2 English (K-E) children?
 - c. Do K-E children lack competence for inversion, unlike what has been argued for M-E children?

2. Theoretical Background

2.1. T-to-C Movement

The account of T-to-C movement that we adopt comes from Pesetsky and Torrego (2001), who proposed that the motivation for this movement comes from an uninterpretable tense feature [u TNS] residing in C. Uninterpretable features, or u F, cannot be interpreted at the interface levels and do not have a value. If the u F is left unvalued, it remains visible at the interface as an unsatisfied feature and thus, the derivation would crash at LF. In order to prevent this crash, the u F requires a value from some other element in its C-commanding domain that has the same feature but does have a value, such as [TNS_{past}]. consists of a valued [TNS] feature moves to C in order to value the [u TNS] feature. The u F is now allowed to delete, thereby avoiding a crash in the derivation (Chomsky, 1995).

2.2. Person Feature Specification

The expression of grammatical person in English requires a ternary distinction in the paradigm: first, second, and third person. Often represented by two binary features, e.g. [\pm PARTICIPANT][\pm ADDRESSEE] (Nevin, 2007). However, there are well-established claims crosslinguistically that declare third person to be a non-person, or an unspecified default (Baker, 2008; Benveniste, 1973; Harley & Ritter, 2002; Kayne, 2000). In this situation, third person needs to special representation. First and second person may be notated as [PARTICIPANT][\pm ADDRESSEE], where [ADDRESSEE] is a binary feature and [PARTICIPANT] is a privative feature that is either present or absent. In contrast, third person simply lacks a feature. This method of giving a privileged status to first and second person, but not third person, is particularly relevant if there is no evidence to specify third person, as the target of an operation. Once third person does require special specification, e.g. targeted in an operation such as movement, a three-way distinction with a feature for third person is necessary. From an acquisition view, we may postulate that children do not acquire these features and distinctions simultaneously; rather, the specifications may be acquired piecemeal. This is one of the key areas we will be exploring in the analysis in Section 5.

3. Methodology

3.1. Participants

Twenty-six Korean-English (K-E) bilingual children (11 girls, 15 boys) and 20 monolingual English-speaking (M-E) children (9 girls, 11 boys) participated in the elicitation task. Five K-E children and one M-E child were dropped from the study due to shyness or inability to complete training items. The K-E bilingual children range between ages 4;0 – 6;10¹, and are sequential bilinguals who were exposed to Korean from birth and acquired English as an early L2 upon entering preschool (mean age of exposure 2;6). All monolingual children were exposed to English from birth and had no influence from another language. The two groups were proficiency-matched using the Sentence Imitation subsection of the TOLD-P:3². Table 1 provides an overview of the ages of both groups of children. The K-E and M-E groups were also matched on socioeconomic status, schools, geographical location, and parents' education.

¹ This particular age group was chosen on the basis of previous corpus data, which shows that this age group exhibits the most variability of T-to-C movement.

² The test of Language Development Primary: Third Edition is a general comprehensive language development measure designed for preschool-aged English-speaking children.

Table 1

Ages of Participants by Group

Group	<i>n</i>	Age Range	Mean Age	Median Age	Mean TOLD:P3
K-E	21	4;0 – 6;10	5;4	5;1	5.24
M-E	19	3;3 – 5;1	4;2	4;3	6.63

3.2. Procedure

The study was designed to elicit wh-questions in English for first, second, and third person for AUX-*be* and AUX-*do*.³ All elicited questions were singular, object-*what* questions, and used transitive lexical verbs that take inanimate objects. The ten verbs used in the study are monosyllabic high-frequency verbs found in ChildFreq (Bååth, 2010)⁴, listed in (2).

- (2) Regular: *brush, clean, cook, pull, push, wash*
 Irregular: *draw, drink, eat, hold*

Past tense was used to prevent contractions with the subject pronoun and AUX-*be* (*he + was = *he's*), which may prevent or complicate SAI. Each child participated in two 30-minute sessions administered on two separate days, one week apart. Sixty total scored test items were given, each eliciting one target wh-question, 20 first person, 20 second person, and 20 third person. Items were counterbalanced in six different forms to reduce any ordering effects. Each form was divided into two sections containing 30 items of the same auxiliary, where one section was administered on Day 1 and the other section on Day 2. The 30 items were grouped by person, such that the first 10 items were one person value, the next 10 items were another person value, and the last 10 items were another person value. The order in which these 10-item groups were presented (e.g. FIRST-SECOND-THIRD, THIRD-FIRST-SECOND, or SECOND, THIRD, FIRST), as well as the order in which the auxiliaries were presented (e.g. AUX-*be* on Day 1 and AUX-*do* on Day 2, or visa versa) were counterbalanced between the six forms.

The elicitation was conducted with the use of puppets and a partially closed curtain that hides the direct object, as described in Thornton (1998). During each elicitation session, one examiner took on the role of the Storyteller and another operated the puppets. Following the warm-up, three training items were given in order for the children to become familiar with the task.

To elicit first person questions, the child was presented with three toys in front of her. The Storyteller would demonstrate an action, e.g. *brush*, and then ask the child to repeat it with one of the three objects while Teddy's eyes were closed. Afterwards, the Storyteller prompted the child to ask the wh-question by saying *Ask Teddy what you brushed*. The child would then ask *What did I brush?* For AUX-*be* items, the child was prompted *Ask Teddy what you were brushing*.

For second person questions, Teddy did something behind the partially closed curtain, and the Storyteller would prompt, *Ask Teddy what he brushed*, eliciting the wh-question, *What did you brush?* For AUX-*be* items, the child was prompted *Ask Teddy what he was brushing*.

For third person, a shy puppet, Giraffe, was used so that in order to find out what Giraffe did, the child would have to ask Teddy. To begin, Giraffe did something behind the curtain, and the Storyteller

³ These auxiliaries were the most frequently occurring auxiliaries and showed the most variability of T-to-C movement usage based on corpus data from Park (2008).

⁴ ChildFreq is an online tool that is linked to the CHILDES Database to explore word frequencies in child English productions.

would prompt, *Ask Teddy what she brushed*, eliciting the wh-question *What did she brush?*⁵ For AUX-be, the child was prompted *Ask Teddy what he was brushing*.

4. Results

The results were analyzed in a generalized linear mixed model, or mixed logit model.⁶ The dependent measure of auxiliary movement (AUXMOVE) has a binary response of movement or no movement.

A significant main effect of GROUP was found, $F(1, 2116) = 16.33, p < .001$, indicating that bilingual and monolingual children performed significantly differently on use of SAI in their wh-questions. A post-hoc comparison of means revealed that monolingual children scored higher than bilingual children, $t(2116) = 4.04, p < .001$. Figure 1 shows a comparison between the two groups on their mean percent performance of SAI. Given the starkly different behavior by each group, the remainder of the analyses were conducted separately per group, as language background is shown to have a profound difference on SAI.

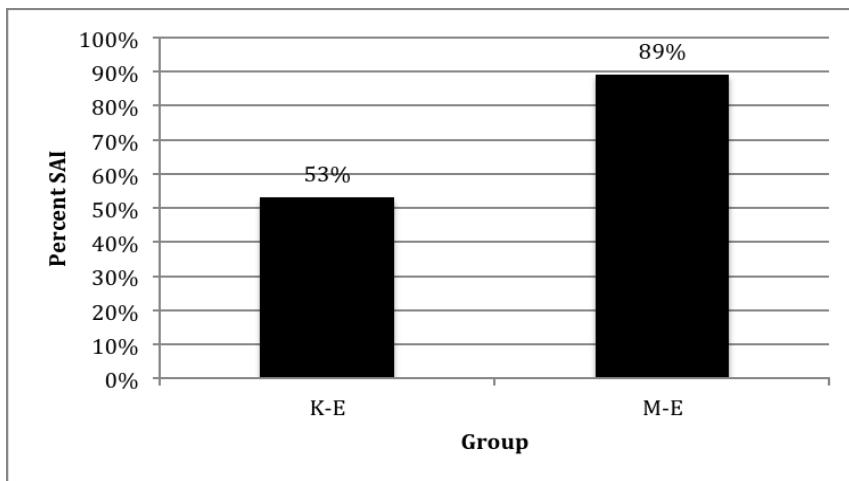


Figure 1. Percent Use of SAI by Bilingual and Monolingual Children

The results for the K-E bilingual group revealed a significant effect for PERSON, $F(2, 1087) = 34.25, p < .001$, indicating that children performed differently on SAI given a different person value. K-E children's use of SAI for each auxiliary by person can be seen in Figure 2. First person differed significantly from second person, $t(1096) = 5.56, p < .001$, with children performing higher for second person. First person also differed significantly from third person, $t(1096) = -4.03, p = .002$, with first person performing higher than third person. The largest differences of means occurred between second and third person, $t(1096) = -8.18, p < .001$, where children perform significantly higher on SAI for second person than third person questions. We can conclude from the data that PERSON is a strong predictor for SAI for K-E children.

⁵ It should be noted that for third person, we elicited the target wh-question with the pronoun form of the subject, *she*, rather than using the proper noun *Giraffe*. This was to maintain consistency of form between third person questions and the first and second person questions, which necessarily must appear with the pronouns *I* and *you*.

⁶ This model accommodates a non-normal distribution and binarity in the response variable, and allows us to specify the random effect of CHILD in the analysis. For more on the use of mixed logit models, see Jaeger (2008).

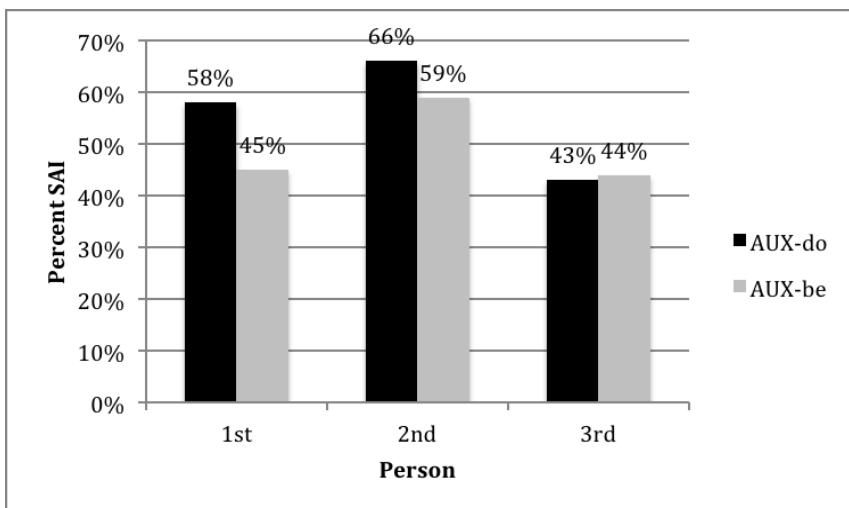


Figure 2. Percent Use of SAI by Korean-English Bilingual Children by Auxiliary Type and Person

In comparison, for the monolingual children there was no significant effect of PERSON on their use of SAI, $F(2, 1026) = 2.50, p = .080$. There are also no significant differences between any of the person features for the monolingual children. Percentage use of SAI for each person by M-E children can be seen in Figure 3.

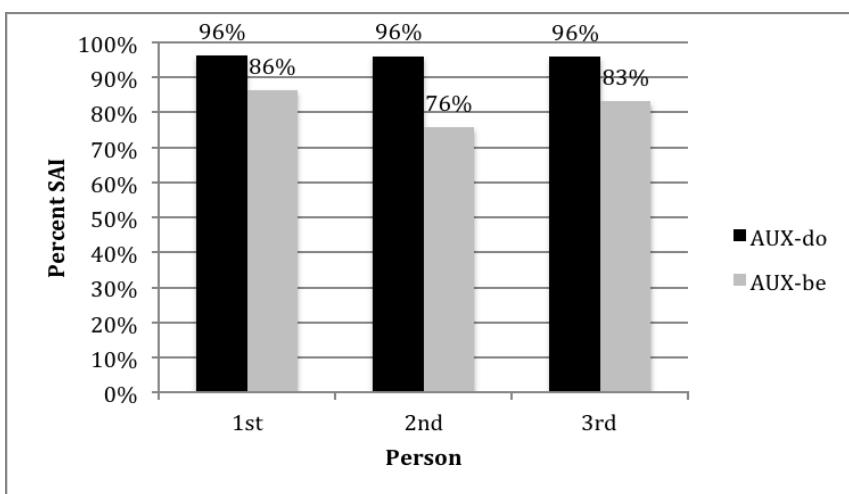


Figure 3. Percent Use of SAI by English Monolingual Children by Auxiliary Type and Person

Let us now turn to a qualitative look at the responses from the children. The bilingual children in the present study showed a four-step progression of the acquisition of AUX-*do* and -*be* inversion, seen in (3) below. The stages were determined based on the nature of the productions by the children, which correspond to the children's TOLD:P-3 score. The sequence of acquisition shows that children initially go through a stage with no auxiliary, then SAI appears for second person utterances, followed by SAI for first person, then finally third person. This is the case for both AUX-*do* and AUX-*be*, although AUX-*be* has the additional Stage 1b where the auxiliary is found in situ for all persons.

(3)

Stages of AUX-do AcquisitionStage 1: *What you eat*No presence of *do* in T or CStage 2: *What did you eat**Do* appears in C for 2nd personStage 3: *What did I eat**Do* appears in C for 1st personStage 4: *What did she eat**Do* appears in C for 3rd personStages of AUX-be AcquisitionStage 1: *What you eating*No presence of *do* in T or CStage 1b: *What you were eating**Be* appears in situStage 2: *What were you eating**Be* appears in C for 2nd personStage 3: *What was I eating**Be* appears in C for 1st personStage 4: *What was she eating**Be* appears in C for 3rd person

An overview of the stages, number of children, ages and TOLD:P-3 scores, and example utterances can be seen in Table 2 for AUX-*do* and Table 3 for AUX-*be*. This step-wise development is consistent with what the quantitative results show, in that there is a significant difference between each person value. The contrasts at ever level are very distinct, as all ten items within first, second, and third person appear consistently with or without SAI, with very little to no deviation from this pattern.

Table 2

Stages of AUX-do Acquisition

Stage	Participants (<i>n</i>)	Mean Age	Mean TOLD:P-3 ⁷	Examples
1	6	4;5	1.0	What I clean? (109-C) What you cook? What she draw?
2	2	4;2	1.5	What I push? (113-A) What'd you cook? What she wash?
3	2	6;0	3.5	What did I drink? (110-D) What did you hold? What she brush?
4	11	5;11	10.3	What did I clean? (106-F) What did you wash? What did she drink?

⁷ Scores from the TOLD:P-3 test is reported here, as it appears to better correlate with SAI than age.

Table 3

Stages of AUX-be Acquisition

Stage	Participants (n)	Mean Age	Mean TOLD:P-3	Examples
1	6	4;5	1.0	What I cooking? (101-A) What you drinking? What she drawing?
1b	2	4;3	1.0	What I was cleaning? (115-C) What you was washing? What she was drinking?
2	2	4;2	1.5	What I was brushing? (113-A) What were you pulling? What she were cleaning?
3	1	6;7	2.0	What did I drink? (110-D) What did you hold? What she brush?
4	9	6;1	10.0	What did I clean? (106-F) What did you wash? What did she drink?

Let us look more in depth at one child whose utterances for *AUX-be* did not fall into any of the stages we have seen thus far. Child 112-F (age 5;1, TOLD:P-3 score 4) produced *AUX-do* and *AUX-be* in all of her *wh*-questions requiring *be*, regardless of person. Some examples can be seen in (4) below.

- (4) a. What do I were cooking? (112-F)
b. What do you were holding?
c. What do she were pushing?

Because all of her *AUX-be* utterances were consistent with this pattern, it is remarkably clear this is not a mere slip of the tongue or influence from the adult prompt, which certainly does not contain *do*. We will reexamine this in the analysis in Section 5.

5. Analysis

To account for the data seen in this study, I propose the PFAM Hypothesis, stated in (5) below.

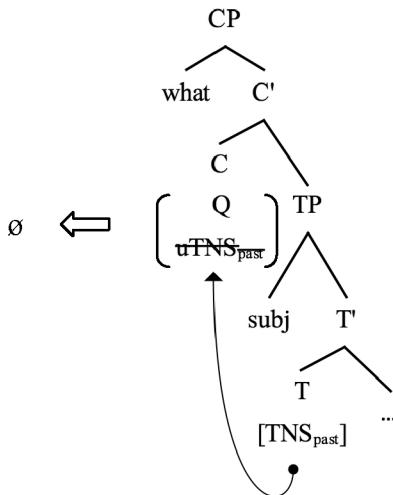
- (5) The Person-Feature Auxiliary Movement Hypothesis

- a. $\left[\begin{array}{c} +Q \\ \mu\text{TNS}_{\text{valued}} \end{array} \right]_{C^0} \rightarrow \emptyset$
b. $\left[\begin{array}{c} +Q \\ \mu\text{TNS}_{\text{valued}} \\ \text{PRS} \end{array} \right]_{C^0} \rightarrow \text{do}$

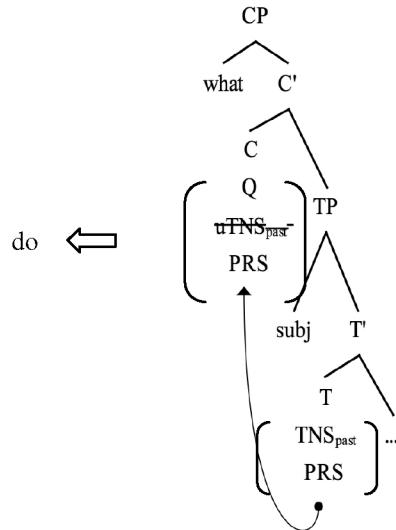
The PFAM Hypothesis, combining feature composition with basic ideas of Distributed Morphology, proposes that the combination of features in (5a) results in a null form in Spell Out, while the features in (5b) will result in *do* for K-E bilingual children. In other words, the presence or lack of the [PRS] feature is responsible for the appearance of variable behavior of T-to-C movement in *wh*-questions. Before [PRS] is acquired, children lack the feature in T altogether, such that the head of T consists of only the [TNS] feature, which is allowed to check the [μ TNS] feature in C singly. This is Spelled Out in

the head of C as a phonologically null element, as seen in (6). However, as each feature value is acquired for second, first, and third person, the feature [PRS] becomes present in T. Due to the presence of this specified feature in the head of T, the [TNS] feature may not be raised to C singly without breaking morphological integrity of the complex head of T, thereby necessitating pied-piping of the entire matrix of features that form it. This is Spelled Out as *do*, as in (7).

(6) PFAM Hypothesis Part A



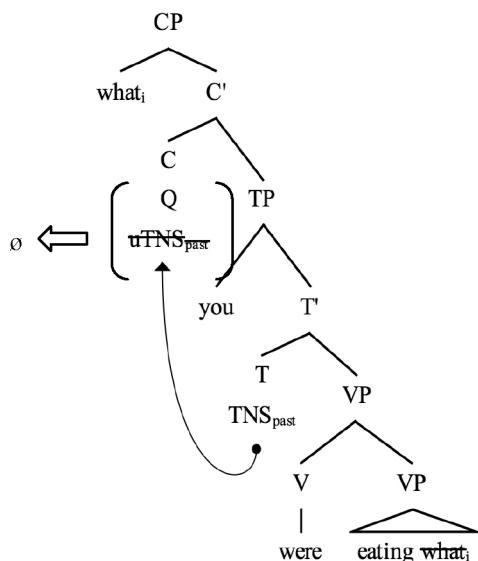
(7) PFAM Hypothesis Part B



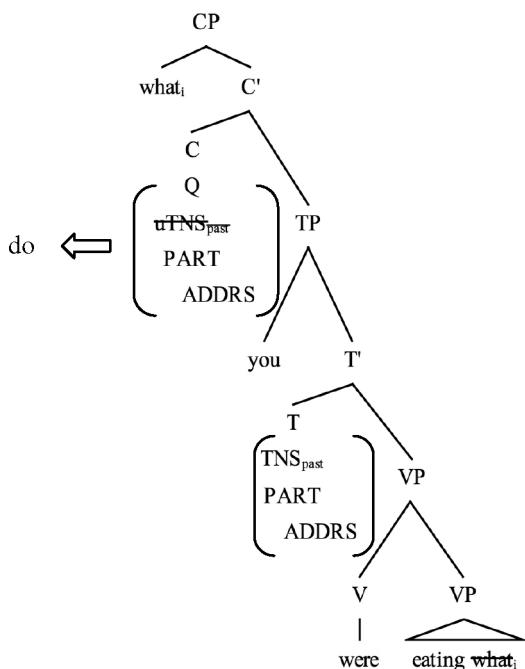
What does it mean for children to acquire specification of [PRS]? Under the system described in Section 2.2, we propose that K-E children acquire [ADDRESSEE] as a privative feature first, which postulates only second person at this time (Stage 2). The nature of privative features is such that when they are not present, they are simply not part of the derivation. Thus, operations may not target them, i.e. they will not be triggers for certain operations. Crucially, in this system, having acquired a feature does not entail that the plus-minus value system is acquired. A child may acquire [PARTICIPANT][ADDRESSEE] initially, but all others that do not have this feature are treated as non-existent, until the binary value system is acquired. In Stage 3, children postulate a binary feature system for that feature [PARTICIPANT][±ADDRESSEE], which yields first and second person distinction, but still no specification for third person. Finally, in Stage 4 children acquire a binary distinction for [±PARTICIPANT] and specification of third person will arise. This system of acquiring each feature subsequently gives rise to a second > first > third sequence.

In Stage 1 where all *wh*-questions appear with no auxiliary in C, children do not yet have [PRS] acquired. Therefore, without [PRS] in T to raise to C, we are left with *What ∅ you eat*, where the combination of [Q] and valued [*u*TNS] in C spells out as null, as in (6). In Stage 2, children acquire second person specification, in which the [PRS] feature is moved along with [TNS_{past}] to C. The features [Q], valued [*u*TNS], and [PRS] together in C spell out as *do*, generating the utterance *What do you eat*, as in (7). During this stage, first and third person *wh*-questions still lack [PRS] specification, similar to the construction we saw for all questions in Stage 1. For Stage 3, children acquire first person specification, which then follows the construction seen in (7), while third person still remains with no [PRS] and spell out of ∅ in C. Finally, in Stage 4, all *wh*-questions contain [PRS], in which the PFAM would predict auxiliaries to always appear in C. Indeed, the data shows that once children invert third person questions, all utterances are inverted without exception.

The analysis is quite similar for *AUX-be* except for an additional movement separate from SAI in which a phonologically overt auxiliary raises from below T, or V-to-T movement. Stage 1b defines one in which auxiliaries appear in the uninverted position, as in *What you were eating?* In this case, V-to-T has occurred, leaving the auxiliary in T, but due to the lack of any person specification, the spellout of the auxiliary is null, as predicted by PFAM, as in (8). Once children start acquiring specification for each person, the auxiliary in T moves with the valued [TNS] and [PRS] into C and is spelled out as *be*.

(8) Stage 1b: *What you were eating*

What would the PFAM Hypothesis predict if V-to-T movement is not acquired before [PRS] is acquired? In other words, AUX-*be* would be in V, but with [PRS] specified, it follows the second condition of PFAM and moves to C with [TNS], spelling out as *do*. In this case, we would expect to see both *do* and *be* in the same question, with *do* in C position, and *be* in a position below the subject. This is borne out in the findings, as we saw for Child 112-F, whose 30 utterances for AUX-*be* exhibited this very pattern, as in (9).

(9) *What do you were eating?*

The crucial point from this analysis is that from the earliest stages where children are producing what appears to be uninverted questions such as *What you eat*, the operation of T-to-C movement is

fully functional and available. This is in line with the analyses that have been conducted with monolingual children; the present analysis attributes bilingual children with the same competence that monolingual children have in terms of syntax proper, a claim that is favorable if we are to assume a universality to language. The difference between monolingual and bilingual children is less to do with their syntactic knowledge, but rather that K-E bilingual children do not have lexical access to [PRS] that L1 English speakers have. This difference may very well be due to English utilizing person marking on its verbal morphology, while Korean does not mark for person. Thus, [PRS] may have to be acquired anew for the K-E children as they are acquiring their L2 English.

6. Conclusions

This study showed that for K-E bilingual children, [PRS] plays a significant role in the presence or absence of inversion in *wh*-questions with *do* and *be*. We have seen that depending on the [PRS] value of the *wh*-utterance, the rate of T-to-C movement is significantly affected. The results also showed that K-E children acquire SAI in stages based on [PRS] specification, in the order of second > first > third. These patterns can be accounted for by the PFAM Hypothesis, which entails that the T-to-C movement operation is present from the initial stages. The lack of [PRS] simply does not provide the condition for the overt auxiliary to appear in C. Future study may involve testing speakers of languages that mark for [PRS] to further investigate the influence of [PRS] from the L1. Additionally, as suggested by an anonymous reviewer, it may be worth investigating the role of input and the relative frequencies of first, second, and third person *wh*-questions in naturally-occurring data. It may be possible that the sequence of acquisition based on person is related to frequency of each type of question in the child's input.

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