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Early Acquisition of Plural Morphology in a Classifier Language:

Data from Korean 2-4 year olds

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## Abstract

Korean is a classifier language in which bare nouns are not obligatorily number-marked. Children learning other classifier languages like Japanese and Mandarin are late in learning the plural morpheme. In this paper, we present two datasets that suggest that Korean plural marker *-tul* is acquired much earlier, in contrast to what has been previously claimed. In a comprehension study, we find that Korean children begin acquiring this morpheme by age 3, showing adult-like performance by age 4. We suggest that the higher frequency of plural marking on both types and tokens of nouns and the consistent marking of plural in the domain of definite nouns may facilitate Korean plural acquisition.

## Early Acquisition of Plural Morphology in a Classifier Language:

Data from Korean 2-4 year olds

Number marking varies across languages in many ways. Languages differ in whether number is marked at all, where in the sentence it is marked, and how consistent this marking is. Languages like English choose to mark plurality systematically on determiners, nouns, and verb endings. For example, the plural marker *-s* appears on a noun when it refers to a plural number of entities as in *girls*. In number-neutral languages like Mandarin and Japanese, on the other hand, number marking does not appear systematically on nouns or verbs. Bare nouns are unmarked for number, or have general number, meaning that these nouns can refer to a singular or a plural entity (Chierchia 1998a,b, Jiang 2012, Rullmann & Yoo 2003). In the Mandarin example in (1), *gou* ('dog') can be used to refer to a single dog or many dogs.

- (1) waimian      gou      zai      jiao.  
 outside      dog      PROG      bark  
 'Outside, {a dog is / dogs are} barking.'

Plural markers do exist in Mandarin and Japanese, but they are infrequent. There is a nominal plural suffix in both languages, *-men* for Mandarin and *-tati* for Japanese, which appears with pronouns and, optionally, on a small set of high animate nouns such as human nouns (Munn et al. 2009 for Mandarin; Kaneko 2007 for Japanese). Generally, however, nouns are not inflected to indicate number. This absence of number marking is taken to be typical of classifier

languages, languages that make use of a generalized classifier system to combine nouns with numerals (see Chierchia 1998, Jiang 2012, a.o.).

Previous studies have found that acquisition of the plural marker is delayed in at least some classifier languages. While English-speaking children understand the nominal plural morpheme *-s* by age three (Jolly & Plunkett 2008, Kouider et al. 2006), Mandarin and Japanese-speaking children are shown to not acquire it until age six or later (Munn et al. 2009, Nakano et al. 2009).

These findings raise an intriguing hypothesis about plural marking and acquisition. Perhaps there is deep connection between the frequency of plural marking, the use of classifiers, and the acquisition of plural marking. The first two features are believed to be linked through the meaning of nouns. In Chierchia 1998b, it is argued that nouns in classifier languages denote kinds, which are unspecified for number when used as properties. Languages that have kind-denoting nouns are predicted to make use of generalized classifiers that individuate the entity into countable units, and to lack frequent, consistent plural marking. This pattern could lead to delayed acquisition for two reasons. First, children learning classifier languages may simply not encounter many plurals, and thus show delayed learning. Second, acquiring a classifier language could alter the learning process in a way that makes acquiring a plural marker intrinsically difficult independent of frequency. For example, if nouns in classifier languages have non-individuated, mass-denoting semantics, conceptual or grammatical distinction between plural or singular may be less salient.

These questions suggest that we could learn more about plural acquisition from examining the acquisition of a classifier language in which plural marking is more frequent. Korean provides just such a test case. Korean is a classifier-language like Mandarin and

Japanese, where bare nouns are unmarked for number (Sohn 1999, Kwon & Zribi-Hertz 2004 a.o.), as shown by the reference to both a singular and a plural entity of trees in (2).

- (2)    na-nun            ecey            namwu-lul      sim-ess-ta.  
        I-TOP            yesterday      tree-ACC        plant-PAST-DECL  
        ‘Yesterday I planted a tree/trees.’

There are two plural markers in Korean that are similar to those of Mandarin and Japanese.

These morphemes *-ney* and *-huy* attach to a small subset of pronouns (including second person (*ne-ney*) and third person (*kyay-ney*) for *-ney* and first person in the formal register (*ce-huy* ‘we’) for *-huy*) and result in a plural interpretation (see Park 2010 for a detailed discussion of *-ney*). Another similarity between *-ney* and the plural markers of Mandarin and Japanese is that they have what is called an associative use. In an associative use, the plural marker can attach to a proper noun and refer to a group associated with the individual denoted by the proper noun (Vassilieva 2008).

In addition to these associative plurals, Korean has a productive plural marker *-tul* that attaches to nouns and contributes a plural meaning similar to English *-s* (Sohn 1999, Kim 2005, a.o.). In this paper, we focus on this plural meaning of *tul* and call this morpheme the ‘plural marker’ of Korean for the sake of convenience, though other meanings of *tul* such as maximality and specificity have been observed and investigated. Another use of *tul* that we do not discuss in this paper is what has been called the extrinsic use of *tul*, which can attach to elements other than the noun and contribute meanings of distributivity in addition to plurality (Kim et al. 2014, 2017).<sup>1</sup>

The presence of a plural marker in Korean that is more productive and less restricted than those of Japanese and Mandarin raises a question about development: Is the acquisition of the plural marker delayed as it is in other classifier languages? Or are plurals acquired fairly early, as they are in non-classifier languages like English? To date the research suggests that the Korean plural marker *-tul* may be acquired quite late. Park (2010) and Kim (2011) tested children between the ages of four and eight in a Truth Value Judgment Tasks (TVJT) on their comprehension of plurals and found that even the oldest children performed quite poorly. Park (2010) suggests that this delay in Korean may result from the optionality of the plural marker, which results in inconsistent input and delays acquisition. However, Kim (2012) finds that five- and six-year-olds are adult-like in their interpretation of the plural marker, using a simpler task: in a picture verification task, children between ages five and six correctly reject a prompt containing a plural marker (“Here, the ducks are playing”) when shown a picture of a single duck. To the best of our knowledge there is no data on how children under four understand *-tul*.

We suspect that the poor performance in Park 2010 and Kim 2011 studies was due to the complexity of the tasks that they used. In these studies, children had to correctly reject sentences with instances of *-tul* after seeing a number of pictures depicting a sequence of events. For example, in one of the test trials of Kim’s (2011) study, children were presented with a story that involved four pictures: the first picture depicting seven sheep walking in a barn; the second picture depicting two sheep falling behind; the third picture showing a dog near the two sheep; and the last picture showing one sheep interacting with the dog. Then, the children were asked to

judge whether the target sentence shown in (3) is true (Kim 2011, Figure 3; gloss slightly modified for clarity).

- (3) kay han-mali-ka yang-tul-eykey kil-ul annayhaycu-ko i-ss-ta.  
 dog one-CL-NOM sheep-PL-DAT way-ACC show-COMP be-PROG-DECL  
 ‘One dog is showing the way to the sheep.’

Because there was only one sheep shown in the target picture, Kim predicted children to reject the target sentence in (3) if they understood the meaning of *-tul* and report that they fail to do so. However, because the pictures leading up to the target picture consistently had more than one sheep, with two depicted as falling behind, it is possible that children were basing their judgment of the sentence on the context pictures rather than the target picture.

The goal of the present study is to determine whether Korean-speaking children between the ages 2 and 4 exhibit any understanding of the plural marker when they are tested in a simpler task. This will shed light on the question of whether delayed acquisition of plural markers is a consistent property of classifier languages.

#### Experiment: comprehension of the plural marker *-tul*

##### *Participants*

Sixty-four Korean-monolingual children (2;00-4;10; mean: 3;01) participated in the study. Because of a large number of 3-year-olds, we split up the group into two groups by median, forming two groups: younger 3-year-olds (3;00-3;03; ‘younger-3’) and older 3-year-olds (3;04-3;11; ‘older-3’). There were 13 participants in the 2-year group (median: 2;06, mean: 2;06), 20 in the younger-3 group (median: 3;02, mean: 3;02), 24 in the older-3 group (median: 3;05, mean: 3;06), and 7 in the 4-year group (median: 4;02, mean: 4;04). They were recruited through preschools and through online advertisements that targeted parents residing in Seoul, Korea. All children were from middle-class families with at least one of their parents having a B.A. degree. Children who were recruited through preschools were tested in a separate room provided by the preschools, while those recruited through online advertisements were tested in a room provided by the town centers closest to the participating family. Korean was used for all parts of the recruitment and the experiments.

In addition, 39 adult participants served as controls. They were asked to fill out a written Qualtrics questionnaire online that were parallel to the tasks given to children.

### *Procedure*

The experiment was administered by a native Korean-speaking researcher from Seoul, where all of the studies were administered. The children were presented with two tasks. The first task was a Picture Matching task where the child was asked to indicate which picture matched the target sentence, and the second task was a Picture Verification task where the child had to decide whether the prompt matched the picture shown. We discuss each task in turn.



*Task 1: Picture Matching Task*

In the Picture Matching Task, the experimenter presented two cards with pictures and asked the child to choose one that matched the question. There was one pretest pair that was presented to familiarize the child with the task. In the pretest, a green apple was drawn on one card and a red apple in the other. The experimenter first described the cards and asked the child what was on the cards with a prompt as the following: “Look! There are two cards here. (Pointing at one of the cards) Can you tell me what this is?” Once the child responded, the experimenter asked the child to pick either a green or a red apple, with the prompt in (4).

- (4) {cholak/ppalkan}-sayk      sakwa iss-nun      khatu etten ke-yey-yo?  
 green/red-color                  apple exist-ADN      card    which one-be-Q  
 ‘Which card has a green/red apple?’

The card asked for (green vs. red) was randomized, and once the child picked the right card, the experimenter proceeded to the test trials.

The task had a total of three test trials, involving three pairs of cards randomly selected from the six pairs shown in the Appendix. Each pair contained a single-item card, which depicted one entity, and a multiple-item card, which depicted two or three entities. In each trial, the experimenter asked for a card that had a plural entity. For example, with a pair of cards, one with

a single turtle and the other with two turtles as shown in Figure 1, the experimenter asked the question in (5):

**FIGURE 1**

- (5)    kepwuki-tul    iss-nun            khatu   etten   ke-yey-yo?  
          turtle-PL        exist-RC            card    which one-be-Q  
          ‘Which card has turtles?’

The child received a score of 1 if she correctly picked the multiple-item picture and 0 otherwise. While three control trials containing a bare noun instead of a plural noun as in (6) were planned, the experimenter did not ask the control prompts consistently, because children were confused when asked to pick a card with an item while both cards had the items. We discuss the limitations of the Picture Matching task that results from the lack of a control condition later in the paper.

- (6)    kepwuki            iss-nun            khatu   etten   ke-yey-yo?  
          turtle            exist-RC            card    which one-be-Q  
          ‘Which card has turtle?’

*Task 2: Picture Verification*

The Picture Verification Task also involved a pretest using the same cards as in the previous task. The experimenter pointed at one of the cards (with the green one, for example) and asked “Is this a green apple?” as shown in (7), expecting an affirmative response. Then the experimenter pointed at the other card (with the red apple) and repeated the same question in (7), expecting a negative answer. If the child correctly answered “yes” for the first question and “no” for the second, the experimenter proceeded to the test trials. One child (2;03) failed both of the questions as well as the test items and was excluded from the analysis and the total count of participants. The color asked in the pretest was counterbalanced.

(7)    ike    choloksayk    sakwa-ey-yo?  
       this    green            apple-be-Q  
       ‘Is this a green apple?’

The test trials were conducted with the remaining three picture pairs that were not used in the first task, presented in a randomized order. The experimenter pointed at the item in the single-item picture and asked the child to identify the object to ensure that the child was familiar with the noun. Then, the experimenter asked the child the same question in (8) about each of the two cards. This resulted in two conditions. In the single-item condition, the experimenter pointed to the single-item card and asked a question using the plural form as in (8). In the multiple-item condition, the experimenter pointed at the multiple-item card and asked the same (plural) question in (8). The order of the conditions was randomized across trials.

(8)    yeki    [ITEM]-tul    iss-e-yo?

here item-PL exist-be-Q

‘Are there [ITEM]-s on this card?’

If the child understood the plural morpheme we would expect a negative answer for the single-item condition and a positive answer for the multiple-item condition. In this task, all of the children answered ‘yes’ to all of the multiple-item trials at 100%, making their negative answer to the single-item condition the only indicator of their understanding of the plural morpheme. Their 100% positive answer to the multiple-item trials could be due to their general tendency to say ‘yes’ to all of the questions as well as the fact that they were always asked to identify what was shown on the cards before the test trials, removing the possibility that they would reject based on misidentification. Because correctly rejecting the single-item trial is more reflective of their understanding, their performance was scored only based on their responses to the single-item trials, with the maximum score being 3. For example, a score of 1 in this task would mean that the child correctly answered ‘no’ to a single-item card once out of three trials. When the child responded with a negative answer when presented with the single-item card, the experimenter prompted for further justification with questions such as “Why not?”, and if the child responded that there was only one item on the card, this was coded as “1”. Any other justification that was irrelevant to the task was coded as “0” indicating no justification.

The order of the two tasks (Picture Matching and Picture Verification) was counterbalanced across participants. The responses were video-recorded and coded by the researcher.

The tasks given to adult participants were identical to those given to children except that they were presented as an online survey with written prompts.

### *Results & Discussion*

Table 1 summarizes the proportion of correct responses by age group and task. The scores for Picture Matching and Picture Verification are shown. Figure 2 plots the mean proportion of correct responses by age group and task with 95% confidence intervals, and Figure 3 plots the per-participant performance by age.

#### **TABLE 1**

#### **FIGURE 2**

#### **FIGURE 3**

We used a Generalized Logistic Mixed model (GLMM) with subjects as a random effect and age group and task as fixed effects assuming a binomial distribution, with the score (1 or 0) per item as the DV. There was a significant effect of the age group ( $Z = 2.742$ ,  $p = 0.006$ ) as well as the task type (Picture Matching vs. Picture Verification;  $Z = -4.450$ ,  $p < 0.0001$ ), but no interaction between the two ( $Z = -1.375$ ,  $p = 0.17$ ).

In the Picture Matching task, the 2-year-olds were at chance ( $p = 0.930$ ), younger 3s were marginally above chance ( $p = 0.0861$ ), and older 3s and the 4-year-olds were above chance (3-o:

$p = 0.011$ , 4yo:  $p = 0.008$ ).<sup>2</sup> For the Picture Verification task, the 2-year-olds and the younger 3s scored at chance (2yo:  $p = 0.412$ , y-3:  $p = 0.375$ ) while the older 3s and the 4-year-olds scored above chance (o-3:  $p < 0.001$ , 4yo:  $p = 0.002$ ). The 4-year-olds' performance did not differ significantly from that of adults in either Picture Matching ( $Z = 0.001$ ,  $p = 0.999$ ) or Picture Verification ( $Z = 0.492$ ,  $p = 0.6228$ ) task.

As discussed briefly in the description of the Picture Matching task, the bare noun fillers were not consistently tested in the experiment, as children were confused by being asked to choose a card when both cards matched the description. This means that we lacked a control condition in the Picture Matching task. Thus we must consider the possibility that the high score in the Picture Matching task was due to some general preference to pick cards with larger amounts of items. We think that this is unlikely for two reasons. First, the same group of children participated in both Picture Matching and Picture Verification tasks, and the children's score in the Picture Verification task was a reliable predictor for their score in the Picture Matching task ( $Z = 4.771$ ,  $p < 0.0001$ ) and vice versa ( $Z = 4.381$ ,  $p < 0.0001$ ). This is also shown in Figure 4, a scatterplot that shows the relationship between the two tasks.<sup>3</sup>

#### Figure 4

The Picture Verification results cannot be explained by a preference for greater quantities, thus the contingency between the two tasks suggests that the Picture Matching task is probably also tapping into the children's sensitivity to the plural marker. Second, we have clear evidence that correct responses in the Picture Verification task were linked to the interpretation of the plural

morpheme. Every child who answered “no” was asked to justify their response. Twenty-seven of the 46 children who answered “no” in the test trials with the single-item card ( $M = 39.8$  months; range 28-54 months) gave a justification related to the number of items (e.g., “there is only one”) on at least one trial. This suggests that they were attending to the presence of plural marking and using it to guide their interpretation. The others refused to elaborate or offered an irrelevant explanation ( $N = 19$ ).

Based on these results, we conclude that Korean children are adult-like in their interpretation of the plural morpheme *-tul* by age four, with above chance performance by age three.

### General Discussion

We have seen in this study that Korean-speaking children understand the meaning of the plural morpheme *-tul* by age 4. Our study thus shows that with simpler stimuli and tasks we are able to detect an adult-like understanding of the plural marker in Korean-speaking children at a much younger age. These findings suggest that Korean children acquire the plural marking substantially earlier than children speaking Mandarin (after six years; Munn et al. 2009) and Japanese (after six years; Nakano et al. 2009). While we cannot directly compare these data sets due to differences in the testing procedures, the languages, and the tasks, a developmental gap of this magnitude (three years) is hard to explain away. This is particularly true in the case of the Munn et al. experiment with Mandarin-speaking children, which used a task that was quite similar to our Picture Verification task. For example, on one trial they showed a picture of three women, with only one woman eating an apple and asked the child whether it is true that “The

women are eating an apple". Munn and colleagues found that Mandarin speaking children did not reliably reject these statements until they were more than six, whereas we found that the older-3s reliably rejected plural descriptions of pictures with single referents. Thus we tentatively conclude that plural marking is acquired much earlier in Korean than in Mandarin.

In the remainder of this paper we discuss why Korean plural acquisition might be earlier than that of Mandarin and Japanese. We discuss two possible differences between Korean, on one hand, and Mandarin and Japanese, on the other, that may account for this developmental gap. The first is the higher frequency of plural marking in Korean compared to that in Mandarin and Japanese, and the second is the more consistent marking of plurals on definite nouns in Korean.

*Korean plural marking is more frequent*

One possible reason for the earlier acquisition of plural marking in Korean could be that it occurs more frequently in Korean than in other classifier languages. There are two ways in which Korean plural marking might be more frequent: a) it can appear with more types of nouns, and b) it can appear on more tokens. Korean plural marking is less restricted than that of Mandarin and Japanese in the kinds of nouns it can appear with. For example, while the plural markers in Mandarin and Japanese are restricted to pronouns and a small set of high animate nouns as discussed in the introduction, Korean plural marking can appear with more types of common nouns, animate and inanimate (Kwon & Zribi-Hertz 2004). Thus, it is possible that Korean-speaking children encounter the plural marker in a wider range of nouns, which facilitates learning. It is also possible that more tokens of nouns are plural marked in Korean.



In order to test these possibilities, a corpus study was conducted. To investigate how many types of nouns appear with a plural marker, we collected 2,000 utterances from four randomly-selected Korean CHILDES corpora (Jong, Joo, and Yun (Ryu 2012) and Jiwon (Ghim 2004); 2 random files from each corpus) with the age range 1;09-2;10. We searched for the plural marker *-tul*, and coded each utterance as containing or not containing an instance of nominal plural marking. For all plural-marked nouns, we also coded the type of the noun: human, inanimate, and non-human animate. Pronouns were included in the count because the same plural marking *-tul* appears on some singular pronouns to make plural pronouns. We found six tokens of this kind in the corpus.

In order to compare the frequency of plural marking in Mandarin, we collected 2,069 utterances from a set of age-matched Mandarin CHILDES corpora from Zhou 2001 (age range 2;01-2;08). As in the Korean corpora, we coded each utterance as containing the plural if it contained a noun with the plural marker *-men*, and we coded the type of the noun.

The results of the corpus study are summarized in Table 2. There were 89 utterances containing plural-marked nouns out of 2,000 utterances in Korean, with a total of 102 noun tokens. In Mandarin, there were 54 utterances containing plural marking out of 2,069 utterances, with a total of 54 noun tokens. The number of noun tokens carrying plural marking in Korean was significantly higher than that in Mandarin (Fisher's Exact test,  $p < 0.001$ ).

## TABLE 2

Thus there was a statistically significant difference between the frequency of nouns with plural marking in Korean and that in Mandarin. However, this difference was not as great as one might expect given the radical difference in how early they are acquired. To explore this further we looked at the variety of nouns that were marked in each corpus.

In Korean, the plural was marked on a total of 46 different noun types, including not only human (babies, ladies, friends, princes) and animate (dinosaurs, fish, animals) nouns, but also inanimate nouns (shapes, names, bones, flowers, buildings). On the other hand, Mandarin only showed plural marking on pronouns, with all 54 tokens being one of the 3 types of personal pronouns: first person (*wo-men*), second person (*ni-men*) and third person (*ta-men*).

While we do not have data for Japanese, we rely on the data from Sarnecka et al. 2007 where they report the frequency of utterances with number marking in Japanese to be 0% out of 400 utterances. Thus, we see that Korean plural marking is more frequent than in Mandarin and Japanese in two ways. First, Korean plural marking occurs in more types of nouns: pronouns, common nouns, animate and inanimate. Second, Korean plural marking appears with a higher frequency overall: at 4.5% compared to 2.6% in Mandarin and 0% in Japanese.<sup>4</sup>

Our analysis does not allow us to determine how frequently a noun appears with the plural marker when it is referring to a plural entity. This calculation requires information about the referent of the noun phrase in the caregiver's speech, which is not systematically available in the corpora. However, we discuss in the following section some evidence suggesting that Korean plural marking is in fact much more reliable and consistent.

*Korean plural marking is more consistent*

Another difference that might facilitate plural acquisition in Korean is the relatively consistent marking of plural in Korean compared to that of Mandarin or Japanese. While Korean is often described as having an ‘optional’ plural marker, it is not the case that the plural marker can simply be dropped optionally in all contexts. The licensing of plural marking is a result of a complex interaction between interpretation, available alternatives, and polarity (see Kwon & Zribi-Hertz 2004, Kim 2005). For example, Kim (2005) observes that Korean plural marking is obligatory with demonstrative phrases. We verified this with seven native speakers of Korean: when asked to judge a non-plural-marked demonstrative pronoun in (9) and a demonstrative description in (10) that refer to more than one entity, all seven speakers rejected the sentences, commenting that *-tul* would be necessary to refer to a plural entity.

- (9) ku-nun            haksayng-i-ta.  
       3.sg-TOP        student-COP-DECL  
       \*‘They are students.’  
       ‘He is a student.’

- (10) ce        salam-i        sakwa-lul        sa-ss-ta.  
       those person-NOM    apple-ACC        buy-PAST-DECL  
       \*‘Those people bought apple(s).’  
       ‘That person bought apple(s).’

We extend the observation in Kim 2005 and present evidence that plural marking is obligatory not only with demonstratives, but with all definite nouns in Korean. Unlike English where definiteness is consistently marked with a definite determiner, Korean does not have an overt definite marker, allowing bare nouns to be interpreted as definites (Lee 1992). In order to detect definite readings of bare nouns, we created anaphoric contexts where the bare noun referred to a contextually salient entity. Anaphoric contexts with overt or contextual antecedents (strong vs. weak familiarity; Roberts 2003) were chosen in order to restrict the possible interpretation of the noun to a definite one. Demonstratives are used in many classifier languages to encode familiarity (Jenks 2015, Ahn 2017), but it was shown that bare nouns can also encode familiarity and refer to a salient antecedent intersententially (Ahn 2019). In a context where the speaker is referring to a familiar, determinate group of friends, all seven native speakers rejected (11), which contains a non-plural marked noun *cinkwu* ('friend').

- (11) *cinkwu-ka wa-ss-ta.*  
 friend-NOM came-PAST-DECL  
 'A/The friend visited.'  
 \* '(Some/The) friends visited.'

What we see is that in a definite context, the bare noun without the plural marker is interpreted as referring to a singular entity, regardless of the presence of demonstratives.<sup>5</sup> Note that Kim's (2005) observation that plural marking is obligatory with demonstratives is consistent with our claim because demonstrative descriptions also encode familiarity.

The obligatory plural marking in definite contexts extends to inanimate nouns as well, and this can be seen from example (12) discussed in Kwon & Zribi-Hertz 2004, as well as our own that we tested in (13). Kwon & Zribi-Hertz observe that when referring to three books introduced in previous discourse, plural marking is necessary as shown in (12). In (13), we show that the bare noun *kulus* ('plate') must be plural-marked to refer anaphorically to the plates the speaker bought. The same seven speakers rejected (13) in a context where the two plates the speaker mentions in the first sentence fell.

(12) [Minna-neun oneul-achim-e chaeg se-gwon-gwa sinmun han-bu-leul  
Minna-TOP today morning-LOC book three-CL-and newspaper one-CL-ACC  
sa-ss-da.]

buy-PAST-DECL

'Minna bought three books and one newspaper this morning.'

a. chaeg-\*(tul)-eun naengjanggo-wi-e noh-yeo-iss-da.  
book-PL-TOP fridge-TOP-LOC lying-exist-DECL

'The books are on top of the fridge.' [Kwon & Zribi-Hertz 2004]

(13) na-nun ecey kulus twu-kay-lul sa-ss-ta. Onul kulus-\*(tul)-i patak-ey  
ttelecy-ess-ta.  
I-TOP yesterday plate 2-CL-ACC buy-PAST-DECL today plate-PL-NOM floor-DAT  
fall-PAST-DECL

'I bought two plates yesterday. Today the plates fell on the floor.'

Thus, we see that plural marking in Korean is required of all definite, anaphoric nouns regardless of animacy. If the consistent marking of plurality in the definite domain is what causes the earlier acquisition of the plural marker in Korean-speaking children, we may be able to account for this using the Variational Model proposed in Yang 2002. In this model the child is trying to decide whether her target grammar marks number in noun phrases. She does this by comparing two possible grammars, one with number marking and one without. Every time a plural noun appears with a plural marker, the target grammar is rewarded, and every time a plural noun appears without a plural marker, the target grammar is punished.

If we consider all nouns, however, plural marking in Korean is neither highly frequent nor highly reliable, compared to that of obligatory number marking languages. To compare, we looked at a small corpus of data from child directed speech in English. We found 258 tokens of plural-marked nouns in 224 utterances out of 2,000 English utterances taken from eight randomly selected transcripts from six corpora in CHILDES (Bates et al. 1991, Cornell n.d., Gleason 1980, McMillan 2004, MacWhinney & Snow 1990, and Valian 1991; age range 1;08 – 3;02). The proportion of plural-marked nouns in Korean was significantly lower than that of English (Fisher's Exact test,  $p < 0.001$ ).

However, the predictions of the Variational Model depend upon the domain in which the child is tracking number marking. If the child is tracking the presence of number marking separately in the definite domain and in the non-definite domain, the data is much cleaner since plural marking is obligatory in the former. If children are sensitive to the distinction between definite and indefinite nouns and can form a natural category of 'definite nouns' out of pronouns, definite

bare nouns, and demonstrative descriptions, then plural marking within that domain would be reliable and consistent, just like the English plural marking. On this model children would be testing a different set of target grammars – one with plural marking on definite nouns and one without – and the input would strongly support the former. The existing data also suggest limits on the kind of domains that children are willing to consider as possible hypotheses. As we noted earlier, Mandarin and Japanese also have mandatory plural marking but only in the domain of pronouns (Munn et al. 2009, a.o.). The delayed acquisition of plural marking in the two languages suggests either that children cannot initially form the relevant hypotheses (plural marking on pronouns) or that computational constraints require a larger domain before consistency can facilitate acquisition (e.g., marking on more noun types may be necessary to parse the morpheme).

In sum, these cross-linguistic comparisons suggest that children can rapidly acquire the plural morpheme if there is some linguistic domain where plurality is consistently marked, provided that this domain is large enough that the child is exposed to the marker used with many different types of nouns. This hypothesis is necessarily tentative, as it is based on just a handful of languages and has many moving parts.

### Conclusion

The present study explored the nature of Korean plural marking and its acquisition. Based on the results of two comprehension tasks, we conclude that Korean children become adult-like in plural acquisition by age four, which is much earlier than previously assumed, and also earlier than other classifier languages like Japanese and Mandarin. To account for why our results

suggest a substantially earlier acquisition than reported in previous studies of Korean, we suggested that our simpler prompt that does not involve a complex narrative allows us to detect the plural interpretation at an earlier age. In discussing why Korean plural acquisition is substantially earlier than that of other classifier languages, we suggested two possible reasons. The first is that the Korean plural marker is far more frequent in child-directed input, both in the types of nouns that it can appear in, and in the token count. The second hypothesis is that the marking of plurality in Korean is more consistent because in definite contexts, plural marking is obligatory. Thus, we suggest that even when number neutrality of bare nouns results in inconsistent input, the relatively higher frequency in type and token as well as obligatory plural marking in the definite domain may facilitate the mapping between the morpheme and the plural meaning.



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Appendix

Stimuli used in the Picture Matching and Picture Verification Tasks

**FIGURE 5**

## Footnotes

<sup>1</sup> *Tul* has been shown to indicate distributivity in addition to plurality (Kim 2012, a.o.), especially when it appears on non-nominal elements such as verbs and adjectives. This use is called the Extrinsic Plural Marker (EPM, in contrast to Intrinsic Plural Marker, IPM; Kim 2012) or a ‘plural copy’ (Kim 2005, Sohn 1999, Song 1975, Song 1997). The plural copy can be added on multiple elements within a sentence, as shown in (a).

(a) namca-tul-i            phwungsen    hana-lul-tul            sasseyo-tul.  
 man-PL(IPM) -NOM    balloon            one-ACC-PL(EPM)    bought-PL(EPM)

‘Each of the men bought a balloon.’ (modified from Kim 2012; (2b))

In this paper, we focus on the nominal *-tul* (IPM) which contributes a plural meaning, and refer interested readers to Kim 2005, Kim 2012, Sohn 1999, Song 1975, and Song 1997 for detailed discussion of the other meanings.

<sup>2</sup> Because there was no variability in the 4-year-olds in the Picture Matching task, the model did not converge. Thus, for calculating the at-chance performance of 4-year-olds in the Picture Matching task, we ran a binomial test treating each participant as a trial.

<sup>3</sup> The size of the symbol represents the number of participants in each point: the smallest circle represents one participant, while the largest circle represents 29 participants (the intermediate sizes represent 2, 3, 4, 7, and 8, respectively).

<sup>4</sup> We also ran a separate analysis comparing the frequency of plural-marked nouns reported in Sarnecka et al. for Japanese with age-matched Korean data, which also turn out to be significant (Fisher's Exact test,  $p < 0.0001$ ).

<sup>5</sup> A reviewer pointed out that in previous studies such as Suh 2008, native speakers who were given a fill-in-the-blank task produced bare nouns in contexts requiring specificity, which conflicts with the data presented here. However, in Suh's study, the contexts did not require an anaphoric reading, enabling an indefinite reading. When we replicated the sentences and provided contextual description ensuring that the noun refers anaphorically to a plural entity, five out of five native speakers consulted separately commented that the plural marking is required in both (i) and (ii).

(i) Context: Yesterday, Hoseok met three students. He met them again.

Hoseok-un ku \_\_\_\_\_ -ul tto mannassta.

Hoseok-TOP DEM ACC again met

'Hoseok met \_\_\_\_ again.'

(ii) Context: Seokjin and Taehyung went to a pond with many frogs. Seokjin wants Taehyung to catch five frogs. What should Seokjin say to Taehyung?

ce \_\_\_\_\_ -ul/lul cacwewe.

dem ACC catch.IMP

'Please catch \_\_\_\_\_.'



Table 1

*Mean proportion of correct responses by age group and task*

**Insert table\_1.pdf**

Table 2

*Percentage of utterances containing nominal plural marking out of total number of utterances in Korean and Mandarin.*

**Insert table\_2.pdf**

Figures

Figure 1. Sample trial, Picture Matching task (multiple-item card, single-item card)

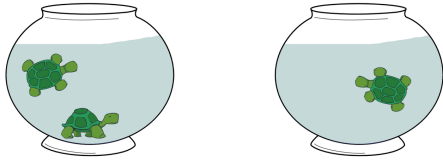


Figure 2. Mean Proportion Correct by Age Group and Task

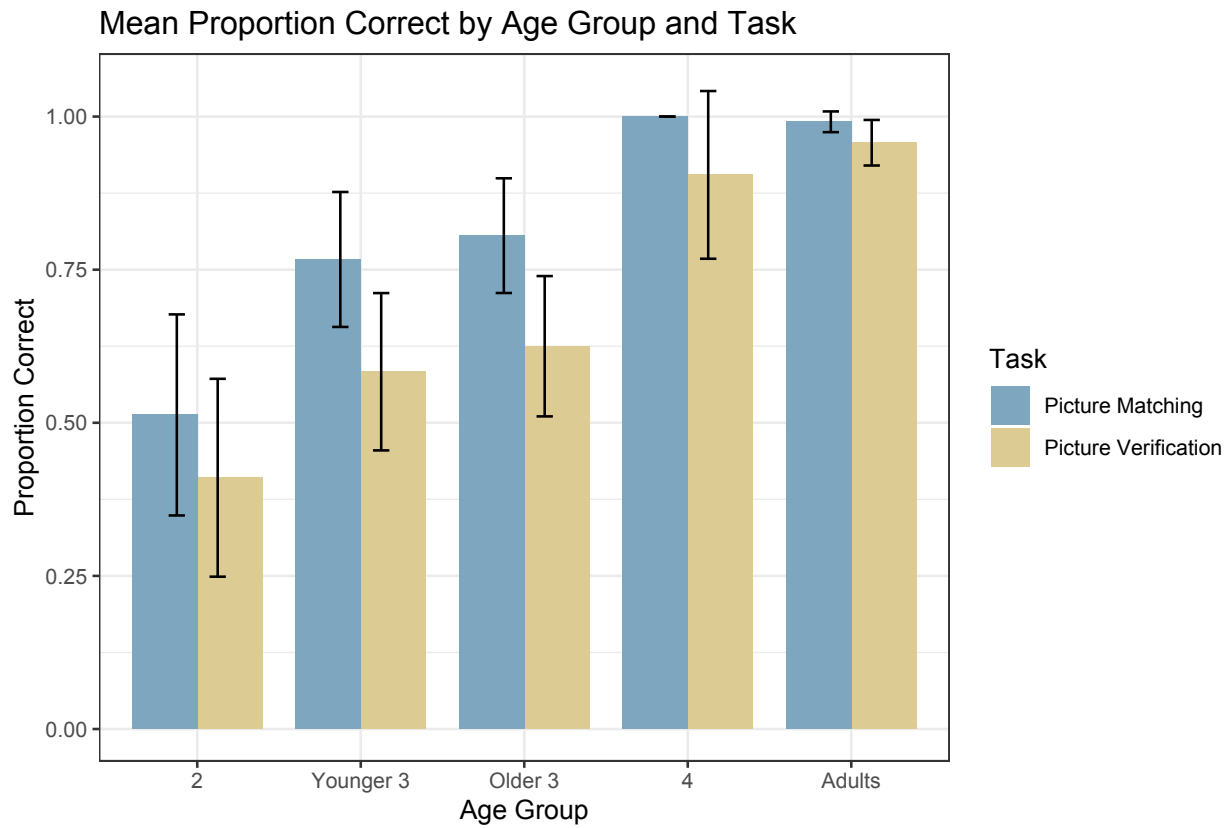


Figure 3. Proportion of Correct Responses per Participant

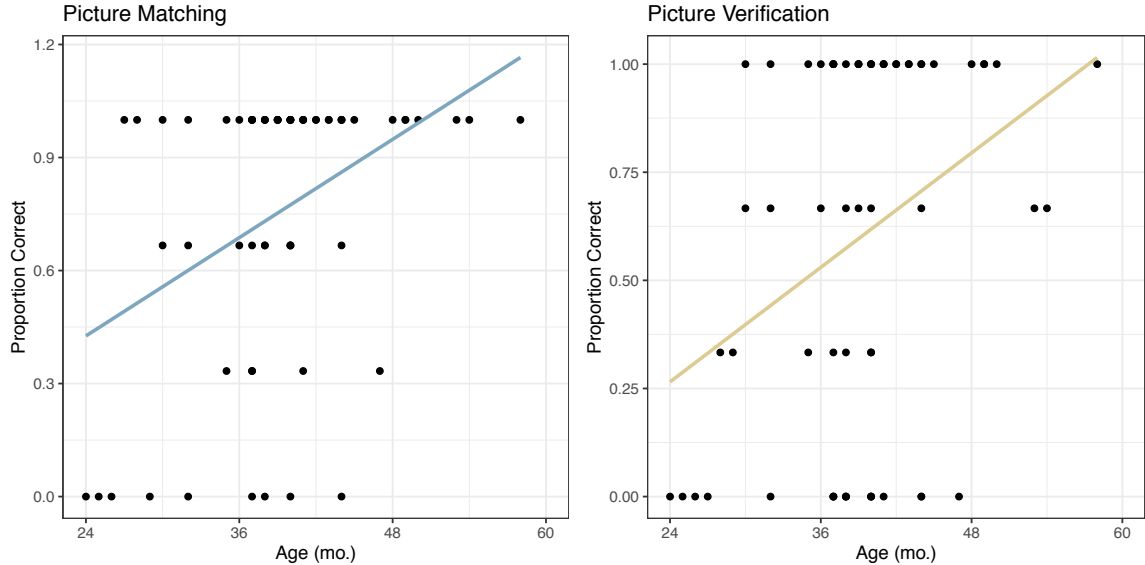
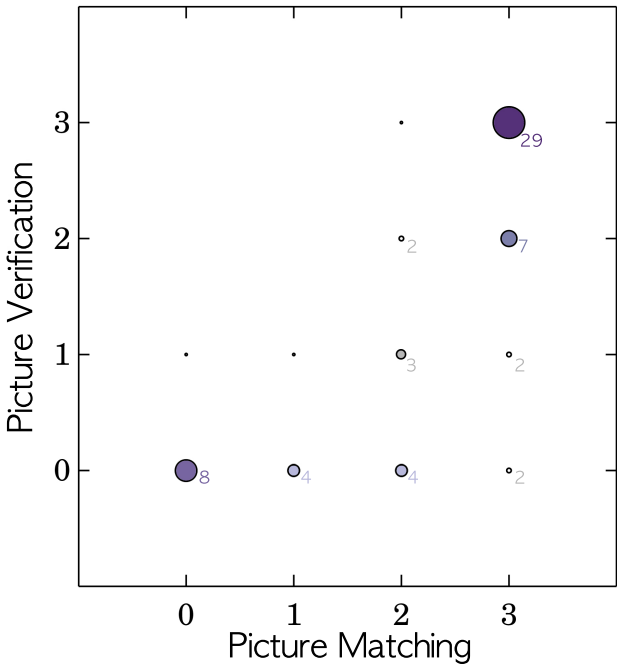


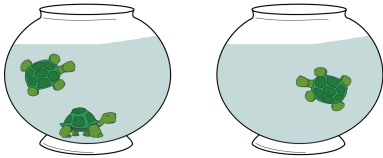
Figure 4. Relationship between Picture Matching and Picture Verification Tasks



*Figure 5.* Stimuli used in the Picture Matching and Picture Verification Tasks



{*choloksayk* / *ppalkansayk*} *sakwa*  
 green red apple  
 ‘{green, red} apple’



{*kepwuki-tul* / *kepwuki*}  
 turtle-PL turtle  
 ‘{turtles, turtle}’



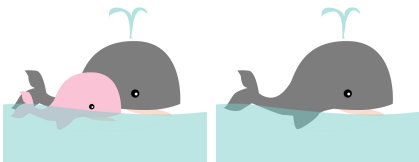
*pyeng-ey* {*khwukhi-tul* / *khwukhi*}  
 jar-DAT cookie-PL cookie  
 ‘{cookies, cookie} in a jar’



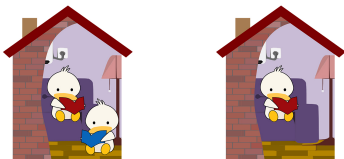
*cepsi wi-ey* {*sakwa-tul* / *sakwa*}  
 plate on-DAT apple-PL apple  
 ‘{apples, apple} on a plate’



*kkochpyeng-ey* {*kkoch-tul* / *kkoch*}  
 vase-DAT flower-PL flower  
 ‘{flowers, flower} in the vase’



{*kolay-tul* / *kolay*}  
 whale-PL whale  
 ‘{whales, whale}’



*cip-ey* {*oli-tul* / *oli*}  
 house-DAT duck-PL duck  
 ‘{ducks, duck} in the house’