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【研究論文】

The First Language Acquisition processes of
Case Markers in Korean
-Focusing on the results of an analysis of the CHILDES Corpus-

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The First Language Acquisition processes of Case Markers in Korean

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This study investigates the early emergence and subsequent development of case markers in Korean, *ka/i* (nominative), *nun/un* (topic), *lul/ul* (accusative), *ui* (possessive), and *do* (delimiting). It also examines the relation between children's age and MLU (Mean Length of Utterances) in the early usage pattern of case markers. Longitudinal Korean data, called the Ryu-Corpus, from the CHILDES database (MacWhinney, 2000) were analyzed. The data consists of longitudinal video-recorded interaction from three children (JONG 1;3-3;5, JOO 1;9-3;10, YUN 2;3-3;9) and their caregivers. Three children produced 3,723 predicate tokens, which used the five case markers. The results indicate that in the early stages of development, the three Korean children began to produce and productively use from *nun/un* (topic) to *do* (delimiting) to *ka/i* (nominative) to *lul/ul* (accusative) and finally, to *ui* (possessive). All three children have shown the same acquisition pattern of the case markers; however, there was a large difference among the three children regarding the age of emergence of case markers. JONG started to use the topic markers *nun/un* at 1;7 in his speech, whereas JOO and YUN started to use it at 2;10 and 2;7, respectively, taking more than one year after JONG started. As for MLU, there is some correlation between the MLU of the emergence of the case markers and their later course of development. Three children started to use the case markers at 2.2~2.6 MLU, and then used stably the case markers at 3.1~3.5 MLU after acquiring the possessive marker *ui*. It suggests that the MLU can be the measure of the acquisition of case markers in Korean, because there has been no study of MLU analysis on the L1 development of Korean.

1. Introduction

In the first language acquisition process, as the development of grammar progresses, it is said that this development is reflected in the length of sentences, with grammatical structures becoming more complex and children starting to use various conjugative endings and markers. Therefore, grammatical development can be captured by mean length of utterances (MLU, the mean number of words used per utterance). Furthermore, while there are large individual differences in the speed of

language development, when children are compared using MLU, a similar developmental order is observed. Brown (1973) clarified that when children learn English as their mother tongue, there is a certain order, such as mastering the present progressive “ing” or plural “s” faster than the third person singular “s” or passive forms (Table 1). At that time of his writings, Brown used MLU to separate children’s language development into five stages, proposing MLU as an indicator of grammatical development. In addition to MLU, Communicative Development Inventories (CDI) that measure the development of vocabulary until the age of 3–4 years and Lee’s (1974) Developmental Sentence Scoring (DSS) that measures grammar are also used, but in this study, we will discuss the processes involved in language development based on the more commonly used MLU.

Table 1. MLU Stages in the English Language (Brown, 1973)

Stage I	(MLU1.0~)	Semantic roles (such as agents); no conjugation endings
StageII	(MLU2.0~)	Modulation of meaning: acquisition of verb conjugation endings and plural forms; acquisition of 14 grammatical morphemes
StageIII	(MLU2.5~)	Single-sentence modulation: Acquisition of Auxiliary Verbs
StageIV	(MLU3.0~)	Compound sentence structures: Complex sentence structures, such as compound sentences
StageV	(MLU4.0~)	

In the case of Japanese, which has the highest level of similarity to Korean of any language, what stages does the learning processes follow? Ogura (1999) and Miyata, Otomo, and Shirai (2015) are cited as studies focusing on the acquisition of specific grammatical items in the study of first language acquisition in Japanese. Ogura (1999) examined the number of people who used particles, auxiliary verbs, etc., more than five times in 19 min in a cross-sectional study of a total 60 people (groups of 10 people every 3 months from ages 1;0 to 2;3). Table 2 summarizes the first occurrences of basic grammar items used more than five times by several people. Since Ogura (1999) did not analyze the objective case marker “*wo*,” the acquisition of the objective case marker cannot be directly compared. In addition, Miyata, Otomo, and Shirai (2015) used CHILDES’s (Child Language Data Exchange System) Japanese-language corpus (one-hour of natural speech data per week from five people) to investigate the acquisition order of particles and the conjunctive auxiliaries of verbs, clarifying the relationship between this order and each MLU stage. As a result, isolating and summarizing only those case markers that will be subject to analysis in this study, it was found that they were acquired in the order of

topic marker "ha" and modifier "no" then the collective "mo" and nominative "ga," and finally the objective case marker "wo" (Table 3).

Table 2. Acquisition of Japanese (Ogura, 1999)

Age	Grammatical item
1;6	Request "te" Past "ta"
1;9	Actor "ga" possessive "no," delimiting "mo" negative "nai" desire "tai"
2;0	Citation "te," target "ni," associate "to," topic "ha," polite "masu," passive, causative, potential
2;3	Means "de," source "kara," volition "yo"

Table 3. Acquisition of Case Markers in Japanese (Miyata, Otomo, and Shirai, 2015)

MLU	Participle
1.5 – 1.99	Topic "ha" · modifier "no"
2.0 – 2.49	Collective "mo" and nominative "ga"
2.5 – 3.5	Objective case maker "wo"

2. Previous Studies

Previous studies cited on the acquisition of case markers in Korean are those of Y.J. Kim (1997) and Zoh (1982). Y.J. Kim (1997) analyzed data on the utterances of five children, saying that acquisition begins with the nominative marker "ka/i," proceeding in the order of the independent particle (delimiting) "do," the object "nun/un," and the accusative case marker "lul/ul." Y.J. Kim (1997) argues that the nominative "ka" is the first case marker that an infant uses when they begin producing binary sentences. According to Kim (1997), the average age at which the nominative "ka" first appears is 1;8 to 2;0, and it is used proficiently immediately after it first appears. In addition, it is reported that the same nominative "i," which is used after a noun ending in a consonant character, is mastered later than "ka" and there were mistakes reported regarding the usage of "i." The independent particle (delimiting) "do" is what is produced after the nominative "ka," appearing at almost exactly the same time as the first appearance of the nominative "ka." One child produced and used the nominative "ka" and the independent participle (additive) "do" for the first time at 2;0, and one child produced the independent participle (additive) "do" (1;10) two weeks after first producing the nominative "ka." Subsequently, it is reported that the object marker

"*nun/un*" is acquired, with individual differences apparent with the accusative "*lul/ul*" (It first appeared in three children between 1;11~2;3 and between 2;6~2;8 in two). It is the final form to be acquired.

As a result of analyzing the utterances of five children, Zoh (1982) reports that they will acquire the independent particle (delimiting) "*do*," nominative "*ka/i*," and object "*nun/un*" in that order. Zoh (1982) reports that independent particle (delimiting) "*do*" and the comitative markers-*lang/-hako* ("with") were first produced before the nominative "*ka*," with that the locative marker-*ey* ("at") mastered before the age 2;0. In addition, they state that the object marker "*nun/un*" will be produced for the first time a few months after the first production of the nominative "*ka*."

Y. J. Kim (1997) states that there is a slight difference in the period when the nominative "*ka/i*" and the independent particle (delimiting) "*do*" are first produced. Therefore, to summarize the results of Kim's (1997) and Zoh's (1982) studies, it can be said that markers will be acquired in the order of nominative "*ka/i*" → independent particle (delimiting) "*do*" → object "*nun/un*" → accusative "*lul/ul*." However, in both previous studies, only the age of first production, that is, when they began to use the item in question, is used as a criterion for mastery and attention is not paid to the initial stage of acquisition, when children use the item in question with confidence and productivity. In addition, when discussing the order of acquisition, it is based on the age of children, with MLU, which is said to be a measure of grammatical development, not mentioned at all. Considering that there is a large individual difference in the speed of language development, there is a necessity for studies to clarify the process of acquisition through an analysis that leverages MLU. In addition, it is also necessary to conduct research that takes a comprehensive look at the developmental process, that is, not only the age of first production, but right up until the initial stage of acquisition.

Table 4. Process of Acquisition of Case Markers in Korean According to Previous Studies

Prior Research	Learning process
Y.J. Kim (1997)	Nominative " <i>ka/i</i> " → independent particle (delimiting) " <i>do</i> " → object " <i>nun/un</i> " → accusative " <i>lul/ul</i> "
Zoh (1982)	Independent particle (delimiting) " <i>do</i> " → Nominative " <i>ka/i</i> " → Accusative " <i>nun/un</i> "

Therefore, this study established the following two questions and developed a

study to clarify them:

Question (1) What developmental processes are followed in the acquisition of case markers among first language speakers of Korean?

Question (2) Is MLU more appropriate than age as a foundation for language development processes?

3. Research methods

3.1 The case markers that are the subject of the analysis

The case markers to be analyzed in this study are shown in Table 5. In the case of Korean, when using a case marker, the marker will change depending on whether the word preceding it ends with a vowel or a consonant. For example, the Korean particles corresponding to the nominative "ga" are *ka* (가) and *i* (이), with *ka* (가) used when the preceding word ends with a vowel and *i* (이) used when the preceding word ends with a consonant. Therefore, there are three pairs of case markers: the nominative "ka/i," the object "nun/un," and the accusative "lul/ul." In this study, in addition to the three case markers, we include the possessive marker "ui" and the independent particle "do" as subjects of analysis for a total of five particles.

Table 5. The Case Markers Analyzed in This Study

Particle	
	① Nominative "ka/i" (vowel + <i>ka</i> 가, consonant + <i>i</i> 이)
	② Object "nun/un" (vowel + <i>nun</i> 는, consonant + <i>un</i> 은)
	③ Accusative "lul/ul" (vowel + <i>lul</i> 를, consonant + <i>ul</i> 을)
	④ Possessive "ui" (의)
	⑤ Independent Particle (Delimiting) "do" (도)

Korean case markers may be omitted as in Japanese (O'Grady (1991), Lee (1989)), and syntactically, there may not be a one-to-one correspondence between the grammatical relations of terms and their semantic roles (Kim (1990), Yang (1972)), making them appear quite complex. However, this study focuses on the utterances of children with the assumption that acquisition begins with typical usages. The following sample sentences are utterances from the data analyzed in which a child uses a case marker.

(1) <i>Ka/i</i> (nominative)	
엄마가 꺼 내 (JONG 1:11)	손이 아팠어 (JONG 2;1)
Emma-ka kko nae	Son-i apha-sse
Mom-NOM put out	Hand-NOM painful-Pst ¹
"Mom takes it out."	"My hand hurts."
(2) <i>Nun/un</i> (topic)	
토끼는 빨리 가 (JOO 3:5)	양은 동물원 (YUN 2;7)
Ttokki-nun ppalli ka	Yang-un dongmwulwuen
Rabbit-TOP fast go	Sheep-TOP zoo
"Rabbits go fast"	"Sheep is a zoo"
(3) <i>Lul/ul</i> (accusative)	
코를 그려요 (JOO 2;9)	무엇을 읽을까? (YUN 2:5)
Kho-lul kulye-yo	Mues-ul ilk-ulkka?
Nose-ACC draw-Dec	What-ACC read-Qes
"I draw a nose"	"What do we read?"
(4) <i>Ui</i> (possessive)	
나의 소방차 (YUN 2:5)	
Na-ui sobangcha	
I-POS fire engine	
"My fire engine"	
(5) <i>Do</i> (delimiting)	
이것도 있다. (JONG 1:11)	
Ikes-do iss-ta	
This-DEL be-Dec	
"There is also this."	

Children who have just begun to talk speak in words, without using case markers. When they can speak in one-word and two-word sentences, their acquisition of grammar begins, but in the first case, it remains a sequence of words. As case

¹ The abbreviations used in the glosses area as follows: ACC = accusative case marker, Dec = declarative sentence ending, DEL = delimiting case marker, NOM = nominative case marker, POS = possessive case marker, Pst = past tense marker, Qes = question ending, TOP = topic marker

markers are acquired, they begin to appear in the utterances of children, but this study analyzes the age of first production and the patterns of usage afterwards. In research on the acquisition of case markers in infants, the issue of when production first occurs is important, but the early stages of learning, when children become able to use the items confidently and productively, is also crucial. Children become aware of grammatical elements, such as case markers, from the speech of the caregiver, and subsequently begin to use them, but even after the first time they are used, a process of hypothesis verification is carried out in order to learn the correct way to use the case markers. Hypothetical verification involves the checking of the child's own hypotheses by looking at the reactions of the caregiver to the child's speech. For example, when a child utters a sentence that is incorrect, the parent will correct the child's mistake, and if there are no mistakes, the conversation will proceed, in a process of interaction between parent and child. As learning progresses even further, children become confident in using grammatical elements correctly, and the proficient use of certain grammatical elements becomes apparent. At that stage, it is recognized that acquisition has been completed to a certain extent, and in this study, the period in which the frequency of use greatly increases is the acquisition stage. Subsequently, the frequency of use by children gradually approaches to that of adult native speakers.

3.2 Data Analyzed

In this study, we utilize the Ryu corpus (Ryu, 2020) available on CHILDES to analyze the usage processes of case markers. The Ryu Corpus is a database consisting of recorded natural speech that has been converted to text between three children (Jong, Joo, Yun) and their caregivers across 2 years, from the ages of 1 to 3 years who are acquiring Korean as a mother tongue (<https://childes.talkbank.org/access/EastAsian/Korean/Ryu.html>). The data was recorded with a video camera at a frequency of one hour per month with a scene established in which the caregiver and the child engage in a dialogue while reading a picture book. The language data collected totaled 81 h and 15 min of natural speech, from which 3,723 sentences in which the children produced the five case markers in question were analyzed as the subjects of the study. The details of the children from whom data were collected are summarized in Table 6.

Table 6. Details of the Children from Whom Data were Collected and Analyzed

	Age	Sex	Siblings	Time Recorded	Total number of utterances	Number of utterances subject to analysis
JONG	1;3~3;5	Man	None	31 h 37 min	13,764	1,451
JOO	1;9~3;10	Woman	One elder sister	29 h 2 min	25,674	1,264
YUN	2;3~3;9	Man	None	20 h 36 min	10,361	1,008
Total				81 h 15 min	49,799	3,723

3.3 Calculations of the MLU

MLU, as proposed by Brown (1973), is an indicator of the grammatical development of children who are acquiring English. Behind this theory is the fact that the number of sentence elements increases as the sentence structure becomes more complicated due to the development of grammar. For example, the utterance “teddy jump” in the early stage of language acquisition is later changed to “the teddy is jumping,” becoming longer with the addition of articles, predicates, verb conjugation endings, etc. Brown (1973) proposes the use of morphemes to calculate the length of utterances. In other words, in addition to independent semantic words, conjugated endings also become units. Plural forms of nouns (-s) and verb endings (-s, -ed, and -ing) are recognized as a single morpheme each. In the above example, teddy/ jump would be 2 morphemes and the/ teddy/ is/ jump/-ing is 5 morphemes (“Mean Length of Utterances in Morphemes” (MLUm)).

In MLU, as proposed by Brown (1973), the morpheme was the unit of calculation, but later, criticisms were voiced against MLUm. It has been pointed out that the morpheme-based MLU overestimates children's abilities in Dutch, German, and Irish. In those languages, since there are no stem-only verb forms, children are forced to use suffixed word forms from the beginning. The English language “go” is one morpheme, but the German “geh-en,” which has the same meaning, becomes dimorphemic with geh not used on its own. We have concluded that in such languages it is better to calculate MLU by word (“Mean Length of Utterances in Words (MLUw)”).

One may summarize the different formula for calculating MLU as follows:

1) Mean Length of Utterances in Words (MLUw)

Ex) 이것도 있다. (JONG 1:11) MLUw= 2.0 (2 words/utterance)

Ikes-do iss-ta

This-DEL be-Dec "There is also this."

2) Mean Length of Utterances in Morphemes (MLUm)

Ex) 이것-도 있-다. (JONG 1:11) MLUm= 4.0 (4 morphemes/utterance)

Ikes-do iss-ta

This-DEL be-Dec "There is also this."

The level of grammar development in Korean is also reflected by the length of sentences. As an agglutinative language, in Korean, suffixes (morphemes) are accumulative; therefore, the more complex the word form, the longer it becomes. The appropriateness of the formula for calculating MLU, whether it is done through MLU in words or MLU in morphemes, should be studied in the future as an outstanding issue. In the case of Japanese language, one that has a high degree of similarity to Korean, one study by Miyata (2012), which sought to verify the appropriateness of the MLU formula, proposed that "when using MLU, it is preferable to calculate MLUw (Mean Length of Utterances in Words) in the early stage of learning (up to 2 /2 and a half years of age for healthy children) and calculate the MLUm (Mean Length of Utterances in Morphemes) when that value exceeds 1.5."

In this study, we conduct analyses using the "Mean Length of Utterances in Words (MLUw)." The reason for using the "Mean Length of Utterances in Words" is that while the Ryu corpus (Ryu, 2020) used in this study has an enormous volume of words, containing scripted utterances between children and guardians, it is a corpus for which a morphemic analysis has yet to be completed. To analyze morphemes, the corpus must be tagged with morphemes and comments, such as the type of sentences and the explanation of the context. Since that would be a large project that goes beyond the scope of this study, it is our hope that a corpus, which includes a morphological analysis, will be developed in the future. However, the Ryu corpus calculates and publishes the "Mean Length of Utterances in Words" in its data. The "Mean Length of Utterances in Words" is calculated based on "separate words" as mentioned above. The Korean language, like the English language, has the characteristic of each word being "separate" in its written form. What is meant by separate words here is that there is a space between word boundaries in a sentence. For example, taking "separate words" as a basis, the sentence "엄마가 사과를

먹었다[Emma(mother)-ka sakwa(apple)-lul mek(eat)-essta]" (My mother ate an apple) has three different words in one utterance and an MLUw value of 3.0. In this study, we used the "Mean Length of Utterances in Words," which was currently available, to carry out the analysis (hereafter, MLU refers to MLUw).

4. Results

The state of usage of the five case markers uttered by each child in all survey periods is summarized in Table 7. In this study, the period when the child began to use the case markers more than 10 times in the one hour recorded every month was recognized as the initial acquisition stage. There are studies that use the age of first production as a means of judging acquisition; however, the age of first production is not known for the data used in this study. Table 7 shows the pattern of use of case markers among each of the children. However, Jong and Yun were already using case markers at the time when the recordings began; thus, it is not clear when they first began to produce them. The age at first appearance was analyzed for Joo, for whom it was observed that the first appearance of the independent particle (delimiting) "*do*," was at the age of 2;2, it came at 2;7 for the object "*nun/un*," 2;9 for the nominative "*ka/i*" and the accusative "*lul/ul*," and 3;7 for the possessive "*ui*." Looking exclusively at Joo, when the process of acquisition is looked at only from the perspective of the age of first production, the order of acquisition is as follows: the independent particle (delimiting) "*do*" → object "*nun/un*" → nominative "*ka/i*" and accusative "*lul/ul*" → possessive "*ui*." However, in this study, it is judged that children acquired case markers on the basis of the initial stage of acquisition rather than at the first age of production; therefore, the period when the use of case markers suddenly increased by at least 10 instances is mapped through shading in Table 7. However, as the frequency of use of "*ui*" is less than that of other case markers, the period when the frequency of use increased is shaded in, even if the number did not reach 10 or more utterances.

Table 7. Use of Case Markers by Each Child (token count)

JONG	Age																				SUM				
	1;7	1;8	1;9	1;10	1;11	2;0	2;1	2;2	2;3	2;4	2;5	2;6	2;7	2;8	2;9	2;10	2;11	3;0	3;1	3;2	3;3	3;4	3;5	token	(%)
NOM ka/i	1	6	24	9	24	17	44	31	28	40	23	23	27	38	27	50	34	53	25	18	24	26	79	671	46
ACC lul/ul	0	0	3	0	5	2	12	2	1	2	4	9	1	5	1	8	9	8	11	10	11	5	4	113	8
TOP nun/un	29	4	34	1	16	4	14	15	27	24	10	19	47	18	21	13	13	17	19	20	16	11	40	432	30
POS ui	0	0	2	0	0	0	0	0	0	1	0	1	7	1	0	0	0	2	3	0	1	0	3	21	1
DEL do	1	12	11	11	16	34	12	6	7	14	4	8	4	5	15	9	9	9	12	8	5	0	2	214	15
Sum	31	22	74	21	61	57	82	54	63	81	41	60	86	67	64	80	65	89	70	56	57	42	128	1451	100
MLU	2.4	2.6	3.1	2.8	2.8	2.9	3.2	3.3	2.8	2.8	3.0	2.7	3.1	2.8	2.9	2.8	2.6	3.4	3.4	2.7	3.1	3.0	3.8		

JOO	Age																	SUM					
	2;2	2;3	2;4	2;5	2;6	2;7	2;8	2;9	2;10	2;11	3;0	3;1	3;2	3;3	3;4	3;5	3;6	3;7	3;8	3;9	3;10	token	(%)
NOM ka/i	0	0	0	0	0	0	0	2	1	3	11	17	12	16	44	99	82	73	42	7	14	423	33
ACC lul/ul	0	0	0	0	0	0	0	1	1	2	0	1	2	25	26	16	38	13	10	4	1	140	11
TOP nun/un	0	0	0	0	0	1	1	2	10	5	18	34	65	69	54	60	48	17	31	16	32	463	37
POS ui	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
DEL do	1	2	1	0	0	2	0	4	5	16	9	23	43	12	13	25	16	10	23	9	23	237	19
Sum	1	2	1	0	0	3	1	9	17	26	38	75	122	122	137	200	184	114	106	36	70	1264	100
MLU	2.9	2.4	2.5	2.5	2.3	2.1	2.2	2.2	2.2	2.4	2.4	2.7	2.9	2.8	3.4	3.7	3.7	3.5	3.5	3.2	3.0		

YUN	Age																	SUM			
	2;3	2;4	2;5	2;6	2;7	2;8	2;9	2;10	2;11	3;0	3;1	3;2	3;3	3;4	3;5	3;6	3;7	3;8	3;9	token	(%)
NOM ka/i	2	2	2	2	3	6	13	22	17	40	28	12	16	17	60	37	43	72	45	439	44
ACC lul/ul	0	0	3	1	0	1	2	3	13	8	6	5	2	7	15	8	6	18	14	112	11
TOP nun/un	2	3	3	9	32	2	13	34	24	12	3	7	14	27	35	27	20	35	21	323	32
POS ui	0	0	1	0	0	0	3	2	0	3	0	0	0	1	0	0	5	1	0	16	2
DEL do	2	3	3	0	5	2	17	1	1	10	2	5	3	2	20	16	4	19	3	118	12
Sum	6	8	12	12	40	11	48	62	55	73	39	29	35	54	130	88	78	145	83	1008	100
MLU	2.2	2.4	2.9	2.5	2.6	3.5	3.4	3.0	3.3	2.9	2.7	3.2	3.0	3.2	3.6	3.3	3.2	4.1	3.8		

Note. NOM = Nominative, ACC = Accusative, TOP = Topic, POS = Possessive, DEL = Delimiting.

Looking at the results in Table 7, from the age of 1;7 to 3;5, it has been calculated that there were 1451 sentences in which Jong used case markers during the survey period. Although the first production of each case marker is unclear, looking at the initial stage of acquisition, it can be seen that the age when this stage of acquisition occurred for the topic marker "nun/un" was at the age 1;7, for the independent marker (delimiting) "do," it was 1;8, for the nominative "ka/i," it was 1;9, for the accusative "lul/ul," it was 2;1, and for the possessive "ui," it was 2;7. In particular, Jong began to acquire words at an earlier stage than the other two children, beginning to acquire case markers from the age of one year and seven months. Jong's MLU is also higher than the average at the age of 1 year and 7 months. He is a child who was quick to speak. There were 1264 sentences made by Joo that were identified as involving utterances using case markers during the survey period, which spanned the ages of 2;2 to 3;10. The first production of each case marker was clear, with the independent participle (delimiting) "do" first produced at 2;2, the topic "nun/un" was first produced at 2;7, the nominative "ka/i" and the accusative "lul/ul" were first produced at 2;9, and the possessive "ui" was first produced at 3;7. However, looking at the initial stage of mastery, we can see that they acquired the topic "nun/un" at 2;10, the independent participle (delimiting) "do" at 2;11, the nominative "ka/i" at 3;0, the accusative "lul/ul" at 3;3, and the possessive "ui" at 3;7, showing small differences from the order of the first production of case markers.

Looking at first production, the independent particle (delimiting) "do" is produced ahead of the topic "nun/un," but in the initial stage of acquisition, the order is reversed. However, the subsequent order of the processes of acquisition was the same for both the first production and in the initial stage of acquisition, in the order of the nominative "ka/i", the accusative "lul/ul," and the possessive "ui". Compared to the other two children, Joo had the slowest language acquisition. The acquisition of case markers began when he was two years and ten months old. There were 1008 sentences in which Yun was seen to use case markers during the survey period, which coincided with the ages of 2;3 and 3;9. Although it is not clear when each case marker was first produced, looking at the initial stage of acquisition, we can see that the topic "nun/un" was first produced at 2;7, the independent particle (delimiting) "do" was first produced at 2;9, the normative "ka/i" was first produced at 2;9, the accusative "lul/ul" at 2;11, and the possessive "ui" at 3;7. Yun's acquisition was slower than Jong, but language acquisition began earlier than Joo, who began to acquire case markers from the age of 2 years and 7 months.

Table 7 contains the MLU for the period from which data were collected from each child. MLU tends to increase with the age of children, but it is not necessarily directly proportionate. That is, the MLU appears to both rise and fall as the child ages, but the trend is roughly for it to rise to the upper right. However, when we look at the MLU at the time when the acquisition of case markers commences, it was 2.4 for Jong, 2.2 for Joo, and 2.6 for Yun, which can be said to be a smaller gap than looking at age. Therefore, it can be recognized that when MLU rises to 2.2~2.6, the acquisition of case markers begins.

Finally, Table 7 reveals the usage ratios of the five case markers. The totals are shown on the right side of the table, but the number and component ratio of the case markers that the child produced during the period in which they were recorded are summarized. Jong uttered 671 sentences, including the nominative "ka/i," which accounts for 46% of all utterances, including the five case markers. In addition, Jong used topic "nun/un" in 432 sentences with a component ratio of 30%. They used the independent particle (delimiting) "do" in 214 sentences (15%), the accusative "lul/ul" was used in 113 sentences (8%), and the possessive case marker "ui" in 21 sentences (1%). It can be seen that the ratio of the use of case markers by Joo is 37% for the topic marker "nun/un," 33% for the nominative "ka/i," 19% for the independent particle (delimiting), "do," 11% for the accusative "lul/ul," and 0% for the possessive "ui." Looking at the ratio of the use of case markers by Yun, the use of the nominative "ka/i" comprised 44%, the object marker "nun/un" comprised 32%, the independent particle (delimiting) "do" comprised 12%, the use of the accusative

object "*lul/ul*" comprised 11%, and the possessive case marker "*ui*" comprised 2%. Taking a wider and more comprehensive perspective, the total ratio of use of the nominative "*ka/i*" and the object "*nun/un*" among the five case markers exceeds 70%, suggesting that the nominative "*ka/i*" and the object "*nun/un*" should play important roles in discussions of the acquisition of case markers. The nominative "*ka/i*," the object "*nun/un*," independent particles (delimiting) "*do*," and accusative "*lul/ul*" comprise 10%–15%, with the possessive marker "*ui*" comprising the lowest proportion, at 1%. We will consider the possessive "*ui*", which has a usage ratio of 1%, in the next chapter.

5. Discussion

The processes of acquiring the case markers among the three children is summarized in Table 8 below that summarizes the ages at which each child acquired case markers as well as their MLU.

Table 8. The Process of Acquisition of Case Markers

Child	Acquisition order				
JONG	TOP <i>nun/un</i>	→ DEL <i>do</i>	→ NOM <i>ka/i</i>	→ ACC <i>lul/ul</i>	→ POS <i>ui</i>
Age	1;7	1;8	1;9	2;1	2;7
MLU	2.435	2.553	3.140	3.185	3.088
JOO	TOP <i>nun/un</i>	→ DEL <i>do</i>	→ NOM <i>ka/i</i>	→ ACC <i>lul/ul</i>	→ POS <i>ui</i>
Age	2;10	2;11	3;0	3;3	3;7
MLU	2.238	2.352	2.350	2.752	3.473
YUN	TOP <i>nun/un</i>	→ DEL <i>do</i>	→ NOM <i>ka/i</i>	→ ACC <i>lul/ul</i>	→ POS <i>ui</i>
Age	2;7	2;9	2;9	2;11	3;7
MLU	2.603	3.412	3.412	3.282	3.234

From the results in Tables 7 and 8, we uncovered the following two points regarding the acquisition process of Korean case markers.

① The processes of acquisition of case markers

Table 8 shows that each child's case marker acquisition pattern follows a constant process. All the children showed the same process of acquisition of case markers, which is as follows: object "*nun/un*" → independent particles (delimiting) "*do*" → nominative "*ka/i*" → accusative marker "*lul/ul*" → possessive marker "*ui*." However, this result differs from the results of previous studies on Korean

(nominative "*ka/i*" → independent particle (delimiting) "*do*" → object "*nun/un*" → accusative marker "*lul/ul*"). In particular, the greatest point of difference between this study and previous studies is that in this study, the object "*nun/un*" is acquired at the earliest stage. The reason for this is thought to be that the process of acquisition changes depending on what the criterion is used as a basis for measuring the acquisition of case markers among children. Prior studies Y.J. Kim (1997) and Zoh (1982) discuss the acquisition process based on the age when markers are first produced. However, in this study, judgments were made based on the initial stage of acquisition; therefore, we believe that this is the reason why the results are different from previous studies. Considering the time when previous research was conducted, I think it was a time when no corpus like the Ryu Corpus existed, where all speech of children and caregivers was arranged as texts, and when no linguistic analysis systems like CLAN and CHILEDS existed. The first production of a marker may have been immediately observable by the observer; however, a set of circumstances may have been present whereby it was difficult for subsequent usage patterns to have been easily produced. In addition, an MLU calculated by analyzing the scripts of all utterances may have been impossible. In response to the question of which criterion is appropriate to observe the process of language acquisition, the age of first production or the initial stage of acquisition, this study is able to adopt the initial stage of acquisition. Looking at the results of this study, the learning processes of the three children is consistent, and we believe that this is evidence that assures the appropriateness of using the initial stage of acquisition.

Allow us to compare the results of this study with the acquisition process of Japanese markers. From the results of Ogura's (1999) study, when only the five markers that are the subjects of this study are isolated and looking at the acquisition processes, the following order was found: "actor '*ga*,' possession '*no*', delimiting '*mo*' → object '*ha*'" (Table 2). This is very different from the results of this study, in which the topic "*nun/un*" was acquired before the nominative "*ka/i*." Ogura (1999) examined the number of people who used case markers and auxiliary verbs more than five times in 19 minutes in a cross-sectional study of 60 people (10 people every 3 months from 1;0 to 2;3). The acquisition process was summarized based on the point when elements of grammar used by several people and which were used more than five times appeared for the first time. This is a slightly different way of studying how to longitudinally record the natural speech of a single child and observe the first production. Although it is difficult to directly compare the methods used in previous studies, Ogura's (1999) study can be said to be one that is based on the age of first production. In other words, Ogura (1999), in terms of using first

production as a criterion of acquisition, takes the same stance as the work of Y.J. Kim (1997) and Zoh (1982), unlike this study. This was also reflected in the research results, with the three studies reporting the result that the nominative "*ka/i*" was acquired before the object "*nun/un*."

However, Miyata, Otomo, and Shirai (2015) used CHILDES's Japanese corpus (five people, one hour of natural speech data per week) to investigate the acquisition order of functional morphemes of verbs and particles. When we extract and summarize only those case markers to be analyzed in this study, we find that the acquisition of the case markers proceeded in the order of the object "*ha*" and modifier "*no*" → delimiting "*mo*" and nominative "*ga*" → accusative "*wo*" (Table 3). The acquisition process is consistent with the results of this study (object "*nun/un*" → independent particle (delimiting) "*do*" → nominative "*ka/i*" → accusative "*lul/ul*" → possessive "*ui*"), except for the modifier "*no*." The Japanese particle "*no*" is different from the Korean particle "*ui*", in that it is used as a case marker, also used to denote ownership, and sometimes used as an ending marker by attaching it to the end of a sentence in order to change the tone of the sentence. For example, the "*no*" in "*usagi no shippo*" (rabbit's tail) is used as a possessive marker, but the "*no*" in "*tabeta no*" (I have eaten "*no*") is used as an ending marker to soften the tone of the sentence and express the idea of making a soft assertion. Miyata, Otomo, and Shirai (2015), in their results combining possessive markers and ending markers, show that the frequency of the use of "*no*" is also high, showing that it is acquired at an early stage. However, because the meanings of "*no*" in Japanese and "*ui*" in Korean are different, it would be difficult to directly compare the results of this study with those of Miyata, Otomo, and Shirai (2015). It can, however, be said that the frequency of the use of "*no*" in Japanese is certainly much higher than that of "*ui*" in Korean. Please refer to Tomioka (2019) for more on the acquisition of "no" among speakers of Japanese as a first language. What I would like to note here is that the results of this study are consistent with those of Miyata, Otomo, and Shirai (2015), and that the case markers for topics were acquired at an earlier stage than that of the nominative. Both Miyata, Otomo, and Shirai (2015) and this study leveraged the CHILDES corpora (natural speech data) in their analysis. In addition, Miyata, Otomo, and Shirai (2015) recognize acquisition as the time when specific elements are used in four different combinations (e.g., "This *ha*," "Mama *ha*," "I *ha*," and "Cat *ha*"). Therefore, they are looking at frequency of use in the initial stage of acquisition and not first production. Accordingly, the quality of the data used by Miyata, Otomo, and Shirai (2015) is the same as this study, the analytical criteria is also the same, and the results show the same tendencies. In other words, it can be

said that the results of an analysis leveraging frequency of use as a basis of acquisition and a corpus that takes the natural speech of the infant in a longitudinal manner showed that topic case markers are acquired earlier than nominative case markers.

② Age and MLU in the Acquisition Process

From the results in Table 8, it was proven that there are great individual differences in the acquisition processes and ages regarding case markers. Looking at topic "*nun/un*," which was acquired first, Jong acquired it at 1;7, Yun acquired it at 2;7, and Joo acquired it at 2;10, with a one-year difference between children with quicker and slower linguistic development. Therefore, it was proven that age varies greatly among individuals and could not be used as a criterion in the acquisition process. However, looking at the MLUs, when acquiring the topic "*nun/un*," the figures are 2.2–2.6; therefore, it can be understood that individual differences are not greater than when looking at age. There is a difference of about 12 months in the age of acquisition of the object "*nun/un*" between children who learn it quickly and those who learn it slowly, but this falls to between 2.2 and 2.6 when viewed in terms of MLU. MLU was found to show a smaller range of individual differences among the three children and to be more appropriate than age as a criterion for the acquisition process. Subsequently, taking MLU as a criterion, it becomes possible to approximate which case marker can be acquired at what MLU. For example, this study revealed that the initial stage of acquisition of the topic "*nun/un*" occurred at an MLU distribution of 2.2–2.6, with this stage occurring for the final possessive marker "*ui*" at an MLU distribution of 3.1–3.5. Therefore, it can be predicted that acquisition of the topic "*nun/un*" will start when MLU exceeds 2.2., and that acquisition of the possessive "*ui*" will commence when MLU exceeds 3.0.

While we have verified in this study that it is more appropriate to use MLU as a criterion than age, in real-life research, it is difficult to calculate MLU. Firstly, natural speech data must be recorded over a long period of time, and the speech of the child and the caregiver must be converted to text. Subsequently, MLU is calculated by language processing programming (using awk programs in this study). However, the current form of MLU refers to "MLUw," but when we try to calculate the "morphological MLU (MLUm)," all scripts must be morphologically analyzed with morpheme tagging information provided. In addition, language processing programming in which the number of morphemes is counted in one sentence must also be developed. Regarding research into first language acquisition, as Sugiura, Naka, Miyata, and Oshima (1997:80) pointed out, one problem in modern day

research on language acquisition among speakers of Korean as a first language is that "because of the enormous amount of time it takes to collect data, convert it into text, and engage in the process of analysis, previously only a small body of research based on a small number of case-studies carried out by individual researchers was possible." However, through the CHILDES (MacWinney 2000), which provides computer-based data sharing and analytical tools, it is now possible to analyze large volumes of natural speech data. In terms of Korean language, three corpora from Jiwon (from 2017), Ko (from 2019), and Ryu (from 2017), have finally been made available on CHILDES. However, although the scripts for all three corpora are complete, we are not yet been able to analyze the morphemes. It is hoped that a project to develop morphological analysis programs will be launched in the future, that analysis of morphemes in the language used by infants will be realized, and that many studies leveraging CHILDES will be actively conducted.

6. Future challenges

Although the process of acquiring case markers has been clarified in this study, there are some issues to be considered as future challenges. First, when considering the acquisition of case markers, it is also necessary to consider the problem of the omission of case markers. In Korean, omitting case markers may not interfere with the understanding of the sentences, depending on the context. For example, the sentence "엄마 먹어[Emma Meke] (Mother eats)" omits the nominative "ka," which represents the subject of the sentence, but it is not difficult to grasp the meaning that "One's mother is eating." Moreover, depending on the case marker, there are some that are not often omitted and others that are. For example, the topic "*nun/un*" and the nominative "*ka/i*" are not frequently omitted, while the accusative "*lul/ul*" and the possessive "*ui*" may be often omitted. This can be seen from the ratio of usage of the particles shown in Table 7. The nominative "*ka/i*" accounted for 33–46% of case marker usage, the object "*nun/un*" accounted for 30–37%, the independent particle (delimiting) "*do*" accounted for 12–19%, the accusative "*lul/ul*" accounted for 8–11%, and the possessive "*ui*" accounted for 1%. Especially in the case of the possessive "*ui*," looking only at the frequency of utterances, there were only three utterances that included it during the entire survey period. The possessive "*ui*" is an often-omitted particle that may be omitted without causing any issue. Therefore, it is very rare to see the frequency of use of that marker in natural speech data. Of course, with longitudinal spontaneous speech data there are limitations with

the data itself, and discussing the acquisition of less frequent morphemes based on that data may constitute a logical leap.

Secondly, as a future challenge, we believe that syntactic considerations are also required. This study discusses the acquisition process based on frequency of use from a morphological perspective, with the premise that "if they acquire case markers, children will produce them correctly." However, the acquisition of particles is related to word order and syntax, whether the case markers were used or omitted must be verified through a different research method, with an understanding of the word order and syntax of Korean. In that case, we believe that with natural speech data, a hypothesis verification method through experimentation is more efficient. This is because speech data alone cannot allow us to verify whether a child understands grammar and produces it correctly. It is our hope that further research will be conducted on the acquisition of case markers.

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