

# The L1 Acquisition of Verb Conjugational Morphemes in Korean: Based on the Analysis of the CHILDES Corpus\*

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## 1 Introduction

During the process of first language (L1) acquisition, the mean length of utterances (MLU; i.e. the average number of words per utterance) is used as a measure of children's grammatical development. However, very few studies on Korean L1 acquisition have analyzed infants' language development based on the MLU metric. One reason for this may be that a corpus of utterances for which MLU can be calculated has not been constructed until now. This study aims to clarify the sequence of the acquisition of verb conjugational morphemes, which are central to the basic grammar of Korean, based on the subjects' MLU and using the Ryu Corpus derived from the Child Language Data Exchange System (CHILDES; MacWhinney, 2000). Of course, in addition to MLU, the measure of early grammatical development, which measure lexical development up to 3–4 years of age (Bates et al. 1995), and Developmental Sentence Scoring by Lee (1974) for grammar measurement have also been used. However, this study examined the language development process based on the more commonly used MLU.

## 2 MLU and the Process of Early Grammatical Development

Although children's spontaneous speech production may initially manifest without conjugational

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sentence-ender suffixes, they begin to use various conjugational endings of this type and particles in the process of L1 acquisition, and the acquisition of grammar begins. As grammar development progresses in this way, sentence structures produced increase in complexity, and development is thought to be reflected in the length of sentences. Therefore, grammatical development can be captured in terms of MLU. Further, although there are large individual differences in the rate of language development in children, when developmental levels are correlated with MLU rather than age, a similar developmental sequence of grammatical items can be observed (Table 1; Brown, 1973).

Stage	MLU	
Stage I	(MLU1.0~)	Semantic role (subject, etc.); no conjugation suffix
Stage II	(MLU2.0~)	Semantic modulation; acquisition of verb endings and plurals and acquisition of 14 grammatical morphemes
Stage III	(MLU2.5~)	Modulation of simple sentences; acquisition of auxiliary verbs
Stage IV	(MLU3.0~)	Complex sentence structures such as sentences containing sophisticated grammatical constructions
Stage V	(MLU4.0~)	

Table 1: Stages of Mean Length of Utterances (MLU) with Respect to English (Brown 1973)

In a study on Japanese L1 acquisition, Ogura (1999) focused on the acquisition of specific grammatical items. In a cross-sectional study of 60 participants (10 participants every 3 months from ages 1;0 to 2;3), the number of particles, auxiliary verbs, and so forth, used more than 5 times within 19 minutes was examined. Table 2 summarizes the point in time when the basic grammar items several participants used five or more times first appeared. However, in Korean L1 acquisition research, no studies such as by Brown (1973) and Ogura (1999) have clarified the acquisition of specific grammatical items in the early stages of development.

Age	
1;6	Requesting <i>-te</i> ; Past <i>-ta</i>
1;9	Actor <i>-ga</i> ; Possessive <i>-no</i> ; Additive <i>-mo</i> ; Negation <i>-nai</i> ; Wish <i>-tai</i>
2;0	Quoting <i>-te</i> ; Object <i>ni</i> ; Conjunctive <i>to</i> ; Subject <i>ha</i> ; Distal suffix <i>-masu</i> ; Passive; Causative; Potential
2;3	Instrumental <i>de</i> ; Source <i>kara</i> ; Intention <i>you</i>

Table 2: Acquisition of Japanese (Ogura, 1999)

The majority of studies on Korean L1 acquisition to date have been based on psychological experiments, and even studies using longitudinal speech data have relied on caregivers' notes and data recorded on children's speech, and the data are not corpus based. As a result, no studies have analyzed infant language development using MLU as a criterion. MLU is used as a measure of language development, but since it is calculated based on the average number of words per utterance, it cannot be easily calculated without a corpus of longitudinal speech material. The Ryu Corpus used in this study is a Korean infant language corpus that individuals themselves have uploaded to CHILDES. By applying Computerized Language Analysis (CLAN), a language analysis tool provided by CHILDES, it is possible to analyze a large amount of spontaneous speech data and objectively view the language development process based on the calculated MLU.

The formula for calculating MLU also varies depending on the level of detail with which the analysis of word count was performed. However, this study calculated MLU data by applying the independent word MLU (Ogura et al. 1997) based on Korean word segmentation. Example sentence (1) presents the formula:

(1)	안	해.	(Jong 1:7)	MLU = 2.0
	An	hay.		(2 words/1 utterance)
	An-NEG	do.DEC		
	'I don't do that'.			

### 3 Past Research

Among studies on Korean L1 acquisition, Choi (1991) and Kim (1997) focused on the acquisition of specific grammatical items. However, both used the child's age as the measure of the degree of acquisition, and studies using MLU as the criterion have not been conducted until recently. In L1 acquisition research, individual differences among children are an important factor in determining the language acquisition process, and significant differences are found between children depending on the speed of their development, even at the same age. In a study on imperfect aspect acquisition in Korean (Ryu & Shirai 2023), a comparison of the age of the first occurrence of imperfective aspect forms revealed a difference of 1 year and 4 months between children with early and late language acquisition, but a constant result of 2.66–2.78 was obtained for MLU (Table 3). While most Korean L1 acquisition studies to date have been based on age, this type of study based on MLU began with Ryu and Shirai (2023).

Child	Age	Mean length of utterances
JONG	1;11	2.78
JOO	3;3	2.66
YUN	2;7	2.68

Table 3: First Appearance of the Korean Imperfect Aspect (Ryu & Shirai 2023)

Ryu (2021), who clarified the acquisition process of case particles in Korean L1 acquisition, used the Ryu Corpus from CHILDES to collect and analyze the utterances using the case particles (see Table 4).

1. Subject *ka/i* (vowel + *ka*, consonant + *i*)
2. Topic *nun/un* (vowel + *nun*, consonant + *un*)
3. Objective *lul/ul* (vowel + *lul*, consonant + *ul*)
4. Possessive *uy*
5. Independent particle (Delimiting) *to*

Table 4: Case Particles Analyzed in Ryu (2021)

The period when the child began to use case particles ten or more times during the hour in which the utterance was recorded was recognized as the initial stage of acquisition; the acquisition process is summarized in Table 5. Table 5 shows the ages of the three children (JONG, JOO, YUN) and their MLU at that point.

Child	Acquisition order					
JONG	TOP <i>nun/un</i>	→ DEL <i>to</i>	→ NOM <i>ka/i</i>	→ ACC <i>lul/ul</i>	→ POS <i>uy</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>to</i>	→ NOM <i>ka/i</i>	→ ACC <i>lul/ul</i>	→ POS <i>uy</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>to</i>	→ NOM <i>ka/i</i>	→ ACC <i>lul/ul</i>	→ POS <i>uy</i>	
Age	2;7	2;9	2;9	2;11	3;7	
MLU	2.603	3.412	3.412	3.282	3.234	

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

Table 5: Process of Case Particle Acquisition

Based on the results of counting the number of times each child used the five case particles uttered in all the study periods, the two points mentioned in Sections 3.1 and 3.2 were found regarding the acquisition process of Korean case particles.

### 3.1 Process of Case Particle Acquisition

Each child's acquisition pattern of case particles was found to follow a certain process. The children showed the acquisition process of subject *nun/un* → independent particle (additive) *do* → genitive *ka/i* → object *lul/ul* → possessive *uy*, and the acquisition order of the three children was consistent. However, this result diverges from the results of previous studies by Zoh (1982) and Kim (1997): genitive *ka/i* → independent particle (additive) *to* → subject *nun/un* → object *lul/ul*. The subject indicator *nun/un* in particular was acquired the earliest. Both previous studies used only the age of the child as the criterion for acquisition and did not mention the relationship with MLU, which is said to be a measure of grammatical development and acquisition. In addition, comparing the results of Ryu (2021) with the acquisition process of Japanese grammar particles, the results of Ogura (1999), who selected only the same particles targeted in Ryu (2021), showed significant differences (i.e. *ga, no, mo* → *ha*). However, the results of Miyata et al. (2015)—*ha, no* → *mo, ga* → *wo*—are consistent with Ryu (2021), except that for *no*. The methodology of Ryu (2021) is identical to that of Miyata et al. (2015), who analyzed Japanese data from CHILDES based on MLU. The results obtained are almost identical, which indicates that MLU used as a measure of grammatical development is useful as a means of objectively observing language development regardless of the target language.

### 3.2 Age, MLU, and the Acquisition Process

The results in Table 5 show that there are significant individual differences with respect to age and the process of the acquisition of case particles. Looking at the first particle acquired, subject *nun/un*, JONG learned it at 1;7, YUN at 2;7, and JOO at 2;10, creating a one-year difference between children with early and delayed language development, and indicating that age cannot be used as a criterion for the acquisition process. MLU, however, was found to have few individual differences among the three children and could be used as a criterion for the acquisition process. For example, it was found that MLU for the acquisition of subject *nun/un* in the early stages of

acquisition had a distribution of 2.2 to 2.6, and that for the acquisition of the final particle, possessive *uy*, had a distribution of 3.1 to 3.5.

#### 4 Research Method

To clarify the early grammatical development of Korean, this study aimed to clarify the acquisition order of verb conjugational morphemes based on MLU using the Ryu Corpus, a Korean infant language corpus. The grammatical items to be analyzed in this study are listed in Table 6. In particular, the number of utterances for the tense expressions ‘present *hay*, past *hayss*, and future *keyss/hal ke*’; the negation expressions ‘prepositional *an*, postpositional *ci anh*’; and the consecutive conjunctive suffixes ‘*hako/hayse*’ were so high that the analysis was limited to the verb *hata* ‘to do’ and its conjugated forms only. For example, in the case of ‘*an, ci anh*’, which express negation, the total frequency of occurrence exceeds 100; as such, when compared to other verb conjugations, the frequency is too large and biased, and so the analysis was limited to *hata* ‘to do’ verbs. In fact, even when all utterances were analyzed without restrictions to *hata* ‘to do’ verbs, the acquisition pattern did not change from the results with the *hata* ‘to do’ verbs.

Sentence-ender suffix	Tense	Present <i>hay</i> , past <i>hayss</i> , and future <i>keyss/hal ke</i>	<i>hata</i> (do) verbs
	Imperfective aspect	Progress <i>ko iss</i> , result <i>a iss</i>	No verb constraints
	Negation	Prepositional <i>an</i> , postpositional <i>ci anh</i>	<i>hata</i> (do) verbs
	Modality	Wish <i>ko siph</i> , potential <i>ul swu iss</i>	No verb constraints
	Politeness	Polite <i>seyyo, supnita</i>	No verb constraints
Conjunctive suffix		Conjunction <i>hako/hayse</i>	<i>hata</i> (do) verbs
		Conditional <i>myen</i> , obligation <i>ya</i>	<i>hata</i> (do) verbs
		Intention <i>le</i> , will <i>lyeko</i>	No verb constraints
		Reason <i>nikka</i>	No verb constraints

Table 6: Grammar Items Analyzed in This Study

The Ryu Corpus used in this study is a collection of spontaneous speech data collected over a two-year period from children 1.5 to 3.5 years of age who are native Korean speakers. Details of the data included in the Ryu Corpus are shown in Table 7.

Child	Age	Data collection period	Recording period		Subject child		Caretaker	
			(minutes)	(hours)	No. of words	No. of utterances	No. of words	No. of utterances
JONG	1;3~3;5	2 years, 2 months	1,897	31 hr 37 min	39,230	13,764	141,680	28,761
JOO	1;9~3;10	2 years, 1 month	1,742	29 hr 2 min	70,499	25,674	274,510	52,589
YUN	2;3~4;3	2 years, 0 months	1,596	26 hr 36 min	44,512	13,814	126,437	22,704
Total			5,235	87 hr 15 min	154,241	53,252	542,627	104,054

Table 7: Details Regarding the Ryu Corpus (Ryu, 2020)

CLAN, a linguistic analysis tool provided by CHILDES, was applied. Children's utterances in which the grammatical expressions in Table 6 appeared from all corpora were collected and analyzed by calculating the frequency of production, age, and MLU for that time period.

## 5 Results and Discussion

Table 8 summarizes the use of verb conjugational morphemes uttered by each child in all study periods. In this study, when a child began to use a grammatical expression two or more times in one recorded hour, it was recognized as the initial stage of acquisition.

### 1) JONG

Age	MLU	Prese	Past	Future		Aspect		Negation		and		if	must	inten	volition	cause	wish	possibilit	honorificat	politenes	
		hay	haysse	hakeysss	hal ke	ko iss	a iss	an hay	haci anh	hako	hayse	myen	ya	le	lyeko	nikka	ko siph	swu iss	seyyo	supnida	
1;7	2.4	3	1					3													
1;8	2.6	1																		4	
1;9	3.1	11	2								2									1	
1;10	2.8	2																			
1;11	2.8	3	2			4	1			4										4	
2;0	2.9	7	1		1	2	3			3	1			1			1			8	
2;1	3.2	4	13			3	2			3	2	15	10	4			1	1		5	1
2;2	3.3	9	2			3	1			1		3	5	4						2	
2;3	2.8	21	5					9		1	1	6	5							7	
2;4	2.8	10	11		2	2	2	1		2	7	12	13	1		1		3	4	4	
2;5	2.7	6	6							1	5		1	1		4			2		
2;6	3.1	4	13		1			1		3	11	1	1	3	4			1	1		
2;7	2.8	7	8		1		3	3		3	2	19	1		1		6	1	3		
2;8	2.9	4	1				1				1	4	1			1		1	1		
2;9	2.8	3	3			1	2				2	6	2	1		2			2		
2;10	2.6	5	1			3	4	1		2	4	11	3		3		2	4	3		
2;11	3.4	7	5			7					2	6	6		1	1		2			
3;0	2.7	1	1		2	3					1	12	6		1		1	4	1		
3;1	3.1	5	1				1			1	4	14	11		1				4	2	
3;2	2.7	4					1			1	3	4	7			4	3				
3;3	3.1	1				3	1				3	7	2			5	1	1			
3;4	3.0		4		1	1	1			1		17									
3;5	3.8		1			2	5					23	1			1	2	1	1		
SUM		118	81	0	8	34	28	18	0	22	37	177	74	13	11	19	21	21	51	7	

2) JOO

Age	MLU	Prese hay	Past haysse	Future hakeyss	hal ke	Aspect ko iss	a iss	Negation an hay	haci anh	and hako	hayse	if myen	must ya	inten le	volition lyeko	cause nikka	wish ko siph	possibilit swu iss	honorificat seyyo	politenes supnida
1:9	2.5																			
1:10	2.6	1																		
1:11	2.9	2	1																	
2:0	3.0																			
2:1	3.5	1						1												
2:2	2.9	2	3					1												
2:3	2.4	5																		
2:4	2.5	1	2																	
2:5	2.5	3	3					1												
2:6	2.3	3						3												
2:7	2.1	3						2												
2:8	2.2	1																		
2:9	2.2	6	3					3					1							
2:10	2.2	1	4					3												
2:11	2.4	7	2					6					1							
3:0	2.4	3	3		1							2	2							1
3:1	2.7	6	2		1			1												
3:2	2.9	11	8										4				2	3	2	
3:3	2.8	11	3			2	1			1		4	9				2	1		3
3:4	3.4	10	3			1						4	13		1	1		1		1
3:5	3.7	15	4		1		2			2		12	23	2	2	1	2	1		
3:6	3.7	8	8		2	4	9				1	14	15	6	1		9	3		2
3:7	3.5	3	5			5	1	2			1	12	4	5	2	4				2
3:8	3.5	11	11		1	5	1	3		1		16	14	1	1	2	3	3		2
3:9	3.2	9	2		2	1		5		1		2	14					1		1
3:10	3.0	4	6				4			1	1	7	15		1	2	2			
SUM		123	72	0	8	18	18	30	1	6	2	73	115	14	8	10	20	13	10	5

3) YUN

Age	MLU	Prese hay	Past haysse	Future hakeyss	hal ke	Aspect ko iss	a iss	Negation an hay	haci anh	and hako	hayse	if myen	must ya	inten le	volition lyeko	cause nikka	wish ko siph	possibilit swu iss	honorificat seyyo	politenes supnida
2:3	2.2																			
2:4	2.4	2																		
2:5	2.9																			
2:6	2.5																			
2:7	2.6	2	2			3				2		1								1
2:8	3.5					3	1				4	1								
2:9	3.4	1				3		1						1			1	4		1
2:10	3.0	1				3				1	1	3		1			2			
2:11	3.3	1				3	2			2	2	4	1				1	3		2
3:0	2.9	1	3			2	2				2	3					4			2
3:1	2.7					3														
3:2	3.2	5	1		1	6		1				9	1	2			4	1		
3:3	3.0	6	1		1					2		5	2			1	2	1		
3:4	3.2	7	2									2	1			1		1		
3:5	3.6	5	7		1		2	1			1	12	5		1	9	1	5	11	7
3:6	3.3	1	2		1	1	9			5	2	20	3	1	1	1	1			
3:7	3.2	6	2			7	2				1	1	7			3	4			1
3:8	4.1	4	2	1		3	9			1	6	44	10		2	14	2	10	5	2
3:9	3.8	2	2				1					11	1				2			
SUM		44	24	1	4	37	28	3	0	13	19	116	31	5	4	31	22	26	22	12

Note: Shading indicates the initial stage of acquisition, and shaded grammatical expressions are limited to *hata* (to do) verbs.

Table 8: Use of Verb Conjugations by Each Child

The results in Table 8 reveal the following six points regarding the acquisition process of verb conjugational morphemes:

1. The development of verb conjugational morphemes begins when the MLU is 2.4–2.6; when the MLU is 2.9–3.2, the use of various grammatical expressions becomes active, and a dramatic grammatical development process is observed.

2. The acquisition of tense and aspect progresses in the order of present → past → imperfective aspect → future.
3. There are two expressions for the sequential connecting suffix ‘and’ in Korean: *hako* and *hayse*. However, acquisition progresses from *hako* to *hayse*.
4. Of the two forms *keyss* and *hal ke* that express the future, acquisition begins with *hal ke*, and *keyss* is not used often.
5. Negating forms are acquired at a fairly early stage (at the same time as the present tense), with the prepositional negative form *an* being used overwhelmingly more frequently and the postpositional negative form *ci anh* being used infrequently.
6. Polite forms such as *seyyo* and *supnita* are not often produced. Speech-level acquisition is acquired at a fairly late stage among word-ending suffixes.

This study aimed to clarify the order of acquisition of verb conjugational morphemes in Korean. Using the Ryu Corpus, a longitudinal spontaneous speech data set, this study analyzed the acquisition process based on MLUs. As a result, the periods when verb conjugational morphemes begin to develop (MLU 2.4–2.6) and when various grammatical expressions develop dramatically (MLU 2.9–3.2) were identified. The acquisition process of tense and aspect as well as word-endings and conjunctive endings were also clarified. However, there is room for discussion regarding the criteria for judging acquisition and the necessity of limiting some conjugated forms to *hata* (to do) verbs. In the future, we would like to conduct in-depth analysis while further considering various alternative angles of inquiry.

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