Case-marking optionality in *wh*-clauses and fragment answers in the L1 Acquisition of Korean

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Abstract

Children acquire language-specific rules in learning their first language, and various hypotheses have been proposed to explain how children learn them. This thesis examines how one monolingual Korean-learning child, JONG[1], from the Ryu Corpus of Korean data (Ryu et al. 2015), acquires asymmetries in the use of nominative and accusative case markings in different sentence structures: declaratives, *wh*-questions, and fragment answers. The data shows that JONG's acquisition of case markers is sensitive to different syntactic structures and that he has different acquisition patterns in each structure. JONG's early production of adult-like and nearly error-free null accusative markers in object fragment answers suggests that he goes through different developmental stages from descriptions in previous literature with respect to the null accusative marker. I conclude that Westergaard's (2009, 2014) micro-cue model, within the framework of generative grammar, optimally explains JONG's acquisition patterns of the null accusative markers in object fragment answers; however, the model cannot explain all of JONG's case-marking patterns in other sentence structures.

[1] His name is Jong Hyeon, 종현, in the Ryu corpus (Ryu et al. 2015). For the sake of the convenience of the thesis, I abbreviated the name as JONG.

General Summary

Some grammar rules are specific to different contexts in the same language. How do children learning their mother tongue learn these structure-specific rules? This thesis analyzes the data of a monolingual Korean child, JONG, and examines how he learns several context-sensitive grammatical rules in his first language. Specifically, this thesis investigates how JONG learns different rules of grammatical suffixes appearing on nouns in subject and object positions. These rules only apply to specific sentence structures. The result shows that JONG produces object suffix adult-like in the particular sentence structure despite having less exposure to the object suffix in the particular sentence structure from his caregivers. This pattern suggests that JONG's learning stages or patterns are different from the previous literature on the first-language learning of Korean. The thesis determines which of several hypotheses can describe JONG's distinct acquisition learning patterns.

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Chapter1 Introduction

Korean is a morphologically rich language, as numerous particles, including case markers, are affixed to lexical categories (Yoon 2011, Ko 2005). Accordingly, Korean case markers are placed post-positionally to an argument to show the grammatical relations between nouns in a sentence (Lee et al., 2016). There is an example sentence with case markers below (1).[2]

(1) 메리**가** 사과**를** 먹었다
Mary-**ka** sakwa-**lul** mek-ess-ta.
Mary-**NOM** apple-**ACC** eat-PST-DECL
'Mary ate an apple.'

In (1), as a nominative case marker *-ka* is being suffixed to an argument, 'Mary' becomes the subject in a sentence. Also, in the same manner, the accusative case marker *-lul* binds to the object argument, 'apple.' According to Choi (2005:p.29), Korean case markers can be categorized into three types: structural, semantic, and delimiters.[3] The subject markers *-i* and *-ka* and the object marker *-ul* and *-lul* fall into the structural type with the genitive marker *-ui.* Arguments that are nouns in Korean are either marked by

[2] Abbreviations used for this proposal are as follows: NOM= the nominative case marker, ACC= the accusative case marker, LAT= lative case marker, PST=the past tense marker, DECL= the declarative marker, DIM= the diminutive marker, IE= the informal ending marker, Q= the question marker, ø= the null case marker.

[3] The particles are categorized by Choi (2005:p.29), which is cited by Yoon (2011) on p.4. The particles below are attached to a noun when it is maximally projected as an NP or DP (there is still debate over which maximal projection is the correct representation).

i) Structural Case particles: *-ka/-i* for nominative, *-lul/-ul* for accusative, and *-ui* for genitive.
ii) Semantic Case particles: *-e/-ege* for dative, *-eseo* for locative, and *-lo/-eulo* for instrumental.
iii) Delimiters: *-nun/-un* for topic, *-man* for 'only', *-to* for 'also'

these case markers as in (1) above or omitted. Korean thus allows case drop. In some constructions, case drop is obligatory[4], as in (3b) below.

(2) a: 누가 선물을 샀니?
Nwukwu-**{ka /*ø}** senmul-**ul** sa-ss-ni?
Who-**NOM** gift-**ACC** buy-PST-Q
'Who bought a gift?

b: 메리**{가 / ø}**

Mary-**{ka / ø}**
Mary-NOM
'Mary (bought a gift).'

(3) a: 메리가 무엇**{을 / ø}** 샀니?
Mary-**ka** mwues-**{ul / ø}** sa-ss-ni?
Mary-**NOM** What-**ACC** buy-PST-Q
'What did Mary buy?'

b: 선물
senmul-**{*ul / ø}**
gift-**ACC**
'(Mary bought) gift.' (Yoon 2011)

In (2), a *wh*-word, *nwukwu* or 'who,' is used with a nominative marker -*ka,* and when the *wh*-word appears in a nominative position with a nominative marker, case drop is not allowed. However, as in (2b), the answer to (2a), Korean allows the optional usage of nominative case markers. On the other hand, in (3), the *wh*-word appears in an accusative position, and the

[4] The judgment of the case drops in different sentence types from Yoon (2011), introduced by Kwon and Zribi-Hertz (2008), and Park (2005). Yoon (2011) conducted an experiment to evaluate the applicability of the judgment of the case drops introduced by Kwon and Zribi-Hertz (2008), and Park (2005).Table 1 below is the result of the experiment by Yoon (2011) that many Korean speakers accept accusative drops, but not nominative drops in clausal constructions. Also, the Yoon's (2011) experiment shows that many Korean speakers reject using overt accusatives in fragment answers unless they are contrastively focused (Yoon 2011, p.48).

optional use of the accusative marker is seen, but not in answer to the question (3a). The argument in (3b) does not allow the accusative case marker, which means a case drop is obligatory. That is, the case drop with a nominative *wh*-argument in a question is ungrammatical; however, the accusative case drop with an accusative *wh*-argument is optional. On the contrary, in a fragment answer such as (2b) and (3b), the nominative case drop is optional but only allowed for the accusative fragment answer. Table 1 below summarizes the different case drop constructions, clausal construction, and fragment answer construction.

Table 1Case Patterns by Case and Utterance Type[5]

Case Type	Utterance Type	Pattern	Example
Nominative	Clausal Construction (w*h*-questions)	Overt	(2a)
	Fragment Answer Construction (Fragment answers to a *wh*-questions)	Optional	(2b)
Accusative	Clausal Construction (*wh*-questions)	Optional	(3a)
	Fragment Answer Construction (Fragment answers to a *wh*-questions)	Null[6]	(3b)

To summarize, there is an asymmetry in the patterns of the case markings in different sentence structures. In a clausal construction, the case markers with *wh*-words are obligatory in the subject position and optional in the object position. In the fragment answer construction, the

[5] Table 1 works as a criteria in this thesis to analyze JONG's usage of nominatives and accusatives in different sentence types.

[6] I used the word "omitted" when any case markers are dropped in a position, where there is an option for case markers either to be overt or omitted depending on sentence structures. I use the word "null" when any nouns in subject / object positions get an obligatory zero overt marker. In this thesis, object fragment answer sentences get null accusative markers. I used these two different terms "omitted" and "null" for different case types (nominatives and accusatives) for a clear distinction between a position that is optional for the case marker and a position that gets obligatory zero overt marker.Simply, "omitted" markers are absent markers at the positions where allows optional, however, "null" markers are obligatorily absent markers at the positions where do not allow overt markers.

noun phrase (henceforth, NP) that represents the subject gets an optional case marking, as in (2b); however, the NP which represents the object gets an obligatory case drop, as in (3b).

As can be seen from the above examples, Korean speakers have linguistic optionality when producing case markers in certain circumstances. My thesis will focus on the child's acquisition of this optionality in different sentence structures. However, since this thesis looks into the data from one child (JONG), the result cannot be considered as a general pattern in which every Korean child goes through JONG's acquisition pattern of nominative and accusative markers. Nonetheless, the findings of this thesis contribute to an asymmetry in the acquisition of case markings in different clausal types in Korean in a larger scope. Chapter 6 further explains the limitation and future research of this thesis.

In the following chapters, I discuss Korean L1 spontaneous speech data by monolingual Korean-learning child JONG from the Ryu Corpus of Korean L1 data (Ryu et al. 2015). From the data, I focus on how JONG acquires asymmetries in the nominative and accusative markers in different sentence structures and interacts with input from his caregivers. In addition, JONG's different acquisition patterns in each sentence structure, particularly null accusative marker acquisition in object FA, suggest the new aspect of Korean case marker acquisition in different sentence structures.

The thesis is outlined as follows: Chapter 2 describes the typical development and acquisition patterns of Korean nominative and accusative markers in the previous literature and acquisition theories to see how monolingual Korean-learning children learn L1 grammar and compares different roles of input in each theoretical approach. In Chapter 3, research questions that will be addressed throughout the thesis and the predictions of JONG's utterance patterns regarding the case markers from the corpus are presented. I also introduce JONG's data from the

Ryu Corpus (Ryu et al. 2015). Then, the data from the different sentence types under investigation are presented, and JONG's error types in the data are summarized. Additionally, I describe how I coded Korean-transcribed data to English with different tiers using the CLAN programs (Child LANguage Analysis) (MacWhinney, 2000) to make it easier to analyze the frequency of the case markings. In Chapter 4, I discuss JONG's nominative and accusative case marker production in each sentence structure with predictions I made based on previous literature. Chapter 5 evaluates the predictions in each sentence structure I mentioned in Chapter 4 and explains the implications of JONG's acquisition pattern of nominative and accusative markers in different sentence structures. Moreover, I summarize JONG's acquisition stages of each case marker in each sentence structure. Lastly, in Chapter 6, I answer the research questions based on the results and findings in Chapter 4 and Chapter 5 with respect to each acquisition theory introduced in Chapter 2.

Chapter2 Background Research

First, I will examine, from the previous literature, how monolingual Korean-learning children acquire overt nominative and accusative markers and case omissions. I also will explain different theoretical approaches in 2.2 that will be used to investigate the research questions of the thesis.

2.1. Korean case-marking acquisition

2.1.1. Chung (1994)

Chung (1994) studies how Korean children acquire the Korean case-marking system,

concentrating on nominative and accusative cases. Chung looks at longitudinal data drawn from notes from a diary and audio-recording of 4 children: H (1;0–3;0), MJ (1;0–2;09), SK (1;1–2;04), and CK (1;0–2;04). The author speculates that the development of Korean-case marking is related to the position of NP in the basic word order, SOV, a position associated with a grammatical function. There are four different stages for the development of the nominative and accusative markers.

- First Stage (1;07–2;0)

  Only the nominative marker *-ka* is produced. However, the production frequency is less than in the caretaker's input, and there are no errors in the usage of the nominative marker.

- Second Stage (2;0–2;4)

  Overextension of the nominative marker *-ka* is seen, which means there is a significant increase in *-ka* production. In other words, children start to use a nominative marker with NPs that do not need a nominative marker.

- Third Stage (2;5–2;07)

  The accusative marker *-lul* starts to be used only with the second NP, and children stick to using a nominative marker with the first NP. However, the children produce wrong case markers in sentences with scrambled word order, such as OSV/OV, or with certain types of verbs. For example, both arguments get a nominative marker in adult speech when the verb is a stative transitive verb. In Chung's study, the children did not produce adult-like case markers in sentences with stative verbs. They use a nominative marker for the first NP and an accusative marker for the second NP. This result shows that the children seem to use the case

markers as a linear ordered pair (*ka*-*lul*) rather than knowing the grammatical function of the case markers.

- Fourth Stage (2;06–3;0)

Children show adult-like nominative marker production. Even though there are frequent errors, such as overextension of the nominative and accusative markers and using wrong case markers, children start to use case markers correctly with various word orders. These facts indicate that children seem to begin to understand the scrambled word orders and comprehend the case markers' grammatical function. The frequency of the nominative marker is the same as in adult speech; however, the children still produce less frequent accusative markers than their caregivers.

According to Chung (1994), children learn the nominative marker -*ka* earlier than the accusative marker -*lul.* Even though they start to produce adult-like case markers at the fourth stage, their proficiency with the accusative marker is not the same as with the nominative marker. Children do not acquire case markers as functional items until the fourth stage, when they begin to understand their grammatical functions, as evidenced by applying them in scrambled word order.

2.1.2. Kim (1997)

Focusing on Korean case marker acquisition, Kim (1997) takes longitudinal data sources, tape-recorded and transcribed adult-child interactions, and explains the developmental changes in Korean language acquisition. The nominative marker -*ka* appears earlier than any other case particle; 5 children in the data acquire -*ka* between 1;08 and 2;00, which is after the one-word

stage. When it comes to the accusative marker *-lul*, the children begin to use *-lul* after they acquired the topic/contrastive marker *-nun*. Three children start to use *-lul* between 1;11 and 2;03 and the other two children produce it between 2;06 and 2;08. Kim notes that common case errors appear before they start to produce the accusative marker: overgeneralization of the nominative marker for NPs for the places where accusative markers are needed, using the two nominative allomorphs *-i* and *-ka* together (*-i ka*) in place of *-i,* and post-verbal repetition of object and subject NPs. The three types of common errors with the nominative markers are exemplified in (4), (5), and (6) below, where the first alternate in each example shows the target and the second one shows what the child (incorrectly) produced.

(4) 아가**를/*가** 업을래
aka-**lul/*-ka** ep-ullay.
baby-ACC /*NOM carry.a person.on.back-VOL
'I would like to carry the baby on my back'

(Kim 1997, p.361)

(5) 별이/*이가 반짝반짝?
pyel-**i/*ika** panccakpanccak?
star-NOM twinkletwinkle
'Does star twinkle?'

(Kim 1997, p.358)

(6) 거북선**을/*이가** 양배형**이** 만들었어, 거북선**을/*이**
kepuksen-**ul/*ika** Yangpay-hyeng-**i** mantul-ess-e, Kepuksen-**ul/* i**
turtleship-ACC/*NOM Yangpay.brother-NOM make-PST-DECL turtleship-ACC/*NOM
'Brother Yangpay made the Turtleship, the Turtleship'

(Kim 1997, p.361)

In other words, the children still make errors with the nominative markers even though they have acquired the nominative markers earlier than any other case particles. The production of *-i* becomes more stable after seven or eight months of using *-ka* productively. Kim points to the input frequency from caregivers as an explanation for these errors. Caregivers often use *-ka*

more frequently than *-i*; therefore, the children acquire *-ka* earlier than *-i*. Kim calculated the frequency of the caregivers' nominative marker production when the children were at the age of 1;07 to 2;06. The results show that the adults utter *-ka* about 20 percent more than *-i*. In short, the more frequent input of *-ka* made it easier for children to grasp *-ka* more saliently than *-i*. In addition, Kim claims that other factors also can affect the late acquisition of *-i*, such as Korean syllable structure; *-i* comes after a coda consonant but not *-ka,* which comes after a vowel. For children, perceiving a coda and using *-i* correctly could be more challenging than using *-ka* (Kim 1997, p.360). For example, when *-i* is affixed to the word having the coda consonant, such as the word 'street' *kil, -i* is re-syllabified with the coda consonant, which results in *[li].* Also, with the word, such as 'bear' *Kom,* which ends with the coda consonant, *-i* is re-syllabified to *[mi]* [7]. Moreover, Kim relates the input frequency to children's accusative marker acquisition. Kim speculates that the higher rate of dropping of accusative markers than nominative markers in adult speech affects children's late acquisition of overt accusative markers, *-l(ul)*, as children also show a similar tendency in the accusative dropping, as in the adult speech (Kim 1997 p.361).

As Kim (1997) finds no relation between word order and case drop, the study has a different claim from Chung (1994). Instead, Kim (1997) emphasizes input frequency in acquiring the nominative and accusative markers.

2.1.3. E. S. Chung (2015)

According to H. Lee (2006 a,b) and Kwon & Zribi-Hertz (2008), the Korean case drop

[7] The phenomenon is broken down as below.

길이	/kil-i/	[ki-li]	street-NOM
곰이	/kom-i/	[ko-mi]	bear-NOM

involves multiple linguistic and non-linguistic factors, such as focus, animacy, and definiteness. In particular, H. Lee (2006 a, b) claims that the nominative and accusative NPs have a hierarchy in terms of case drop at subject and object position. Focus has the most significant effect on case drop, followed by animacy and definiteness. Animate and definite subjects tend to have no case markers; however, for object NPs, it works otherwise; inanimate and indefinite NPs have fewer accusative markers. Based on H. Lee's (2006 a,b) study, E.S. Chung (2015) predicts that Korean-speaking children will acquire the case drop later than overt case markers because of its complexity. E.S. Chung (2015) expects that the children would manifest difficulties in case drop productions employing the three factors: focus, animacy, and definiteness. However, the children show adult-like production in case drop even though whose production has less frequent case drops in general: they exhibit most case drop in object position with Non-contrastive, Human, and Indefinite nouns. These facts indicate that children ages 5-6 comprehend the factors in case drop, contrary to the prediction. In other words, children employ the three factors as cues for the usage of the case marker as an adult-like production, which demonstrates a possibility for these factors involved in the Korean case markers to be a part of a Universal Grammar due to children's adult-like optional usage of case-markings, even though the frequency case drop is low.

2.1.4. Summary

In summary, according to Chung (1994) and Kim (1997), case markers are not observed in the one-word stage, and in general, both caregivers and children produce nominative markers more often than accusative markers. These patterns show that the children who participated in the experiments in Chung (1994), Kim (1997), and E.S Chung (2015) received considerable

influence from caregivers' utterances, showing an adult-like production in case markings. According to E.S Chung (2015), this may imply that the abstract three factors (i.e., animacy, definiteness, focus), which decide overt or omitted case markers, are a part of Universal Grammar as children, ages 5 and 6, showed adult-like case drop usage. Additionally, the children use case markers in response to abstract linguistic and non-linguistic factors in an adult-like manner, even though the caregivers' inputs are various and inconsistent as the factors impact case markings differently.

2.2. Acquisition Theory

This section discusses generativist and constructivist approaches to language acquisition. I will draw on both theories' perspectives to analyze Ryu's Corpus (Ryu et al. 2015), focusing on how monolingual Korean-learning children learn the asymmetric case drop patterns in the nominative and accusative markers in different sentence types.

2.2.1. Generativist Approach

Generativists claim that language knowledge is biologically endowed. That is, children are born with the ability to learn a language quickly by knowledge of possible syntactic structures (Chomsky, 1995). Pinker (1984) also posited that children are endowed with a linking rule between syntactic categories and lexical categories. The ability to learn language knowledge is called Faculty of Language (FL), and FL incorporates Universal Grammar (UG), which enables children to acquire any human language (Chomsky, 1981). UG consists of universal principles and parameters. Principles are constraints of UG, and these principles are operative at birth. Children acquire their native language grammar through their language experience and the

language input from adult speakers (i.e., caretakers, such as families). Thus, the linguistic experience serves as a guide to narrow down which language/grammar children acquire. Once children are exposed to the input, the procedure of choosing parameters begins for a given language. The input, the language experience, triggers children to choose options from their innate language knowledge. Radford (2009) schematized language acquisition according to Chomsky as below.

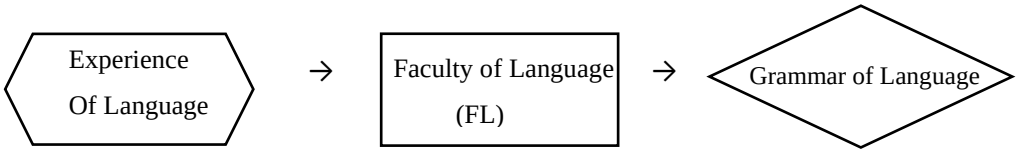
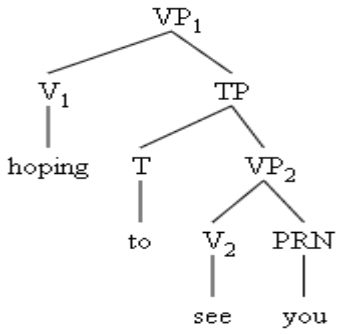


Figure 1Language acquisition process according to Chomsky

(adopted from (17) in Radford (2009: 16))

In figure 1, the experience of language is the input of FL. Children use their language experience to develop a grammar of a given language, the output of FL.

(7)



The phrase in (7) *hoping to see you* is a Verb Phrase (VP_1) headed by the verb (V_1) *hoping*, and the infinitival tense phrase (TP) *to see you* is the complement of the V_1 *hoping*. Here, at least two structural principles are operating:

(8) Headness Principle

Every nonterminal node[8] in a syntactic structure is a projection of a head word

(9) Binarity Principle

Every nonterminal node in a syntactic structure is binary-branching

(Definitions are adopted from (12) & (13) in Radford (2009: 43))

In (7), the structure follows the Headness Principle as all nonterminal nodes VP_1, TP and VP_2 are projected by a head word V_1 *hoping*, T *to* and V_2 *see*. Furthermore, the structure (7) is composed of multiple binary branches; therefore, (7) follows the Binarity Principle. These principles are innate. On the other hand, some aspects of language are not innately endowed; therefore, learning is required because these aspects vary cross-linguistically. These language particular aspects are called parameters, which account for the acquisition of language-specific properties. For example, English is a head-first language; however, Korean is a head-last language.

(10) (a) I eat an apple

(11) (b) 내가 사과를 먹다
Nae-ka sakwa-lul meok-ta
I-NOM apple-ACC eat-DECL
'I eat an apple'

In the English sentence in (10), the head verb *eat* comes before its complements *an apple*, whereas, in the Korean sentence in (11), the head verb *meok-* comes after *sakwa*, an apple. Based on examples (10) and (11), the position of a verb makes English different from Korean. The parameter related to a position of a head is called the head position parameter. This parameter is

[8] A terminal node is a node that does not have a further branch under a node; however, a nonterminal node has a further branch under the node. For example, in a tree diagram in (#2), individual words, *hoping*, *to*, *see*, and *you* are terminal nodes and VP_1, TP, and VP_2 are nonterminal nodes.

only one type among many different parameters. English and Italian also contrast one another in a parametric variation.

(12) (a) He eats an apple
(b) *Eats an apple

(13) (a) John mangi-a un-a mela[9]
John eat-3SG INDF-F apple
'John eats an apple'

(b) Mangi-a un-a mela
eat-3SG INDF-F apple
'(He) Eats an apple'

The English sentence (12a) requires a subject *he*. English sentences such as (12b) are grammatically wrong without a subject. By contrast, subject-drop is allowed in Italian, as the sentence (13b) is still grammatically correct. Italian verb *mangia*$_{eat}$ encodes person and number agreement with the subject. In (13b), even though there is no overt subject, it is considered that there is a hidden subject, *he*. This silent subject is called *pro(ø)*; hence, the full structure of (13b) is *ø mangia una mela*, which means '*pro(ø)* eats an apple.' In other words, Italian can have a null subject *ø*, unlike English. The relevant parameter, which makes Italian and English different, is the null subject parameter. Therefore, Italian is a null subject language, whereas English is a non-null subject language. From the examples between English & Korean in (10) and (11) and English & Italian in (12) and (13), we can see that the parametric variation happens across languages, and it is binary. When it comes to grammatical learning, the learning is limited by these binary parameters. According to Chomsky (1980), parameters are set based on the language they are exposed to. That is, if children are exposed to Italian, the null subject parameter is set, or if they are exposed to Korean, the head-last parameter is set. To sum up, the

[9] I am grateful to Alex Cucinelli for explaining how this sentence works in Italian.

range of parameters is already endowed. The adult input, the language environment children are exposed to, triggers children to set parameters.

However, accounting for the variation in Korean case-marking using parameters would involve many different parameters. Korean nominative and accusative markers behave differently in each sentence, which implies that several parameters would need to be available to describe the asymmetries in the patterns of case markings in different sentence structures.

The following section describes how a different generative approach accounts for learning optional grammatical patterns in different languages. As Korean case droppings involve optionality and different case marking rules in each sentence structure, the hypothesis is critical to my research.

2.2.1.1. A model of micro-cues

Westergaard (2009, 2014) explains the acquisition of word order variation in Norwegian, specific to the Tromsø dialect. Norwegian is a V2 language like some other Germanic languages, such as German, Icelandic, Swedish, etc. However, in the Tromosø dialect, V2 features vary across clausal types and information structures. For example, the main clause gets V2 word order, which means that a finite verb occupies the second position in a sentence, and NP precedes the verb; however, this V2 word order does not hold in the embedded clause. (16) and (17) below show the V2 word order in Norwegian varies.

(16) *Peter **snakker** ikke / aldri italiensk.*
Peter **speaks** not / never Italian
'Peter doesn't speak/never speaks Italian.' (Westergaard 2009: p.17)

(17) *Jeg vet at Peter ikke/aldri **snakker** italiensk.*
I know that Peter not/never **speaks** Italian
'I know that Peter doesn't speak/never speaks Italian.' (Westergaard 2009: p.18)

As shown by the example in (16), the finite verb *snakker,* 'speaks,' comes before the negation *ikke* or the adverb *aldri,* 'never.' However, in the embedded clause in (17), the finite verb *snakker*, 'speaks' appears after the negation *ikke* and the adverb *aldri*, 'never.' Moreover, in *wh*-question sentences, when the *wh*-words are monosyllabic, the V2 word order is not obligatory in the Tromsø dialect (Westergaard 2009: p.23). The examples are presented in (18).

(18) Ka legen **sa**? / Ka **sa** legen?
what doctor.DEF **said**? / what **said** doctor.DEF?
'What did the doctor say?' (Westergaard 2009: p.23)

The example (18) has two distinct sentences; both are the same sentences having an identical meaning but different verb positions. The first sentence, the left side of the slash (/), follows V2 order, as the finite verb *sa*, 'said,' appears after the noun *legen*, 'the doctor.' On the other hand, the second sentence, on the right side of the slash (/), having the same meaning, does not follow V2 word order, as the finite verb comes after the wh-word, *ka*, 'what.' Both sentences are grammatical in the Tromsø dialect. In sum, Norwegian's V2 word order is not always obligatory but is optional in some constructions.

Westergaard (2009, 2014) addresses how monolingual Tromsø Norwegian-learning children acquire word order without making errors, and the role of input in the acquisition of language-specific and structure-specific word order by investigating three children's spontaneous child-directed speech data with their caregivers. The children's speech patterns reveal that all three children produce adult-like V2 and non-V2 word orders depending on sentence structures from early on (Westergaard, 2014).

According to Westergaard (2009, 2014), children's sensitivity to variations within the language is more complicated than choosing binary parameters, and Westergaard (2009, 2014)

proposes the micro-cue model to account for this complexity. The concept of the micro-cues is derived from the cue-based model by Lightfoot (1999, 2006). The cue is "a piece of I-language structure produced in the child's grammar on exposure to the relevant input (Westergaard 2009, p.5)." Micro-cues are small pieces of abstract syntactic structures which are language-specific and context-specific; therefore, 'learning' the micro-cues from the input is required. Westergaard claims that learning micro-cues results from the interaction of UG and input since children need UG to parse the language-specific cues in the input. The input, which already contains micro-cues, is a trigger itself that the children incorporate into their I-language, thus forming the abstract pieces of the syntactic structure of the relevant input. That is, micro-cues are a crucial ingredient in the acquisition process along with UG and the triggering experience in the input (Westergaard 2009: p.52). In addition, the frequency of the input does not affect children learning the language-specific variations because children are exposed to the most per micro-cues in the relevant input – this is confirmed by Westergaard's (2009, 2014) corpus analysis showing that children were able to consistently use non-V2 word order in a target-like fashion in exclamatives and embedded question types from an early age, even though the input of those sentence types from adults were not frequent as other sentence structures, which explains that the children are sensitive to syntactic distinction in the input from an early age (Westergaard 2009: p.188).

2.2.2. Constructivist Approach

In construction grammar, the construction pattern (e.g., transitive verb sentence structure: NOUN1 VERB NOUN2) can be acquired from the input instead of having the structure, including a syntactic category, endowed. It does not mean that children learn a construction or

sentence structure immediately once they hear it from a caregiver—the amount of the input matters. Many adult utterances as input are needed, and children should combine a particular meaning into the structure to learn grammar from the utterance. According to Tomasello (2003), overall, there are three stages to children acquiring grammar as below:

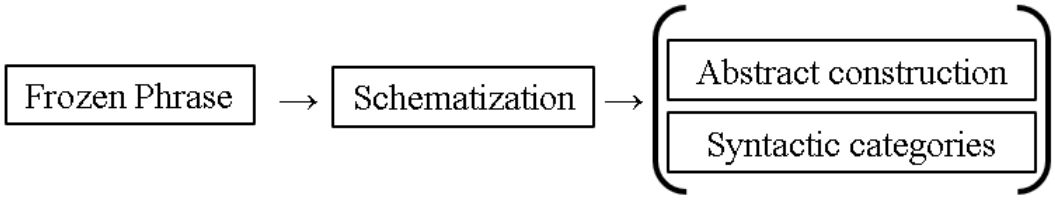


Figure 2 Language acquisition process based on Tomasello (2003)

First, children are exposed to many different structures from adult utterances. The children do not know the meaning of a sentence uttered by a caregiver initially; however, they memorize whole utterances having a similar structure and understand the meaning of a sentence by associating the utterance to the speaker's (caregiver) following behavior. For example, when a caregiver says *I'm eating it* (Ambridge and Lieven 2011: p. 134), children observe a caregiver's action after the utterance and analogize the meaning of the whole sentence. Here, 'analogize' by Tomasello (2003) means that children observe the caregiver's behavior after the utterance in order to assign a meaning to the utterance. Children try to find relations based on functions (e.g., the role of arguments based on a type of predicate in a sentence) among all elements in a sentence to generalize the sentence construction. When the children learn the whole phrase, they use the phrase or sentence referring to their action (Ambridge and Lieven, 2011). This stage is called the frozen phrase stage because children start to understand fixed phrases or sentences in adult utterances and associate them with meanings. In the second stage, children initiate generalizations from the sentences they stored at the first stage. This generalization occurs with some frequent phrases.

For example, children frequently hear *I'm eating it, I'm kicking it,* and *I'm hitting it* (Ambridge and Lieven, 2011)*;* they can generalize those sentences into a pattern as *I'm ACTIONing it* (Ambridge and Lieven, 2011). This schema still focuses on combining patterns with meanings according to particular communication situations rather than on the structure itself.

Finally, children can build adultlike abstract constructions. In this last stage, the children focus on the structure more than the meaning since they acquired the meaning in previous stages. Thus, the utterance *I'm ACTIONing it* becomes the most abstract construction SUBJECT VERB OBJECT. However, this abstract construction does not occur at once for all syntactic categories. It happens one by one and stage by stage. For instance, the sentence *I'm ACTIONing it* precedes *I'm VERBing it.* While abstract construction is going on, children begin to group the lexical items together in categories based on similar functions in communication. Thus, they group the words such as *eat, kick* and *hit* together in ACTION because those words share a similar function of denoting a relationship between two specific objects, although they have different meanings. This is an emerging stage of labeling a syntactic category. (Ambridge and Lieven 2011: p.126, Tomasello 2003: p.144-195)

The above process can be summarized as below:

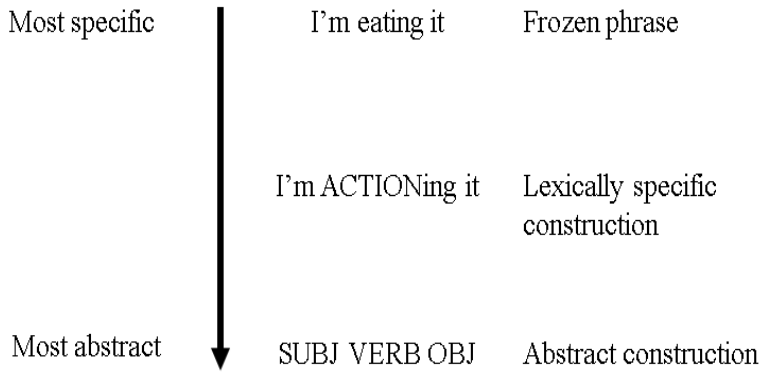


Figure 3 Summary of the constructivist model of the possible process of language acquisition based on Ambridge and Lieven (2011) and Tomasello (2003)

Figure 3 represents the hypothesized process of how children learn and generalize to an abstract construction, SUBJECT VERB OBJECT, from a specific phrase, *I'm eating it*.

To sum up, according to a constructivist approach, grammar learning occurs based upon input, and the learning happens from children's memorization of different frozen phrases ranging from single words to entire sentences. To reach adultlike abstract construction, which could be a 'rule' for a sentence pattern in construction grammar, children must combine input utterances with meanings to store frozen phrases in their brains. Once they internalize the frozen phrases, those phrases are ready to be abstracted. They become the most abstract form via lexically specific construction; in this construction stage, either argument of the transitive verb is still identified with a specific word instead of being abstracted.

2.2.3. Differences between the generativist and the constructivist in language acquisition

Generativist accounts assume that children are born with UG, enabling them to learn

whichever languages they are exposed to. 'Grammar learning' for generativists means selecting the right parameters to generate the right language system in children's brains. On the other hand, constructivists claim that every child is born with the potential to learn a language (Ambridge and Lieven, 2011) but that this language knowledge (categories, features, and basic syntactic operations) emerges from the input. Thus, input frequency plays a greater role in constructivist accounts. From a constructivist's perspective, to reach construction formation (e.g., transitive sentence structure: SUBJECT VERB OBJECT), children go through different stages to make the abstractions from their input. They do not know the syntactic categories; they learn from the generalization and abstraction of their input. However, generativists claim that children are born with the knowledge of language principles, constraining grammar, and syntactic categories. These differences are summarized in Table 2. These differences will be used to form predictions about the acquisition of case marking in Korean (see Section 3.2).

Table 2 Differences between two language acquisition theories: generativist and constructivist

Predictions	**Generativist**	**Constructivist**
What are endowed	Universal Grammar (principles, syntactic categories, etc.)	-
What children learn	Setting of Parameters (aspects particular in each language)	Everything from input (through generalization & abstraction)
The role of input	A trigger to set the parameters for a given language	Data that is analogized and generalized to make abstract construction

Chapter3 Research Questions & Methodology

In this chapter, I posit research questions and make predictions addressed in this thesis based on the previous literature and the theoretical frameworks mentioned in Chapter 2. I also explain how I coded the Korean-transcribed corpus using the CLAN programs (Child LANguage Analysis), a part of CHILDES (CHIld Language Data Exchange System) (MacWhinney, 2000), to analyze the speaker's utterances in detail. Finally, I summarize the types of sentence structures that I investigate from the corpus and the types of frequencies and errors that are counted from the corpus.

3.1. Research Questions

Chapter 2 reviews the literature on how monolingual Korean-learning children acquire Korean case markers (e.g., Chung 1994, Chung 2013, Kim et al. 1995). However, the literature does not focus on children's sensitivity to non-optional or the optional use of case markers based on different sentence structures. To fill this gap, I will explore how monolingual Korean-learning children acquire the asymmetric patterns of the nominative and accusative markers in different sentence types focusing on *wh*-questions and fragment answers (FA).

The following research questions will be addressed:

(1) When does JONG[10] acquire optional features of the Korean case marker?

(2) What is the role of input in the acquisition of case markings in different sentence structures; declarative, *wh*-questions, and fragment answers?

(3) Which theoretical approach explains JONG's acquisition of asymmetric Korean case

[10] His name is Jong Hyeon, 종현, in the Ryu corpus (Ryu et al. 2015). For the sake of the convenience of the thesis, I abbreviated the name as JONG.

marking patterns in different sentence structures?

3.2. Predictions: JONG's acquisition pattern of an asymmetry in Korean case markings in different sentence structures

Chapter 1 presents the asymmetry in the patterns of Korean case markings in different sentence structures. In a declarative sentence structure, nominative and accusative markers are optional. However, nominative markers are obligatorily overt in *wh*-question sentence type, but accusative markers are optional in *wh*-question sentences. In fragment answer sentence types, nominative markers occur optionally in subject fragment answer structure, but accusative markers are obligatorily null in object fragment answer structure.

Chapter 2 reviews the typical acquisition patterns of Korean nominative and accusative markers, as reported in the previous work. Based on this, the predictions concerning JONG's development of nominative and accusative markers in each sentence structure are presented in Table 3 below. These predictions are further detailed in Table A.2 in the appendix, including additional breakdowns by age and case types. The evaluation of each prediction will be discussed in Chapters 5 and 6, with results addressed in Chapter 4.

Table 3 Prediction of JONG's acquisition pattern in nominative & accusative case - markings in different sentence structures

Sentence Type	Case Type: **Nominative**	**Accusative**
	Previous literature from Chapter 2	
Declaratives	➢ Korean L1 learning children start to produce overt nominative *-ka* at ages between	➢ Korean L1 learning children start to produce overt accusative -lul for the first

	1;07 – 2;0, and they overgeneralize overt nominatives at the ages between 2;02 and 2:04 (Chung, 1994). ➢ Children reach adult-like nominative usage at the ages between 2;06 and 3;0 (Chung, 1994).	time at ages between 2;05 and 2;07 (Chung, 1994).
	Prediction	
	1) JONG should produce overt nominative markers more frequently than omitted nominative markers 2) JONG will reach an adult-like nominative marker usage at age around 2;06	1) JONG's first production of overt accusative marker should be at the age between 2;06 and 3;0
	Previous literature from Chapter 2	
***wh*-questions**	➢ Korean *wh*-subject questions have obligatory overt nominativs (Yoon, 2011). ➢ The acquisition age of Korean *wh*-questions is later than the acquisition of the overt nominatives (Clancy, 1989a; 1989b).	➢ The acquisition age of Korean *wh*-questions is later than the acquisition of the overt nominatives, as suggested by Chung (1994) (Clancy, 1989a; 1989b). ➢ Overt accusatives appear in children's speeches ages 2;05 and 2;07 (Chung, 1994). ➢ Children frequently drop accusative markers (Chung, 1994; Kim, 1997, among others).

	Prediction	
	1) Once JONG starts to produce *wh*-questions with overt nominative markers, he should not make any errors with overt nominative markers	1) JONG's onset of *wh*-object questions should be later than any other sentence types 2) JONG will omit most of the accusative markers in *wh*-question sentences
	Previous literature from Chapter 2	
Fragment Answers (FA)	➢ Korean L1 learning children start to produce overt nominative *-ka* at ages between 1;07 – 2;0, and they overgeneralize overt nominatives at the ages between 2;02 and 2:04 (Chung, 1994).	➢ Korean object FA allows obligatory accusative omission (Yoon, 2011).
	Prediction	
	1) JONG will produce overt nominative markers more frequently than omitted nominative markers	1) JONG will produce adult-like object FA at an older age than Chung's (1994) fourth stage age (2;06-3;0)

Chapter 2 discusses two major theoretical approaches: generativist and constructivist. This chapter also discusses the micro-cue model, a modified generativists model. Based on a generativist approach to Korean asymmetric case-marking, I predict that JONG will learn the case markers no matter how much input he is exposed to from his caregivers in different sentence structures. If JONG produces case markings that his caregivers do not frequently produce, this supports the generativist assumption that innate abstract language knowledge guides language acquisition. However, if JONG's acquisition of Korean asymmetric case

markings is affected by the input frequency, this supports a major assumption of the constructivist approach. Furthermore, a constructivist-based approach leads to the prediction that there will be overgeneralization errors in the process of learning the case markers in different sentence structures. These overgeneralization errors will be impacted by frequency in the input, so the more frequent marker will be used in contexts where the less frequent marker is expected.

3.3. Spontaneous Speech Data

For the current study, the Korean data comes from the Ryu Corpus of Korean L1 (Ryu et al. 2015) from CHILDES (CHIld Language Data Exchange System) (MacWhinney, 2000), the child language database. The corpus consists of longitudinal video-recorded speech samples from three children's spontaneous speeches during adult-child interaction. The corpus, which also includes all child-directed speech from caregivers (JONG's mother, father, and grandparents), is already transcribed in Korean (MacWhinney, 2000). One child's data, JONG, is coded and analyzed for this study (see Table 4).

Table 4 Characteristics of the case study

Children	Age range	Sex
JONG	1;05–3;05	M

Considering the development stages of Korean case marking acquisition from the previous literature, Korean-learning children start to produce the nominative marker *-ka* first from 1;07 and 2;0 (Chung, 1994). Hence, JONG's corpus is coded and analyzed from the age of 1;07. The data represents the early acquisition of the asymmetry in Korean case-marking patterns in different sentence structures: declaratives, *wh*-questions, and fragment answers.

3.4. Coding

The corpus is analyzed using the CLAN program (Child LANguage Analysis), a part of CHILDES. Overt and omitted nominative and accusative case markers in all utterances from the child and caregivers are coded in English with different tiers. Nominative markers are suffixes that appear on nominals in the subject's position, thereby signaling their role as the subject of the sentence. Likewise, accusative markers are suffixes that appear on nominals in the object's position. For *wh*-question sentences, I examine those nominal *wh*-words in subject and object positions. For instance, sentences starting with *nwukwu (nwu-)* or 'who,' *mwues (mwe-)* or 'what,' and *eti* or 'where' are considered *wh*-question sentences in this study. Other *wh*-words such as *encey* or 'when,' *way* or 'why,' *ettehkey* or 'how,' and *etten* or 'which' in Korean are excluded from the study: these *wh*-words are either used with other types of case markers such as the locative marker *ey* or not case-marked at all since they are used as a modifier. For example, as shown in (18) below, *etten phwungsen* or 'which balloon*'* is not considered a *wh*-word. However, the nominative marker -*i* is counted as a nominative marker in declarative. As in (18), the noun, *phwungsen* or 'balloon,' gets a nominative marker -*i,* and it appears in the subject position of the sentence. For FA, all bare nouns/demonstrative pronouns, and nouns/demonstrative pronouns with optional nominative markers, which are the answers to any *wh*-utterances, are coded and counted.

(18) a: 어떤 풍선이 제일 커?
etten phwungsen-i ceyil khe?
which balloon-NOM most big?
'which balloon is bigger?' (Father to JONG, 2;04)

b: 이거
ike-ø
this-NOM

‘this (balloon is big)’ (JONG, 2;04)

The example in (18) shows a part of conversations between a caregiver (JONG’s father) and JONG at the age of 2;04. As in (18a), the father of the child asks a question using one of the *wh*-words that I decided not to code and count; however, the answer, JONG’s utterance (18b), still constitutes a fragment answer to the caregiver’s question because the rest of the sentence, *phwungsen-i khe* or ‘balloon is big,’ is omitted.

Coding these utterances with different tiers allows for an analysis of the frequency of the case markings in the caregivers’ and the child’s production. Figure 4 below shows a part of coded transcription files applying all descriptions as mentioned.

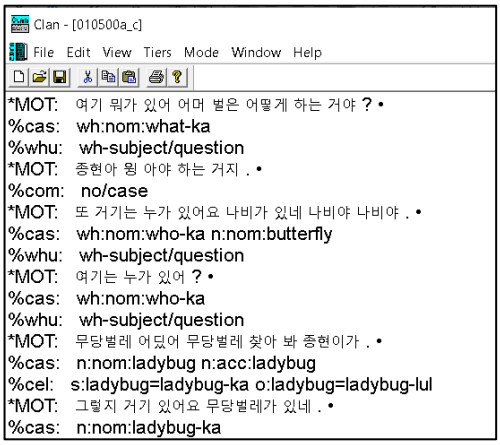


Figure 4 A part of a sample coding file

The line that begins with an asterisk(*) identifies the speaker of the sentence; the first line, which starts with **MOT,* is a MOTher’s utterance spoken to the child in the conversation. *%* indicates a dependent tier in the transcript. The line beginning with *%* shows what I want to code from the utterance with different types of tiers. I named the four separate tiers in Figure 4 as *%cas*, *%whu*, and *%com*. *%cas* to show the types of NPs and case markers used with the NPs. For example, in the second line, *wh* means NP with a *wh*-word, and *nom* means ‘in a NOMinative position.’ Thus, *wh:nom* means that a *wh*-word appears in the subject position and

is expected to get a nominative marker. In the second line of Figure 4, *what-ka* after *wh:nom* describes which *wh*-words and nominative markers are uttered by the speaker. *%whu* is a particular tier for utterances of *wh*-questions, indicating in which position the *wh*-word is. If the *wh*-word is in the subject position, it is coded as '*wh*-subject/question,' and if it is in the object position, it is coded as '*wh*-object/question.' *%cel* is a tier for the utterances having Case marker Elisions (omissions). At the second last utterance from the mother, the tier *%cel* shows that the word *ladybug* in a subject position is uttered without a case marker, coded as *s=ladybug*. *Ladybug-ka* represents which case marker is omitted. Here, the nominative marker *-ka* is dropped.

3.5. Calculations and Data analysis sheet

I ran different CLAN commands to examine the frequency of case-marking production by the caregivers and the child in the data. These commands count how many NPs are used with or without case-markers. Then, based on the counts by CLAN commands, I first calculated an overall rate (percentage) of produced case markers from each. Then, their rate of case marking was analyzed by sentence type. The following details are taken into account to count the data:

(1) Determining the total number of nouns: As mentioned above, the total number of nouns that is relevant to the current analysis is the sum of all nominals, including demonstrative pronouns[11], in the subject and object position from all sentences uttered by each speaker. This sum represents the number of contexts in each case, whether overtly produced or

[11] Demonstrative Pronouns in Korean are such as, *i(-)* or 'this', *ku(-)/ce(-)* or 'that', *yeki* or 'here', and *keki/ceki* or 'there'. *i(-)* or 'this' and *ku(-)/ce(-)* or 'that' are either affixed to a noun, *kes* or 'thing', or used independently from nouns. Korean does not have definite articles like English *the*, however, Korean demonstrative pronouns, *i(-)* 'this', *ku(-)/ce(-)* 'that', also indicates definiteness.

omitted, that play a role. This total number serves as a denominator to calculate the overall case-marker production and omission rate. However, I used the denominator, which consists of nominals and demonstrative pronouns that appear either in subject or object position, mainly to see how many instances of overt markers and case omissions speakers produce, according to the grammatical roles. For example, when analyzing case production in *wh*-questions, the denominator represents the sum of nominals in different grammatical roles in *wh*-questions.

(2) Case production rates: The following percentages are calculated; a) grammatically correct overt nominative and accusative case markers in different sentence types: declarative, *wh*-questions, and FAs; b) grammatically correct omitted nominative and accusative case markers in different sentence types: declarative, *wh*-questions, and FA;

(3) Error rates: ungrammatical production includes a) substitution errors: sentences with wrong overt case-markers (19a); b) omission errors, incorrectly omitted case-markers (19b); c) doubling errors: using both allomorphs of the same type of a case marker at once (19c); d) addition errors: unnecessary case marker production in the position where the case markers are not allowed (19d)

(19) (a) Substitution error

종현이***는/가** 여기 일어서는 거 봐
JONG-i-***nun/-ka** yeki ilesenun ke pwa
JONG-DIM-TOP/NOM here standing NMLZ look
'Look JONG stand up' (JONG, 3;0)

(b) Omission error

어디***ø/가** 찢어졌어?
eti-***ø/-ka** ccicecyesse?
where(NOM) tear.PASS.PST.Q
'where is it torn?' (JONG, 2;05)

(c) Doubling error

손*이가 아야 그랬어
son-***ika/-i** aya kulaysse
hand-NOM ouch do.PST
'(my) hand was ouch' (JONG 2;01)

(d) Addition error

a: 뭐를?
mwe-lul
what-ACC
'what?' (Mother to JONG 2;04)

b: 손톱*을/ø
sonthop-***ul**/ø
fingernail-ACC
'fingernail' (JONG 2;04)

The four different types of erroneous sentences are exemplified as above in (19)—the first alternation with an asterisk (*) is when the speakers incorrectly produced case markers. The second one, after the slash, is the expected form. In (19a), JONG is expected to use the nominative marker *-ka* for his name, *Jong*, in the subject position. However, JONG replaces it with the topic marker *-nun*. (19b), an error involving case markers that are omitted when obligatory. The nominative markers are mandatory for *wh*-words in the subject position in *wh*-question sentences. JONG in (19b) omitted the obligatory nominative marker *-ka*. (19c) is the example of two allomorphs from the same case markers used. In (19c), a nominative marker *-i* is necessary. Object FAs get obligatory case drops, but in (19d), JONG produces the accusative marker *-ul*.

(4) The markings of errors depended on my personal judgment as a native Korean speaker to mark which sentences were erroneous. Some decisions could be arguable since my

Korean comes from a different dialect (Jeju dialect[12], also known as *Ceycwue* or *Ceycwu mal*), which differs from the so-called standard Korean[13] dialect.

(5) Data comparison: I am comparing the percentages described above between caregivers and children, in general, to answer the main research questions on how adults' input affects children's early acquisition of asymmetric patterns of case-maker usages in *wh*-questions and FA. I also include the overall use of nominative and accusative markers in declaratives, which gives an insight into whether the pattern of case marker usage in declarative sentences exerts an influence on the pattern of use in *wh*-questions and FAs.

[12] Jeju dialect (*Ceycwue* or *Ceycwu mal*) is categorized as a critically endangered language in 2010 by UNESCO (United Nations Educational, Scientific and Cultural Organization). Jeju dialect has distinct features from standard Korean (Yang 2018, Shin et al. 2020, Yang et al. 2020). The definition of standard Korean is in footnote 13.

[13] Standard Korean is defined by the National Institute of Korean Language as "the modern speech of Seoul (the capital city of South Korea) widely used by the well-cultivated".

Chapter4 Results

4.1. Introduction

This chapter describes JONG's nominative and accusative marker production patterns in each sentence type in detail. First, in Section 4.2, I summarize patterns and the frequencies of the production of each case marker from all speakers, JONG, and caregivers, in all sentence types combined. In Section 4.3, I examine JONG's nominative and accusative marker productions in each sentence type. Lastly, I discuss the implications of JONG's case-marking pattern, suggesting a distinct learning pattern for nominative markers in overall sentence types and a different developmental stage from the previous literature for the null accusative marker in object FA.

4.2. JONG's overall null / omitted & overt case marker rate

When combining all sentence types together, JONG's overall null / omitted case marker rate is similar to those mentioned in previous studies (e.g., Chung 1994, Chung 2013, among others). However, JONG's case usage patterns varied according to sentence structure distinctions. The rates of JONG's and caregivers' usage of overt and omitted / null[14] case markers are calculated as the percentage of all nominals in subject or object position bearing null and overt nominative or accusative case markings out of the total nominals in subject or object position, as in Table 5 below. Indeed, JONG's null nominative marker rate (46.8%) is less than the null accusative marker rate (89.0%), showing that he exhibits the most case drop with the

[14] The word "omitted" is for when any case markers are dropped in a position, where there is an option for case markers either to be overt or omitted depending on sentence structures. "Null" is used when any nouns in subject / object positions get obligatory zero overt markers. In this thesis, object fragment answer sentences get null accusative markers.

accusative (all structure types combined). Compared with the overall null case marker and overt case marker present in the input, JONG's caregivers also show frequent null accusative markers. In this way, JONG's overall pattern resembles that of his caregivers, as illustrated in Table 5.

Table 5 Overall rates (from all sentence types) of null & overt case markers

	Case markers	Omission /Null rate	Overt rate
JONG (1;07–3;05)	NOM	46.8% (690/1474)	53.2% (784/1474)
	ACC	89.0% (919/1033)	11.0% (114/1033)
Caregiver	NOM	25.5% (1936/7601)	74.5% (5665/7601)
	ACC	64.4% (3773/5857)	35.6% (2084/5857)

However, this overall rate does not take into account whether those overt or null nominatives and accusative markers are grammatical or JONG's production patterns in different syntactic structures. In the next section, I break down the overall overt & null / omitted nominative and the rate of accusative markers into different sentence types.

4.3. JONG's case usage patterns in different syntactic structures

4.3.1. JONG's case usage patterns: Declarative sentences

In declarative sentences in Korean, nominative and accusative markers are optional. Hence, nominals in subject and object positions are grammatical with or without nominative and accusative markers. Table 6 below illustrates the production rate of each nominative and accusative marker in declarative sentences by JONG (1;07–3;05) and his caregivers.

Table 6 Case marker usage in different syntactic structures by JONG (1;07-3;05) and caregivers: **Declaratives**

Sentence Type	Case Type	Speaker	Onset	Overt	Omission
Declartives	Nominative	JONG	1;07	58.4% (743/1272)	41.6% (529/1272)
		Caregiver		73.6% (5274/7163)	26.4% (1889/7163)
	Accusative	JONG	1;11	13.4% (107/797)	86.6% (690/797)
		Caregiver		37.5% (1931/5151)	62.5% (3220/5151)

In Table 6, JONG's onset age is when JONG produced his first overt nominative marker (1;07) and accusative maker (1;11). JONG produced nominals in object position at age 1;07, but he omitted all accusative markers, as illustrated in (20).

(20) 이거 까 이거 큰 거
ike-ø kka ike khun ke
this-ACC peel this big one-ACC
'peel this, this big one.' (JONG, 1;07)

His first overt accusative markers were uttered at age 1;11. The example is provided in (21).

(21) 토끼가 전화를 해
Thokki-ka cenhwa-lul hay
Rabbit-NOM call-ACC do
'Rabbit is on the phone.' (JONG, 1;11)

Overt nominative markers were more frequent in caregiver's speech; caregivers often produced overt nominative markers: 73.6% of the total nominals in subject position in declarative sentences uttered by caregivers occurred with overt nominative markers. In JONG's speech, overt nominative markers are more frequent (58.4%) than omitted/null nominatives (41.6%). However, JONG drops the nominative markers even more frequently (41.6%) than his

caregivers (26.4%). JONG's overt and dropped nominative marker usage in the corpus are shown below (22) and (23).

(22) 애벌레가 딸기 먹었어
Aypelley-ka ttalki-ø mek-ess-e
caterpillar-NOM strawberry-ACC eat-PST-DECL
'A caterpillar ate a strawberry.' (JONG, 1;09)

(23) 기린 목 길지
kilin-ø mok-ø kil-ci
giraffe-NOM neck-NOM long-DECL
'Giraffe's neck is long.' (JONG, 1;09)

As for accusative markers, JONG and caregivers both frequently drop them in declarative sentences (JONG: 86.6%, caregiver: 62.5%); however, JONG drops them even more frequently than caregivers – JONG does not produce overt accusative markers in declaratives until 1;10 and all accusative markers in declaratives are all omitted until that age.

From age (1;11), JONG generally followed caregivers' patterns of using nominative and accusative markers in declarative sentences. JONG more frequently produced overt nominative markers than dropped nominative markers and, conversely, more dropped accusative markers than overt accusative markers. JONG and his caregivers both had a higher rate of overt nominative markers than omitted ones, but JONG dropped nominative and accusative markers more frequently than his caregivers.

4.3.2. JONG's case usage patterns: *wh*-questions

For *wh*-questions, the nominative markers, *-i* and *-ka,* are obligatorily overt in subject position, and the accusative markers, *-ul* and *-lul,* are optional in object position. This section

looks into how often JONG and the caregivers grammatically produce case markers (nominative or accusative) in *wh*-questions (*wh*-subject or *wh*-object). Incorrect case marker usages in *wh*-questions give insight into the role of structure type in JONG's development of case marking.

4.3.2.1. *wh*-subject questions

In *wh*-subject questions, JONG and his caregivers show similar patterns by producing most of the nominatives with overt nominative markers. However, JONG dropped about 20% more nominative markers than caregivers, as shown in Table 7.

Table 7 Case marker usage in different syntactic structures by JONG (1;07-3;05) and caregivers: ***wh*-subject questions**

Sentence Type	Case Type	Speaker	Onset	Overt	Null
wh-subject questions	Nominative	JONG	2;01	71.4% (15/21)	*****28.6% (6/21)
		Caregiver		91.5% (386/422)	*****8.5% (36/422)

The asterisk in the null column in the *wh*-subject question sentence type shows that the null nominative markers are ungrammatical in the *wh*-subject questions. The sentence (24) is an example of one of JONG's grammatical productions of *wh*-subject questions with an obligatory overt nominative marker in the corpus. The sentence (25) provides an ungrammatical example of the *wh*-subject question without an overt nominative marker in the corpus.

(24) 뭐가 됐어?
mwe-ka tway-ss-e
what-NOM become-PST-Q
'what happened?' (JONG, 2;01)

(25) *누구 있어?
nwukwu-ø iss-e?
who-NOM be-Q
'who's there?' (JONG, 2;01)

4.3.2.2. *wh*-object questions

Sentences with *wh*-object questions allow optional accusative case markings. JONG and caregivers have similar overt accusative marker usage patterns (JONG: 18.2%, caregiver: 16.4%) even though there is a difference in the total number of *wh*-object question sentences produced: JONG uttered a total of 22 *wh*-object questions, while caregivers produced a total of 681 *wh*-object questions, as shown in Table 8 below.

Table 8 Case marker usage in different syntactic structures by JONG (1;07-3;05) and caregivers: ***wh*-object questions**

Sentence Type	Case Type	Speaker	Onset	Overt	Omission
wh-object questions	Accusative	JONG	1;11	18.2% (4/22)	81.8% (19/22)
		Caregiver		16.4% (112/681)	83.6% (569/681)

Moreover, JONG and adults both often dropped accusative markers in *wh*-object questions. JONG's first production of the *wh*-object questions happened at age 1;11, and he omitted the accusative markers from the beginning with *wh*-words in the object position. JONG's first production of the *wh*-object question sentence is illustrated in (26).

(26) 뭐 하니?
mwe-ø ha-ni?
what-ACC do-Q
'what are you doing?' (JONG, 1;11)

Although the structure allows optional case-markings, looking into the production rate of accusative markers in *wh*-object sentence type is critical because this analysis will enable me to understand if JONG begins producing overt accusative markers in all sentence types at once at a certain age or if he begins producing them in one sentence structure before other sentence structures.

4.3.3. JONG's case usage patterns: Fragments Answers (FA)

For FA, nominative case markers are optional with nominals in subject position, and null accusative markers are obligatory with nominals in object position. This section demonstrates each speaker's nominative and accusative markers usage in a different position in FA.

Table 9 Case marker usage in different syntactic structures by JONG (1;07 -3;05) and caregivers: **FA**

Sentence Type	Case Type	Speaker	Onset	Overt	Omission/ Null
Subject FA	Nominative	JONG	1;07	14.4% (26/181)	85.6% (155/181)
		Caregiver		31.2% (5/16)	68.8% (11/16)
Object FA	Accusative	JONG	1;07	*****1.4% (3/214)	98.6% (211/214)
		Caregiver		*****0% (0/26)	100% (26/26)

JONG started producing both subject and object FA earlier than *wh*-questions. The first FAs were uttered at age 1;07, and both subject and object FA appeared without case markers, as in Table 9 above. JONG's first production of subject FA and object FA in the corpus are illustrated in (27) and (28).

(27) a: 누가 닦아 줘?
nwu-ka takka cw-e?
who-NOM wipe give-IE
'who wipes?' (Grandfather to JONG, 1;07)

b: 엄마
emma-ø
emma-NOM
'mommy' (JONG, 1;07)

(28) a: 어떤 거 볼까요?
etten-ke-ø pol-kka-yo?
which-one-ACC see-Q-DECL
'which one shall we see?' (Grandfather to JONG, 1;07)

b: 이거
ike-ø
this-ACC
'this one' (JONG, 1;07)

Although subject FAs allow optional nominative case markings, both JONG and his caregivers frequently drop the nominative markers. JONG omits most of the nominative markers in subject FAs (85.6%), which is 16.8% higher than the omission rate of caregivers. For object FAs, caregivers always drop the accusative markers. JONG omitted accusative markings at a similar rate, 98.6%. JONG's erroneous object FA productions in the corpus are provided in (29) – (31).

(29) a: 누구를 만났을까?
nwukwu-lul manna-ssul-kka?
who-ACC meet-PST-Q
'who did you meet?' (Mother to JONG, 1;11)

b: *멍멍이를
mengmengi-lul
puppy-acc
'puppy' (JONG, 1;11)

(30) a: 양털로 뭐 만들어?
yangthel-lo mwe mantul-e?
wool-INST what make-IE
'what do you make with wool?' (Mother to JONG, 2;01)

b: *옷을
os-ul
clothes-ACC
'clothes' (JONG, 2;01)

(31) a: 뭐를?
mwe-lul?
what-ACC
'what?' (Mother to JONG, 2;04)

b: *손톱을

sonthop-ul
nail-ACC
'nail' (JONG, 2;04)

4.3.4. Summary

Overall, JONG's case marking is similar to that of his caregivers. Indeed, they both produced overt nominative markers more frequently than accusative markers (see Table 5). Also, in *wh*-object questions, JONG and caregivers both show frequent omissions of accusative markers. However, some development stages predicted by Chung (1994), Clancy (1989a, 1989b), and in other previous works are different from JONG's acquisition patterns. For example, JONG begins using overt accusative markers earlier (i.e., at 1;11) than Chung (1994) predicts (Third stage, the age of 2;05). Furthermore, JONG used null accusative markers in an adult-like way in object FAs from the beginning at 1;07. He also begins producing overt nominative markers in declaratives at 1;07. His adult-like productions of null accusatives in a specific sentence structure indicate that JONG goes through different acquisition stages for null accusative markers from those suggested by previous studies.

4.4. JONG's usage patterns of nominative and accusative markers

This section addresses JONG's learning pattern of nominative markers and his distinct acquisition patterns, such as using null accusative markers in object FAs. Moreover, I summarize JONG's error types and rates. I will elaborate on the predictions I made in Chapter 3 on JONG's nominative and accusative marker usage in different sentence structures in the next chapter.

4.4.1. JONG's overall patterns of nominative markers: U-shaped learning pattern & Overgeneralization

Table 10 shows the production rates by JONG and his caregivers in overt nominative and accusative markers over time. JONG manifests a similar rate of overt NOM to his caregivers. In Table 10, only overt nominative markers appeared in JONG's data at ages 1;07, and 1;08. Between those ages (1;07 and 1;08), he optionally marked only nominative case markers for nouns in subject positions, and he dropped all accusative markers for nouns in object positions. The total number of nominals (JONG: 1474; Adult: 7601) in subject positions is less than his caregivers'. There are several ages from 1;09 (e.g., 1;09, 1;10, 2;05, 2;08, 3;0, 3;05), during which JONG produced the overt nominative markers at close to an adult-like rate for a period. Then the rate declined and returned to an adult-like rate again later. For example, JONG produces overt NOM markers as much as caregivers (78.8% and 70.0%) at ages 1;09 (78.1%) and 1;10 (72.7%), and JONG abruptly decreased the frequency of overt NOM markers to 44.2% at 1;11. At age 2;05, he shows the adult-like overt NOM rate again (JONG: 56.1%, caregivers: 58.4%). A similar pattern is seen in his 2;08, 3;0, and 3;05 data.

Table 10 The overt NOM & ACC markers' rate over time in JONG's data (1;07 – 3;05)

AGE	NOM				ACC			
	Jong		Caregiver		Jong		Caregiver	
1;07	40.0%	(2/5)	56.2%	(176/313)	0.0%	(0/2)	21.0%	(47/224)
1;08	52.0%	(13/25)	76.3%	(400/524)	0.0%	(0/37)	28.4%	(118/416)
1;09	78.1%	(50/64)	78.8%	(245/311)	0.0%	(0/44)	33.5%	(76/227)
1;10	72.7%	(8/11)	70.0%	(49/70)	0.0%	(0/17)	21.3%	(19/89)
1;11	44.2%	(23/52)	64.2%	(185/288)	11.3%	(6/53)	18.6%	(43/231)
2;0	39.1%	(18/46)	76.8%	(209/272)	3.8%	(2/53)	27.2%	(62/228)
2;01	57.4%	(54/94)	75.2%	(349/464)	14.8%	(12/81)	30.3%	(105/347)
2;02	45.0%	(36/80)	66.9%	(198/296)	4.2%	(2/48)	23.5%	(44/187)
2;03	54.5%	(30/55)	75.2%	(309/411)	2.2%	(1/46)	27.0%	(96/355)
2;04	42.7%	(50/117)	76.5%	(390/510)	5.5%	(3/55)	35.0%	(118/337)
2;05	56.1%	(23/41)	58.4%	(115/197)	5.5%	(3/55)	27.4%	(43/157)
2;06	28.9%	(26/90)	72.2%	(405/561)	15.7%	(8/51)	30.9%	(129/418)
2;07	37.8%	(28/74)	56.2%	(141/251)	7.7%	(3/39)	10.1%	(19/188)
2;08	63.8%	(37/58)	74.5%	(184/247)	9.8%	(4/41)	35.7%	(84/235)
2;09	43.7%	(31/71)	80.5%	(248/308)	2.6%	(1/38)	39.2%	(85/217)
2;10	49.1%	(54/110)	77.2%	(456/591)	9.2%	(7/76)	39.9%	(174/443)
2;11	45.7%	(37/81)	82.6%	(355/430)	13.7%	(10/73)	32.7%	(129/394)
3;0	64.9%	(63/97)	75.4%	(190/252)	14.3%	(9/63)	45.8%	(103/225)
3;01	62.7%	(32/51)	83.9%	(234/279)	29.4%	(15/51)	61.5%	(166/270)
3;02	53.7%	(22/41)	78.3%	(253/323)	25.0%	(11/44)	90.6%	(213/235)
3;03	56.4%	(31/55)	81.0%	(255/315)	32.4%	(11/34)	53.5%	(152/284)
3;05	74.3%	(116/156)	82.2%	(319/388)	18.8%	(6/32)	39.3%	(59/150)
Total	53.2%	(784/1474)	74.5%	(5665/7601)	11.0%	(114/1033)	35.6%	(2084/5857)

As predicted by U-shaped learning, he learns to use overt nominative markers overall by producing a massive (i.e., adult-like) number of overt nominative markers. Figure 5. below demonstrates the pattern clearly.

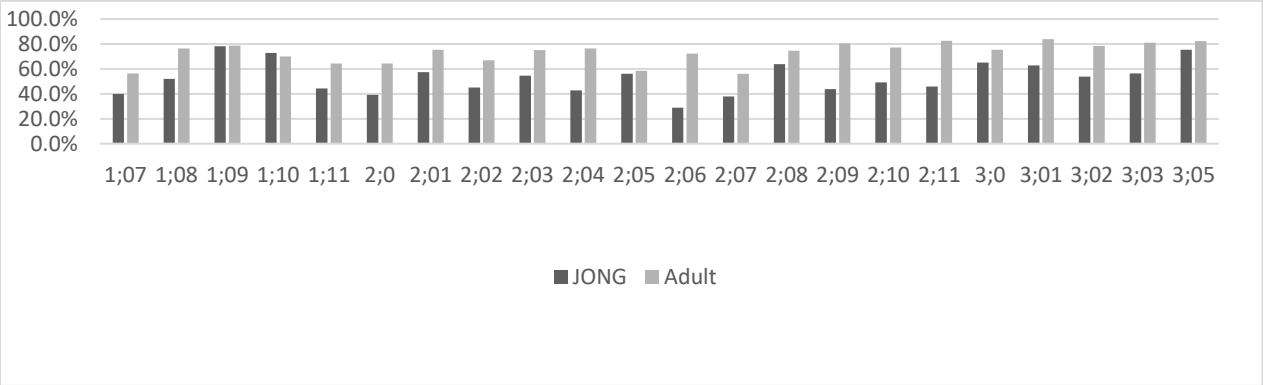


Figure 5 Rates of overt NOM overt time by JONG (1;07 -3;05) and caregivers

Table 11 shows JONG's error types and rate. JONG tends to overuse the nominative markers on nominals in object positions or where they need topic markers in declaratives (NOM overgeneralization: 42.1%). His NOM overgeneralization includes instances with NOM doubling and substitution errors (see Section 3.4 (19) for the definition of different types of errors). In addition, JONG's first instances of overgeneralized nominative markers (at ages 1;08 and 1;09) overlap with the period in which he produces the overt nominative markers at a frequency similar to his caregivers (see Table 10.). The initial period of the second stage (2;0), which is marked by overuse of nominative markers, is fairly consistent with previous studies of Korean L1 acquisition of case marking (Chung, 1994; Kim, 1997).

Table 11 JONG's (1;07 – 3;05) error types and rates

Type	Rate	Age
Object FA (with overt accusative markers)	15.8% (3/19)	1;11, 2;01, 2;04
Wh-subject question (without case)	28.6% (6/21)	2;01, 2;02, 2;07
NOM overgeneralization	42.1% (8/19)	1;08, 1;09,2;01, 3;01

Others	10.5% (2/19)	2;02, 3;0, 3;05

This pattern suggests JONG acquires Korean nominative case markers through U-shaped learning. In U-shaped learning, overgeneralization is a phase for children to process linguistic knowledge into a system where the rules and exceptions exist together (Plunkett and Marchman, 1991).

4.4.2. Stabilization of JONG's overt nominative marker

For the patterns of *wh*-subject question sentences, JONG must learn to use overt nominative markers with *wh*-words in the subject position; otherwise, the *wh*-words without nominative markers will be grammatically wrong since overt nominatives are obligatory in this construction. JONG's first productions of the *wh*-subject questions were made at age 2;01, and two out of three of his first production were erroneous. Although JONG omitted nominative markers erroneously in *wh*-subject questions between 2;02 and 2;07, his *wh*-subject questions were target-like after age 2;07. Considering his errorless production of *wh*-subject sentences from age 2;09 and increased rate of overt nominative markers across different sentence structures from age 2;09 (see Table.10), JONG's obligatory overt nominative marker usage in *wh*-subject questions or overall overt nominative marker usage across the sentence structures becomes stable from the age 2;09.

JONG seems to begin to acquire obligatory Korean nominative markers at age 2;01, the age at which he started producing wh-subject questions requiring overt nominative markers. His obligatory nominative marker usage becomes mature at age 2;09 as he stops making errors at that age, and the frequency of overt nominative marking is generally increased. This pattern is consistent with the developmental stages that Chung (1994) suggested for nominative marker

development: Stage 1- only the optional overt nominative markers and no overt accusatives are seen in JONG's utterances at ages 1;07, and 1;08; Stage 2- he uses overt nominatives with adult-like frequency but overgeneralizes them, using the overt nominatives on nominals in object position and where need topic markers; Stage 4- JONG seems to stabilize at age 2;09, using overt nominatives in several different sentence structures at an adult-like frequency. The age (2;09) is consistent with Chung's (1994) Stage 4.

4.5. JONG's use of null accusative marker: a suggestion of different acquisition stages

JONG's frequent use of null and omitted accusative markers in different sentence structures suggests that his acquisition pattern of accusative markers does not follow Chung's (1994) and Kim's (1997) developmental stages of Korean case-marking acquisition. JONG applies the null accusative markers grammatically to object FA from the age of 1;07, and overt accusative marker production follows at age 1;11. JONG produced adult-like object FAs (i.e., nominals with no overt accusative marking) from the beginning, which brings two possibilities: either he has already acquired the obligatory null accusatives, or he is generalizing from omitted/null accusatives in other sentence structures. However, once he started producing the overt accusative marker in declarative sentences at 1;11, he also made errors in object FAs using overt accusative markers. Outside of these errors, which are small in number, JONG's case marking in object FAs is adult-like. This adult-like production and the age when he made the first error in the object FAs suggest that JONG acquired obligatory null accusative markers in a particular sentence structure (object FA) while he was learning to use overt accusative markers in other sentence types such as declaratives.

Additionally, JONG could acquire null accusatives before overt accusatives because the shape of obligatory null accusatives is identical to the bare noun form, leading JONG to learn null accusatives easier than overt accusatives even though there was less input (Object FAs) than other sentence structures. His first error in object FAs was made at 1;11, and his first productions of overt accusative markers also were made in the same period. Moreover, his adult-like production of null accusative marker with a small number of errors, which is a distinct pattern from case marker usage in other sentence structures, suggests that JONG develops case marker acquisitions depending on different sentence structures. Based on JONG's production patterns of accusative markers in different sentence structures, I speculate that; first, he acquired obligatory null accusative markers in object FAs (i.e., ages between 1;07–1;10) before learning overt accusative marker usage in declarative sentences (age 1;11); second, the overgeneralization[15] of omitted accusative markers occurs in *wh*-object question sentences (age 2;01), which is based on JONG's frequent use of omitted accusatives in *wh*-object questions even though the rule is optional for the accusative markers. A further discussion on JONG's acquisition pattern in null accusatives will be in section 5.2.2.

To sum up, JONG's use of accusative markers differs for different sentence structures. And these patterns are different from what is expected from the previous literature, showing distinct production patterns in each sentence structure. JONG's patterns of null accusatives thus suggest different acquisition stages for accusatives (i.e., acquisition stage for obligatory null accusatives) of the prior literature.

[15] Here, the "overgeneralization" is not an error type since *wh*-object questions allow optional accusatives. Therefore, the "overgeneralization" in this context indicates JONG's preference for using omitted accusatives over overt accusatives, which closely resembles his caregivers' pattern (see Section 4.3.2.2.).

Chung (1994) concentrates on how monolingual Korean children develop overt nominative and accusative markers depending on the position of NP in the basic Korean language order, SOV. Chung (1994) summarizes Korean children's usage of nominal case markers into four stages: first stage – the overt nominative marker *-ka* emerges; second stage – overextension (e.g., substitution errors– see Section 3.5) of the overt nominative marker *-ka*; third stage – the overt accusative marker *-lul* emerges only with the second NP, and the usage of the nominative marker and the accusative marker as a linear ordered pair (*ka-lul*); fourth stage – adult-like nominative marker production emerges and correct nominative and accusative markers increase with scrambled word orders (see Section 2.1.1). In addition, Chung (1994) mentioned that caregivers in the study more frequently omit the accusative markers than nominative markers, and children at stage 4 show similar patterns to their caregivers' production, frequently dropping the accusatives starting using various word orders that caregivers often used. Kim (1997) elaborates on Chung (1994)'s claim, adding more detail on the acquisition of nominative allomorph *-i*. Kim (1994) also states that adults' high omission rates in accusative marker usage impact children's late acquisition of overt accusative markers since children exhibit a similar pattern to adults' productions.

The figures below summarize the predicted age onset for overt nominative and accusative markers based on the previous literature (Figure 6) and JONG's actual age onset of nominative and accusative markers (Figure 7) in different sentence structures. As shown in Figure 7 below, JONG's age-onset points in the current study are more detailed in demonstrating the use of case markers than the points of age-onsets suggested previously (Figure 6).

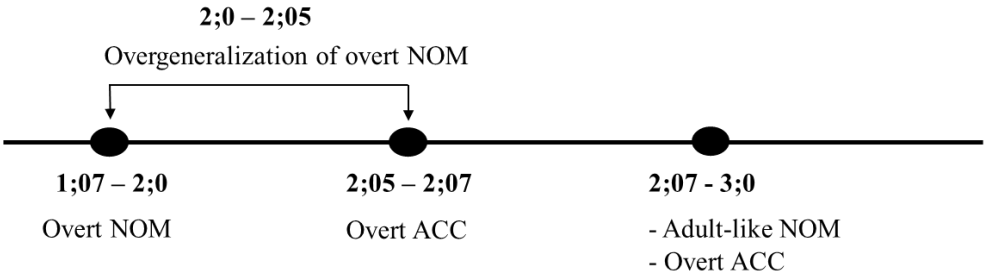


Figure 6 Age-onsets based on the previous studies

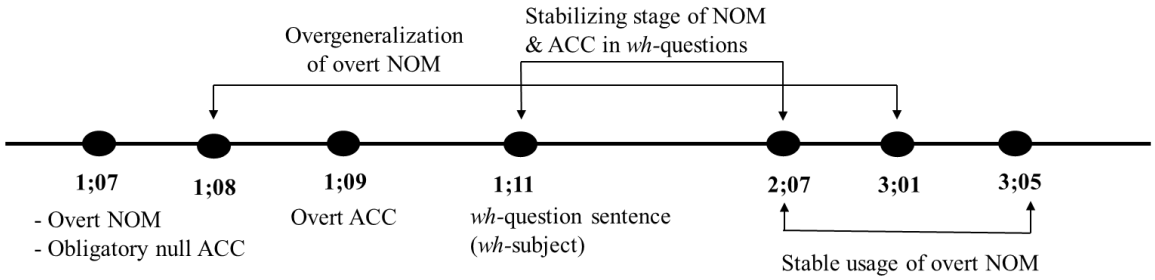


Figure 7 JONG's age-onset based on the current study (all sentence types combined)

In the next chapter, I will evaluate the predictions based on JONG's data and more detailed implications of JONG's frequent production of the adult-like omitted and null accusative markers in *wh*-object question and object FA.

Chapter5 Discussion

This chapter evaluates the predictions presented in Section 3.2 and Appendix Table A.2. Appendix tables A.2 summarizes the predictions (in addition to Table 3 in Chapter 3) of JONG's utterance pattern of nominative and accusative markers by different sentence types based on previous literature (Table A.2) and the evaluation of the prediction after the data analysis (Table A.3). The research questions are as follows: (1) when does JONG acquire optional features of Korean case markers? (2) what is the role of input in the acquisition of case markings in different sentence structures declarative, wh-questions, and fragment answers? (3) which theoretical approach explains JONG's acquisition of asymmetric Korean case marking patterns in different sentence structures? I close this chapter with the limitations of this thesis and future research.

5.1. Predictions on JONG's acquisition patterns in different sentence structures

I predicted (see Table.3) that JONG would develop Korean nominative and accusative marker use as reported in previous studies (e.g., Chung 1994, Chung 2013, Kim et al. 1995, among others) and undergo the same development stages for different sentence types: declaratives, *wh*-questions, and FAs. For example, considering his age range in the study and the development stages of nominative and accusative markers from the previous literature, I expected JONG to exhibit frequent usage of overt nominative case markers in all sentence types (declaratives, *wh*-questions, and FAs). The prediction turns out to be partially true for certain sentence structures – declaratives, *wh*-object questions, and object FAs, but false for others – *wh*-subject questions and subject FA. This section explains the difference between predictions based on previous literature and the results from different syntactic structures. The implications of

JONG's acquisition of nominative and accusative markers in different syntactic structures will follow.

5.1.1. Declarative sentences

The data is analyzed from when JONG was 1;07 — the first stage when Korean children start to produce the nominative *-ka* (Chung, 1994) and extends to age 3;05 — older than the age range of Chung's (1994) fourth stage when Korean children aged between 2;06 and 3;0 show adult-like frequency in the production of nominative markers, but show less frequent production of overt accusative markers (Chung, 1994). Based on this, I predicted that JONG would be influenced by his caregivers' production patterns of nominative and accusative markers (i.e., JONG would more frequently produce overt nominative markers than omitted nominative markers and fewer omitted accusative markers than overt accusative markers). In a second prediction, I predicted that JONG would not utter any overt accusative markers at age 1;07–2;06 (see Section 3.2, Table 3). The first prediction was confirmed, though adults' rates of overt nominative markers and omitted accusative markers were quantitively higher. JONG followed the overall adult pattern of having a higher rate of overt nominatives (743/1272 or 58.4%) than an omission rate (529/1272 or 41.6%) and a higher rate of omission of accusative markers (696/797 or 86.6%) than the rate of overt accusative (107/797 or 13.7%) markers (see Table 2 in Section 4.1.1). In terms of the second prediction, JONG uttered overt accusative markers at age 1;11, which is earlier than documented in the previous literature. Thus, the second prediction is not supported by the current findings.

5.1.2. *wh*-questions

5.1.2.1. *wh*-subject questions

I predicted that JONG would produce overt nominative markers in *wh*-subject questions without errors (see Table.3). This prediction was made based on previous research, which analyzed the case acquisition and the usage without distinguishing between different sentence types, and on two facts: (1) Korean *wh*-subject questions have obligatory overt nominative markers (Yoon, 2011); (2) children develop *wh*-sentences after they have acquired overt nominatives in declaratives (Clancy, 1989a; 1989b). However, the current results do not support the prediction. JONG made the first total of three *wh*-subject questions at age 2;01. And he produced only one adult-like *wh*-subject question, while the other two utterances were erroneous, without nominative markers. JONG's error rate (28.6% (6/21)) is higher than the caregivers' (8.5% (36/422)). JONG continued making a few mistakes until 2;07, and from 2;09 to the end of the analysis age period (3;05), he produced a total of 6 *wh*-subject questions, and they were all grammatically correct with overt nominative markers.[16]

In short, JONG's production patterns in the obligatory nominative marker are different from the prediction that I made in Chapter 3. Furthermore, his nominative productions in *wh*-subject questions are different from his declaratives in terms of the rate of overt nominatives.

5.1.2.2. *wh*-object questions

Following previous literature, I predicted that JONG would omit most of the accusative markers in *wh*-object questions (see Table.3). I also expected JONG to produce his first *wh*-

[16] see Appendix Table A.1.

object questions later than any other sentence type. The current study supports the first prediction, as JONG and his caregivers both omitted most of the accusative markers in *wh*-object questions. In other words, their use of omitted accusative markers is more frequent than overt accusative markers in *wh*-object questions. However, the second prediction is not confirmed, as JONG made his first utterance of *wh*-object questions at age 1;11, which is earlier than *wh*-subject questions.

JONG's productions of *wh*-questions, including *wh*-subject and *wh*-object types, are few; therefore, only limited conclusions can be drawn. However, his production patterns of *wh*-questions will be helpful in understanding the use of nominatives and accusatives in different sentence structures with varying rules for case markers.

5.1.3. Fragment Answers (FA)

5.1.3.1. Subject FAs

I predicted that JONG would produce more overt nominative markers than omissions in subject FAs (see Table.3) because, first, subject FAs allow both overt and omitted nominative markers; second, children and caregivers, in general, use overt nominative markers more frequently than omitted nominatives or overt accusatives across different types of sentences (Chung 1994, Kim 1997); third, Korean children learn to use the overt nominative marker *-ka* first, before learning overt accusative markers. The current findings do not confirm the prediction, as JONG produced more omitted nominative markers (155/181 or 85.6%) than overt nominative markers (26/181 or 14.4%) in subject FAs. He followed the adults' trend with a higher omission rate than overt nominative markers in subject FAs. Moreover, JONG made the

first subject FA at age 1;07, and his initial subject FAs were all produced with omitted nominatives. At 1;07, JONG used overt nominatives only in declarative sentences.

5.1.3.2. Object FAs

JONG produced utterances that seem like null accusatives in object FAs from the beginning of the data period (1;07). It is difficult to tell whether these are bare nouns (before the onset of case acquisition) or adult-like obligatory null accusatives. However, his overgeneralization of overt accusatives in three erroneous object FAs at 1;11, 2;01, and 2;04 suggests that the period from 1;11-2;04 represents the acquisition of adult-like null accusatives, as he has learned that overt accusatives are ungrammatical in this construction. Nevertheless, JONG's erroneous object FA at 1;11 could be the glimpse of evidence of JONG's acquisition of overt accusatives in declaratives, where he hears them. That is to say, JONG's adult-like object FAs from the beginning can be a continuance of the bare noun stage in object position. Together with JONG's acquisition of overt accusatives in his first year (1;11), earlier than Chung's (1994) prediction of 2;05–3;0, these data suggest that the onset of accusative acquisition varies with construction type.

5.2. JONG's sensitivity to case marker usage in different syntactic structures

Based on JONG's nominative and accusative case marking patterns in various sentence types from Section 5.1, JONG seems responsive to the nominative and accusative case markers used in different syntactic structures with distinct rules early on. For example, he produced adult-like optional accusatives in *wh*-object questions and obligatory null accusatives in object FAs from his initial productions made at 1;11and 1;07. Of course, there is a huge difference in

frequency between JONG and adults; qualitatively, JONG follows the adults' production trends in those particular sentence structures, showing frequent omission of accusatives in *wh*-object sentences and null accusative productions in object FAs. He still makes some minor errors in object FAs; however, he generally follows adults' production frequency and pattern from an early age. His case marker production pattern is more complex than the previous literature's specified nominative and accusative marker acquisition stages. He acquires overt nominative markers as in the previous literature, but his case marker usage differs by sentence type, emulating his caregivers' production pattern. The question is how JONG picks up the different uses of the nominative and accusative markers in various sentence types early, and produces them with adult-like grammar and frequency.

5.2.1. JONG's acquisition pattern in nominative markers

JONG's development of overt nominative markers in declarative sentences is as mentioned in the previous literature (e.g., Chung 1994, Chung 2013, Kim et al. 1995, among others), even though JONG shows different age of onset and duration in development for each stage from Chung (1994). For example, according to Chung (1994), Korean children (1;07–2;0) undergo stage 1 – only overt nominative marker, *-ka*, appears in children's utterances. However, JONG shows a shorter period (1;07–1;10) for stage 1 than the previous literature. Moreover, JONG's onset age of stage 2 (JONG: 1;08–3:01) – overgeneralization of the overt nominative markers – is earlier than the previous literature (2;0–2;04).

Although subject FAs allow optional nominative markers as the declarative sentence type, JONG shows different patterns of nominatives in subject FAs compared to declarative sentences. In subject FAs, JONG does not go through the overgeneralization stage but produces most of the

subject FAs with omitted nominatives. Omitted nominative markers more frequently appear in subject FAs than declarative sentences. Thus, JONG seems to develop Korean nominative markers differently depending on the sentence structure. JONG's developmental stages for Korean nominative markers in different sentences are summarized in Table 12.

Table 12 JONG's development stages of nominative markers in different sentence types

Sentence Type	NOM Development
Declarative	• **Stage 1 – Only overt nominatives (1;07–1;10)** Only overt nominative markers appear. • **Stage 2 – Overextension of overt nominatives (1;08–3;01)** Overt nominative markers are used where accusative markers are expected. Also, there is an increase in the production of nominative markers. • **Stage 3 – Adult-like use of overt nominatives (3;02–3;05)** Adult-like frequency of overt nominative marker usage.
wh-subject	JONG's first *wh*-subject appears with both overt nominative markers and omitted nominative markers at 2;01; however, JONG makes no errors (obligatory overt nominative markers) in *wh*-subject sentences from 2;09.
Subject FA	• **Stage 1 – Omitted nominative marker (1;07)** Only omitted nominative markers appear in subject FAs from the beginning. • **Stage 2 - Optional use of overt & omitted nominative marker (1;08–3;05)** Both overt and omitted nominative markers appear; however, omitted nominative markers are more frequent than overt nominative markers.

5.2.2. JONG's acquisition pattern in null accusative marker

Based on JONG's object FA and *wh*-object question production, he appears to have different development stages for accusative markers than Chung (1994) suggested. His onset periods for the sentence structures, *wh*-object questions, and object FAs are even earlier than expected or predicted in the previous literature. Furthermore, he developed adult-like production patterns of accusative markings in both sentence structures. He seems to understand early that *wh*-object questions and object FAs have distinctive rules with case-markings from other sentence structures.

I theorize that JONG acquires Korean obligatory null accusative markers more easily and faster than other case-marking patterns because the shape of the null accusative markings is identical to bare noun constructions. Children utter bare nouns first before any other linguistic developments. According to Chung (1994), the bare noun phase happens before acquiring overt nominative case markings at the first stage, at age 1;07–2;0.[17]

JONG's developmental stages for Korean omitted/null accusative markers are summarized in Table 13. The development stages in each sentence type occur in specific orders, but nominative marker development overlaps with accusative marker development in each sentence type (i.e., the emergence of overt accusatives in declaratives). Another possible explanation about JONG producing target-like object FAs from early on is that the stages in each sentence type can affect one another. For example, stage 2 of object FAs is affected by stage 2 of declarative sentences, resulting in erroneous object FAs with overt accusative markers between

[17] However, JONG's adult-like production of object FAs could be a continuance of the bare noun stage. I mentioned the possibility of continuing the bare noun stage in object FAs in section 5.1.3.2.

ages 1;11–2;04. Also, JONG's first production of a *wh*-object sentence appeared with an overt accusative marker influenced by stage 2 of the declarative sentence type.

Table 13 JONG's development stages of accusative markers in different sentence types

Sentence Type	ACC Development
Declarative	• **Stage 1** – **Bare nouns (1;07–1;10)** No overt accusative markers appear in declarative at age 1;07-1;10. • **Stage 2** – **Early overt accusatives (1;11–3;05)** Huge fluctuations with JONG's frequency of overt accusative markers and merely reaching the adult frequency of overt accusative marker production.
wh-object	JONG's first *wh*-object appears with the overt accusative markers (1;11); however, JONG follows the adult pattern of frequent use of omitted accusative markers.
Object FA	• **Stage 1 – Early null accusatives (1;07)** Obligatory null accusatives appear in object FA from the beginning (1;07). • **Stage 2 – Overgeneralization of overt accusative marker (1;11–2;04)** JONG's usage pattern of the overt accusative marker in declarative sentences affects the accusative marker patterns in object FAs by JONG making errors in object FAs with overt accusative markers. • **Stage 3 – Mature null accusatives (2;05–3;05)** No more errors with the overt accusative markers in utterances of JONG's object FAs.

5.2.3. Summary of JONG's acquisition in nominative and accusative markers

JONG's different developmental patterns in Korean nominative and accusative case markers imply that: a) children are sensitive to different syntactic structures, and they adapt to

different rules in different sentence structures early on. However, those stages can also influence other stages in different sentence structures; b) Korean case markers do not share the same or similar development stages across various sentence structures, but each nominative and accusative markers have different developmental stages depending on the sentence structures. For instance, JONG's early development of overt accusative markers in declaratives between 1;11 and 3;05 influences the overgeneralization of overt accusative markers in FAs at age 1;11–2;04. For the development of null accusatives in object FAs, it is hard to say that JONG's erroneous object FAs with overt accusative markers result from caregivers' input because in caregivers' object FAs, First, their object FAs are not as frequent as JONG's. Caregivers usually ask JONG *wh*-questions and JONG answers the questions with subject or object FAs. Second, caregivers never make any errors in object FAs with overt accusative markers.

To sum up, JONG shows different developmental patterns for each case marker based on specific contexts, with different rules applied for different sentence types, such as *wh*-question sentences or FAs.

Chapter6 Review of research questions

Chapter 6 addresses the theoretical implications of JONG's acquisition of the asymmetries in the nominative and accusatives in different sentence structures and answers the three main research questions posed in the thesis — (1) when does JONG acquire the optional features of Korean case markers? (2) what is the role of input in the acquisition of case markings in different sentence structures: declaratives, *wh*-questions, and fragment answers? (3) which theoretical approach explains JONG's acquisition of asymmetric Korean case marking patterns in different sentence structures? Furthermore, this chapter explains the limitations and future research of the thesis.

6.1. Answers to the research question: One

The acquisition periods of optional features of nominative and accusative markers differ for different structures since each sentence structure has different rules for the nominative and accusative markers. JONG evidently showed different patterns of the case marker use in various sentence types. However, it is too early to set out the exact developmental stages for the acquisition of the asymmetry in the patterns of nominative and accusative markers in different sentence structures in this study since this thesis investigated the data from one child.

6.2. Answers to the research question: Two & Three

This section describes which theoretical approach from Chapter 2 (generativist – Micro-cue model, and constructivist) JONG might optimally use for learning the asymmetries in case markings in different sentence structures in Korean. The asymmetries in the nominative and

accusative markers in different sentence structures are particular contexts in a specific language, Korean.

6.2.1. Micro-cue approach

In JONG's data, he showed adult-like productions of object FAs with null accusative markers early, even though JONG had been exposed to fewer examples of object FAs than any other sentence structures. While he was still learning overt accusative markers in declaratives, he could already produce adult-like object FAs. However, his development of overt accusative markers in declarative sentences does not seem to have affected his development of null accusative markers in object FAs since he produced adult-like null accusative markers from the outset. This pattern in object FAs suggests that he was learning obligatory null accusative markers in object FAs through the micro-cues; First, he produced adult-like object FAs early without frequent input of null accusative markers in object FAs; Second, JONG produced fewer errors with null accusative markers in object FAs compared to his error rates in other sentence structures.

Nevertheless, the micro-cue model cannot explain case-marking patterns in all different sentence structures. For example, JONG's patterns of overt nominative and accusative markers in declarative sentences are in line with a constructivist account of language development, which is different from his patterns of null accusatives in object FAs.

6.2.2. Constructivist approach

A constructivist approach adequately explains JONG's production of nominative case markings in optional contexts (i.e., declaratives) and his later development of overt accusative

markers than overt nominative markers with a frequency similar to that of his caregivers. Furthermore, the nominative markers in declaratives were overgeneralized to contexts in which the accusative markers or topic markers were expected. JONG's production of overgeneralized overt nominatives is also in line with a constructivist account of language development. However, the constructivist account can not explain all patterns of nominatives and accusatives in different sentence structures – nominatives and accusatives behave differently in each sentence type, and input frequencies differ depending on sentence structures. For example, the input frequency of overt nominatives in declaratives differs from that of the overt nominatives in subject FA. The input frequency of overt accusatives varies from declaratives compared to object FA.

6.2.3. Summary

This thesis examined the development of nominative and accusative cases in different sentence structures in a monolingual Korean-learning child, JONG. The research questions focused on (1) the development of case marking in optional contexts (declaratives, object *wh*-questions, and subject FAs) and non-optional contexts (subject *wh*-questions and object FAs), (2) the role of caregiver input, and (3) the theoretical approaches that could best explain the findings. With respect to the first and second questions, JONG's nominative case markings in optional contexts with frequency were similar to that of his caregivers. Overt accusative marking appeared later than overt nominative marking and was used less frequently than the omitted or null accusative case, which also provides evidence for the role of input frequency in development. Furthermore, the nominative case marker was overgeneralized to contexts in which the accusative markers were expected. These findings are largely in line with a constructivist

account of language development. However, the fact that nominative and accusative markings emerged independently in separate structure types (e.g., the frequency of overt nominative case marking in declaratives was different from the frequency of overt nominatives in subject *wh*-questions and the frequency of overt accusatives was different in declaratives compared to object FAs), suggests that the child has prior abstract knowledge of these structure types, which is in line with the predictions based on a micro-cue approach to language development. JONG's data clearly show that fine-grained analyses of this type have important implications for the documentation of their emergence and theoretical models of language development.

6.3. Limitations & Future Research

Regardless of the significant findings above, some limitations of this thesis can not be overlooked. First, the major results are of the data from one child, JONG. Thus, the results can not determine that every Korean child goes through what JONG did for nominative and accusative case marking acquisition in different sentence structures. For future research, having the data from more children with a broader range of ages than JONG's (1;07-3;05) is more reliable for setting out the acquisition stages and age periods of asymmetrical nominative and accusative case markings in different sentence structures. Second, given that Korean nominative and accusative markers are also related to information structure, such as focus, and other semantic factors, such as animacy and definiteness (E.S. Chung, 2013, 2015; Lee, 2006; Lee & Choi, 2010; Kwon & Zribi-Hertz, 2008), I believe that information structure and semantic or discourse principles could affect children's early acquisition of the case marking asymmetry in different sentence structures. In particular, unlike optional accusatives in declarative sentences, Korean object FAs have a specific rule for the accusative markers. Moreover, JONG showed

adult-like productions of object FAs from his initial productions, suggesting that monolingual Korean-learning children undergo the null accusative marker acquisition stage in object FAs. This null accusative marker acquisition in object FAs could also be related to the early development of information structures because JONG's object FAs are answers to *wh*-object questions, which can be involved in different focus types — contrastive and non-contrastive. And when the argument is contrastively focused, the case markers with the argument cannot be dropped (Lee & Choi, 2010), which obligatory null accusative markers in object FAs can relate to. These other factors are worth investigating for future research. Additionally, the structure of object FA is identical to a bare noun in an object position, which led to another possibility that the acquisition stage of object FA could be a continuation of the bare noun stage in an object position. Therefore, for future research, more research is required to distinguish if null accusatives are true null accusatives or bare nouns in object position. Moreover, in the analysis of JONG's corpus for this thesis, my judgment of the speakers' utterances with case markings *could* be affected by my Korean dialect from Jeju, Ceycwue, which is different from standard Korean.

References

Ambridge, B. & Lieven, E. V. M. (2011). *Child language acquisition: Contrasting theoretical approaches*. Cambridge: Cambridge University Press.

Choi, K.Y. (2005). Remarks on Structural Case Particles in Korean, *Studies in generative grammar*,15-1, p.29-51.

Choi, S. (2015). First Language Acquisition. In *The handbook of Korean linguistics*, edited by Lucien Brown & Jaehoon Yeon, 339-354. John Wiley & Sons. Inc.

Chomsky, N. (1980). *Rules and representations*. Oxford: Blackwell.

Chomsky, N. (1986). *Barriers*. Cambridge, MA: MIT Press.

Chomsky, N. (1995). *The Minimalist Program*. Cambridge, MA: MIT Press.

Chung, E. S. (2015). The acquisition of case drop in child Korean. *Language and Linguistics*, 68, 117-148.

Chung, E. S. (2013). *Exploring the degree of native-likeness in bilingual acquisition: Second and heritage language acquisition of Korean case-ellipsis* (Doctoral dissertation). University of Illinois at Urbana-Champaign, Urbana, Illinois.

Chung, G. (1994). *Case and its acquisition in Korean*. University of Texas at Austin Ph.D. dissertation.

Clancy, P. (1989a). A case study in language socialization: Korean wh-questions. *Discourse Processes*, 12, 169-191.

Clancy, P. (1989b). Form and foundation in the acquisition of Korean wh-questions. *Journal of Child Language*, 16, 323-47.

Croft, W. & Cruse, A. (2004). *Cognitive Linguistics*. Cambridge University Press.

Eisenbeiss, S. (2009). Generative Approaches to Language Learning. *Linguistics,47*(2), 273-310.

Kim, S. & William, O. & and Cho, S. (1995). The acquisition of case and word order in Korean: A note on the role of context. *Language Research* 31:687- 95.

Kim, Y. J. (1997). The acquisition of Korean. In D. I. Slobin (ed), *The Crosslinguistic Study of Language Acquisition*, vol.4, 335-443. Lawrence Erlbaum Associates.

Plunkett, K. & Marchman, V. (1991). U-shaped learning and frequency effects in a multi-layered perception: Implications for child language acquisition, *Cognition*, 38:1, 43-102.

Ko, I. (2005). Nominative case-marker omission and A-Chain deficit in child language acquisition of Korean. *University of Hawai'i at Mānoa Working Papers in Linguistics,36(9).*

Lee, H. & Choi, H. (2010). Focus Types and Subject-Object Asymmetry in Korean Case Ellipsis: A New Look at Focus Effects. *Pacific Asia Conference on Language, Information and Computation (PACLIC).*

Lee, E. H. & Sean, M. & Park, M. J. (2016). *An Introduction to Korean Linguistics*, New York: Routledge.

Lee, H. (2006a). Effects of focus and markedness hierarchies on object case ellipses in Korean. *Discourse and Cognition* 13(2): 205-231.

Lee, H. (2006b). Parallel optimization in case system: Evidence from case ellipses in Korean. *Journal of East Asian Linguistics* 15: 69-96

Lightfoot, D. (1999). *The Development of Language: Acquisition, Change and Evolution.* Oxford: Blackwell.

Lightfoot, D. (2006). *How New Languages Emerge*. Cambridge, UK: Cambridge University Press.

MacWhinney, B. (2000). *The CHILDES Project: Tools for Analyzing Talk*. 3rd Edition. Mahwah, NJ: Lawrence Erlbaum Associates

Park, Bum-Sik (2005). "Island-Insensitive Fragment Answers in Korean," In John Alderete et al. (eds.), *Proceedings of the 24th West Coast Conference on Formal Linguistics*: pp. 317-325.

Pinker, S. (1984). *Language Learnability and Language Development*. Cambridge, MA: Harvard University Press.

Radford, A. (2009). *An introduction to English sentence structure*. Cambridge, UK: Cambridge University Press.

Roeper, T. & deVilliers, J. G. (1992). Ordered decisions in the acquisition of wh-questions. In J. Weissenborn, H. Goodluck & T. Roeper (eds.), *Theoretical issues in language acquisition: Continuity and change in development*, 191–236. Hillsdale, NJ: Lawrence Erlbaum.

Ryu, J. & Horie, K. & Shirai, Y. (2015). Acquisition of the Korean imperfective aspect markers -ko iss- and -a iss- by Japanese Learners: A Multiple-Factor Account, *Language Learning*, 65:4, 791–823.

Shin, U., Kiaer, J., & Shin, J. (2020). Jejudo Korean. In Robbeets, M., & Savelyev, A. (eds.), *The Oxford Guide to the Transeurasian Languages*, 258-268. Oxford University Press.

Tomasello, M. (2003). *Constructing a Language: A Usage-based Theory of Language Acquisition*. Cambridge, MA: Harvard University Press.

Westergaard, M. (2009a). *The acquisition of word order: Micro-cues, information structure, and economy.* Amsterdam: John Benjamins Publishing.

Westergaard, M. (2009b). Usage-based vs. rule-based learning: the acquisition of word order in wh-questions in English and Norwegian. *Journal of Child Language* 36. 1023–1051.

Westergaard, M. (2014). Linguistic variation and micro-cues in first language acquisition. *Linguistic Variation* 14. 26–45.

Yang, C., Yang, S., & O'Grady, W. (2020). *Jejueo: The Language of Korea's Jeju Island*. University of Hawai'i Press.

Yang, S. (2018). *ASSESSING LANGUAGE KNOWLEDGE IN JEJU: VOCABULARY AND VERBAL PATTERNS IN JEJUEO AND ENGLISH*, Ph. D. Dissertation, University of Hawai‘i at Mānoa.

Yoon, J. (2011). *Case Drop in Korean -Its Empirical and Theoretical Investigation*, Ph. D. Dissertation, Indiana University.

Appendix

Table A. 1 JONG's overt and null/omitted NOM & ACC by different sentence structures over time

Age	Declarative				*wh*-question				FA			
	Subject		Object		Subject		Object		Subject		Object	
	Overt	Null/Omit	Overt	Null/Omit	Overt	*Null/Omit	Overt	Null/Omit	Overt	Null/Omit	*Overt	Null/Omit
1;07	2	0	0	0	0	0	0	0	0	5	0	1
1;08	10	8	0	21	0	0	0	0	3	4	0	16
1;09	46	9	0	36	0	0	0	0	4	5	0	8
1;10	8	3	0	11	0	0	0	0	0	0	0	6
1;11	20	24	5	35	0	0	0	0	3	5	1	12
2;0	13	26	1	37	0	0	1	0	5	2	0	13
2;01	52	34	10	55	1	2	1	1	1	4	1	14
2;02	32	41	2	40	2	1	0	1	2	2	0	5
2;03	28	22	0	35	0	0	1	5	2	3	0	5
2;04	47	53	2	45	0	0	0	2	3	14	1	6
2;05	20	6	3	49	3	0	0	0	0	12	0	3
2;06	25	49	8	25	0	0	0	3	1	15	0	15
2;07	26	42	2	33	2	3	1	1	0	1	0	2
2;08	37	12	4	26	0	0	0	0	0	9	0	11
2;09	29	31	1	22	2	0	0	1	0	9	0	14
2;10	53	46	7	40	0	0	0	2	1	10	0	27
2;11	36	20	10	48	1	0	0	0	0	24	0	15
3;0	62	26	9	44	1	0	0	0	0	8	0	10
3;01	29	15	15	27	3	0	0	1	0	4	0	8
3;02	22	10	11	24	0	0	0	1	0	9	0	8
3;03	31	22	11	13	0	0	0	0	0	2	0	10
3;05	115	30	6	24	0	0	0	0	1	8	0	2
Total	743	529	107	690	15	6	4	18	26	155	3	211

Note. The asterisk (*) indicates grammatically incorrect structures.

Table A. 2 The summary of the prediction (before the analysis)

		Age Range															
		1;07 – 2;0				2;0 – 2;04				2;05 – 2;07				2;06 – 3;05			
	Case Type	Overt NOM	Omit/ Null NOM	Overt ACC	Omit/ Null ACC	Overt NOM	Omit/ Null NOM	Overt ACC	Omit/ Null ACC	Overt NOM	Omit/ Null NOM	Overt ACC	Omit/ Null ACC	Overt NOM	Omit/ Null NOM	Overt ACC	Omit/ Null ACC
		●[a]	●			●	●			●	●	●	●	●	●	●	●
Predictions based on the Previous literature (Before Data Analysis)		- Only overt NOM is expected in all sentence types. - JONG would produce overt NOM less frequently than adults. - The initial age of overt NOM production; therefore, I predict frequent instances of omitted / null NOM. - Not expecting any production of *wh*-sentences.				- Overgeneralization of overt NOM - Onset of *wh*-sentences - Errorless *wh*-subject sentences				- The onset of overt ACC - Frequent null / omitted ACC - Stable usage of overt NOM - Errorless *wh*-subject sentences				- Adult-like usage of NOM (overt & omitted/null) - Overgeneralization of overt ACC - Increased rate of the overt ACC in *wh*-object questions			

Note. NOM = Nominative markers; ACC = Accusative markers.
[a]The dots in case types indicate which types of case markers are expected from JONG at specific age ranges based on the previous literature.

Table A. 3 The summary of the evaluation of the prediction (after the data analysis)

	Age Range															
	1;07 – 2;0				2;0 – 2;04				2;05 – 2;07				2;06 – 3;05			
Evaluation of the prediction based on the current study (After data analysis)	**Declarative**															
	Case Type	Overt NOM	Omit/Null NOM	Overt ACC	Omit/Null ACC	Overt NOM	Omit/ Null NOM	Overt ACC	Omit/ Null ACC	Overt NOM	Omit/ Null NOM	Overt ACC	Omit/ Null ACC	Overt NOM	Omit/ Null NOM	Overt ACC	Omit/ Null ACC
		●[b]	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		NOM		ACC		NOM		ACC		NOM		ACC		NOM		ACC	
		Only overt NOM (1;07 – 1;08) Production rate: overt > omitted/null (still less frequent than adults)		Earlier onset of overt ACC than expected (1;11) More frequent omitted ACC production (86.6%) than adults (62.5%)													
	***wh*-questions**																
	Case Type	Overt NOM	Omit/Null NOM	Overt ACC	Omit/Null ACC	Overt NOM	Omit/ Null NOM	Overt ACC	Omit/ Null ACC	Overt NOM	Omit/ Null NOM	Overt ACC	Omit/ Null ACC	Overt NOM	Omit/ Null NOM	Overt ACC	Omit/ Null ACC
				●	●	●	●	●	●	●	●	●	●	●		●	●
		wh-subject		*wh*-object		*wh*-subject		*wh*-object		*wh*-subject		*wh*-object		*wh*-subject		*wh*-object	
				Earlier onset than expected (1;11) Adult-like production pattern: higher rate of omission rate (81.8%)		Higher error rates than adults (28.6%)				Errors appear until 2;07				No more errors with NOM omission			
	FA																
	Case Type	Overt NOM	Omit/Null NOM	Overt ACC	Omit/Null ACC	Overt NOM	Omit/ Null NOM	Overt ACC	Omit/ Null ACC	Overt NOM	Omit/ Null NOM	Overt ACC	Omit/ Null ACC	Overt NOM	Omit/ Null NOM	Overt ACC	Omit/ Null ACC
		●	●	●	●	●	●	●	●	●	●		●	●	●		●
		Subject FA		Object FA		Subject FA		Object FA		Subject FA		Object FA		Subject FA		Object FA	
		Higher NOM omission rate (85.6%)		Earlier onset than expected (1;07)													

Note. [b]The dots in the case types indicate which case markers JONG actually uttered in the data by sentence types.
The greyed-out cells indicate produced case markers by JONG in the data, which is different from the prediction by sentence types.