

# Learnability and Starting Age of English Article Acquisition: Evidence from CPH\*

Mi-Jeong Song  
(Seoul National University)

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Based on Song (2006), this study investigated the relationship between learnability and starting age of English article acquisition. As a preliminary research question, it examined whether there is a difference in the ultimate level of English article proficiency between the early arrivals (AOA  $\leq$  12) and the late arrivals (AOA  $>$  12). Then, this study compared the two AOA groups in their article test performance on 5 major types and 22 subtypes of the English article in order to find out what types and subtypes late-starting Korean learners can and can't learn well. Lastly, this study investigated which types or subtypes are sensitive to the starting age. The participants of the present study were 34 native speakers of Korean who differed only in the age of arrival, but were similar in the mean length of residence, years of education in the United States, and daily use of English. Knowledge of English articles was tested using a 102-item article cloze test. The analyses of the data showed that the two AOA groups did not differ in the ultimate level of overall article proficiency. However, among the 5 types and 22 subtypes of the English articles, the early AOA group excelled the late AOA group in type 3 and two subtypes of conventional use. It was also found that among the 5 types, type 3 was the most sensitive to the starting age, followed by type 4 and conventional use type. These findings suggest that starting age differently affects the learnability of each type and subtype of the English article.

**Keywords:** English article acquisition, Critical period hypothesis, learnability, Korean EFL college learners, age effect in SLA

## 1. Introduction

English articles are known as one of the most difficult and challenging grammatical features for any Korean learners of English. The

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cause of the difficulty mainly results from the complexity in their form, meaning and form-function relationship as well as the lack of such a structure in their native language. Therefore, even after many years of learning about the rules and usage of articles along with a lot of corrective feedback, most Korean learners, even very advanced learners, still lack confidence and have problems in selecting correct or appropriate articles in a variety of given contexts.

Many Korean learners say that they are frustrated when their selection of articles based on the explicit grammatical rules they learned in the classroom is often wrong, and the selection based on their 'shaky' intuition also does not work. They complain that since English articles have so many exceptions to the explicit rules they learned, there are many contexts where they can't apply the rules that they know. Highly advanced learners are not the exception to this. Quite a few advanced adult learners who have extensive explicit knowledge on English articles argue that their article performance will never improve beyond a certain level no matter how hard they try because there are some aspects of articles that are random and can't be tackled only with explicit rules. Therefore, some claim that one should start to learn English early if he or she wishes to possess near-native, intuitive ability for determining appropriate or correct articles.

In fact, there have been quite a few researchers who maintain that English articles are one of the structures that may be better acquired implicitly than explicitly because they are inherently complex, abstract and probabilistic in their form-function relationship (DeKeyser, 2000). In particular, some of the researchers, who work within the CPH (Critical Period Hypothesis) framework, argue that since the English article is the structure that is better acquired implicitly, it is better learned in the earlier period in life when implicit acquisition occurs easily and naturally due to neurological plasticity of the human brain. In other words, according to their arguments, as far as the article acquisition is concerned, the earlier is the better; thus, learners who begin their acquisition in their later life (after puberty) may not learn English articles as well as learners who begin their acquisition in their

early life (before puberty), for biologically endowed ability to learn abstract structures implicitly is presumed to disappear after so-called the critical period.

For this issue, several studies (Johnson & Newport, 1989; DeKeyser, 2000; Song, 2006) tested the hypothesis only to yield mixed results. Johnson & Newport (1989) and DeKeyser (2000) found that early learners' ultimate level of article proficiency was higher than that of late learners, and articles were one of the structures which were most sensitive to learners' starting age. Song (2006), however, found that although early learners' proficiency was higher than that of late learners, the difference in performance was not big enough to be statistically meaningful. Although these studies are significant in that they analyzed the effect of critical period on one specific grammatical feature, they did not explore this issue in detail and in depth. Unlike the three previous studies which investigated the impact of starting age on the overall article proficiency, the present study examines the effect of learners' starting age on the acquisition of English articles more extensively based on the classification system of English articles (Type 1-Type 4, and conventional use type and their 22 subtypes), which was modified from Huebner (1983, 1985) and Butler (2002).

As for the relationship between specific types of English articles and their level of acquisition, there has been a study to show that Korean advanced learners of English found some article types (e.g. Type 3 referential indefinites) more difficult and challenging, and made more errors, whereas they felt some article types (e.g. Type 2 referential definites) relatively easy and made fewer errors (Park, 2005). Based on these findings, this present study hypothesizes that not all of the 5 English article types and 22 subtypes would be equally affected by neurological change in the brain, as not all the English structures were found to be equally sensitive to the critical period effect (DeKeyser, 2000). Based on this assumption, this study aims to find out which types and subtypes of the English articles are more sensitive to the critical period effect, and which are not. Such findings of the present study will provide valuable information as to which types of English

articles Korean adult learners of English may not learn well due to passing of the critical period, and which types they may learn relatively well even after their window of opportunity for implicit learning closed. Using this information, both learners and teachers may set a more realistic and effective goal for learning and teaching English articles without being too much obsessed and frustrated over not being able to attain a near-native level and not being able to help the learners reach the level.

In order to find solutions for learners' difficulty in acquiring English articles, previous studies have mainly focused on examining common patterns and types of learners' errors. In addition, they also explored the causes and reasons behind the learners' incorrect selection of articles by analyzing the learners' interview and performance data. However, no studies have examined the cause of learners' difficulty in learning English articles from the viewpoint of critical period effect. Using the CPH framework, the present study explores whether starting age of L2 acquisition can be another underlying cause for the difficulty in learning some of the specific types of English articles. Based on the findings, this study also aims to suggest both theoretical and practical implications.

## **2. Review of Literature**

As noted in the introduction section, one line of the previous studies related to the acquisition of English articles has mainly focused on examining the common patterns and types of article errors that adult learners of English make and their difficulty order (Park, 2005). Some of the previous studies in this line also investigated the possible causes and reasons behind the learners' incorrect article choices and suggested effective pedagogic intervention based on their findings (Park & Song, 2008).

The other line of research on the acquisition of English articles has been carried out within the framework of the critical period

hypothesis. These studies investigated whether learners' starting age of extensive exposure to the target language affects the ultimate level of proficiency in English articles (Song, 2006), and how sensitive the acquisition of English articles to the critical period effect, compared to the acquisition of other English structures (DeKeyser, 2000).

Among the studies in the first line, Park's (2005) study has relevance to the present study. Based on the article classification system modified from Huebner (1983, 1985) and Butler (1999), she investigated which semantic types of English articles (Type 1-Type 4 & Conventional Use Type) cause difficulty for her advanced Korean college learners of English. She administered a fill-in-the-blank article test which comprises of 130 items on the five article types. From the analysis of the obtained data, she found that Conventional use (e.g., *They went to Central Park yesterday*) was the most difficult for the learners, followed by Type 3 (+SR/-HK Referential Indefinites *I saw a black dog this morning*), Type 4 (-SR/-HK Non-referential Indefinites *He wants to buy a hat*), and Type 1 (-SR/+HK Generics *A mango is a tropical fruit*). Compared with the four article types, Type 2 (+SR/+HK Referential Definites *Please pass me the salt*) was relatively easy for her learners. The mean accuracy rates for each semantic type and conventional use on the article test were as follows: *Type 1* (63.22%), *Type 2* (78.20%), *Type 3* (59.72%), *Type 4* (61.16%), and *Conventional Use* (59.24%). Based on the findings, she suggested that extensive article exercises should be provided especially on Conventional Use and Type 3, and more effective methods for teaching these semantic types should be developed.

Extending Park (2005)'s study, Park & Song (2008) explored the underlying causes and reasons why the advanced Korean EFL learners made more errors particularly in Type 3, Type 4 and Type 1 compared to Type 2. From the analysis of the data they obtained from the individual interviews with the participants, they found that misjudgment of both referentiality and noun countability were the two major reasons behind their incorrect use of the articles. Although the Korean advanced learners understood the concept of a hearer's knowledge and

shared knowledge and were able to apply the concept to local contexts, they often misinterpreted a hearer's knowledge in more global, larger contexts. In addition, they had a great deal of difficulty in determining the countability of a noun in a given context when the noun is especially non-countable. From the findings, they suggested a number of effective learning and teaching strategies to improve the learners' judgment of referentiality and noun countability in broader contexts.

In addition to Park (2005) and Park & Song (2008), which investigated article acquisition of the Korean adult learners of English, there have been studies which examined the problems of article acquisition experienced by Japanese adult learners of English (Butler, 1999; Butler, 2002; Yoon, 1993).

Butler (1999) investigated the problems of Japanese learners of English in the acquisition of English articles. Based on the structured interview data with Japanese learners of English, Butler (1999) presented a developmental process through which Japanese learners acquire English articles. According to her analysis, in the earlier acquisition phase, the learners heavily rely on local cues in order to determine articles, and they form their own unique rules and have a fixed notion of countability. In the final phase, they finally grasp the concept of a hearer's knowledge and obtain a more flexible notion of countability. Then, they begin to focus more on global, dynamic context when they determine articles. However, even in the final phase when their English becomes very advanced, they often have problems in judging hearer's knowledge and noun countability, as Park & Song (2008)'s advanced learners.

Butler (2002) also reported that among her five semantic types of English articles, Type 5 use (idioms and other conventional use) was the most difficult for all three proficiency levels of English among her Japanese students. Further, she found that her Type 5 was significantly different in accuracy from the other four types. She argued that since idioms should be memorized one by one not by the application of article rules, it may be natural that using articles accurately in

idioms is very difficult for L2 learners.

Yoon (1993) investigated how learners' judgment on the countability of nouns affects their performance on a cloze test for 24 obligatory indefinite articles. She compared the result to the data obtained from native speakers. From the analysis, she found that for the learners, there was a correlation between the two variables, whereas for the native speakers, no clear relationship was found. From the findings, she argued that the learners had a fixed notion of countability; on the contrary, the native speakers had a flexible notion of countability depending on the context. She argued that one of the reasons why the learners had difficulty choosing correct indefinite articles is that they may not know that native speakers determine the countability of a noun depending on the context where the noun appears.

One of the general findings of L2 article acquisition in terms of three article types is that, for advanced learners, the most difficult article type is the indefinite article 'a/an.' According to Yamada and Matsuura (1982), the overall difficulty order for Japanese advanced learners was, from easier to harder, 'the,'  $\emptyset$ , and 'a/an.' Master (1994) also indicates that "even at the advanced level, 'a' accuracy is the lowest for the three articles, suggesting that it is the most difficult to acquire" (p. 49).

Unlike the first line of research whose main purpose was to improve teaching English articles by drawing pedagogical implications from the findings, the second line of research had more theoretical motivation. The studies in this line have focused more on how learners' starting age affects their ultimate level of proficiency in English articles.

In a study which replicated Johnson & Newport (1989), DeKeyser (2000) retested the CPH (Critical Period Hypothesis) on the acquisition of 10 morphosyntactic aspects of English, which consisted of both UG and non-UG features. From the analysis of the data that he obtained from his 200-item-grammaticality judgment test, he found that learners' starting age are strongly related to their ultimate level of success in L2 learning. The learners who came to the US before the age of 16 performed far better than the learners who arrived after the

age of 16. Along with the analysis of the effect of the critical period on the overall proficiency in L2 morphosyntax, he analyzed the age effect on each of the 10 morphosyntactic features in the instrument. Among the 10 categories, some morphosyntactic categories (the use of articles, the use of position of auxiliaries, the position of adverbs, certain elements of verb sub-categorization, and some uses of the plural morpheme) were found to be sensitive to age effects, whereas the categories such as basic word order, subject-verb inversion, do-support in yes-no questions, and pronoun gender were not. Among the 54 age sensitive morphosyntactic items, all 7 article items (4 determiners used with abstract nouns and 3 determiners omitted in obligatory context) ranked the highest in the size of correlation with age of arrival. For example, the second item in the determiner used with abstract nouns subcategory (DEAB02: *After a life like that he will go straight to the hell\**) ranked the 4<sup>th</sup> ( $r = -.5171$   $p < .01$ ). From the findings, he claimed that as far as article acquisition is concerned, the earlier is better.

Motivated by the findings of DeKeyser (2000), which examined the critical period effect on the acquisition of English articles, Song (2006) reinvestigated the same issue more in depth using an instrument which contains 102 items on a variety of article usages. DeKeyser (2000) examined the issue with only 7 article items, which dealt with very limited usage of English articles. In her study, she controlled several variables that may be confounded with the learners' age of extensive exposure to English, such as the number of years of education in the US and the percentage of the amount of use of English on a daily basis, which most previous studies did not control. As DeKeyser (2000) did, she analyzed the data using the age of 16 as the cut-off. From the analysis of the data of the two groups (early arrival group vs. late arrival group), which are matched according to the variables mentioned above except their age of arrival to the US, she found that although the mean score of the article test of the early group was higher than that of the late group, the difference was not big enough to be statistically significant. From the findings, she concluded that as far as the overall English article acquisition is concerned, starting age didn't mat-

ter much as DeKeyser (2000) argued. She attributed the difference in the results of the two studies to the two factors: a greater number of items in English article usage tested and the better control of variables confounded with starting age.

### **3. The Study**

#### 3.1. Research Motivation

The present study was motivated by DeKeyser (2000), Park (2005), and Song (2006), which were reviewed in the earlier section. As discussed in the section, DeKeyser (2000) found that among the grammatical features that he investigated, some of the features including articles were highly correlated with the participants' starting age of acquisition, and the relationship was statistically very strong. However, structures such as basic word order, pronoun gender and subject-verb inversion did not show differential proficiency as the function of starting age. The participants, regardless of their starting age, eventually learned these structures well. These findings of DeKeyser (2000) led the researcher of the present study to develop a hypothesis that different semantic types and subtypes of English articles which Huebner (1983, 1985) and Butler (1999) classified might show differential correlation with learners' starting age, as the various grammatical features he analyzed.

Such an assumption was also strengthened by Park's (2005) study, which showed that her advanced Korean learners of English differed in the accuracy rate of Huebner's each semantic type in the fill-in-the-blank article test. She found that article types such as conventional use and type 3 were more difficult than type 2 for these learners. The reason behind the results may be that some aspects of English articles such as type 3 are more complex and abstract in their nature; some of English article types such as type 2 are relatively straightforward in the form, meaning, and their form-function relationship. Therefore, adult learners may be able to learn this usage more easily based on the ex-

PLICIT rules they know. That is, all the English article usages may not be challenging for late adult learners; thus, it may be assumed that some types of English articles such as Type 2 may be learned well even after the critical period.

As an extension to DeKeyser (2000), Song (2006) reinvestigated the effect of the critical period in the acquisition of English articles. She found that the overall article proficiency between the early group ( $AOA \leq 16$ ) and the late group ( $AOA > 16$ ) was not significantly different, when the variables confounded with the AOA were controlled. Although her study was very significant in that she focused on one specific feature with a great number of items, she did not analyze the impact of the critical period on each specific semantic article type. Though overall proficiency did not differ between the two groups, the two groups might differ in some aspects or types of English articles. Furthermore, careful examination of her data revealed that her participants with AOA between 13 and 16 had significantly much lower test scores than the participants with AOA below 13, which may lead to lowering the mean score of the early group, and consequently yielding the result of no difference between the two groups. Since English articles have been known as one of the features for which early acquisition occurs, it would be interesting and meaningful to reinvestigate the age effect in the acquisition of English articles by lowering the critical point to the age of 12, as many CPH researchers have done (Birdsong, 1992; White & Genesee, 1996; Cranshaw, 1997; Van Wuijtswinkel, 1994). Therefore, this study, using the age of 12 as the critical point, reanalyzes the data of Song (2006) in terms of the effect of starting age on the ultimate level of overall article proficiency as well as the proficiency of 5 article types including the conventional use and 22 subtypes of English articles.

From these rationales, this study aims to explore the following questions: Do early learners ( $AOA \leq 12$ ) are better than late learners ( $AOA > 12$ ) in the overall proficiency in English articles in the long run?; If they do, do they learn all the different semantic types of articles better than late learners?; Aren't there any types of English ar-

ticles that late learners can learn equally well as early learners despite their late start?; What are the types of English articles that adult late learners can't learn well even after many of years of education and long residence in the target language country?; Which types of English articles are more sensitive to starting age, and why?"

If this study can find the answers for these questions, it can contribute to deepening the understanding of the phenomenon of age effect in SLA by adding the critical information that the critical period effect does not apply to all the aspects of one grammatical feature across the board. In addition, as argued in the earlier section, the findings of this study can help both learners and teachers set a more effective and realistic goal for learning and teaching English articles. For example, this study can help our learners understand why some aspects of English articles are very difficult to learn, and provide them with research-based information about what they can and can't improve easily and why it is difficult for adult second language learners of English to achieve near-native proficiency in articles. In addition, the findings of this study can also help our English teachers to set different expectations for their students' learning progress and outcome for each type of English articles, and make a different approach for teaching each article type.

### 3.2. Research Hypotheses

The findings from the previous studies and rationales presented in the previous sections led to the following hypotheses:

Hypothesis 1: When the cut-off age for the critical point is lowered to 12 instead of 16, the overall article proficiency between the early group and the late group may differ.

Hypothesis 2: Early learners ( $AOA \leq 12$ ) will not outperform late learners ( $AOA > 12$ ) in all 5 major types and subtypes of English articles. Although there will be some article types for which early

learners do better in the long run, there will be some article types for which the late learner group performs as well.

Hypothesis 3: Not all the 5 types and 22 subtypes of English articles will equally be sensitive to learners' starting age of acquisition. Some article types and subtypes such as type 3 will have higher correlation with AOA, whereas some article types and subtypes such as type 2 will have lower, or even no correlation with AOA.

## 4. Method

### 4.1. Data Source

The data used for this study originated from Song (2006), in which she retested the CPH for Korean immigrants' acquisition of English articles. In the study, she utilized a modified version of the fill-in-the-blank article test developed by Park (2005). The test comprised of 102 items which represented 5 types and 22 subtypes of English articles. She obtained the data by administering the test to 82 Korean speakers of English who were living in the United States (36 male and 46 female). In order to test the participants' ultimate level of acquisition rather than the rate of acquisition, only the immigrants whose minimum length of residence was 10 years were selected. The participants varied in their age of arrival to the United States, the occupation, the number of years of education in the United States, the length of residence in the US, and the percentage of daily English use.

The original data, which were coded with the AOA of 16 as a cut-off, were recoded using the AOA of 12 as a cutoff. Among the 82 participants, the number of the participants who arrived in the country before the age of 13 was 31, and the number of the participants who arrived after the age of 13 was 51. The average number of years of education in the US was 13.12 years for the early arrival group, and 4.56 years for the late arrival group, and the average length of the residence for the early arrivals was 17.58 years, and 18.61 years for the

late arrivals. The participants who arrived in the US before 13 used English 74.64% daily, whereas those who arrived after 12 used English 45.49% daily.

From the re-coded data, the present study randomly selected 17 participants from the early arrival group ( $AOA \leq 12$ ), and 17 participants from the late arrival group ( $AOA > 12$ ) without looking at their article test scores until the two groups statistically differed only in their age of arrival ( $t = -6.93$ ,  $p = .000$ ) and not in the other variables: the length of residence ( $t = -1.45$ ,  $p = .155$ ), number of years of education in the United States ( $t = 1.77$ ,  $p = .085$ ), the percentage of English use on a daily basis ( $t = 1.85$ ,  $p = .072$ ). The reason for selecting such two subgroups of 34 participants from the original data source of the 82 participants was to examine the pure effect of starting age (AOA) or critical period on acquisition of each type and subtype of English articles since the variables such as the English use, the number of years of education in the target country were known to be confounded with AOA.

In addition to the article test, Song (2006) distributed a background questionnaire on the participants' age of arrival to the United States, the number of years of education in the US, the length of residence in the US, and the percentage of English and Korean use on a daily basis.

In order to obtain the control group data, Song (2006) also administered the same test to 5 native speakers of English who also varied in their background (For more information on the participants, settings, and data collection procedures, see Song 2006).

#### 4.2. Types and Subtypes of English Articles in the Study

The article test modified from Park (2005) contained 40 short passages, in which 102 selected articles were made into blanks. Among the 40 passages, 32 passages were excerpted from written texts, and 8 were selected from spoken texts. The selected 102 articles represented Huebner's four semantic types (Types 1-4), under which 19 semantic subtypes are categorized, and 3 subtypes under Butler's (1999) conven-

tional use category.

Table 1 shows the coding of each subtype, the example, and the number of items in each type and subtype.

**Table 1.** Types and Subtypes of English Articles

Types and Subtypes	Examples	No of items
Type 1 [-SR/+HK]	Generics	19 items
T1SG (a/an)	<u>A banana</u> is a tropical fruit.	5
T1SG (the)	<u>The telephone</u> was invented by Bell.	3
T1PG	<u>Dogs</u> are loyal to us.	3
T1ZG	<u>Sugar</u> is sweet.	6
Type 2 [+SR/+HK]	Referential Definites	24 items
T2IS	Would you please open <u>the door</u> ?	4
T2LS	I need to pick up my dad at <u>the station</u> .	4
T2ANA	I had a sandwich for lunch. <u>The sandwich</u> was very good.	4
T2AANA	We had a good time on holiday. <u>The hotel</u> was very good.	4
T2PM	<u>The state</u> of women's health was poor.	4
T2SUA	She was <u>the best</u> teacher.	4
Type 3 [+SR/-HK]	Referential indefinites	22 items
T3FMS (a/an)	I bought <u>a house</u> last week.	10
T3FMP	Dad gave me <u>gifts</u> .	4
T3FMZ	He split <u>milk</u> on the floor.	8
Type 4 [-SR/-HK]	Non-referential Indefinites	21 items
T4AIS (a/an)	He is <u>a lawyer</u> .	5
T4AIP	They are <u>students</u> .	2
T4AIZ	It is <u>sugar</u> .	4
T4NSIS	I should buy <u>a notebook</u> .	6
T4NSIP	I am going to buy <u>books</u> .	2
T4NSIZ	I need to buy <u>wine</u> .	2

Types and Subtypes	Examples	No of items
Conventional Use Type		16 items
C-MI	Did you have <u>breakfast</u> today? My mom goes to <u>hospital</u> .	5
C-GPN	Lake Saint-Louis, The Atlantic Ocean	7
C-NBI	The Kennedy Center, Carnegie Hall	4

\* Note: T1SG(a/an)=Type1 Singular Generic; T1PG=Type1 Plural Generic; T1ZG=Type1 Zero Generic; T2IS=Type2 Immediate Situation; T2LS=Type2 Larger Situation; T2ANA=Type 2 Anaphoric; T2AANA=Type2 Associative Anaphoric; T2PM=Type2 Postmodification; T2SUA=Type 2 Superlative and Unique Adjectives; T3FMS(a/an)=Type 3 First-mention Singular; T3FMP=Type 3 First-mention Plural; T3FMZ=Type 3 First-mention Zero; T4AIS (a/an)=Type 4 Attributive Indefinites Singular; T4AIP=Type4 Attributive Indefinites Plural; T4AIZ=Type 4 Attributive Indefinites Zero; T4NSIS (a/an)=Type4 Nonspecific Indefinites Singular; T4NSIP=Type 4 Nonspecific Indefinites Plural; T4NSIZ=Type 4 Nonspecific Indefinites Zero; CMI=Conventional Use -Meals & Institutions in Society; C-GPN=Conventional Use-Geographical Place Names; C-NBI=Conventional Use-Names of Buildings & Institutions.

\* The table 1 was modified from Park (2005) and Song (2006).

### 4.3. Data Analysis

In order to test the first hypothesis, the overall article test scores between the early arrival group and the late arrival group were compared using the independent *t*-test. The second hypothesis, which examines the performance differences in the 5 types and 22 subtypes of English articles between the two groups, was also tested using multiple independent *t*-tests. The third hypothesis about the degree of sensitivity of each type and subtype to the critical period effect was tested using correlation analysis.

## 5. Results and Discussion

The first objective of this study was to examine whether there is a difference in the overall performance on the article test between the early arrival group and the late arrival group when the critical point

was lowered to 12 years old. The second objective was to compare the two different AOA groups in their test performance on 5 types and 22 subtypes of English articles to find out which types and subtypes adult late Korean speakers can and can't learn well, compared to the speakers who started early. Finally the third objective was to explore the types or subtypes which are most sensitive to the starting age. For each objective, a specific hypothesis was established. The results of data analyses are presented and discussed for each hypothesis.

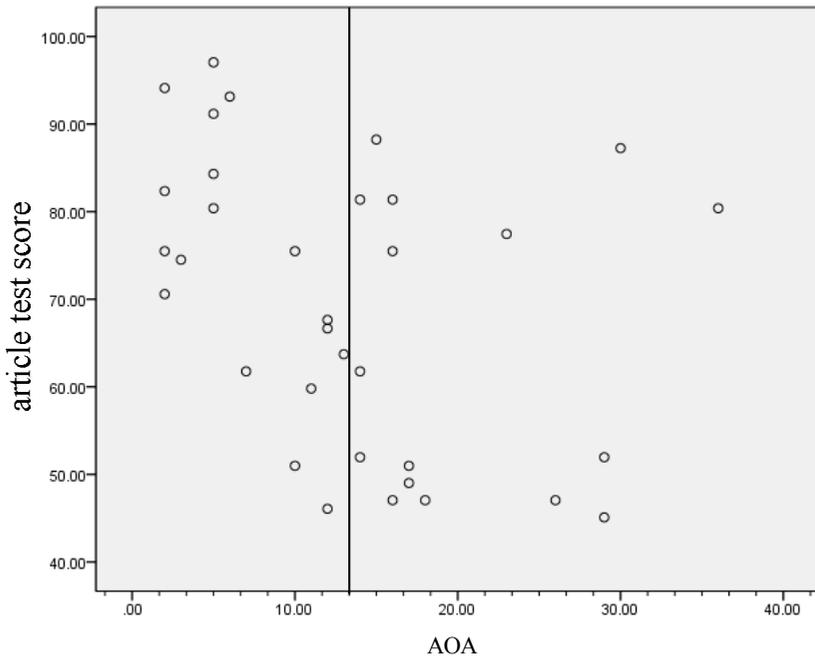
### 5.1. Research Hypothesis 1

The first hypothesis of the study was that when the cutoff point was lowered to 12 instead of 16 years old, the ultimate level of article proficiency between the early arrival group and the late arrival group would differ. English articles have been claimed as one of the structures that are better acquired implicitly in the early part of life; thus, this study hypothesized that the participants who arrived in the US early would have higher proficiency in English articles than those who arrived late.

According to the analyses of the data, the mean article test score of the 17 participants who had arrived in the US before the age of 13 was 74.79 % ( $SD=14.94$ ), and that of the 17 participants who had arrived in the country after the age of 12 was 63.95% ( $SD=16.24$ ). When the two mean percentage scores were compared using the independent  $t$ -test, the difference was found to be insignificant at 0.05 level ( $t=2.025$ ,  $p=.051$ ). From the result, we might interpret that the starting age may not affect the ultimate attainment of English article proficiency. However, a strong claim should not be made as to the result since the obtained  $p$  value (0.051) is marginally higher than the 0.05 significance level. Therefore, care should be given when interpreting the result.

Figure 1 presents scatterplots for AOA and article test score of the two matched groups which only differ in their AOA. Although the two groups were found to be similar in their ultimate level of attain-

ment in overall article proficiency, the scatterplot for each group presents quite a different picture when it is divided into two parts before and after the critical point of 12 years old. The article test scores and AOA of the 17 early arriving participants have the pattern of negative correlation, whereas those of the 17 late arriving participants have no such a pattern. That is, below the critical point of age 13, the younger the participants arrived in the US, the higher scores they received. However, after the critical point of age 12, the younger did not necessarily performed better than the older. The correlation analysis results support the observation. The correlation between AOA and the test scores of the early arrival group was  $r=-.640$  ( $p=.006$ ), which indicates strong relationship, and that of the late arrival group was  $r=.047$  ( $p=.857$ ), which indicates almost no relationship between the two variables.



**Figure 1.** Scatterplot for AOA and article test scores of the two matched groups.

This result is in line with the results of the previous pro-CPH research which showed that there was age effect for early groups, whereas there was no age effect for late groups. Based on the results, pro-CPH researchers have argued that learners who started before a certain critical period had innate neurological advantage over learners who started after it (DeKeyser, 2000). In the present study, the mean score difference between the two groups (74.79% for early group vs. 63.95% for late group) did not differ statistically. However, as mentioned above, since the statistical probability ( $p=.051$ ) was slightly higher than the significance level of 0.05 by 0.001, the result is not clear-cut enough to strongly argue for the no-age effect; in other words, it is not easy and straightforward to interpret the obtained statistical result. This may help to understand why the scatterplot show a different pattern of correlation for each of the two AOA groups. If the article test mean score difference were less greater and the  $p$  value were far higher than the obtained value, the scatterplot pattern for the younger group might show a similar pattern to the older group.

In addition, the 4 participants who scored above 90% from the test were all in the early arrival group, and their scores and AOAs were 94.11% (AOA 2), 97.05% (AOA 5), 91.17% (AOA 5), and 93.13% (AOA 6), although none of the participants received the scores within the native speakers' score range (95.09%~100%). The mean percentage score of the 5 native speakers in the control group was 97.56%. However, no participants in the late arriving group scored above 90% from the test. The two highest scores from the late arrival group were 88.23% (AOA 14) and 87.25% (AOA 30). It is interesting to note that only early starters (AOA<7) reached the level approximating to that of native speakers despite the fact that the late starters were all similar to the early starters in factors such as length of residence, years of education, and use of English. The only different factor between the two groups was the starting age. These results may indicate that one should start to learn English at least before 7 years old if he/she is to attain the article proficiency which approximates to that of native speakers. The late starters, although their mean proficiency is similar

to that of early starters and some of them attained upper 80%, couldn't reach the near-native level as some of the early starters did.

The next section evaluates the hypothesis 2 by presenting the results of independent *t*-tests on the 5 major types and 22 subtypes of English articles.

## 5.2. Research Hypothesis 2

The second hypothesis was that early starters would not excel in all 5 major types and 22 subtypes of English articles, and there would be some types for which late learners do as well. Table 2 presents descriptive statistics and the results of the independent *t*-tests of the two AOA groups.

**Table 2.** Means, SD, and the Results of the Independent *t*-tests of the 5 Types and 22 Subtypes of the English Articles of the Early Starters and the Late Starters

	Early starters		Late starters		<i>t</i>	<i>p</i>
	Mean(%)	SD (%)	Mean(%)	SD (%)		
T1SG(a/an)	77.65	26.35	77.65	25.35	.0	1.000
T1SG(the)	78.82	21.76	67.06	23.39	1.518	.139
T1PG	56.86	38.67	35.29	34.30	1.721	.095
T1ZG	55.88	36.77	50.00	42.49	.432	.669
T1	67.78	22.09	59.75	23.46	1.030	.311
T2IS	94.12	10.93	92.65	11.74	.378	.708
T2LS	91.18	17.55	92.65	27.87	.921	.364
T2ANA	82.35	21.22	77.94	17.68	1.098	.281
T2AANA	80.88	25.82	70.59	23.78	1.209	.235
T2PM	66.18	26.43	67.65	24.63	-.168	.868
T2SUA	91.18	15.16	85.29	15.46	1.120	.271
T2	84.28	11.64	79.16	11.12	1.311	.199
T3FMS(a/an)	80.59	19.84	70.59	19.52	1.482	.148
T3FMP	83.82	27.87	60.29	43.35	1.882	.069

	Early starters		Late starters		<i>t</i>	<i>p</i>
	Mean(%)	SD (%)	Mean(%)	SD (%)		
T3FMZ	58.09	27.58	37.50	33.37	1.961	.059
T3	72.99	19.05	56.68	23.30	2.235	.033*
T4AIS(a/an)	87.06	17.24	78.82	27.81	1.038	.307
T4AIP	82.35	30.32	64.71	45.98	1.321	.196
T4AIZ	70.59	25.36	51.47	37.99	1.726	.094
T4NSIS	78.43	28.12	74.51	24.38	.435	.667
T4NSIP	73.53	35.87	55.89	42.87	1.302	.202
T4NSIZ	55.88	39.06	47.06	37.38	.673	.506
T4	76.75	16.31	65.82	22.91	1.601	.119
C-MI	54.12	30.63	30.59	32.49	2.173	.037*
C-GPN	84.87	17.84	72.26	16.34	2.148	.039*
C-NBI	58.82	21.54	52.94	8.30	1.050	.301
C	68.75	19.52	54.41	15.90	2.349	.025*

Among the 5 major types of the English article, conventional use type and type 3 were found to be statistically different in the mean test scores ( $t=2.35$ ,  $p=.025$  for conventional use type;  $t=2.24$ ,  $p=.033$  for type 3). The mean differences between the two AOA groups in the other three types were not big enough to be statistically significant ( $t=1.03$ ,  $p=.311$  for type 1;  $t=1.31$ ,  $p=.199$  for type 2;  $t=1.60$ ,  $p=.119$  for type 4).

Among the 22 subtypes, only two subtypes (C-MI and C-GPN) in the conventional use type were found to be statistically different in the mean test scores ( $t=2.17$ ,  $p=.037$  for C-MI;  $t=2.15$ ,  $p=.039$  for C-GPN). The mean score differences for T3FMZ and T3FMP in type 3 and T4AIZ in type 4 were quite large (20.05%, 23.53%, 21.1%), but they didn't turn out to be statistically significant ( $p=.059$  for T3FMN;  $p=.069$  for T3FMP;  $p=.094$ ).

For T1SG, T2PM, and T2IS, the two age groups showed least difference in their mean scores (0% for T1SG, 1.4% for T2PM, 1.5% for

T2IS). Out of the 22 subtypes, the only one type for which the late starting group excelled the early starting group was T2PM (67.6% vs. 66.2%); however, their mean difference was not statistically meaningful ( $t = -0.16$ ,  $p = .868$ ).

As hypothesized in the previous section, the early arrival group did not outperform the late arrival group in all 5 types and 22 subtypes of English articles. The early starters outperformed the late starters in two types, which are conventional use type and type 3, and in two subtypes of conventional use type; however, the late starters did not excel the early starters in any of the 5 types and 22 subtypes. Since the two groups are similar in their length of residence, number of years of education, and daily use of the target language, and differ only in the age of being extensively exposed to the target language, it can be claimed that the conventional use type and type 3 are better learned in young age when implicit acquisition occurs more easily and naturally. This result shows that if learners start to acquire a second language after the critical period of 12 years old, they are generally not likely to learn the conventional use type and the type 3 of English articles as well as early learners no matter how much input and education they get in the target language country.

The findings of the study are similar to Park (2005), which found that among the 5 types of English articles, her 72 advanced Korean college and graduate students who lived in the target language country from 0 years to 5 years had more difficulty in learning conventional use, Type 3 and Type 4 than Type 1 and Type 2. The most challenging type for her participants was type 3, followed by conventional use and Type 4. The findings of the present study clearly show that even after living in the target language country for more than 10 years and receiving many years of education in the target language country, the late starting learners were not able to learn English article usage related to the conventional use and Type 3 as well as the early starting learners. Therefore, from the result, it may be argued that the article types such as conventional use and Type 3 are better learned when L2 acquisition begins early (before 13 years old).

A question remains, then, as to the reasons why conventional use type and Type 3 articles are better learned at early ages. The article type for which the two groups showed greatest difference in the test scores was the conventional use type. Since there are few categorical rules for selecting a correct article for a referent in the conventional article type (e.g. I had breakfast. She is in college. Lake Sainte-Louis, The Atlantic Ocean, The Kennedy Center, etc.), the learners in both groups may have depended on their intuition or feel, which may have been formed implicitly. As claimed in the previous section, children are known to be generally better at learning things implicitly without depending on explicit rules, whereas adults are better at learning things explicitly. Article use in the conventional type is not rule-based, but item-based; it's random and unpredictable. Therefore, it is not easily acquired through explicit processing but better acquired implicitly because there are so many exceptions and idiosyncratic uses. Thus, early starters may have advantage of learning these types of articles through implicit learning mechanism, whereas late starting adult learners may have difficulty in learning these types due to the disappearance of such innate ability

A similar reason can be found for Type 3 articles. The type 3 article is used for a first-mentioned noun. In other words, when a noun is specific to the speaker, but first introduced and not known to the hearer, a type 3 article is used (e.g. I saw a black dog this morning. There's wine on sale). However, in order to use this article type well, learners should be able to determine first whether or not the hearer can identify a specific referent through the given context. Learners are usually successful for indentifying the hearer's knowledge in a local context, but not always in a global context. Therefore, in a more global context, even though the referent is first introduced, learners often wrongly assume that the referent can be identified by the hearer through the given context. Thus, they incorrectly use type 2 definite articles instead of type 3 indefinite or zero articles due to the misunderstanding of presupposition. Furthermore, even when learners correctly determine the relationship between the speaker and the hearer, they also have to decide whether the referent is a countable noun or

non-countable noun given the context. Since there is no straightforward relationship between a form and a function, and the decision often depends on a variety of contexts where the referent is used, it is very difficult to learn the usage because no explicit rules exist. Therefore, as argued above, type 3, whose underlying rule is abstract and probabilistic, may be better learned at a young age when implicit acquisition of abstract structures are known to occur easily and naturally.

### 5.3. Research Hypothesis 3

The third hypothesis was that types of English articles would have different sensitivity to the starting age of acquisition. More specifically, this study assumed that type 3 would have higher correlation with AOA than type 2. To test this hypothesis, a Pearson moment correlation test was run. Table 3 shows the results.

**Table 3.** 5 Types and 22 Subtypes of English Articles Ordered by Size of Correlation with Age of Arrival

	<i>p</i> < .05		<i>p</i> ≥ .05	
5 Major types	-.441 T3			
-	-.357 T4	-.193 T1		
	-.349 C	-.172 T2		
22 Subtypes	-.397 T3FMZ			
	-.355 T3FMP	-.329 C-MI	-.222 C-NBI	
	-.355 T4NSIP	-.324 T4AIZ	-.198 T4AIS (a/an)	
		-.316 T3FMS	-.195 T2SUA	
		-.308 T1PG	-.169 T1ZG	
		-.291 T4AIP	-.109 T4NSIS	
		-.290 C-GPN	-.106 T2AANA	
		-.249 T2IS	-.058 T2LS	
		-.243 T4NSIZ	-.044 T1SG(a/an)	
		-.242 T2PM	-.035 T1SG(the)	
		-.231 T2ANA		

Depending on whether or not the correlation of the score of each type with AOA was high (*r* significant at .01 < *p* < .05) or low (*r* not sig-

nificant at  $p \geq .05$ ), all 5 types and 22 subtypes were divided into two groups. As shown in Table 3, among the 5 types, type 3 was found to have the highest correlation with age of arrival ( $r = -.441$ ,  $p = .009$ ), followed by type 4 ( $r = -.357$ ,  $p = .038$ ) and conventional use type ( $r = -.349$ ,  $p = .043$ ). Type 1 and type 2 were not found to be sensitive to the starting age of the learners ( $r = -.193$ ,  $p = .275$  for type 1;  $r = -.172$ ,  $p = .331$  for type 2).

Among the 22 subtypes of the English article, only 3 subtypes were found to be sensitive to the learners' age of arrival. The subtype that turned out to be the most sensitive to the starting age of acquisition was T3FMZ, type 3 first-mention zero ( $r = -.397$ ,  $p = .020$ ), followed by T3FMP, type 3 first-mention plural ( $r = -.355$ ,  $p = .039$ ), and T4NSIP, type 4 nonspecific indefinites plural ( $r = -.356$ ,  $p = .040$ ).

The fact that certain types of English articles are more sensitive to the age of exposure than others begs for an explanation. Flege, Yeni-Komshian, and Liu (1999) argued that rule-based grammatical items were less affected by increasing AOA than were irregular, ungeneralizable (lexically based) grammatical items. Pinker (1999) also claimed that irregulars are sensitive to the item's frequency in the input and better acquired implicitly. Compared to type 1 and type 2, which generally involves concrete, rule-based uses, type 3, in particular, is abstract, not rule-based; rather, its use depends on unpredictable, global contexts. For example, in the use of T2SUA (Suplative and unique adjectives), a definite article *the* is always used before the words such as *best*, *only*, etc. (e.g. *She was the best teacher*). In addition, in the T2IS (immediate situation), the learners do not have to ponder over whether they should use either *the* or *a/an* or zero article because a referent in immediate situation always takes *the* (e.g. *Would you please open the door ?*). This is why T2IS type turned out to be easy to learn even for the late starting participants.

However, in Type 3 uses, the use of an article is conceptually and semantically complex and not straightforward, unlike many of the type 2 uses. For example, in order to use a type 3 article correctly, the learner first should determine whether a referent is known to the hear-

er within a given context, and then whether the referent is a countable or non-countable noun (e.g. He split milk on the floor). The decision for using a zero article for the referent *milk* is not rule-based, but should be made by considering the given context where the word milk is used. Like type 3 uses, the use of type 4 articles has a similar problem of determining countability of a referent, which has no clear form-function relationship. For type 5, conventional use, as mentioned in the previous section, although there are some rules for determining articles (e.g. no articles for the names of lakes, parks, stations, etc.), there are many exceptions. They are generally ungeneralizable, lexically-based items.

From the results, it can be argued that the earlier the Korean learners start to acquire English, the better they are likely to learn type 3, type 4, and conventional use type. For example, those who start to learn English at the age of 4 are likely to perform better in the three types of the English article than those who begin to learn at the age of 5, 7, 10, 14, etc., for example. However, this study suggests that the acquisition of the other two types such as type 1 and type 2 is not sensitive to the starting age.

## **6. Conclusions and Practical Implications**

Pointing out the methodological problem of setting the age of 16 as a critical point in Song (2006), this study first investigated whether there are age effects when the cutoff age was lowered to 12. Contrary to the hypothesis, no critical period effect was found for the data of the 34 Korean speakers of English. In other words, the early arrivals and the late arrivals didn't differ in the overall average article test scores. This result may indicate that starting age of acquisition is not a critical factor in determining the ultimate level of overall English article acquisition. However, as mentioned in the result section, the *p* value which almost reached to the significance level and the careful examination of the scatterplot lead to the minor modification of the

conclusions above. It is true to say that starting age may not matter in the acquisition of English articles in the overall sense; however, it is also difficult to totally deny the age effect in the acquisition of English articles due to the marginal *p* value. From the findings of the study, it can be claimed that one should begin to learn a L2 as early as 7 years old if he/she wishes to obtain the ability which approximates to a native speaker's level of acquisition.

In addition to the overall effect of starting age on English article acquisition, this study also aimed to explore the age effect on each major type and subtype of the English article. Among the 5 major types and 22 subtypes of the English article, the early arrivals were found to excel the late arrivals in the conventional use type and type 3, C-MI (conventional type- meals and institution), and C-GPN (conventional type- geographical place names). Except these 2 major types and 2 subtypes of the English article, the two age groups did not differ in the ultimate level of the rest of the types and subtypes of the English article. The result shows that age effect in the acquisition of English articles depends on the type or subtype of the English article. The types which involve rather abstract and irregular form-function relations were found to be acquired better by the early starting group than by the late starting group. From the finding of the study, it can be argued that it is advantageous to acquire the conventional use type and type 3 before the age of 13 when the innate ability to learn abstract, irregular patterns easily and naturally exists.

The last major purpose of the present study was to investigate the types and subtypes of the English article which are most sensitive to the starting age of acquisition. From the correlation analyses, it was found that type 3 is the most sensitive to AOA, followed by type 4, and conventional use type. Among the 22 subtypes, T3 FMZ (type 3-first mention zero), T3FMP (type 3- first mention plural), and T4 NSIP (type 4- non-specific indefinites plural), all of which involve the use of no-article, were found to be most sensitive to the age of arrival to the target language country. From these findings, it can be concluded that the younger is the better as far as the acquisition of type

3, type 4, conventional use type, and subtypes such as type 3 first-mention zero, type 3 first-mention plural, and type 4 non-specific indefinite plurals. Due to the ungeneralizable, abstract, irregular form-function relation, these grammatical items should be learnt as early as possible.

English articles have been known as one of the most challenging grammatical structures for Korean learners of English. Even highly advanced adult learners are often heard to say that they still have no confidence in English articles, and many feel that early acquisition is a must to possess ability similar to that of native speakers. Teachers are also often frustrated over how to teach English articles more effectively and why they can't help their students reach the near-native proficiency level. Despite their efforts, most students continuously have problems in using English articles correctly.

As for the belief that one must start to learn English early in his/her life to reach the near-native level, the findings of the study suggest that the claim is not necessarily true. The participants who started acquisition before the age of 13 did not perform better than the participants who did after the age. More importantly, the average total article score of the early group (74.79%) was far below that of native speakers (97.56%), although there is only one participant (AOA 5) who reached within the range of native speakers (95.09-100%). Even after living in the target language country for more than 15 years and receiving an average 10 years of education, the majority of Korean immigrant learners were not able to master English articles regardless of the age of arrival. These results imply that it is extremely challenging and rare for Korean learners to master English articles, and that starting age is not a crucial factor in determining ultimate level of overall English article proficiency. Therefore, rather than be frustrated over not being able to master English articles, Korean learners should set a more realistic goal and make their efforts to keep improving English articles with a positive attitude.

However, in an effort to improve the English article, Korean learners should be informed of which types and subtypes are or are not af-

ected by starting age. For example, learners should know that type 1 and type 2 English articles have no age effect and thus can be learned well, whereas type 3, type 4, and conventional use type have age effect, and is not relatively learned well. Teachers should also be informed of these research findings and develop different teaching methods for each type and subtype of English articles. For instance, teachers should approach type 1 and 2 more explicitly, instructing their students to apply concrete and explicit article rules, while they need to approach type 3, type 4, and conventional use type more implicitly by presenting ample amount of input that contains such types of articles. They also should tell their students not to be frustrated over not being able to reach a level which is comparable to that of English native speakers.

Many researchers and teachers have attempted to find out reasons for why Korean learners have difficulty in learning English articles. The present study was one of those endeavors to find the answer for the same problem, but this study has a significance in that it investigates the problem from a unique perspective of the critical period of language learning, which no other previous studies have considered so far. The current study, in this sense, has a value and significance.

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Mi-Jeong Song  
Dept. of English Language and Literature  
College of Humanities  
Seoul National University  
San 56-1, Sinlim-dong, Kwanak-gu, Seoul 151-742, Korea  
E-mail: mjs@snu.ac.kr

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