Acquisition of English P-modifiers by Korean Learners*

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Kim, Jung-Tae. 2012. Acquisition of English P-modifiers by Korean Learners. *The Linguistic Association of Korea Journal. 20*(2). 1-21. The present study examined adult Korean learners' knowledge of the modificational hierarchy instantiated in English multiple P-modifiers. One hundred seven native speakers of Korean, along with a control group of 15 native speakers of English, participated in two types of experimental tests (preference and grammaticality judgment tests) designed to investigate the UG accessibility in the EFL context and the effects of ESL experience on the acquisition of the target knowledge. The results showed that 1) Korean EFL learners, regardless of whether they are intermediate or advanced learners, are sensitive to the universal hierarchy that a Degree modifier occupies the higher position than a Flow or a Trajectory modifier although they are not aware of the hierarchical relation between the Flow and Trajectory modifiers; and 2) Learners who experienced the ESL context for an extensive period of time have attained more robust knowledge of the hierarchy than those who did not. From these results, it is argued that while UG-based L2 acquisition of the target grammar may be possible, the role of input is also crucial in developing and consolidating the L2 grammar like the present one.

Key Words: prepositions, modifiers, hierarchy, UG, ESL, EFL

1. Introduction

It has been well known that there are certain universal hierarchies in the

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domain of the prepositional phrase (PP) structure. For example, as shown in (1), a hierarchy exists among directional preposition (PathP), locational preposition (Place P), and a locative nominal projection (LocN) (e.g.,Koopman, 2000; van Riemsdijk, 1990).

(1) [$_{PathP}$ from [$_{PlaceP}$ on [$_{LocN}$ top [$_{P}$ of [$_{DP}$ the building]]]]]

Although manifestations of the category P differ greatly from language to language (e.g., prepositions, postpositions, particles, or affixes), this hierarchy is shown universally in most languages (e.g., van Riemsdijk, 1990; van Riemsdijk & Huybregts, 2007; Stringer, 2008).

Just as there are universal orderings for the prepositions inside PP, it has also been known that there is a structural hierarchy among the modifiers for the PP. The following English sentence contains a spatial PP modified by two P-modifiers, *right* and *back*.

(2) The bat flew [*right back* [$_{PP}$ into the cave]].

When the two words *right* and *back* co-occur to modify the spatial PP, they occur in a fixed order, not allowing the reverse order. English is known to have at least three different types of P-modifiers and a relatively robust structural hierarchy exists among them (Stringer, 2005). As we will see in detail in the following section, the hierarchy is argued to be universal as the same hierarchy is observed in other languages. However, not all languages lexicalize all types of modifiers. This raises a question of whether L2 learners can acquire the hierarchy of P-modifiers when it is absent in their L1. This question may also be related to the question of whether L2 learners can overcome the poverty of stimulus as this type of modifier hierarchy is sparsely evidenced in the input and a formal instruction is rarely given in this domain.

The present study investigates the knowledge of the hierarchy of English P-modifiers possessed by Korean learners of English. In the following section, an overview of the syntax of P-modifiers as well as some of the current SLA theories relevant to the current study will be presented.

2. Backgrounds and Hypotheses

2.1. Hierarchy in Spatial Modifiers

In English, at least three types of P-modifiers are distinguished: Degree, Flow, and Trajectory P-modifiers (Stringer, 2005). (3a), (3b) and (3c) show an example of each of these three types, respectively.

(3) a. John drove [*right* [$_{PP}$ into the tunnel]]. (Degree)
b. John drove [*on* [$_{PP}$ into the tunnel]]. (Flow)
c. John drove [*down* [$_{PP}$ into the tunnel]]. (Trajectory)

Although hard to define precisely, Degree modifiers are generally known to denote the 'completeness', 'exactness' and 'directness'. The most common Degree P-modifiers in English are *right* and *straight*. Flow modifiers typically express the continuation or reversal of the directional flow. Lexical items *on* (continuation) and *back* (reversal) belong to this type. Trajectory modifiers elaborate on simple trajectories, and include *up*, *down*, *through*, *over*, and *across*. P-modifiers in this type appear as prepositions, but function as modifiers of a spatial PP.

Different types of P-modifiers can occur together to modify a single PP as shown in (4).

(4) John drove [*right* $_{(Deg)}$ *on* $_{(Flow)}$ *down* $_{(Traj)}$ [$_{PP}$ into the tunnel]].

The displacement tests below show that the italicized lexical elements above are indeed modifiers for a PP (thus, P-modifiers), not verb particles.

(5) a. It was [*right on down* into the tunnel] that John drove.
b. *It was [*down* into the tunnel] that John drove *right on*.
c. *It was [into the tunnel] that John drove *right on down*.

When different types of P-modifiers co-occur, there is a fixed word order: Degree modifiers always precede Flow and Trajectory modifiers, and Flow modifiers always precede Trajectory modifiers (Stringer, 2005). If a sentence

deviates from this word order, it becomes ungrammatical, as shown in (6b)~(6f).

(6) a. John drove [*right* (Deg) *on* (Flow) *down* (Traj) [into the tunnel]]
b. John drove ??[*right down on* [into the tunnel]].
c. John drove *[*on right down* [into the tunnel]].
d. John drove *[*on down right* [into the tunnel]].
e. John drove *[*down right on* [into the tunnel]].
f. John drove *[*down on right* [into the tunnel]].

It should be noted here that prosody is critical in the parsing of multiple modifiers. Compare the sentence (7a), (7b) and (7c). *P* indicates the prosodic boundaries.

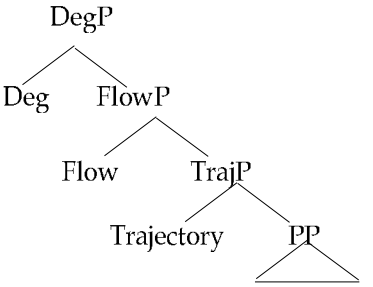
(7) a. The bird flies [$_P$ *right down* [into the cave]]. [Deg [Traj]]
b. The bird flies *[$_P$ *down right* [into the cave]]. *[Traj [Deg]]
c. The bird flies down [$_P$ *right* [into the cave]].

The insertion of pauses and shifting of stress can assign a different syntactic structure to the same string of words. Although (7b) and (7c) exhibit the same word order, *down* in (7b) is a trajectory P-modifier in the given prosodic interpretation while *down* in (7c) is an adverb modifying the verb. Therefore, (7b) is ungrammatical as the Trajectory P-modifier precedes the Degree P-modifier, whereas (7c) is a grammatically flawless. This means that if the language speaker's knowledge of the modificational hierarchy is to be tested, proper controls must be made to prosody of the test items.

For the purpose of the current study, we will assume the following structure for the phrasal structure of the multiple P-modifiers.[1)]

1) This structure is consistent with the proposals made for the fixed hierarchy of adjectives (Cinque, 1994; Shlonsky, 2004) and adverbs (Alexiadou, 1997; Cinque, 1999) in that each type of adposition sets up a distinct functional projections. While an argument could be made on whether the above analysis best represents the adpositional hierarchy, the research goals in this article remain the same regardless of the syntactic structure adopted. The same structure is also adopted by Stringer et al. (2011).

(8)



Interestingly, the same hierarchy is known to be observed in other languages. According to Stringer, Burghardt, Seo, and Wang (2011), not all languages lexicalize all types of P-modifiers, but when two or more are found, they follow the same hierarchy. For example, German, which has all three types of P-modifiers, shows the same hierarchy as English. In Estonian and Hungarian, which have only Degree and Flow P-modifiers, Degree P-modifiers always precedes Flow P-modifiers. When a language has only one P-modifier, it is always the Degree modifier, the highest one in the hierarchy (e.g., French and Spanish). The crosslinguistic manifestations of the hierarchy seem to suggest that the hierarchy is universal.

In Korean, like in Japanese, the inventory of adposition is very small. While few studies have been conducted on whether Korean has P-modifiers of any type, Stringer et al. (2011) report that no evidence of existence of P-modifiers is found in Korean and Japanese. According to their observation, Korean, like Japanese, lacks P-modifiers as those functions are generally realized by means of verbs or adverbs modifying the verbs. In these languages directional predication is characteristically lexicalized within a verb complex (e.g., *cip-eu-ro gel-e-nairye-ka-ss-ta* "walked down to the house"). An intensifying modifier like *baro* exist in Korean (as in *John-un baro tunnel-ro dui-dol-a-se gele-ka-ss-ta* "John walked straight back to the tunnel") but it is not clear whether it is attached to the postpositional phrase or the verb phrase. While further study is needed to decide whether the Korean intensifying modifier is equivalent to the English Degree P-modifier, it seems obvious that the hierarchy of P-modifier is absent in Korean. If the hierarchy of P-modifiers is part of universal grammar, which is fully instantiated in a language like English, but not in a language like Korean,

L2 acquisition of the English P-modifiers by Korean learners may be closely related to the issue of UG availability in L2 acquisition. The next section briefly discusses the issue of UG availability with regard to the hierarchy of P-modifiers.

2.2. UG-based SLA Theories and Hypotheses

The knowledge of the hierarchy of P-modifiers is highly abstract. If someone acquires the system without explicit grammar instruction or extensitve positive input, it raises a learnability problem. For example, if Korean EFL learners could somehow acquire the system of the hierarchy of English P-modifiers, this acquisition may not be attributed to the ample positive input, explicit grammar instruction, nor transfer from L1 knowledge. In the generative grammar approach to the second language acquisition, the issue of the learnability problem is related to the UG access to L2 acquisition. If UG is directly accessible to adult second language acquisition, adult L2 learners would acquire the grammar of the target language with relative ease as UG guides the acquisition (The UG- full access hypothesis, e.g., Flynn, 1996).

A particular view of the UG access relevant to the present target structure is the Full Transfer/Full Access hypothesis proposed by Schwartz and Sprouse (1996). According to this view, L2 learners initially transfer their L1 functional categories to L2, but soon acquire the full L2 structure of functional categories, thus, allowing a rapid convergence on the target grammar. That is, L2 learners will utilize the inborn UG, and only a certain minimum amount of exposure to L2 input will be enough to trigger the development of full functional categories of the target language. This view predicts that an initial failure of acquisition of L2 P-modifier hierarchy can soon be overcome even by the learners whose L1 lacks the hierarchy.

Other views involving the UG access issue include the UG-indirect access hypothesis and the UG-no access hypothesis. The UG-indirect access hypothesis argues that L2 learners have access to UG, but only via their L1 (e.g., Schachter, 1989, 1996). According to this view, only the UG properties that are instantiated in the learners' L1 are available for L2 acquisition, effectively explaining some persistent L1 transfer phenomena shown in the L2 learning processes. The

UG-no access hypothesis claims that UG is totally inaccessible to adult L2 learners, and thus, L2 acquisition does not involve the help of UG. Both the UG-indirect and UG-no access hypotheses predict an unsurmountable difficulty in the L2 acquisition of the present target grammar when the learners' L1 lacks the hierarchy. Some previous studies in the domain of functional categories (Eubank, 1993/94; Smith & Tsimpli, 1995), showed that distinct L2 functional projections that are not instantiated in the L1 caused unterminable confusion in the course of L2 acquisition.

The only study that directly dealt with the L2 acquisition of the P-modifier hierarchy was Stinger et al.'s study (2011) which examined the knowledge of English modificational hierarchy possessed by ESL learners from a variety of L1 backgrounds. The subjects had been learning English in the USA and their L1s included Arabic, Bambara, Chinese, French, Hungarian, Japanese, Korean, Mongolian, Portuguese, Russian, Spanish, Tajik, Thai, Tamil, Tartar, Turkish, and Vietnamese. The study reported that L2 learners showed the knowledge of the hierarchy across all proficiency levels, irrespective of their L1 backgrounds. According to the results of the study, even very low-level English learners whose L1 does not have P-modifiers showed rates of accuracy that were well above chance. Stinger et al. argued that this result implies that the knowledge of modificational hierarchy is available to L2 learners once L2 learners acquire the basic lexical semantics of each modifier. That is, the modificational hierarchy is part of UG, which is accessible to adult L2 learners when the semantic properties of the individual modifier are in place in the learners' L2 system.

The result of Stinger et al.'s study, especially the fact that even very low-level learners in ESL context showed the knowledge, raises a question as to whether the same knowledge is acquirable in the EFL context. While the nature of input is quite different between the ESL and EFL contexts, basic semantic properties of modifiers are likely to be acquired by proficient L2 learners regardless of the learning context. If it is the case, EFL learners will also show the knowledge of English modificational hierarchy. On the other hand, some previous studies contrasting the ESL and EFL contexts observed that even highly proficient EFL learners failed to acquire some less salient L2 grammatical aspects, for which the learners with an extensive ESL experience could attain native-like proficiency (e.g., Kim, 2012; Schauer, 2006). These studies argue that

the ESL context may have provided the learners with more compelling environment to develop the complex and inconspicuous target grammars.

The present study investigates the knowledge of English P-modifier hierarchy possessed by Korean adult learners of English. Specifically it asks the following questions:

1. Will Korean EFL learners show the knowledge of universal hierarchy of P-modifiers? If so, does their English proficiency level correlate with the level of knowledge they possess?

2. Does learners' experience of the ESL context affect their knowledge of the target hierarchy? That is, can the experience of intensive exposure to the natural input lead to better acquisition of the target grammar?

3. Experimental Design

3.1. Participants

One hundred seven native speakers of Korean participated in the experiments along with a control group of 15 native speakers of English. The Korean participants were undergraduate and graduate students at a university in Korea. The undergraduate students were English majors and minors and the graduate students were all English education majors. Students' ages ranged from 20 to 43, and 37 of them were male and 70 were female. The Korean participants were assigned to four experimental groups: Low-intermediate group (N=30), High-intermediate group (N=38), Advanced group (N=27) and ESL-experienced group (N=12). The subjects in the first three groups were the students who had not lived in an English-speaking country more than six months and they were assigned to different proficiency groups based on their TOEIC scores[2]. The subjects in the ESL-experienced group were those who have

2) Students were assigned to the advanced group if their TOEIC score is 870 or above, the high-intermediate group if it is between 740-869, and the low-intermediate if it is between 550-739. Note that these scores were set arbitrarily, and thus, the terms 'advanced' and

an experience of living in an English-speaking country for more than one year in their childhood and/or adolescence. Their average year of exposure was 3;1 years (range: 1:0 ~ 11;4). Fifteen native speakers of English were all students at a state university in the eastern part of the USA (aged from 18 to 34).

3.2. Materials

Two different test materials, the preference test and the grammaticality judgment test, were used to investigate whether the participants have knowledge of the functional hierarchy of adpositional modifiers. The formats of the tests were adopted from the test materials used in Stinger et al. (2011).

1) Preference test

The purpose of the preference test was to see whether the participants were inclined to a specific order of multiple P-modifiers. The test consisted of 16 test items, each of which included a visual aid slide, a stimulus sentence, and two orally recorded answer choices. An example test item is given below.

<Preference test sample>

Target: The bird flies *straight back* across the river. [DEG [FLOW]]

Visual aid slide:

A picture slide that depicts a bird flying across a river with an arrow indicating the bird has turned back to its start point across the river.

Stimulus sentence:

The bird flies _____ across the river.

Your answer: a. or b. (Mark only one)

'intermediate' here do not represent the standardized proficiency levels. Among more than 140 Korean students who initially participated, those who had never taken a TOEIC or had a score lower than 550 on the test were excluded from the analyses. Some of the graduate student participants were secondary school English teachers.

Recorded answer choices

a. The bird flies *back straight* across the river. [FLOW [DEG]]
b. The bird flies *straight back* across the river. [DEG [FLOW]]

The visual aid slides were designed to help the participants make an intended interpretation of a given sentence. Some of the P-modifiers that we used in the test are potentially ambiguous as they can be interpreted in other ways. For example, 'on' may be interpreted as a locative preposition and 'back' as a movement adverbial modifying a verb. Therefore, a visual aid was necessary to provide appropriate context for the P-modifiers, which express continuation ('on') or return ('back') with specific reference to prior location. MS Power Point program was used to make and present the visual aid slides.

Stimulus sentences were provided in a separate paper sheet. As shown in the example, each stimulus described the picture in the visual aid slide, but with a blank for the targeted part of the sentence. Providing the stimulus sentence with the blank was to help participants focus only on the targeted part.

Four target hierarchy structures were tested by 16 test items. The combinations of the target modificational hierarchy were shown in (9)

(9) Combinations of the target modificational hierarchy

a. DEG-FLOW (4 items)
e.g. The bird flies *right back* across the river.

b. DEG-TRAJ (4 items)
e.g., The bird flies *straight through* to the city.

c. FLOW-TRAJ (4 items)
e.g., The bird flies *on down* into the city.

d. DEG-FLOW-TRAJ (4 items)
e.g., The bird falls *right back down* onto a tree.

For each test item, two answer choices were provided: one sentence that fits the target modificational hierarchy (correct answer) and the other that deviates

from the hierarchy (incorrect answer). These answer choices were presented aurally by a pre-recorded voice of a native English speaker. Sound files incorporated into Power Point slides were used to present the answer choices. Presenting the answer choices by recorded voice, rather than visually in letters, was to control the prosody for the intended parsing. As mentioned earlier, prosody plays an important role in parsing of phrases with multiple modifiers. For the answer choices, the pause and intonation in each sentence were manipulated so that the lexical elements of the modificational hierarchy are parsed as part of a prosodic unit with PP, not as being aligned with V.

2) Grammaticality judgment test

As the second experimental material, a grammaticality judgment test was developed. The purpose of this test was to elicit straightforward binary judgments of grammaticality. In the preference test, we cannot be sure whether the learner believed a sentence to be ungrammatical by choosing the other answer as the preferred sentence. By adding the grammaticality judgment test, we could see if there is a converging effect across the results of the two tests.

The grammaticality test used the same test items as the ones used in the preference test, but with different orders and different formats. There were total of 16 test items which were visually presented in a paper sheet. An example stimulus from the grammaticality judgment test is given below.

<Grammaticality test sample>

Target: The bird flies straight back across the river.

Visual aid slide: The same Power Point visual aid used for the preference test for the same target.

Stimulus:

Question: Where does the bird go?

Answer: *straight back* across the river. [DEG [FLOW]]

The above answer is: a: good b: bad (mark only one)

The order of presentation of grammatical and ungrammatical answers was randomized across stimuli. The reason for using sentence fragments for answers, rather than full sentences, was to control the prosodic reanalysis by participants. For example, the use of a fragment answer such as *'back straight across the river' ensures that the participants analyze the target sentence as [The bird goes *[back straight across the river]], rather than [The bird goes back [straight across the river]], which is grammatically correct.

In addition to the preference and grammaticality judgment tests, a background information questionnaire was used to get the data on the subjects' English proficiency, age, educational background, and other relevant information.

3.3. Procedure

The experiments were carried out in Korea (for the experimental groups) and in the USA (for the control group). The preference and grammatical judgment tests were presented to the Korean participants during one of their class hours (except for five participants in the ESL experienced group).[3] To native English controls and five of the ESL-experienced group participants, the same tests were given individually or in a small group in their free time. Before the participants began the task, they were given an exemplary test item showing the format of the forthcoming task.

The preference test was administered first and the grammaticality judgment test followed immediately after it. For each preference test item, participants were first guided to watch the visual aid slide on the screen and read the stimulus sentence. Then they were asked to choose one sentence from the two answer choices that they hear. They were instructed to choose the one that sounds more natural and correct. For each grammaticality judgment test item, the participants watched the visual aid slide and were asked to judge whether the given answer to the question is a good English phrase. After completing the tests, the participants were requested to fill out a background information questionnaire.

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3) Seven participants in the ESL experienced group took the tests during one of their class hours.

4. Results and Discussion

Table 1 shows the percentage means of the correct answers on the preference test obtained by each subject group for each combination type.

Table 1. Preference Test

Overall Means for Each Type (%)

Combination Type	Low-Intermediate (N=30)	High-Intermediate (N=38)	Advanced (N=27)	ESL-experienced (N=12)	Native controls (N=15)
D-F	67.50* (23.81)	71.05* (22.90)	70.37* (23.04)	87.50* (16.86)	91.67* (15.43)
D-T	68.33* (24.51)	73.69* (23.23)	71.30* (19.25)	77.08* (19.82)	95.00* (23.72)
F-T	54.17 (28.68)	44.74 (27.97)	51.67 (28.89)	64.58* (22.51)	83.33* (18.09)
D-F-T	59.17* (23.19)	61.84* (24.18)	67.59* (21.72)	79.17* (23.44)	91.67* (12.40)
Total	62.29 (25.52)	62.83 (27.89)	64.31 (25.06)	77.08 (21.78)	90.42 (14.62)

D-F: Degree-Flow combination, D-T: Degree-Trajectory combination, F-T: Flow-Trajectory combination, D-F-T: Degree-Flow-Trajectory combination,
( ): Standard Deviation, *: significance above chance level ($p<.05$)

An ANOVA was conducted with combination type as the within-participant factor and subject type as between-participant factors.

The results showed that there was a main effect of combination type ($F=17.090$, $p<.001$). A post-hoc analysis indicated that the mean score of the F-T type was significantly lower than the other three types ($p<.001$) while no significant difference was found among the three types (D-F: 74.18, D-T: 74.80, F-T: 54.47, and D-F-T: 67.83). A main effect of subject type was also found ($F=17.700$, $p<.001$). There was no significant difference among the three EFL-only groups (Low-intermediate, High-intermediate, and Advanced group), but their scores were significantly lower than the ESL-experience group, which, in turn, was significantly lower than the native control group.

One sample t-test analysis on each mean score, however, revealed that, for the D-F, D-T, and D-F-T types, Korean EFL-only groups at all proficiency levels scored significantly above chance level, as indicated by * marker in Table 1. This result shows the possibility that Korean EFL learners are sensitive to the English modificational hierarchy. For the F-T type, no such possibility was shown.

Table 2 shows the results of the grammaticality judgment test obtained by each subject group for each combination type.

Table 2. Grammaticality Judgment Test
Overall Means for Each Type (%)

Type	Low-Intermediate (N=30)	High-Intermediate (N=38)	Advanced (N=27)	ESL-experienced (N=12)	Native controls (N=15)
D-F	66.67* (23.97)	67.11* (25.41)	63.89* (24.35)	83.33* (19.46)	96.67* (8.80)
D-T	63.33* (21.51)	65.13* (29.37)	64.81* (34.15)	79.17* (20.87)	95.00* (14.02)
F-T	50.83 (31.13)	33.55 (30.91)	42.59 (24.82)	54.16 (23.44)	83.33* (15.43)
D-F-T	49.17 (28.98)	53.95 (27.59)	67.59* (28.43)	75.00* (23.84)	91.67* (15.43)
Total	57.50 (27.42)	54.93 (31.13)	59.72 (29.57)	72.92 (24.10)	91.67 (14.31)

Overall, the results of the grammaticality judgment test were similar to those of the preference test. There was a main effect of combination type ($F=17.108$, $p<.001$), and, again, the score of the F-T type was significantly lower than those of the other three types (D-F, D-T, and D-F-T types) while no significant difference was found among the three types (D-F: 71.52, D-T: 69.67, F-T: 47.95, and D-F-T: 62.50). A main effect of subject type was also found ($F=22.499$, $p<.001$): Like the results of the preference test, the three EFL-only groups scored significantly lower than the ESL-experienced group which, again, showed a significantly lower score than the native control group.

For the D-F and D-T types, Korean EFL-only groups at all proficiency levels performed significantly above chance, as indicated by * marker in the Table 2.

For the F-T type, however, all Korean EFL-only groups as well as the ESL-experienced group failed to reach above-chance level. For the D-F-T type, only the advanced EFL-only group attained significance above chance.

The results of the preference and the grammaticality judgment tests commonly indicated that Korean EFL learners achieved relatively high accuracy rates on the D-F and D-T types. For these types, the EFL subjects performed significantly above chance regardless of their proficiency level, although their performances were distinguished from those of the ESL-experienced group and the native control group. These results appear to suggest that the learners have some knowledge on the modificational hierarchy realized in these types. In comparison, for the F-T type, none of the EFL groups reached statistically significant above-chance level on both tests. The generally weak performances on the F-T type seem to suggest that when the Degree modifier is missing in a modifier combination, it poses a higher level of difficulty compared to the ones that contain a Degree modifier (i.e., D-F, D-T, and D-F-T types). If this is the case, the EFL learners may somehow know that a Degree modifier always occupies the highest position on the modificational hierarchy, but they are not aware of the hierarchical relation between Flow and Trajectory modifiers.

For the ternary combination (D-F-T Type), EFL subjects' performances were different between the two tests: on the preference test, the subjects performed well above chance level at all proficiency levels whereas, on the grammaticality judgment test, they performed above chance level only at the advanced level. A second look at the descriptive statistics, however, seems to suggest that, on both tests, the subjects' performances improve as general proficiency increases. The EFL subjects experienced more difficulty for this type on the grammaticality judgment test, but the Advanced group somehow could overcome the difficulty and attain the score above chance level. Considering that Korean EFL subjects seem to have some knowledge of modificational hierarchy involved in the D-F and D-T types, the difficulty with the D-F-T type (and gradual increase in accuracy) might be associated with the processing load of the ternary combination. That is, relatively heavier processing load of the ternary combination, compared to the binary combinations, might require higher level of L2 proficiency to correctly judge its grammaticality.

To summarize the results with the EFL-only groups, the learners seem to

possess a certain degree of knowledge that the Degree modifier always occupies the highest position on the modificational hierarchy, although the robustness of their knowledge is far below that of native speakers. Also, the learners' L2 proficiency appears to play a role only when the heavier processing load is involved. Considering the paucity of evidence and absence of formal instruction for this domain in the EFL context, these results might be interpreted as suggesting that UG is accessible to EFL learners. That is, the learners' preference of putting the Degree modifier first may be explained by the learners' predisposed grammar system which somehow leads them to choose the order that conforms to the universal hierarchy of P-modifiers.

The question remains, however, as to why the EFL learners are not sensitive to the hierarchy of the F-T type. While no definite answer to this question will be given here, one tentative suggestion would be that the amount of exposure to the target language was not enough to trigger the development of full functional categories of P-modifiers. It is conjectured that the binary combination initiated with a Flow modifier (i.e., the F-T type) is less frequent than the ones initiated with a Degree modifier (D-F, D-T, D-F-T types) in the L2 input. Considering that a certain minimum amount of exposure to the input is necessary for UG to be activated, it may be possible to suggest that the input available to the EFL learners was just enough to establish the structural hierarchy involving the Degree modifier, but not enough to establish the complete hierarchy. Of course, in order for the validity of this suggestion to be proven, more comprehensive investigation should be made, including the actual amount of input available to the EFL learners for each type and the minimal amount of input needed to activate UG.

With regard to the effect of learning context, both tests found that, overall, the ESL-experienced group performed better than the EFL-only groups. While the current study showed that EFL learners have some knowledge on the P-modifier hierarchy, it also indicated that even highly proficient EFL learners could not reach the same level of competence possessed by the ESL-experienced learners.[4] This result seems to imply that for the target structure like the present

4) While the ESL-experienced learners also showed considerable difficulty for the F-T type, they were different from the EFL groups as they could score above chance level on the preference test as shown in Table 1.

one, robustness of positive evidence plays a role. Acquisition of the present target structure may be very difficult for L2 learners because absence of the target grammar would not cause a serious incomprehension or communication breakdown, and subsequently, learners would not be forced to pay much attention to the target structure. Kim (2012) and Schauer (2006) showed that, for the acquisition of the grammar elements that do not cause a serious communication breakdown, more extensive exposure to the L2 input is needed. According to these studies, the ESL context offers favorable environment for the acquisition of those type of grammar elements because the ESL context would provide learners with more opportunities to encounter the relevant input and with more compelling situations where learners are forced to develop the target grammar. The ESL-experienced group's superior performance in the present study is consistent with the predictions of these previous studies.

5. Conclusion

The present study examined adult Korean learners' knowledge of the modificational hierarchy instantiated in English multiple P-modifiers. The results obtained from the preference and grammaticality judgment tests commonly indicated that Korean EFL learners, regardless of whether they are advanced or intermediate learners, are sensitive to the universal hierarchy that a Degree modifier occupies the higher position than a Flow or Trajectory modifier in the hierarchy. However, they were not able to sense the ordering relation between the Flow and Trajectory modifiers, implying that they could not develop the full range of hierarchical structure of English P-modifiers. This result with the F-T type blurred the overall results of our study which otherwise were clearly supportive of the UG full-access hypothesis. The EFL learners' performances in the present study then might be understood as showing that the L2 input available in the EFL context is not enough to trigger the development of the full hierarchy of functional categories.

The importance of input is further highlighted by the disparity between the results of the EFL-only groups and the ESL-experienced group. Our result showed that learners who had experienced the ESL context for an extensive

period of time could attain more robust knowledge of the hierarchy than those who did not. That is, the experience of intensive exposure to the natural input works positively for the consolidation of the target grammar like the present one. Overall, the results of the present study may be taken as suggesting the importance of input in the acquisition of the less salient grammar structure: while UG-based L2 acquisition of the target grammar may be possible, role of input is also crucial in developing and consolidating the L2 grammar knowledge.

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Appendix
Target sentences in the preference test and grammaticality test

[DEG[FlOW]] type: 4 items
The bird flies *straight on* over the cars.
The bird flies *right on* across the river. .
The bird flies *straight back* across the river.
The bird flies *right back* into the desert.

[DEG[TRAJ]] type: 4 items
The bird flies *right up* out of the cave.
The bird flies *straight down* behind the waterfall.
The bird flies *right out* from the cave.
The bird flies *straight through* into the city.

[DEG[FlOW[TRAJ]]] type: 4 items
The bird flies *right on up* into the clouds.
The bird falls *right back down* onto a tree.
The bird flies *straight on down* into the water.
The bird falls *straight back down* to the ground.

[FLOW[TRAJ]] type: 4 items
The bird flies *on through* to the outside.
The bird flies *back over* to the waterfall.
The bird flies *on down* into the city.
The bird flies *back through* into the city.

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