Comprehensive Acquisition Status on English *Wh* Questions

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Lee, Eun Kyeong. "Comprehensive Acquisition Status on English W*h* Questions." *Studies in English Language & Literature* **45.4 (2019): 255-275.** This paper explored the overall acquisition status on *wh*-question patterns of Korean English learners (the second language learners, L2ers) based on the recent literatures (cf. Lee, 2017, 2018, 2019). Given that these are somewhat partially surveyed contents, this experiment is conducted simultaneously with the same items for one target. It is clear that consistent and reasonable outcomes will be driven from three hypotheses. These are as follows: first, the understanding rate of simple sentences will be readily higher than that of complex sentences. Second, as for English L2ers sophisticated Items with two *wh*-words compared to simple Items are likely to have big trouble fully comprehending. Third, uncommon and picky syntactic rules such as *that*-trace filter or *wh*-island (argument & adjunct) effect seem to be realized at the latest by English L2ers. In result, it is confirmed that three assumptions argued here could be substantially predicted. (Jeonju University)

Key Words: English L2 acquisition, complexity rating, embedding, *that*-trace filter, *wh*-Island effect

I. Introduction

Lee (2017, 2018, 2019)'s serial studies reported recently have been about the L2ers (the second language learners)' acquisition degree of English *wh* questions' extraction patterns in the example (1) below, which exclusively targets for almost three types of sections (item 1, item 2 and item 3)[1] of different Korean L1 (the first

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[1] In conducting the actual survey for L2ers, Lee (2017, 2018, 2019) would divide three or four items on

language) groups of university students (aged 20 to 25), respectively. This study ranges from a simple sentence easy to understand to a complex sentence including a complement clause or a relative clause comparatively confusing to understand. Judging from these syntactic constructions, as for English L1ers of native speakers, there has been intuition of innateness naturally realized from birth. On the other hand, Korean L2ers for English seem to have taken the learned intuition depending on the continuous learning environment consciously or unconsciously trained until now: their mastering status and speed between English L1ers and L2ers could be nearly the same or dissimilar or totally different as to which certain grammatical sentential structures are built up and surveyed to them.

(1) a. initially underlined structure: Lucy should buy *what*. (N. Chomsky 1977,1981)
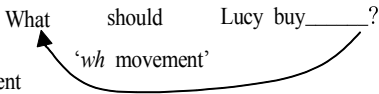
   b. After movement

Returning to *wh*-extraction matter again, let us see the typical examples below: the relative gapping distance between an initial *wh*-word and its real gap in a simple sentence (Lee, 2017) in (2a-g), upgraded *wh* extraction principle such as *that*-trace filter and complex NP constraint (CNPC) occurring in an embedded clause (Lee, 2018) in (3a-g) and then *wh* argument & adjunct island effect (Lee, 2019) relating to moving possibility of initial *wh* and intermediate *wh* in (4a-g).

(2) a. Who [s ① is [vp helping the girl ②]]?
    b. Who [s ① is the girl [vp helping ②]]?
    c. What [s ① will Mary [vp say ②]]?
    d. What [s ① will Mary [vp talk ② [pp about ③]]]?

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the basis of each syntactic attribute. For example, there are a simple gapping structure, gap embedding depth, gap ambiguity and subject-object asymmetrical status (Lee, 2017), *that*-trace filter, CNPC and gap interpretation (Lee, 2018) and argument *wh* island & adjunct island and semantic ambiguity by *wh* island generally considered as the most advanced developmental stage (Lee, 2019).

e. What [s ① will Mary [VP read ② [NP book ③ [PP about ④]]]]?

f. Who [s do you [VP think ① [s ② saw Sue]]]?

g. Who [s do you [VP think ① [s Sue [VP saw ②]]]]?

(3) a. *Who did the lion see ① [that ② swam in the pond]?

b. I notice the people ① [that ② mistrusted the stranger].[2]

c. Who did the lion see ① [② swam in the pond]?

d. Who did the dog know ① [that the rooster kicked ②]?

e. Who did the horse know ① [the lion hugged ②]?

f. Who did Harry [VP think ① [s that Sue met ②]]?

g. *Who did Harry believe ① [NP the man [s that met ②]]?

(4) a. What does John know [how to explain ① to the audience ②]?

b. *What does John know [who to explain ① to ② carefully]?

c. *When does John know [what to do ① ②]?

d. *When does John know [how to do it ① ②]?

e. Who did the woman decide ① [that she should consult ②]?

f. Who did the woman decide ① [to consult ②]?

g. *Who did the woman decide ① [after she consulted ②]?

Here are three viewpoints to be argued: first, in (2a-g) *wh* subject question (WSQ) can be acquired more comfortably than *wh* object question (WOQ) and one more, the embedding depth on XP strongly influences L2 acquisition's development (Lee, 2017). Next, in (3a-g) English L2ers would distinguish a relative clause from a complement clause although two constructions are considerably tricky. In the same vein, the identity of *that*-trace filter and CNPC has been acquired from English L2ers with over medium percentage against our expectation (Lee, 2018). Lastly, in (4a-g) *wh* argument & adjunct island effect on two *wh* positions could be mastered at the latest under 50% or so (Lee, 2019).

However, the comprehensive findings of this paper will be most likely reasonable given that the survey contents including the testing patterns of the previous

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[2] (3b)'s example in a relative clause is presented to compare (3a) with *that* trace filter.

literatures on *wh* questions are distributed to the same participants again at once but not with partial chance of the previous one. This trial is to consider how degree the L2ers would figure out all *wh* sentences with each syntactic feature in all-inclusive manner. So, this paper will be willing to attempt the whole ratings on the basis of realization status and catch which factor will bring about a strong impact to master short (simple) or long (complex) *wh* sentences. This paper is organized in the following way: Section II briefly introduces the empirical background of English L1ers of *wh*-question acquisition status contingent on each syntactic title. In section III, this paper examines the experiment method including its subjects, procedures, survey contents and three hypotheses judged for English L2ers. Section IV provides its subsequent results and debating points in conjunction with on-site data. Finally, section V wraps up the main conclusion.

II. Previous Linguistic Research

2.1 Simple buildup & Embedding depth on XP

In view of the experimental *wh* questions' production, a study by Wilhelm and Hanna (1992) presents a preference for subject *wh* words as Table 1 based on Box 1. At this time, the young children gave poor performance on both SQ and OQ, taking fewer than half sharp. The old children did poor performance on the OQ (50% correct) but performed comparatively well on the SQ (70% correct). The most common structural mistake was associated in a SQ's production when an OQ was asked for (21 of 120 answers). The reverse mistake was very rare (3 of 120 responses), which strongly backs up an outstanding preference for SQ.

Box 1 & The Study: Wilhelm & Hanna 1992

Subjects: 11 children aged 3;4-4;4 (6 boys and 5 girls)

Sentence Types: (3 tokens of each type)

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who subject: who is helping the boy? & *what* subject: What is pushing the boy?

who object: who is the boy helping? & *what* object: What is the boy pushing?

Task: Two experimenters presented the child with a picture depicting an action involving two participants, one of whom was covered over. The child was then given a prompt such as the following(for the *who* object sentence type): The experiment began with the two experimenters modeling a series of examples; only one child refused to participate or did not understand what was expected.

Experimenter I: The monkey is pushing someone, and I know who.

Experimenter II: Can you make up a question to find out who?

Table 1. Results of the Production Task (out of 30 tokens)

Type	Age Groups	
	3;4-3;6(5 children)	4;1-4;7(5 children)
subject *wh*	12(40%)	21(70%)
object *wh*	13(43.3%)	15(50%)

Box 2 & The study: Hildebrand 1987

Subjects: 48 children: 12 4-years, 12 6-years, 12 8-years, and 12 10-years

Task: imitation of sentences with gaps (test sentences were nearly equal in length)

Types: Type I(4 tokens): gap inside an S and a VP

What [s did the little girl [vp hit __ with the block today]]?

Type II(4 tokens): gap inside an S, a VP, and a PP

What [s did the little boy [vp play [pp with __] behind his mother]]?

Type III (3 tokens): gap inside an S, a VP, a NP and an PP:

What [s did the boy [vp read [np a story [pp about __]] this morning]]?

Table 2. Results of the Imitation Task (% correct) (from Hildbrand 1984: 69)

Type	4-year-olds	6-year-olds	8-year-olds	10-year-olds
I	83	94	97	100
II	46	80	86	97
III	31	78	89	89

In another vein, confusing embedding errors are reported by Hildebrand (1984) under Table 2's result. So exciting is the result that 84% of the children's mistakes

on both Type II and III held restructuring in (footnote 2) so that the gap do not occur in the PP, closing the distance between it and its matching *wh*-word. Hildebrand's results are matching with the data that the acquisition is sensitive to the 'distance' between a gap and its *wh* word.[3] This embedding contrast is in (5) below. The two patterns have similar inversion and word order, but they differ from the gap depth: there are three XP nodes in (5a) and four ones in (5b). Stromswold (1995) noticed that 11 of the 12 children led biclausal sentences of the *wh* object extraction and even one aged 5;0 led the *wh* subject extraction. On the one hand, Yoshinaga (1996) derived biclausal SQ and OQ's production work from 17 children aged 3;0 and 4;0. The children would induce SQ far more comfortably than OQ (75% vs 51%). But, it is vague how this result is matched with Stromswold' sayings of *wh* OQ extraction preference.

(5) Subject gap & Object gap in an embedded clause:
    a. Who [$_s$ do you [$_{VP}$ think [$_s$ ____ saw Sue]]]? complexity degree = 3
    b. Who [$_s$ do you [$_{VP}$ think [$_s$ Sue [$_{VP}$ saw___]]]]? complexity degree = 4

2.2 That-trace filter

(6) The *that*-trace filter (e.g., Chomsky and Lasnik 1977):
    *that _____ (except in a relative clause)

   Regarding the *that*-trace filter's acquisition, the stories before the test questions were devised by a method that each question was responded by the bracketed S as a complement or a relative clause. This is presented in the sentence type (i).

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[3] Restructuring on Type II: (complexity degree = 3)   (complexity degree = 2)
                    What [$_s$ did she [$_{VP}$ do [$_{PP}$ with ___]]]? → What [$_s$ did she [$_{VP}$ do___]]?

Box 3 & The study: Phinney 1981

Subjects: 85 children aged 3;0-6;5, divided into four groups on a pretest asking sentences limitation with finite and nonfinite complement clauses: G(group)-GI mean age=3;7, GII mean age=4;9, GIII mean age=5;0, GIV mean age=5;2

Sentence Types: (4 tokens of each type):(SG: subject gap & OG: object gap)

   i. SG with *that*: *Who did the lion know [that __ swam in the pond]?

   ii. SG without *that*: Who did the lion believe [__ swam in the pond]?

   iii. OG with *that*: Who did the dog notice [that the rooster kicked ____]?

   iv. OG without *that*: Who did the horse believe [the lion hugged ____]?

Task: Children responded to the above types after listening to a short story.[4]

One access treats the embedded clause as a complement of the verb *know*. As this clause holds the Comp *that* and a SG, it does not keep the *that* trace filter. Children to try this interpretation react to 'the dog', because this is the animal that the lion actually saw swimming in the pond. Another access takes the embedded clause as a relative clause. This *who* is interpreted as the object of the verb *know*. This is the only access by an adult grammar keeping *that*-trace filter. Children with this interpretation react to 'the rooster', because this is the animal who is accustomed to the lion and who swam in the pond. Table 3 results in his experiment for two groups. The figure for type (i) show the recognition of the *that*-trace filter. In the remaining three types, the complement clause's response is equivalent to the filter due to no *that* (type ii) or object gaps (types iii and iv). Even the youngest children have already recognized *that*-trace filter given that they would evade the prohibited response in type (i) with 5% or less.

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[4] Presented story script: The lion and the rooster are friends. Yesterday, the lion saw a strange dog who was swimming in the pond. While the lion was away, the rooster went swimming. *Who did the lion know ____ that _____ swam in the pond?*

Table 3. Results of the *that*-Trace Experiment(%) (based on Phinney 1981:193-96)

Sentence type	Complement Clause Response		Relative Clause Response	
	Group I	Group II	Group I	Group II
i	5	3	36	52
ii	63	84	17	5
iii	78	83	12	16
iv	70	89	17	0

Table 4 by Thornton (1990, Box 2(footnote)) partly confirms Phinney's study that the young follow the *that*-trace filter. Many questions were drawn, with all but one of the children making sentences with a gap in the embedded clause. The children uttered *that* with an embedded clause bearing a subject gap 18% of the chance (19 chances out of 105) in spite of the *that*-trace filter. Even if this mistake is unexpectedly high, he notes this status was made consistently by only two children (both aged 3;9). Nevertheless, McDaniel, Chiu, and Maxfield (1995:723) mention that on a grammaticality task for 32 children aged 2;11 to 5;7, the usage rate of *that*-trace sentences was 24% compared with 2% for adults.

Table 4. Results of Thornton's *that*-Trace Experiment (Thornton 1990:88)

a. Violates the *that*-trace filter.	with *that*	without *that*
embedded clause with subject gap	19[a](18%)	86(82%)
embedded clause with object gap	21(25%)	62(75%)

2.3 Wh Island Effect & Adjunct Effect

Many detailed *wh* structures are closely associated with *wh* islands. Above all, it is generally known that the *wh* island effect functions strongly when the medially posited *wh* word is an argument rather than an adjunct. Thus, a clear contrast between (7) and (8) is shown. In sentence (7) the initial *wh* word *what* can be associated with the embedded verb given that the medially posited *wh* word *how* is an adjunct. However, now that in (8) the medially posited *wh* word *who* is an

argument, the initial *wh* word *what* cannot be correlated with a embedded verb *explain*. This *wh* island principle is conceptualized as (9) below:

(7) *Medial* wh *word is the adjunct* how:

   What does John know [how to explain ____ to the audience ____]?

(8) *Medial* wh *word is the argument* who:

   *What does John know [who to explain ____ to ____ carefully]?

(9) *The* wh *Island Condition*:

   *[*wh*   [s *wh*-argument... _____ ...]]

   de Villiers, Roeper, and Vainikka (1990) had trial to determine the developmental status of this *wh* constraint in children's acquisition process. Thus, the question and context were deliberately designed to investigate that the initial *wh* word could be closely involved with either the matrix verb *ask* or the embedded verb *help*. A sample story for sentence type II is presented in Box 4.

Box 4. The study: de Villers, Roeper, and Vainkka, 1990
Subjects: 25 preschool children aged 3;7-6;11 (12 boys and 13 girls)
Sentence Types: (2 tokens of Type I: 4 tokens of Type II)
        Type I- Medial argument: *Who did the girl ask [what to throw]?
        Type II- Medial adjunct: Who did Big Bird ask [how to help]?
Task: the children had to answer the relevant *wh* questions after hearing a story illustrated by pictures: Kermit asked Big Bird to help his friend clean up the playroom. Big Bird wanted to know how he should help. He asked Kermit, "How can I help my friend?" And, look, he helped Bert to sweep the floor. *Who did Big Bird ask how to help?*[5]

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[5] The response 'Kermit' hints that the children connects a *wh* word as the matrix gap while the response 'his friend' hints that a *wh* word is connected to the embedded gap: the experimenters saw the children's

Table 5. Results of the *Wh* Island Study(%) (de Villiers et al. 1990: 270)

Sentence Type	LD Response	Non-LD Response	Other
I: medial argument	2	70	28
II: medial adjunct	30	63	7

(LD: long distance & Non-LD: non-long distance)

Another island effect presents the obvious comparison between (10) and (11) as exemplified below. The primary difference between the two sentences is that whereas the gap lies within a complement clause (*that*-clause or *to*-infinitive) in (10), it occurs inside an adjunct clause (*after*-clause or *after*-phrase) in (11). In the event of the latter pattern the Adjunct Island Condition in (12) that any *wh*-word in an adjunct clause can not be moved outside over it is not followed.

(10) a. Who did the woman decide [that she should consult ____]?
    b. Who did the woman decide [to consult ____]?

(11) a. *Who did the woman decide [after she consulted ____]?
    b. *Who did the woman decide [after consulting ____]?

(12) *The Adjunct Island condition:*

        *[*Wh*   [adjunct ...._____....]]

As with the other phenomena taken into consideration here, certain questions are raised as to when adjunct island effects would take place in the realization process. This issue is described in a study (Box 5) implemented by Goodluck, Sedivy, and Foley (1989) and reproduced by Goodluck, Foley, and Sedivy (1992).

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response (Table 5) to see if they follow the *wh* Island rule. As a medium *wh* adjunct does not create a *wh* island, either response is accepted. But, the medial *wh* argument in type I says that only *who* is matched with the matrix verb by *wh* Island rule. The young children never linked the initial *wh* word with the embedded verb with a medial *wh* argument (type I). On the other hand, they made this linking in one third of their responses that the medial *wh* word is an adjunct (type II).

Box 5. The Study: Goodluck, Sedivy and Foley 1989
Subjects: 10 3-year-olds, 10 4-year-olds, 10 5-year-olds
Sentence Types: (3 tokens of each type)
    Type I- Eat *with adjunct clause*: *What did the fox eat [*before singing*]?
    Type II- Ask *with clausal complement:* Who did the zebra ask [*to kiss*]?
    Type III-Ask *with adjunct clause*: *Who did the elephant ask [*before helping*]?
Task: The children were present in this stories: The fox ran down to the river. First
       he ate an ice cream cone. Then he whistled a tune he's heard on the radio. The
       fox felt pretty happy. *What did the fox eat before whistling*? The answer 'an ice
       cream cone' indicates children link the gap with matrix clause while the answer
       'a tune' implies the gap is linked with embedded verb.

Table 6. Interpretation of the *wh* word in Sentences with Adjunct Clauses (%)

Age(yrs.)	Type I			Type III		
	matrix S	adjunct S	other	matrix S	adjunct S	other
3	50	13	36	47	20	33
4	60	7	33	70	7	23
5	90	3	7	100	0	0

Table 7. Results of the Comprehension Task for Sentence Type II (%)

Age	upper clause	embedded	other
3	37	43	20
4	23	53	23
5	53	40	7

Answers for types I and III are split into three scopes (Table 6): (a) those taking the
wh as the matrix clause's part; (b) those taking the *wh* as the adjunct clause's part;
and (c) 'other'- improper answers. Response type (a) but not (b) would follow the
Adjunct Island Rule. From these results, even the youngest children showed a deep
taste that linked *wh* word to a matrix clause, not to an adjunct clause. Obvious
Adjunct Island offenses are not rare especially among three-year-olds (13% on type
I and 20% on type III, respectively). But, these results are by the processing
preference to connect unassociated elements with the last clause. Different answers

are in type II including no adjunct island (Table 7). At this point, the youngest children tend to match the *wh* word with either the matrix clause (37%) or the embedded clause (43%). Again, it is clearly revealed that this rule follows the acquisition device from a beginning development stage.[6]

III. Procedure & Hypothesis

3.1 Subjects & Mastering Procedure

The subjects of this survey dealing with L2 acquisition status regarding the comprehensive *wh* question patterns are split into the six different groups (G1 through G6) of the classified groups in the beginning of the semester. This purposeful test holds total 124 participants who are attending the required English language classes at J University in Jeonju. This experiment is conducted by short and intensive method depending on the previous knowledge or current learning of English L2ers. Also, it is mainly contingent on a title of class given that these group are already sorted out by certain level test. In other words, G1(13), G2(18) are made up of all the graders taking basic English conversation. Next, G3(16) and G4(21) are the groups for Intermediate English conversation consisting of the first and second graders by almost 95%. Lastly, G5(25) and G6(31) targeting TOEIC class spontaneously are for TOEIC speaking and TOEIC LC/RC, respectively, designating

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[6] Visible *Wh* questions (i) with overt movement and relative clauses (ii) are regarded as the same island constraints despite different syntactic construction (Radford 1988). As this complementary data show, this movement principle is also involved in the relative clauses.

    (i) a. Who did she engineer [the upturn of _____]?
       b. *Who did [the upturn of _____] cause production?
       c. *Who did the office refresh [after the upturn of _____]?
    (ii) a. Anyone who she engineered [the upturn of _____]
       b. *Anyone who [the downfall of _____] caused production
       c. *Anyone who the office refresh [after the upturn of _____]

them as the advanced level.

This on-site questionnaire was conducted for about 15 minutes by going through a concentrated diagnostic test, making confirmation that the total 22 segmentalized questions with each sentence-structural title were given to 124 experimentees taking part in the English class. Here, all participants had to circle the correct choice among the given options (from ① to ③ or ④) based on their syntactic or subsequent intuition within a limited time. Also, they are readily prepared and then organized under the provided verbs' grammatical tip and another lexical attribute without indicating each sentence's grammaticality and ungrammaticality. After carefully listening to the brief syntactic explanation and extra processing method from the designated experimenter in class, this test is requested to indicate a *wh*-word's original extraction position that it stays over before moved up to a sentence-initial position as the last resort in a moment.

3.2 Survey Content

Item 1: a simple sentence's movement
1) Who [$_s$ _①_ is [$_{VP}$ helping the girl _②_]]? ③ unex
2) Who [$_s$ _①_ is the girl [$_{VP}$ helping _②_]]? ③ unex
3) What [$_s$ _①_ is [$_{VP}$ pushing the girl _②_]]? ③ unex
4) What [$_s$ _①_ is the girl [$_{VP}$ pushing _②_]]? ③ unex
Item 2: a simple sentence's embedding
5) What [$_s$ _①_ will Mary [$_{VP}$ say _②_]]? ③ unex
6) What [$_s$ _①_ will Mary [$_{VP}$ talk _②_ [$_{PP}$ about _③_]]]? ④ unex
7) What [$_s$ _①_ will Mary [$_{VP}$ read _②_ [$_{NP}$ book _③_ [$_{PP}$ about_④_]]]]? ⑤ unex
Item 3: subject-object asymmetry
8) Who [$_s$ do you [$_{VP}$ think _①_ [$_s$ _②_ saw Sue]]]? ③ unex
9) Who [$_s$ do you [$_{VP}$ think _①_ [$_s$ Sue [$_{VP}$ saw _②_]]]]? ③ unex
Item 4: that-trace filter
10) *Who [$_s$ did the lion [$_{VP}$ see_①_ [$_{CP}$ that _②_ swam in the pond]]]? ③ unex
11) Who [$_s$ did the lion [$_{VP}$ see _①_ [$_{CP}$ _②_swam in the pond]]]? ③ unex
12) Who [$_s$ did the dog [$_{VP}$ know _①_ [$_{CP}$ that the rooster kicked _②_]]]? ③ unex
13) Who [$_s$ did the horse [$_{VP}$ know _①_ [$_{CP}$ the lion hugged _②_]]]? ③ unex

Item 5: Island effect (two *wh*-words & adjunct)

14) What [s do they [VP know _①_ [CP that Sue gave _②_ to her brother_③_]]]? ④ unex

15) What [s do they [VP know _①_ [CP when to launch _②_ to the public _③_]]]? ④ unex

16) What [s do you [VP know_①_ [CP where he showed _②_ to the audience _③_]]]? ④ unex

17) *What [s do they [VP know _①_ [CP who Mary gave _②_ to _③_]]]? ④ unex

18) What [s does Harry [VP know _①_ [CP how to explain _②_ to students_③_]]]? ④ unex

Item 6: adjunct island effect

19) Who [s did the woman [VP decide _①_ [CP that she should consult _②_]]]? ③ unex

20) Who [s did the woman [VP decide _①_ [IP to consult _②_]]]? ③ unex

21) *Who [s did the woman [VP decide _①_ [CP after she consulted _②_]]]? ③ unex

22) *Who [s did the woman [VP decide _①_ [CP after consulting _②_]]] ③ unex

3.3 Expected Predictions

(13) a. Hypothesis 1: The understanding of simple sentences such as Item 1 and 2 will be relatively higher than that of complex embedded sentences like Item 3, 4, 5 and 6.

   b. Hypothesis 2: As for English L2ers, Item 5 with two *wh*-words unlike other Items is most likely to have big trouble fully comprehending in terms of tracking back their traces.

   c. Hypothesis 3: Uncommon and advanced syntactic rules including *that*-trace filter or *wh*-island effect(argument & adjunct) seem to be realized at the latest by L2ers.

IV. Result & Discussion

4.1 Total figure

Table 8 below shows that the overall result of this experiment is not very deviant from three assumptions mentioned already in (13). Here are two primary keypoints. First, let us observe the order of each Item's correction rate: Item 1 (71%) > Item

2 (59%) > Item 3 (57%) > Item 4 (46%) > Item 5 (33%) > Item 6 (30%). That is to say, from the top to the bottom, L2ers' acquisition status is ranked by big or light gap step by step, thus leading that sentence simplicity(no embedding) and complexity (light or heavy embedding) are vital factors for L2ers to figure out certain syntactic aspect. Second, as for the order of each group's correction rate there are G5 (56%) > G6 (53%) > G3 (46%) > G1 (41%) > G4 (39%) > G2 (31%), hinting that TOEIC groups (G5, G6) with a little more than a half percent have already held empirically well-built grammatical background.

Table 8.

Question \ Group		G1	G2	G3	G4	G5	G6	M**	item	
1		6	10	12	16	20	24	71%	①	
2		8	11	11	15	21	24	73%		71%
3		6	7	12	16	20	22	67%		
4		6	9	12	18	19	28	74%		
5		9	10	10	18	18	19	68%	②	
6		7	6	10	13	18	16	56%		59%
7		7	2	10	12	16	19	53%		
8		7	7	4	11	9	12	40%	③57%	
9		11	6	13	17	22	23	74%		
10		0	0	0	1	1	3	4%	④	
11		5	10	9	10	18	20	58%		46%
12		5	6	7	12	18	22	56%		
13		9	10	11	15	18	18	65%		
14(what)		4	12	8	9	15	20	55%		
15	what	3	4	4	1	10	9	25%		
	when	6	1	9	0	16	19	41%		
16	what	3	3	4	1	9	17	30%	⑤	
	where	6	2	6	0	15	19	39%		33%
17	what	1	0	0	0	0	0	1%		
	who	6	8	13	0	19	22	55%		
18	what	5	2	5	1	11	16	32%		
	how	5	2	7	0	16	16	37%		
19		6	5	8	10	16	20	52%	⑥	
20		6	11	7	13	18	17	58%		30%
21		2	1	1	2	3	1	8%		
22		0	0	0	1	1	2	3%		

4.2 Hypothesis Analysis

4.2.1. Hypothesis 1: a simple sentence's understanding ratio is highest.

The first hypothesis mentions that a structurally simple sentence will be easily accessible to L2ers in terms of seeking for a *wh*-word' initial position before it is moved. This supposition seems to be fairly appropriate given that Table 9 confirms that the average rate of Item 1 (Q 1-4), 71% and Item 2 (Q 5-7), 59% take the priority to other 4 Items (57%, 46%, 33%, 30%). It follows that the simpler the structural buildup of the sentence is, the easier the accessibility of participants is, directly demonstrating that embedding degree in relation with (in)transitivity verb or preposition attribute in a simple sentence is likely to be a conclusive factor for L2ers to clearly indicate *wh*-word's movement source.

1) Who [$_s$ _①_ is [$_{VP}$ helping the girl _②_]]? ③ Unex
2) Who [$_s$ _①_ is the girl [$_{VP}$ helping _②_]]? ③ Unex
3) What [$_s$ _①_ is [$_{VP}$ pushing the girl _②_]]? ③ Unex
4) What [$_s$ _①_ is the girl [$_{VP}$ pushing _②_]]? ③ Unex
5) What [$_s$ _①_ will Mary [$_{VP}$ say _②_]]? ③ Unex
6) What [$_s$ _①_ will Mary [$_{VP}$ talk _②_ [$_{PP}$ about _③_]]]? ④ Unex
7) What [$_s$ _①_ will Mary [$_{VP}$ read _②_ [$_{NP}$ book _③_ [$_{PP}$ about_④_]]]]? ⑤ Unex

Table 9.

Group \ Question	G1	G2	G3	G4	G5	G6	M**	item
1	6	10	12	16	20	24	71%	① 71%
2	8	11	11	15	21	24	73%	
3	6	7	12	16	20	22	67%	
4	6	9	12	18	19	28	74%	
5	9	10	10	18	18	19	68%	② 59%
6	7	6	10	13	18	16	56%	
7	7	2	10	12	16	19	53%	

4.2.2. Hypothesis 2: an Item with two *wh*-words has trouble comprehending.

   The second hypothesis predicts that *wh*-question patterns as the below examples in (15-18) will be difficult to think back their original positions of two *wh*-words. As persuasive prediction in Table 10, considering that Item ⑤'s correction rate, 33% is lightly higher than the lowest Item ⑥'s, 30%, this is regarded as valid basis, which strongly confirms that more than searching for the source of more than two *wh*-words in a sentence is significantly confusing for L2ers. Fortunately, relatively advanced groups, G5 and G6 would bear the somewhat high *wh*-word's matching rate between an initial *wh*-word and its trace. Nevertheless, even they seem not to obey *wh*-island effect that an initial *what* in the example (17) is not extracted from a trace ② crossing over medial *wh*-argument *who*.

   15) What [s do they [VP know _①_ [CP when to launch _②_ to the public _③_]]]? ④ unex.
   16) What [s do you [VP know _①_ [CP where he showed _②_ to audience _③_]]]? ④ unex
   17)*What [s do they [VP know _①_ [CP who Mary gave _②_ to _③_]]]? ④ unex
   18) What [s does Harry [VP know _①_ [CP how to explain _②_ to students _③_]]]? ④ unex

Table 10.

Question	Group	G1	G2	G3	G4	G5	G6	M**	item
15	what	3	4	4	1	10	9	25%	
	when	6	1	9	0	16	19	41%	
16	what	3	3	4	1	9	17	30%	
	where	6	2	6	0	15	19	39%	⑤
17	what	1	0	0	0	0	0	1%	33%
	who	6	8	13	0	19	22	55%	
18	what	5	2	5	1	11	16	32%	
	how	5	2	7	0	16	16	37%	

4.2.3. Hypothesis 3: advanced syntactic rules seem to be realized at the latest.

   Hypothesis 3 shows that the below rates of three syntactic rules difficult even for native L1ers as illustrated in (11) are probably the most complicated and abstruse circumstance given that they are seemingly similar structures compared to other

sentences of each Item. Their detailed rates are as follows; *that*-trace filter (Item 4, Q 10) is 4%,   argument *wh*-island effect (Item 5, Q 17) 0.8% and adjunct island effect (Item 6, Q 21 & 22) 8%, 3%, respectively. In other words, this low mean rates (4% + 1% + 8% + 3%= 4%) below 5% confirm that already organized knowledge from learning could be only the way to approach these high-tech distinctions. So, this assumption borne out to be fairly reasonable.

10) *Who [$_s$ did the lion [$_{VP}$ see _①_ [$_{CP}$ that _②_ swam in the pond]]]? ③ Unex.
17) *What [$_s$ do they [$_{VP}$ know _①_ [$_{CP}$ who Mary gave _②_ to _③_]]]? ④ Unex.
21) *Who [$_s$ did the woman [$_{VP}$ decide _①_ [$_{CP}$ after she consulted _②_]]]? ③ Unex.
22) *Who [$_s$ did the woman [$_{VP}$ decide _①_ [$_{CP}$ after consulting _②_]]]? ③ Unex.

Table 11.

Group \ Question	G1	G2	G3	G4	G5	G6	M**	item
10	0	0	0	1	1	3	4%	
17(what)	1	0	0	0	0	0	1%	4%
21	2	1	1	2	3	1	8%	
22	0	0	0	1	1	2	3%	

Table 12's result below is technically calculated by SPSS program. This data is narrowed down and then sorted out by two groups, G/A (G1-G4, English conversation class) and G/B (G5-G6, TOEIC class), assuming that speaking and grammar class could induce definite inconsistencies. As it is, whereas the former has the basic or medial English level, the latter hold more advanced level. As a result, significance between two new groups is demonstrated according to six items as the previous way described in this paper. Specifically, Item 1 (9.522*), Item 4 (11.025*) and Item 5 (what: 11.878** & non-what: when, where, who, how: 27.696***) would verify mutual difference among them and other items not.[7] Namely, Item 1 with simple embedding and Item 4 with *that*-trace filter are

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[7] From SPSS method in Table 12 above, Q14 is arbitrarily excluded now that it is the same pattern as Q12 shown in 3.3's survey content. One more, this statistic method is done only in Table 12 in that

slightly different, Item 5 with *wh*-word's long distance is different and moreover Item 5 with *wh*-word's non-long distance is significantly different.

Table 12. (〔 〕: count & %: percentage within class)

G \ Q	G/A[68]		G/B[56]		χ^2(P)	
Item 1	[175] 64.3%		[178] 79.4%		9.522*	
Item 2	[114] 55.8%		[106] 63.0%		6.40	
Item 3	[76] 55.8%		[66] 56.9%		0.122	
Item 4	[100] 36.7%		[118] 52.6%		11.025*	
Item 5	what	[37] 13.6%	what	[72] 32.1%	what	11.878**
	non-what	[71] 26.1%	non-what	[142] 63.3%	non-what	27.696***
Item 6	[73] 26.8%		[78] 34.8%		4.225	

*** P < .001, ** P < .01, * P < .05

V. Conclusion

This paper argued that through three predicted hypotheses which pros and cons each syntactic proposal on English *wh*-question acquisition process would bear and which subsequent supporting evidences in the real data exist. Above all, the comprehension degree of simple sentences proves to be far higher than that of or doubly or triply embedded sentences due to complexity rating. Next, in searching for each *wh*-word's posited source two *wh*-words' patterns in a sentence would have the significantly challengeable property in comparison with one *wh*-word patterns in light of English L2ers' understanding rate. Lastly, unaccustomed syntactic rules such as *that*-trace filter or *wh*-island effect (argument & adjunct) have a strong tendency to feel quite difficult to master them without hesitation or nearly completely, considering that they possess the similar structural embedding depth at first

this narrowed down two groups' reduction with the respective grammar and conversation class unlike Table 9, 10 and 11 analyzed by various groups' division(six groups).

appearance. In sum, these three assumptions bore out that the specifically surveyed six items would reflect Korean English L2ers' linguistic innateness and posteriority simultaneously despite numerical flexibility.

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