ON THE L2 ACQUISITION OF KOREAN WH-CONSTRUCTIONS
WITH NEGATIVE POLARITY ITEMS:
ADULT L2, CHILD L2, AND CHILD L1 DEVELOPMENT

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I am the only person responsible for any misunderstandings, faults, and errors that might be found in this thesis.
ABSTRACT

This thesis investigates the acquisition of Korean wh-constructions with negative polarity items (NPIs) in two ways: (i) demonstrating L2 poverty-of-the-stimulus effects (e.g., Schwartz & Sprouse, 2000) and (ii) comparing three different groups of language learners – adult L2ers, child L2ers, and first language (L1) children – in their developmental sequences (e.g., Schwartz, 1992, 2003). The phenomena investigated are Korean wh-constructions with NPIs. While scrambling in Korean (an SOV wh-in-situ language) is generally optional, in the context of negative questions with an NPI (e.g., amwuto ‘anyone’), (i) scrambling of object wh-phrases is obligatory (i.e., OSV) on the wh-question reading (an Intervention Effect, Beck & Kim, 1997) and (ii) the non-scrambled question (SOV) has a yes/no-question reading (exclusively). These properties of Korean wh-constructions with NPIs constitute poverty-of-the-stimulus problems for English-speaking learners as well as for native Korean children. Adult L2ers and child L2ers, independently assessed for Korean proficiency, as well as native Korean children and adults participated in an elicited-production task, an acceptability judgment task, and an interpretation-verification task. The results show: (i) that adult and child L2ers performed like the native adult controls on all three tasks, indicating that they overcame L2 poverty-of-the-stimulus problems, and (ii) that adult L2ers and child L2ers go through the same development sequences in their acquisition of Korean wh-constructions with NPIs. On the basis of these results, it can be argued that UG constrains (adult) L2 acquisition.
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<td>AJT</td>
<td>Acceptability-judgment task</td>
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<td>Dec</td>
<td>Declarative</td>
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<td>EPT</td>
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<td>Negation</td>
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<td>Nom</td>
<td>Nominative</td>
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<td>NPI</td>
<td>Negative polarity item</td>
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<td>NQ</td>
<td>Negative wh-question without negative polarity item</td>
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<td>NNQ-WH</td>
<td>Negative wh-question with negative polarity item</td>
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CHAPTER 1
INTRODUCTION

This thesis investigates the second language (L2) acquisition of Korean *wh*-constructions with negative polarity items (hereafter, NPIs) by testing L2 poverty-of-the-stimulus phenomena and by comparing three different groups of language learners – (L1-English) L2 adults, L2 children, and first language (L1) children -- to determine whether they show similar/dissimilar development paths.

The debate as to whether (adult) L2 learners do or do not have access to Universal Grammar (UG) has received considerable attention during the past twenty five years in the field of L2 acquisition. Some scholars believe that L2 learners who start learning a language after a certain maturational point end up with knowledge that is fundamentally different from the grammar of native speakers, such that UG is not involved in adult L2 acquisition (e.g., Bley-Vroman, 1989; Johnson & Newport, 1989). However, this perspective on adult L2 acquisition has had a problem explaining how some adult L2ers come to overcome poverty-of-the-stimulus phenomena (e.g., Dekydtspotter, Sprouse & Thyre, 1998; Hopp, 2005; Kanno, 1998; Marsden, 2003). Within the field of generative L2 acquisition, demonstrations of L2 poverty-of-the-stimulus effects -- which are underdetermined by both target language (TL) input and L2 learners’ L1, and are not taught in the L2 classroom – are the most convincing way to argue that UG constrains adult L2 acquisition and that L1 acquisition and L2 acquisition are not fundamentally different (e.g., Schwartz & Sprouse, 2000).
Recently, child L2 acquisition has been argued to be potentially informative with respect to the nature of adult L2 acquisition as well as child L1 acquisition (Lakshmanan, 1995; Schwartz, 2004; Unsworth, 2005). Schwartz (1992, 2003) proposes that directly comparing adult and child L2 acquisition, where their L1 is kept constant, is one way in which developmental sequence data can be used to determine the role of UG in adult L2 acquisition. In this thesis, following Schwartz (2003), similarities and differences that child L2 acquisition has with respect to both adult L2 acquisition and child L1 acquisition are explored in terms of developmental sequences. By comparing the three different groups of language learners – L2 adults, L2 children, and L1 children – in their acquisition of particular properties of the TL, this thesis asks whether L1 children, L2 children and L2 adults pass through similar or dissimilar developmental paths.

This thesis uses these two ways to identify the role of UG in (adult) L2 acquisition, investigating the acquisition of Korean wh-constructions with NPIs by English-speaking learners. The two properties of Korean wh-constructions with NPIs that language acquirers should acquire are: (i) that in negative wh-object questions with an NPI (subject), the object wh-phrase should scramble across the NPI, and (ii) that there are two different interpretations (a wh-question reading and a yes/no-question reading), depending on whether or not the object wh-phrase is scrambled. These two properties are poverty-of-the-stimulus phenomena for English-speaking learners of Korean as well as Korean natives, because each property is underdetermined by both the L2ers' L1 and the TL input, and neither property is taught in the L2 classroom. In addition to ascertaining whether these two learnability problems can be overcome by adult L2ers, this thesis also
compares three different groups of language learners – L2 adults, L2 children, and L1 children – in the development of Korean *wh*-constructions with NPIs.

This thesis is organized as follows. Chapter 2 explains the properties of Korean *wh*-constructions\(^1\) with NPIs, reviews previous L2 acquisition research on the constructions, and provides the rationale behind the child L2 and adult L2 comparison. Chapter 3 provides details about methods and results of the experiments that were designed to investigate the L2 acquisition of Korean *wh*-constructions with NPIs. Three experiments are reported: (i) an elicited-production task, whose purpose was to test whether participants produce a targetlike order (SOV or OSV) in all test conditions; (ii) an acceptability-judgment task, the purpose of which was to examine whether L2ers show L1 transfer effects (*wh*-movement), whether participants know that Korean allows scrambling, and whether participants know that scrambling of *wh*-phrases is obligatory or prohibited depending on certain conditions; (iii) an interpretation-verification task designed for determining whether participants know that each of the two interpretations of negative questions with NPIs is a function of word order (i.e., OSV vs. SOV). Chapter 4 provides the general discussion of the results, examining what implications the current findings have for the investigation of the acquisition of Korean *wh*-constructions with NPIs. Chapter 5 concludes this thesis.

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\(^1\) *Wh-construction* is used as a cover term for sentences containing a *wh*-phrase that is either interrogative or non-interrogative. See below.
CHAPTER 2
BACKGROUND

Chapter 2 explores the constructions that are directly related to this thesis – *wh*-constructions with NPIs in Korean. Of particular interest are two properties: (i) that in negative *wh*-object questions with an NPI (subject), scrambling of the object *wh*-phrase across the NPI is obligatory (see Section 2.1.1), and (ii) that there are two different interpretations (a *wh*-question reading and a *yes/no*-question reading), depending on whether or not the object *wh*-phrase is scrambled (see Section 2.1.2). In addition, this chapter shows that the two properties of *wh*-constructions with NPIs constitute L2 poverty-of-the-stimulus problems for English-speaking L2ers of Korean.

2.1. *Wh*-constructions with negative polarity items

2.1.1. Intervention Effect

(1a) and (2a) are Korean *wh*-questions in the canonical word order (SOV) with the subject preceding the direct object. In (1b) and (2b), the *wh*-phrase (*mwues-ul ‘what-Acc’) is scrambled, showing Object-Subject-Verb (OSV) word order. Although Korean is a *wh-in-situ* language, both the non-scrambled and scrambled options are acceptable (in the appropriate discourse context), as shown in (1) and (2).

(1) a. Swuna-ka *mwues-ul* sa-ass-ni?
    Swuna-Nom what-Acc buy-Past-Q
    SOV (Non-scrambled)

       what-Acc Swuna-Nom buy-Past-Q
       OSV (Scrambled)

‘What did Swuna buy?’
    Swuna-Nom what-Acc buy-ci Neg-Past-Q
    'What didn’t Swuna buy?'

However, for negative *wh*-questions with an NPI (subject), scrambling² of the object
*wh*-phrase is obligatory, as shown in (3).

    anyone what-Acc buy-ci Neg-Past-Q
    (cannot mean 'What did no one buy?')
    anyone buy-ci Neg-Past-Q
    ‘What did no one buy?’

There are several proposals that attempt to explain the contrast exemplified in (3) (e.g.,
Beck, 1996a; Beck & Kim, 1997; Kim, 2002; Miyagawa, 2003). However, these works,
with minor differences, are basically based on Beck’s (1996b) original Minimal
Quantified Structure Constraint (MQSC) analysis (described in Section 2.1.2). Thus, this

Observing the contrast between (3a) and (3b), Beck and Kim (1997) adopt the
Minimal Negative Structure Constraint (hereafter, MNSC) of Beck (1996a), as given in
(5), and argue that the NPI, *amwuto* (‘anyone’), blocks LF *wh*-movement in Korean.

² The term "scrambling" is used in various ways, often referring to any kind of word order permutation. Here it is a
cover term for the reordering of constituents (usually object NPs) in languages such as Korean and Japanese.
Negation Induced Barrier (NIB): The first node that dominates a negative quantifier, its restriction, and its nuclear scope is a Negative Induced Barrier. (Beck, 1996a, p. 18)

Minimal Negative Structure Constraint (MNSC): If a Logical Form (LF) trace $\beta$ is dominated by an NIB $\alpha$, then the binder of $\beta$ must also be dominated by $\alpha$. (Beck, 1996a, p. 18)

To show how this derives the facts in (3), the sentences in (3a) and (3b) are represented in the LF tree diagrams (6a) and (6b), respectively. In (6a), the NIB that dominates an LF trace $t_m^\text{LF}$ does not dominate the wh-phrase, violating the MNSC; thus, wh-movement of the wh-phrase at LF is disallowed and therefore the negative question in (3a/6a) is unacceptable on the wh-question reading. However, (3a/6a) can mean ‘Did no one buy something?’ – i.e., it is acceptable on the yes/no-question reading (Beck & Kim, 1997; Choi, 2007; Ha, in press; Song, 2007).

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3 Beck and Kim (1997) make the following general assumptions: A subject stays in its base position, Spec of VP, and it is assigned nominative case by the predicate V'; scrambling is adjunction to VP; (interrogative) wh-phrases should be moved at LF to Spec of CP or a related position above C.

4 Nishigauchi (1990) argues that Korean wh-expressions, like Japanese wh-expressions, can be interpreted as wh-interrogative words or wh-indefinite words. In (3a/6a), mwues has a wh-indefinite interpretation (‘something’). See below.
As shown in (6b), by contrast, the object wh-phrase is first scrambled across the subject NPI (amwuto 'anyone') at S-structure (the NIB does not block overt movement (scrambling) of wh-phrases) and at LF it is subsequently moved to Spec of CP, which derives an acceptable negative wh-question. Here, the NIB that does not dominate the trace of the wh-phrase after scrambling also does not dominate the wh-phrase; there is thus no violation of the MNSC.

The ungrammaticality illustrated in (6a) in Korean is referred to as an "Intervention Effect" (Beck & Kim, 1997). Assuming that for wh-questions, an in-situ wh-phrase has to move from its S-structure position to an LF landing site outside the scope of negation, Beck and Kim generalize as follows: An intervening negative quantifier, e.g., the NPI amwuto ('anyone'), blocks LF wh-movement. Thus, interrogative wh-phrases cannot be c-commanded by NPIs. This generalization of the Intervention Effect has been formulated in various syntactic, semantic and pragmatic perspectives in
the literature (e.g., Beck, 1996b; Beck & Kim, 1997; Choi, 2007; Kim, 2002; Pesetsky, 2000; Tanaka, 2003).

2.1.2. Two different interpretations

Now let us look at the second property of Korean wh-constructions with NPIs. As mentioned above, Beck and Kim (1997) noted that the non-scrambled question in (7a) has a yes/no-question reading and the scrambled question in (7b) a wh-question reading.

(7) a. Amwuto mwues-ul eat-ci anh-ass-ni?
Anyone something-Acc mek-ci Neg-Past-Q
‘Did no one eat something?’ (yes/no-question reading)

b. Mwues-ul amwuto eat-ci anh-ass-ni?
What-Acc anyone mek-ci Neg-Past-Q
‘What did no one eat?’ (wh-question reading)

Although Beck and Kim did not precisely account for why (7a) can have the yes/no-question reading, they offer an interesting suggestion, namely, that there is a transparency requirement for S-structure: Scope relations\(^5\) should be made clear at S-structure. The MNSC (see (5)) is expected to hold in languages, like Korean, that have the syntactic freedom to do so. This presupposes a view of scrambling in which scrambling cannot be irrelevant to the interpretation procedure. Rather, scrambling is a means by which S-

\(^5\) I assume that scope is defined in terms of c-command, which is formulated in the following way (Chomsky, 1981): \(x\) c-commands \(y\) iff (a) the first branching node dominating \(x\) also dominates \(y\); (b) \(x\) does not dominate \(y\); (c) \(x \neq y\).
structure transparency can be achieved in Korean. But before discussing Beck and Kim's suggestion in more detail, we first need to consider the nature of wh-words in Korean.

Cross-linguistically, wh-words are not identical in nature. Indeed, a number of researchers (Aoun & Li, 1993; Cheng, 1997; Nishigauchi, 1990, among others) argue that wh-expressions in natural languages differ as far as their morphological and syntactic properties are concerned. The claim is that wh-words in, e.g., Chinese, Japanese, and Korean do not have quantificational force of their own and are like indefinite NPs. This claim is based on the fact that in these languages, wh-words that function as interrogative expressions can also act as universal and existential quantifiers. Hence the interpretation of a wh-word must be determined in its sentential context, depending on an element that binds the wh-expression and assigns its quantificational force.

Turning back to Beck and Kim's suggestion, the idea of a transparency requirement was originally suggested in Beck's (1996b) dissertation, which argues for the Minimal Quantified Structure Constraint (hereafter, MQSC), a constraint for LF, by investigating the interaction of wh-constructions with negation and quantifiers in German and Korean. First let us look at the definitions of the MQSC and Quantifier Induced Barrier (QUIB) below.

Beck and Kim (1997) assume that scrambling has the semantic function of making intended scope relations visible, so it therefore cannot be vacuous. They argue, contra Saito (1992), that scrambling (at least local scrambling) does not have to be undone.
Quantifier Induced Barrier (QUIB)
The first node that dominates a quantifier, its restriction and its nuclear scope is a quantifier induced barrier. (Beck, 1996b, p.2)

Minimal Quantified Structure Constraint (MQSC)
If an LF trace \( \beta \) is dominated by aQUIB \( \alpha \), then the binder of \( \beta \) must also be dominated by \( \alpha \). (Beck, 1996b, p. 2)

Similarly to the MNSC (see (5) in Section 2.1.1), the MQSC is supposed to operate at LF, and indicates that \( wh \)-movement across a quantifier is prohibited at LF. The MQSC deals with \( wh \)-movement across a quantifier and the MNSC across only a negation or negative quantifier (i.e., NPI).

Beck (1996b) argues that the MQSC and MNSC are general constraints stating a well-formedness requirement on structures at LF. She investigates \( wh \)-related LF movement only, not declarative LFs (e.g., someone likes everyone). The conception of LF Beck adopts is “that of a semantically transparent level of representation. […] One can do all kinds of movement on the way from S-structure to LF to achieve that interpretational transparency” (Beck, 1996b, p. 10). Therefore, her argument for the MQSC and MNSC is in a sense a transparency requirement for S-structure, which means that the intended scope relations should be made clear at S-structure. Also, it is suggested that the MQSC and the MNSC are expected to hold in languages with scrambling. This is a characteristic that Korean and German share, in contrast to English, to make scope relations correspond to the surface order.

Adopting the idea of the transparency requirement at S-structure (Beck, 1996b; Beck & Kim, 1997), let us now consider the sentences below.
The *wh*-phrase in sentence (10b) is scrambled and thus can undergo LF *wh*-movement without violation of the MNSC, as sketched in (6b), showing that the *wh*-phrase in (10b) has quantificational force and allowing the *wh*-word wide scope interpretation (i.e., object-wide scope reading (*wh*-word ‘mwues’>*NPI ‘amwuto’) through scrambling. On the other hand, the *wh*-phrase in (10a) is *wh*-in-situ and cannot undergo LF *wh*-movement because it would violate the MNSC, as presented in (6a), reflecting the fact that the *wh*-word does not have quantificational force, forcing the NPI to have wide scope interpretation (i.e., subject-wide scope reading (NPI ‘amwuto’>*wh*-word ‘mwues’)). Thus, the two *wh*-phrases in (10a) and (10b) are interpreted as a *wh*-indefinite and a *wh*-interrogative, respectively. In brief, Beck and Kim’s basic idea is that in Korean *wh*-constructions with NPIs, the intended scope relations can be made visible at S-structure through the presence or absence of scrambling, and since they can be made visible, they have to be.

In summary, there are the two main properties of *wh*-constructions with NPIs in Korean: (i) in negative *wh*-questions with NPIs, object *wh*-phrases must scramble across subject NPIs to obviate the Intervention Effect, and (ii) there are two different interpretations depending on whether or not the *wh*-phrase is scrambled (a *wh*-question reading (see (10b)) and a *yes/no*-question reading (see (10a)).
2.1.3. L2 poverty-of-the-stimulus problems

For English-speaking learners of Korean, the acquisition of the two properties of *wh*-constructions with NPIs – (i) scrambling of *wh*-phrases is obligatory to obviate the Intervention Effect; and (ii) two interpretations are available in a negative question with an NPI through presence/absence of scrambling – gives rise to poverty-of-the-stimulus problems for the following reasons.

First, with respect to the first property (i), Beck and Kim note that Korean allows scrambling of a *wh*-phrase (as in (10b)) to remove it from the scope of a negative quantifier (i.e., an NPI), but English does not. They suggest that if a language has a scrambling process that can obviate the Intervention Effect, it must use it – and they speculate that the absence of scrambling correlates with the absence of the Intervention Effect. According to Beck and Kim, languages such as Hindi, Turkish and Urdu, like Korean (and unlike English), do not have obligatory *wh*-movement but do have scrambling, and thus these languages exhibit the Intervention Effect. In contrast, English, the first language of the L2ers in this study, does not show the Intervention Effect. For native English speakers acquiring Korean, the Intervention Effect is not in the TL input and is not a characteristic of their L1 grammar. Also this phenomenon is not the focus of TL instruction. Therefore, such L2ers will face learnability problems in the acquisition of Korean *wh*-constructions with NPIs.

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7 Pesetsky (2000) argues that English does have the Intervention Effect in restricted contexts – but only with D(iscourse)-linked *wh*-expressions (e.g., *which book*) and only under rather special circumstances. In addition, D-linked *wh*-expressions tend to behave differently from non-D-linked *wh*-expressions (e.g., *who, what*). I therefore follow Beck and Kim (1997) in assuming that English lacks the Intervention Effect. Note also that I do not include D-linked *wh*-expressions in the experiments of the present study.

8 I asked Korean instructors at the University of Hawai‘i at Manoa whether Korean textbooks cover the two properties of *wh*-constructions with NPIs and whether they teach them in their class. It is definitely true that the two properties are not taught at all because even the instructors did not know these phenomena before I asked them.
Next, as described in Section 2.1.2, the second property of *wh*-constructions with NPIs is that the in-situ order (SOV) and the scrambled order (OSV), respectively, have only a *yes/no*-question reading and a *wh*-question reading. These interpretive restrictions on negative NPI-subject *wh*-constructions make the learnability problems all the more severe for English-speaking learners of Korean. However, if English-speaking L2ers of Korean can overcome these two L2 poverty-of-the-stimulus problems, it can be argued that UG constrains (adult and child) L2 acquisition. The next section reviews the previous L2 research on *wh*-constructions with NPIs in Korean.

2.2. Prior research on Korean *wh*-constructions with negative polarity items

There has been very little experimental work on the L2 acquisition of Korean *wh*-constructions with NPIs. Song (2007) investigated the Intervention Effect in adult English-speaking L2ers of Korean. Since my thesis builds on that study, here the experimental details of Song (2007) are omitted.

The results from Song’s elicited-production task (see Section 3.3) indicated that adult native speakers, tested on three syntactic contexts (see (1), (2), and (3b)), almost always produced scrambled object *wh*-phrases across subject NPIs only in negative NPI-context *wh*-questions (see (3b)). Some adult L2ers also demonstrated exactly the same contrast, despite the learnability problem – thereby providing the first suggestive evidence that in regard to this phenomenon, adult L2 acquisition is constrained by UG.

Interestingly, many native controls suggested that there were two possible interpretations of negative *wh*-constructions with NPIs, depending on whether the object
wh-phrase scrambles or stays in situ: the wh-question reading and the yes/no-question reading. This is explicitly tested in my thesis (see Section 3.5).

Song (2007) also showed that wh-constructions with NPIs are very rare in Korea natural data. The Sejong Corpus of the 21st Century Sejong Project Organization was searched in order to investigate the frequency of *amwuto* (‘anyone’), *mwues-ul* (‘what-Acc’/‘something-Acc’) and *nwukwwu-lul* (‘who-Acc’/‘someone-Acc’). Despite the fact that there are hundreds of tokens of each of the three phrases at issue, there is no occurrence of a scrambled wh-phrase in the context of negative wh-constructions with an NPI subject, *amwuto* (‘anyone’). In addition, it should be emphasized that the interpretive restrictions on such negative NPI-subject wh-constructions (with scrambled vs. in-situ object wh-phrases) are in any case not in the input at all.

2.3. Adult and child L2 acquisition compared

Before explaining the rationale behind the child L2 and adult L2 comparison, the term “child L2ers” should be defined. Here I consider a child L2er to be an L2er who was first exposed to the target language between the ages of four and seven. The lower boundary is fixed at four as it is generally assumed that most of the child’s L1 is in place at this age. The upper boundary is set at seven as an estimate of the start of a (possible) decline in nativelike attainment (e.g., Johnson & Newport, 1989).

---

9 The corpus has a total of 124,372,711 tokens, 90% from a written corpus and 10% from a spoken corpus.

10 Even though there is not a single question in the corpus containing *amwuto* (‘anyone’) with *mwues-ul* (‘what-Acc’/‘something-Acc’) or with *nwukwwu-lul* (‘who-Acc’/‘someone-Acc’), it cannot be assumed that such negative questions do not occur at all in Korean natural data, because Korean native speakers do utter them. However, it is definitely true that such negative questions are extremely rare in Korean natural data.
The rationale behind the child L2 and adult L2 comparison conducted in this study is based on work by Schwartz (1992, 2003). Child L2 acquisition, she claims, could provide a missing link in answering whether adult L2 acquisition is constrained by the same innate domain-specific knowledge as in L1 acquisition, namely UG, or whether adult L2 acquisition is based on something domain-general (Bley-Vroman, 1989; Clahsen & Muysken, 1986). Her argument works as follows: Assuming (i) that child L2 acquisition is constrained by UG and (ii) that the general learning principles in question are more relevant to adult L2ers, then (iii) comparing developmental sequences of child L2ers with those of adult L2ers, while holding the L1 constant, will provide evidence for or against UG involvement in adult L2 acquisition. Similar developmental sequences would indicate that UG constrains adult L2 acquisition, whereas dissimilar paths (that are not attributable to L1 transfer differences) would indicate that adult L2 acquisition stems from something other than UG, i.e., domain-general properties of the mind, but child L2 acquisition stems from UG. On the basis of this approach, this thesis examines whether L2 adults, L2 children, and L1 children pass through the same or different developmental stages in the acquisition of Korean wh-constructions with NPIs.
CHAPTER 3

THE STUDY

The purpose of this thesis is to determine the role of UG in (adult) L2 acquisition by providing answers to the following questions:

(11) Do L1 English-speaking L2ers of Korean overcome L2 poverty-of-the-stimulus problems in the acquisition of wh-constructions with NPIs?

(12) Do L1 English-speaking adult and child L2ers of Korean follow the same developmental sequence for these phenomena, and how does L1 Korean development compare?

In order to answer these two questions, I conducted three main tasks -- an elicited-production task, an acceptability-judgment task, and an interpretation-verification task -- with English-speaking adult and child L2ers of Korean and adult and child natives. Subsequent sections first describe the participants, then present the purposes, the methods, and the results of the three tasks, and lastly discuss the findings.

3.1. Participants

There are four groups of participants in this study: adult and child English-speaking learners of Korean, and adult and child Korean native speakers. The details of all participants are presented in Table 1.
Table 1. Participant details

<table>
<thead>
<tr>
<th></th>
<th>L1 Adult</th>
<th>L1 Child</th>
<th>L2 Adult</th>
<th>L2 Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (n)</td>
<td>15</td>
<td>23</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Age at time of testing</td>
<td>19;8-45;7</td>
<td>5;0-7;9</td>
<td>20;4-43;8</td>
<td>6;8-13;8</td>
</tr>
<tr>
<td>Age of Korean onset</td>
<td></td>
<td></td>
<td>10;9-37;8</td>
<td>4;1-7;0</td>
</tr>
</tbody>
</table>

All the L2 participants in this study had been exposed to Korean in a classroom setting, the adults at university and the children at Korean Saturday schools. They had had varying amounts of naturalistic communication with Korean teachers and friends, not with their families (i.e., they were not heritage language learners). Also, some L2 participants reported enjoying Korean dramas and movies on television in Hawai‘i.

All participants had to be able to read Korean because the experiments required them to use four written word/phrase cards to produce sentences and to comprehend sentences presented to them. Since the experiments in this study would not be possible with children (much) younger than 5, the L1 (and L2) children had to be at least 5 years old. Also, L2 children should be older than age 4 because “child L2er” is considered to be an L2er whose initial exposure to the target language occurs between the age of 4 and 7.

In addition to a picture-narration task given only to the L2ers to assess their Korean, all participants took part in three tasks: an elicited-production task, an acceptability-judgment task, and an interpretation-verification task. The four tasks were conducted on two separate days. Korean natives participated in the elicited-production task on the first day, and then had the acceptability-judgment task and the interpretation-verification task one week later. L2 participants took part in the elicited-production task and a picture-narration task for assessing L2 proficiency (see Section 3.2) on the first day.
One week later, they participated in the acceptability-judgment task and the interpretation-verification task. All participants completed each task individually in a quiet room.

3.2. L2 proficiency assessment (picture-narration task)

3.2.1. L2 proficiency

In L2 acquisition research, L2 learners' language proficiency has been defined in numerous ways. Language proficiency is used not only as a general indicator of an L2er's ability in the target language, but also as a measure of specific aspects of linguistic competence, such as syntax, morphology, lexicon and/or discourse. In this cross-sectional study, determining L2 proficiency is necessary for comparing child L2ers and adult L2ers and seeing whether their developmental paths are similar or dissimilar. L2 proficiency in this study is defined in terms of the ability to produce lexically and syntactically complex and accurate utterances in the target language.

Lalleman (1986) argues that it is necessary to assess both syntactic complexity and syntactic accuracy because these two aspects of language proficiency closely interact. In other words, the more complex an utterance is, the more opportunity there is for errors to be made. If an assessment of L2 proficiency were made on the basis of complexity alone, where complexity is measured, for example, by utterance length, L2ers who produce long yet inaccurate utterances would be considered more proficient than L2ers who produced shorter but more accurate utterances. It is therefore essential that both complexity and accuracy be incorporated into a proficiency score. Similar to Lalleman's argument, Larsen-Freeman (1983) also suggests that a measure combining complexity...
and accuracy can be the most successful means of getting reliable L2 proficiency scores. Thus, in this study, measures of complexity and accuracy are combined in order to get L2 proficiency scores, which will be explained in detail in the next section.

In this thesis, a picture-narration task was adopted to get an independent measure of L2 proficiency (Whong-Barr & Schwartz, 2002). This study has child participants (older than age 5), so the picture-narration task is much more appropriate for them than other types of L2 proficiency tests (e.g., a cloze test, a standardized test) because the task is based on spoken data, and telling a story with pictures and describing pictures are familiar to young children. However, one difference here from Whong-Barr and Schwartz (2002) is that they defined a segment in oral data as an utterance, but here “T-unit” was used to divide oral data into segments because the oral data collected from the picture-narration task are not fragmentary and elliptical. I excluded pausing and intonational features, false starts, and repetitions from the segmented data.

3.2.2. Materials

This task consists of three sets of four pictures depicting a sequence of events. Each series of pictures elicits (semi-)spontaneous data, and all the actions depicted are considered general enough to happen in everyday life, such as washing one’s face, brushing one’s teeth, reading a book, and going to bed. An example for the picture-narration task is provided in Figure 1 (see Appendix A for the other examples).

11 Whong-Barr and Schwartz (2002) adopted the convention of counting error-free segments of Larsen-Freeman (1983). Whereas Larsen-Freeman analyzed her L2 data by T-units, not utterances, Whong-Barr and Schwartz decided to use utterances over T-units because their oral data tend to be fragmentary.

12 The definition of a T-unit is “one main clause plus whatever subordinate clause and nonclausal expressions are attached to or embedded within it” (Hunt, 1970, p. 14). T-unit is clearly the most popular unit for the analysis of both written and spoken data (Iwashita, 2006; Ortega, 2003)
The L2 participants were presented with the three sets of four pictures via Microsoft Office Powerpoint slides and asked, for each set, to tell a story about what they saw. If they seemed to look nervous and had difficulty starting to speak, the experimenter allowed them to say what they wanted to describe in their native language (English) and then asked them to say it in Korean. This could encourage them to tell a story.

3.2.3. Data analysis

Table 2 below shows the proficiency results in which the child L2ers and adult L2ers are ranked by their L2 Proficiency Scores. I will explain how to calculate the numbers presented in Table 2 to get an L2 Proficiency Score by going through those of one child L2 participant (glossed as C5) as an example. The cell for C5 is highlighted in grey in Table 2.

First, to measure complexity, the total number of words was divided by the total number of T-units from the picture-narration task (C5 in Table 2, 53+13=4.08). Second, the accuracy measure exhibits the rate of error-free T-units; any T-unit that contained
even one syntactic, morphological or lexical error was deemed “errorful.” The number of error-free T-units was divided by the total number of T-units and then multiplied by 100, providing a percentage of error-free T-units (C5 in Table 2, (6+13)*100=46.2%). Third, the accuracy measure (%) was converted into a decimal figure by multiplying it by 10 (C5 in Table 2, 46.2%*10=4.62) to make it comparable to the complexity measure, and then the range for the converted accuracy measure and the range for the complexity measure were each calculated. Fourth, based on the results from all the adult and child L2ers, the range for the converted accuracy measure (at 8.06) was 1.11 times greater than the range for the complexity measure (at 7.26). Finally, the complexity measure for each participant was multiplied by 1.11, and then added to his/her converted accuracy measure, resulting in a relative L2 Proficiency Score for each L2 participant (C5 in Table 2, (4.08*1.11)+4.62=9.14 (participant C5’s L2 Proficiency Score)).

13 The Proficiency Scores of the L2 adults and the L2 children are not statistically different (t=1.68, p>0.1), suggesting that these two groups are comparable.
Table 2. Proficiency results of all L2 participants

<table>
<thead>
<tr>
<th>L2er</th>
<th>Total words</th>
<th>Total T-units</th>
<th>Complexity Measure&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Error-free T-units</th>
<th>Accuracy Measure&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Converted Accuracy Measure&lt;sup&gt;c&lt;/sup&gt;</th>
<th>Proficiency Score&lt;sup&gt;d&lt;/sup&gt;</th>
<th>Proficiency Level&lt;sup&gt;e&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>22</td>
<td>9</td>
<td>2.44</td>
<td>1</td>
<td>11.1%</td>
<td>1.11</td>
<td>3.82</td>
<td>L</td>
</tr>
<tr>
<td>C2</td>
<td>35</td>
<td>12</td>
<td>2.92</td>
<td>3</td>
<td>25.0%</td>
<td>2.50</td>
<td>5.74</td>
<td>L</td>
</tr>
<tr>
<td>C3</td>
<td>38</td>
<td>13</td>
<td>2.92</td>
<td>5</td>
<td>38.5%</td>
<td>3.85</td>
<td>7.09</td>
<td>L</td>
</tr>
<tr>
<td>C4</td>
<td>56</td>
<td>14</td>
<td>4.00</td>
<td>5</td>
<td>35.7%</td>
<td>3.57</td>
<td>8.01</td>
<td>L</td>
</tr>
<tr>
<td>C5</td>
<td>53</td>
<td>13</td>
<td>4.08</td>
<td>6</td>
<td>46.2%</td>
<td>4.62</td>
<td>9.14</td>
<td>L</td>
</tr>
<tr>
<td>C6</td>
<td>53</td>
<td>12</td>
<td>4.42</td>
<td>7</td>
<td>58.3%</td>
<td>5.83</td>
<td>10.74</td>
<td>LI</td>
</tr>
<tr>
<td>C7</td>
<td>62</td>
<td>12</td>
<td>5.17</td>
<td>8</td>
<td>66.7%</td>
<td>6.67</td>
<td>12.40</td>
<td>LI</td>
</tr>
<tr>
<td>C8</td>
<td>71</td>
<td>11</td>
<td>6.45</td>
<td>8</td>
<td>72.7%</td>
<td>7.27</td>
<td>14.44</td>
<td>I</td>
</tr>
<tr>
<td>C9</td>
<td>74</td>
<td>10</td>
<td>7.40</td>
<td>7</td>
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<td>7.00</td>
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</tr>
<tr>
<td>C10</td>
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<td>10</td>
<td>8.00</td>
<td>8</td>
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<td>8.00</td>
<td>16.88</td>
<td>H</td>
</tr>
<tr>
<td>A1</td>
<td>26</td>
<td>9</td>
<td>2.89</td>
<td>2</td>
<td>22.2%</td>
<td>2.22</td>
<td>5.43</td>
<td>L</td>
</tr>
<tr>
<td>A2</td>
<td>35</td>
<td>10</td>
<td>3.50</td>
<td>2</td>
<td>20.0%</td>
<td>2.00</td>
<td>5.89</td>
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</tr>
<tr>
<td>A3</td>
<td>41</td>
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<td>3.73</td>
<td>5</td>
<td>45.5%</td>
<td>4.55</td>
<td>8.68</td>
<td>L</td>
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<td>5</td>
<td>50.0%</td>
<td>5.00</td>
<td>10.00</td>
<td>L</td>
</tr>
<tr>
<td>A5</td>
<td>50</td>
<td>10</td>
<td>5.00</td>
<td>6</td>
<td>60.0%</td>
<td>6.00</td>
<td>11.55</td>
<td>L</td>
</tr>
<tr>
<td>A6</td>
<td>63</td>
<td>15</td>
<td>4.20</td>
<td>11</td>
<td>73.3%</td>
<td>7.33</td>
<td>12.00</td>
<td>LI</td>
</tr>
<tr>
<td>A7</td>
<td>59</td>
<td>12</td>
<td>4.92</td>
<td>9</td>
<td>75.0%</td>
<td>7.50</td>
<td>12.96</td>
<td>LI</td>
</tr>
<tr>
<td>A8</td>
<td>71</td>
<td>13</td>
<td>5.46</td>
<td>10</td>
<td>76.9%</td>
<td>7.69</td>
<td>13.75</td>
<td>I</td>
</tr>
<tr>
<td>A9</td>
<td>77</td>
<td>12</td>
<td>6.42</td>
<td>9</td>
<td>75.0%</td>
<td>7.50</td>
<td>14.62</td>
<td>I</td>
</tr>
<tr>
<td>A10</td>
<td>79</td>
<td>13</td>
<td>6.08</td>
<td>11</td>
<td>84.6%</td>
<td>8.46</td>
<td>15.21</td>
<td>I</td>
</tr>
<tr>
<td>A11</td>
<td>79</td>
<td>12</td>
<td>6.58</td>
<td>11</td>
<td>91.7%</td>
<td>9.17</td>
<td>16.47</td>
<td>I</td>
</tr>
<tr>
<td>A12</td>
<td>80</td>
<td>9</td>
<td>8.89</td>
<td>7</td>
<td>77.8%</td>
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</tr>
<tr>
<td>A15</td>
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<td>10</td>
<td>9.70</td>
<td>9</td>
<td>90.0%</td>
<td>9.00</td>
<td>19.77</td>
<td>H</td>
</tr>
</tbody>
</table>

Note. C=child; A=adult; L=Low; LI=Low-intermediate; I=Intermediate; H=High

<sup>a</sup>Complexity Measure=Average number of words per T-unit; <sup>b</sup>Accuracy Measure=Percentage of error-free T-units
<sup>c</sup>Converted Accuracy Measure=(Percentage of error-free T-units) x 10
<sup>d</sup>Proficiency Score=(Complexity Measure x 1.1) + Converted Accuracy Measure
3.3. Elicited-production task

The purpose of the elicited-production task is to test whether participants produce a targetlike order (SOV or OSV) in the four conditions described below in Section 3.3.1.1. The research questions addressed in the elicited-production task are stated in (13).

(13) Research questions addressed in the elicited-production task

a. Do participants produce either scrambled or in-situ orders in wh-questions without NPIs?

b. Do participants produce only the scrambled order (OSV) in negative wh-questions with NPIs?

c. Do participants produce only the in-situ order (SOV) in negative yes/no-questions with NPIs?

3.3.1. Method

3.3.1.1. Materials

For this study, the Korean NPI amwuto (‘anyone’) is used and the experiments make use of two wh-words: mwues (‘what’ or ‘something’) and nwukwu (‘who’ or ‘someone’). There are four experimental conditions: positive wh-questions without NPI (“PQ,” as in (14)), negative wh-questions without NPI (“NQ,” as in (15)), negative wh-questions with NPI (“NNQ-WH,” as in (16a) – target: *SOV/√OSV (wh-question reading only)), and negative yes/no-questions with NPI (“NNQ-Y/N,” as in (16b) – target: √SOV/*OSV (yes/no-question reading only)).
There are 16 experimental items (i.e., 4 per condition). To distract participants’ attention from the experimental items, they are mixed with 16 fillers. As 3 of the 4 experimental items are negative questions with mwues (‘what’/‘something’) or nwukwu (‘who’/‘someone’), all fillers are simple positive yes/no-questions (e.g., Emma-Nom napi-Acc cap-ass-ni? ‘Did mother catch a butterfly?’). A sample protocol for the PQ condition is provided in Figure 2. A full list of the experimental items in the elicited-production task is presented in Appendices B, C, D, and E. An example of a filler in the elicited-production task is presented in Figure 3 (see Appendix F for the full list of filler sentences used in the elicited-production task).
Figure 2. A sample protocol for the PQ condition in the elicited-production task

Context: The family came to a store to buy snacks. All of them bought different things.

Experimenter <in Korean, using SOV order>: Mother bought cookies. Cheolsoo bought candy. Younghee bought ice cream. Father bought this at the store.

<in English for L2ers> BBUNG BBUNG (the puppet) knows what it is. Ask him about it. You can use these four cards to ask him.

Participant: 

\[
\begin{array}{|c|c|c|c|}
\hline
\text{appa-ka} & \text{kakey-eyse} & \text{mwues-ul} & \text{sa-ass-nil?} \\
\text{father-Nom} & \text{store-Loc} & \text{what-Acc} & \text{buy-Past-Q} \\
\hline
\end{array}
\]

→ SOV (targetlike)

\[
\begin{array}{|c|c|c|c|}
\hline
\text{mwues-ul} & \text{kakey-eyse} & \text{appa-ka} & \text{sa-ass-nil?} \\
\text{what-Acc} & \text{store-Loc} & \text{father-Nom} & \text{buy-Past-Q} \\
\hline
\end{array}
\]

→ OSV (targetlike)

'What did father buy at the store?'

Figure 3. An example of a filler in the elicited-production task
Context: A monkey has two sons, John, Tom, and one daughter, Mini. He had to go to the market to buy food. Before he left, he gave three bananas to them and told them that each one should have a banana for lunch while he was not at home.

Experimenter <in Korean, using SOV order>: When he came home, John was eating a banana, and Tom was holding a banana. However, Mini did not have it.

<in English for L2ers> BBUNG BBUNG (the puppet) knows whether Mini ate a banana or not. Ask him about it. You can use these four cards to ask him.

Participant: 

<table>
<thead>
<tr>
<th>Mini-ka</th>
<th>cemsim-ulo</th>
<th>panana-lul</th>
<th>mek-ess-ni?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini-Nom</td>
<td>lunch-for</td>
<td>banana-Acc</td>
<td>eat-Past-Q</td>
</tr>
</tbody>
</table>

→ SOV (targetlike)

<table>
<thead>
<tr>
<th>panana-lul</th>
<th>cemsim-ulo</th>
<th>Mini-ka</th>
<th>mek-ess-ni?</th>
</tr>
</thead>
<tbody>
<tr>
<td>banana-Acc</td>
<td>lunch-for</td>
<td>Mini-Nom</td>
<td>eat-Past-Q</td>
</tr>
</tbody>
</table>

→ OSV (targetlike)
‘Did Mini eat a banana for lunch?’

3.3.1.2. Procedure

Prior to the actual experiment, participants had a training session with 3 items to familiarize them with the task. While each participant was presented with a picture (on a computer screen, via Microsoft Office PowerPoint slides), the experimenter told him/her a story about it (starting in English for L2ers – i.e., “Context” in Figures 2 and 3 – and ending in two or three short (SOV) sentences in Korean). After that, the participant was instructed (in English to L2ers) to ask BBUNG BBUNG, the puppet, a question using Korean word/phrase cards that he/she was given. For each item, there were four cards: one NP or amwuto ‘anyone’ (for the subject); one wh-word (for the object); one verb part (with or without negation); one (locative or temporal) adverbial phrase. As adverbials can occur anywhere (proverbally) in Korean sentences, the position of the adverbial phrase in test sentences is not analyzed. Note also that no such adverbials were included in Song (2007).
together were handed to the participant so as to remove any possible effects from the order in which the cards were presented. The participant was allowed to lay out the given cards only once per trial.

3.3.2. Results

Because of L2 proficiency differences within the L2 child group and the L2 adult group (see Table 2), it is difficult to determine on the basis of pooled results from these groupings (by learner type) whether L2ers came to know the two properties of Korean wh-constructions with NPIs. For this reason, I combined the adult and child L2ers, using their L2 Proficiency Scores to create four proficiency groups: Low (L), Low-Intermediate (LI), Intermediate (I) and High (H). The L2 proficiency ranges of these four groups are: L=3.82-10.00; LI=10.74-12.96; I=13.75-16.47; H=16.88-19.77. All four of these groups contain both L2 children and L2 adults. Within each proficiency group, it is necessary to know how (similarly/differently) the L2 adults and the L2 children perform on all conditions. Therefore, before presenting the results from the four L2 proficiency groups (Low, Low-Intermediate, Intermediate, High), the results by adult and child L2ers in each proficiency group will be provided in order to see whether the rates of the adult L2ers’ responses are (relatively) parallel to those of the child L2ers. If they are parallel (and as we shall see, they are indeed) throughout what follows, the results from these four L2 proficiency groups will then be examined and compared to those from the two native groups.

15 There is no specific standard, based on the Proficiency Scores themselves, for dividing all L2 participants into four groups. As you will see below, I found some patterns from the responses of L2ers, and matched them to their Proficiency Scores, and it was on this basis that I divided the L2ers into the four groups.
For the elicited-production task, the data are analyzed in terms of the percentage of OSV (scrambled order) responses in all conditions (PQ, NQ, NNQ-WH, and NNQ-Y/N), since the purpose of this elicited-production experiment is to see whether or not participants scramble the object wh-phrase across the subject, especially across a subject NPI, amwuto ‘anyone’, when required, i.e., in NNQ-WH, but not when prohibited, i.e., in NNQ-Y/N (note that if not OSV, the order produced was always SOV). Table 3 presents the percentages of OSV in each of the four conditions from the elicited-production task by adult and child L2ers in each proficiency group.

Table 3. OSV responses in the elicited-production task by adult and child L2ers in each proficiency group

<table>
<thead>
<tr>
<th></th>
<th>L1 group</th>
<th>Low</th>
<th>Low-Intermediate</th>
<th>Intermediate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L1A</td>
<td>L1C</td>
<td>L2A</td>
<td>L2C</td>
</tr>
<tr>
<td>L2 group</td>
<td></td>
<td>(n=15)</td>
<td>(n=23)</td>
<td>(n=4)</td>
<td>(n=5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L2A</td>
<td>L2C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(n=3)</td>
<td>(n=2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L2A</td>
<td>L2C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(n=4)</td>
<td>(n=2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L2A</td>
<td>L2C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(n=4)</td>
<td>(n=1)</td>
</tr>
<tr>
<td>PQ (k=4)</td>
<td>5.0%</td>
<td>9.8%</td>
<td>87.5%</td>
<td>85.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td>(3/60)</td>
<td>(9/92)</td>
<td>(14/16)</td>
<td>(17/20)</td>
<td>(0/12)</td>
</tr>
<tr>
<td></td>
<td>6.3%</td>
<td>12.5%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>12.5%</td>
</tr>
<tr>
<td></td>
<td>(1/8)</td>
<td>(1/16)</td>
<td>(1/8)</td>
<td>(1/8)</td>
<td>(1/8)</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td>(0/16)</td>
<td>(0/16)</td>
<td>(0/16)</td>
<td>(0/16)</td>
<td>(0/4)</td>
</tr>
<tr>
<td>NQ (k=4)</td>
<td>1.7%</td>
<td>4.3%</td>
<td>87.5%</td>
<td>90.0%</td>
<td>8.3%</td>
</tr>
<tr>
<td></td>
<td>(1/60)</td>
<td>(4/92)</td>
<td>(14/16)</td>
<td>(18/20)</td>
<td>(1/12)</td>
</tr>
<tr>
<td></td>
<td>6.3%</td>
<td>12.5%</td>
<td>6.3%</td>
<td>12.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td>(1/8)</td>
<td>(1/16)</td>
<td>(1/8)</td>
<td>(1/8)</td>
<td>(1/8)</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td>(0/16)</td>
<td>(0/16)</td>
<td>(0/16)</td>
<td>(0/16)</td>
<td>(0/4)</td>
</tr>
<tr>
<td>NNQ-WH (k=4)</td>
<td>93.3%</td>
<td>67.4%</td>
<td>93.8%</td>
<td>80.0%</td>
<td>8.3%</td>
</tr>
<tr>
<td></td>
<td>(56/60)</td>
<td>(62/92)</td>
<td>(15/16)</td>
<td>(18/20)</td>
<td>(1/12)</td>
</tr>
<tr>
<td></td>
<td>12.5%</td>
<td>56.3%</td>
<td>62.5%</td>
<td>87.5%</td>
<td>75.0%</td>
</tr>
<tr>
<td></td>
<td>(5/8)</td>
<td>(9/16)</td>
<td>(14/16)</td>
<td>(14/16)</td>
<td>(3/4)</td>
</tr>
<tr>
<td>NNQ-Y/N (k=4)</td>
<td>3.3%</td>
<td>19.6%</td>
<td>87.5%</td>
<td>80.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td>(2/60)</td>
<td>(18/92)</td>
<td>(14/16)</td>
<td>(16/20)</td>
<td>(0/12)</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td>50.0%</td>
<td>37.5%</td>
<td>12.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td>(0/8)</td>
<td>(8/16)</td>
<td>(3/8)</td>
<td>(2/16)</td>
<td>(0/4)</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children

Target response: PQ: √SOV(√OSV); NQ: √SOV(√OSV); NNQ-WH: *SOV/√OSV; NNQ-Y/N: √SOV/*OSV

As shown above, in each proficiency group, the rates of OSV responses of L2 children are parallel to those of L2 adults across all four experimental conditions. Therefore,
Figure 3 provides the percentages of OSV in each of the four conditions from the elicited-production task by L2 proficiency group.
Figure 4. OSV responses in the elicited-production task

OSV in the elicited-production task: By proficiency

<table>
<thead>
<tr>
<th>OSV in the elicited-production task: By proficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1A (n=15)</td>
</tr>
<tr>
<td>PQ (k=4)</td>
</tr>
<tr>
<td>NQ (k=4)</td>
</tr>
<tr>
<td>NNQ-WH (k=4)</td>
</tr>
<tr>
<td>NNQ-Y/N (k=4)</td>
</tr>
</tbody>
</table>

*Note.* L1A=L1 adults; L1C=L1 children; L2-L=Low L2ers; L2-L1=Low-Intermediate L2ers; L2-I=Intermediate L2ers; L2-H=High L2ers

Target response: PQ: √SOV/√OSV; NQ: √SOV/√OSV; NNQ-WH: *SOV/√OSV; NNQ-Y/N: √SOV/*OSV
The L1 adults performed as expected. Although they almost never produced (possible but non-canonical) OSV responses in PQ and NQ, they did produce OSV in NNQ-WH at the high rate of 93.3%, and almost never produced OSV in NNQ-Y/N (3.3%). The L1 children showed a relatively similar pattern to that of the L1 adults. They produced OSV much more often in NNQ-WH than in any other condition, although not quite as frequently as the L1 adults did.

We turn now to the four L2 proficiency groups. The L2ers in the low proficiency group almost always produced OSV orders in all four conditions. The L2ers in the low-intermediate proficiency group, on the other hand, almost never produced OSV responses, across all the conditions; in other words, they produced SOV utterances in all conditions. The intermediate proficiency group restricted OSV to the two NNQ conditions, both around half the time. However, the high proficiency L2ers performed similarly to the L1 adults across all conditions.

As for the results from the fillers in the elicited-production task, all participants almost never produced OSV responses in fillers, i.e., simple positive yes/no-questions without either wh-phrases or NPIs, as shown in Table 4 (see Appendix G for the results from the fillers by adult and child L2ers in each proficiency group for the elicited-production task).
Table 4. OSV responses (%) in fillers in the elicited-production task

<table>
<thead>
<tr>
<th></th>
<th>L1A (n=15)</th>
<th>L1C (n=23)</th>
<th>L2A + L2C (n=25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fillers (k=16)</td>
<td>4.2% (10/240)</td>
<td>7.1% (26/368)</td>
<td>1.4% (2/144) 1.3% (1/80) 6.3% (6/96) 2.5% (2/80)</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children; L2-L=Low L2ers; L2-LI=Low-Intermediate L2ers; L2-I=Intermediate L2ers; L2-H=High L2ers

Target response: Fillers: √SOV(√OSV)

3.3.3. Discussion

The aim of the elicited-production task was to determine whether participants produce a targetlike order (SOV or OSV) in each of the four conditions (PQ, NQ, NNQ-WH, NNQ-Y/N). All the patterns found in the data of the L1 adults and most L1 children are as expected. Importantly, they consistently scramble object wh-phrases across subject NPIs in negative wh-questions with NPIs, but almost never scramble in negative yes/no-questions with NPIs. Although they could scramble object wh-phrases freely in wh-questions without NPIs (PQ & NQ), producing OSV orders, they virtually always produced in-situ orders (SOV), a finding which will be addressed below.

As for the L2 learners, the low and low intermediate L2ers did not seem to know that scrambling of wh-phrases is obligatory in NNQ-WH but prohibited in NNQ-Y/N. However, the high L2ers show nativelike performance across all the conditions. Interestingly, it was found that the responses of adult and child L2ers in each proficiency group on all the conditions show a similar pattern, as summarized in Table 5.
Table 5. Patterns of all participants’ responses from the elicited-production task

<table>
<thead>
<tr>
<th></th>
<th>L1A</th>
<th>L1C</th>
<th>L2A + L2C</th>
<th>Elicited-production task</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PQ</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>OSV</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>OSV</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>SOV</td>
</tr>
<tr>
<td>4</td>
<td>Some</td>
<td>Intermediate</td>
<td>SOV</td>
<td>SOV</td>
</tr>
<tr>
<td>5</td>
<td>All</td>
<td>Most</td>
<td>High</td>
<td>SOV</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children. PQ=positive wh-question without NPI; NQ=negative wh-question without NPI; NNQ-WH=negative wh-question with NPI; NNQ-Y/N=negative yes/no-question with NPI. Target response: PQ: √SOV(√OSV); NQ: √SOV(√OSV); NNQ-WH: √SOV/√OSV; NNQ-Y/N: √SOV/#OSV

This pattern could be a developmental sequence of Korean wh-constructions with NPIs, specifically, with respect to their production. However, in order to confirm this hypothesized developmental sequence, three questions raised by the findings of the elicited-production task need to be answered.

First, all participants – except for the low L2ers – almost always produced only SOV responses in PQ and NQ, where target responses are both SOV and OSV. Thus, it is unclear whether or not they know that Korean allows scrambling and specifically whether or not they accept OSV in PQ and NQ.

Second, the low L2ers almost always produced only OSV responses across all the conditions; this means that although they did produce OSV responses in NNQ-WH, it seems not to have been for the right reason. One possible explanation for this might be an

<sup>16</sup> The cell highlighted in grey in Table 4 indicates both OSV and SOV responses because in contrast to the L2ers in the low proficiency level 1, some L2ers in the low proficiency level 2 produced both OSV and SOV, although most of their responses were OSV orders (86.1%).
L1 transfer effect (wh-movement in their L1 grammar). Interestingly, it was found that the low L2ers almost never produced (at 1.4%) OSV responses in fillers, i.e., simple positive yes/no-questions without either wh-phrases or NPIs. Therefore, it might be possible that the low L2ers moved object wh-phrases across the subject in all four experimental conditions, because in English wh-objects should always be fronted in object wh-questions. However, it is difficult to determine whether or not this possible explanation is right, on the basis of the results from the elicited-production task.

Third, although L1 adults (as expected) and high L2ers produced OSV at a high rate only in NNQ-WH and almost always produced SOV in NNQ-Y/N, it is also difficult to know whether or not they disallow SOV in NNQ-WH (target response: only OSV), and disallow OSV in NNQ-Y/N (target response: only SOV). That is, it is unclear whether the L1 adults and high L2ers know that wh-phrases should be scrambled in NNQ-WH but should not in NNQ-Y/N.

In summary, for each trial in the elicited-production task, the participants had the opportunity to produce only one response. As such, the results from the elicited-production task indicate only what the participants’ preferred response is, not what responses the participants allow or disallow in each condition. Thus, in order to ascertain what participants allow and disallow in each of the four conditions, an acceptability-judgment task was employed, the details of which are discussed in the next section.
3.4. Acceptability-judgment task

The purpose of the acceptability-judgment task was used to investigate whether the low L1-English speakers fronted wh-phrases due to wh-movement, to test the participants’ knowledge of scrambling, and to examine whether participants had acquired the first property of wh-constructions, i.e., the Intervention Effect (see 2.1.1). The research questions for the acceptability-judgment task are as follows.

(17) Research questions addressed in the acceptability-judgment task

a. Do English-speaking nonnatives show L1 transfer effects (wh-movement)?

b. Do participants accept both scrambled and in-situ orders in PQ and NQ?

c. Do participants know that scrambling of wh-phrases is obligatory in NNQ-WH but prohibited in NNQ-Y/N?

3.4.1. Method

3.4.1.1. Materials

To reduce experimental time and participant fatigue (especially for the children), the same 16 test items and 16 fillers in the four experimental conditions (PQ, NQ, NNQ-WH, and NNQ-Y/N) used in the elicited-production task were also used in the acceptability-judgment task. In this task, there are 32 test items (16 scrambled orders (OSV); 16 in-situ orders (SOV)) and 32 fillers (16 scrambled orders (OSV); 16 in-situ orders (SOV)). The test items were counter-balanced with the fillers so that the experimental items were separated from each other with an intervening filler. A sample protocol for the NQ condition is provided in Figure 5. A full list of the experimental
items in the acceptability-judgment task is presented in Appendices H, I, J, and K, and the full list of filler sentences in this task is provided in Appendix L.

Figure 5. A sample protocol for the NQ condition in the acceptability-judgment task

Context: Mother prepared lunch for her family in the kitchen. Father also helped her cook some food.

Experimenter <in Korean, using SOY order>:
Mother made a chicken and a big sandwich in the kitchen. Mother did not make this in the kitchen.

<in English to L2ers> BBUNG BBUNG (the puppet) knows what it is. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.

(Scrambled: OSV)

Experimenter: 

\[
\begin{array}{|c|}
\hline
\text{mwues-ul} & \text{pwuek-eyse} & \text{emma-ka} & \text{mantul-ci anh-ass-ni?} \\
\text{what-Acc} & \text{kitchen-Loc} & \text{mother-Nom} & \text{make-ci Neg-Past-Q} \\
\hline
\end{array}
\]

Participant: YES NO DON'T KNOW

(Non-scrambled: SOV)

Experimenter: 

\[
\begin{array}{|c|}
\hline
\text{emma-ka} & \text{pwuek-eyse} & \text{mwues-ul} & \text{mantul-ci anh-ass-ni?} \\
\text{mother-Nom} & \text{kitchen-Loc} & \text{what-Acc} & \text{make-ci Neg-Past-Q} \\
\hline
\end{array}
\]

Participant: YES NO DON'T KNOW
While a father was driving a car very carefully, a mother, Cheolsoo, and Younghee were enjoying the sight of beautiful woodland scenery. Younghee saw a cute rabbit which appeared suddenly. She looked at her family in order to tell them to look at the little rabbit. She saw her mother and Cheolsoo look at the little rabbit. However, her father was staring straight ahead concentrating on driving.

Experimenter <in Korean, using SOV order>:
The mother and Cheolsoo saw the rabbit. The father did not seem to see the rabbit.

<in English to L2ers> BBUNG BBUNG (the puppet) knows whether the father saw a rabbit. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.

(Scrambled: OSV)

Experimenter: thokki-lul
  rabbit-Acc
swuph-eyse
  forest-Loc
appa-ka
  father-Nom
po-ass-ni?
  see-Past-Q

Participant: YES NO DON'T KNOW

(Non-scrambled: SOV)

Experimenter: appa-ka
  father-Nom
swuph-eyse
  forest-Loc
thokki-lul
  rabbit-Acc
po-ass-ni?
  see-Past-Q

Participant: YES NO DON'T KNOW
3.4.1.2. Procedure

The experiment started with a short warm-up session to familiarize participants with the acceptability-judgment task. Once they understood how to do this task, the experimenter proceeded to the main experiment. After listening to each story (again partially in English for L2ers – see Figures 5 and 6), the participant was presented with the question that the experimenter had asked BBUNG BBUNG (the puppet) using the four Korean word/phrase cards. Given three choices (YES, NO and DON'T KNOW), the participant was told to choose “YES” if it feels okay to use that question in the context but “NO” if it does not feel okay.

3.4.2. Results

Tables 6 and 7 present the acceptance rates (%) of scrambled (OSV) and in-situ (SOV) orders, respectively, in the four conditions from the acceptability-judgment task by adult and child L2ers in each proficiency group. Note that all answers (in all groups) were YES or NO (i.e., there were no DON'T KNOW responses).
Table 6. Acceptance rates (%) of OSV from the acceptability-judgment task by adult and child L2ers in each proficiency group

|      | L1 group | L1 group | L2 group | L2 group | L2 group | L2 group | L2 group | L2 group | L2 group | L2 group | L2 group | L2 group | L2 group |
|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|      | L1A      | L1C      | Low      | Low      | Intermediate | Intermediate | High    | High    | High    | High    | High    | High    | High    | High    |
|      | (n=15)   | (n=23)   | L2A      | L2C      | L2A      | L2C      | L2A      | L2C      | L2A      | L2C      | L2A      | L2C      | L2A      | L2C      |
|      |          |          | (n=4)    | (n=5)    | (n=3)    | (n=2)    | (n=4)    | (n=2)    | (n=4)    | (n=1)    |
| PQ   | 100%     | 91.3%    | 100%     | 95.0%    | 0.0%     | 12.5%    | 87.5%    | 87.5%    | 93.8%    | 100%    |
|      | (16/16)  | (19/20)  | (0/12)   | (1/8)    | (14/16)  | (7/8)    | (15/16)  | (4/4)    |
| NQ   | 98.3%    | 90.2%    | 93.8%    | 95.0%    | 0.0%     | 0.0%     | 87.5%    | 87.5%    | 93.8%    | 100%    |
|      | (15/16)  | (19/20)  | (0/12)   | (0/6)    | (14/16)  | (7/8)    | (15/16)  | (4/4)    |
| NNQ-WH | 93.3%  | 65.2%    | 100%     | 85.0%    | 8.3%     | 12.5%    | 75.5%    | 62.5%    | 87.5%    | 75.0%   |
|      | (56/60)  | (60/92)  | (17/20)  | (1/12)   | (12/16)  | (5/8)    | (14/16)  | (3/4)    |
| NNQ-Y/N | 5.0%  | 38.0%    | 87.5%    | 90.0%    | 8.3%     | 12.5%    | 43.8%    | 37.5%    | 12.5%    | 25.0%   |
|      | (3/60)   | (35/92)  | (14/16)  | (18/20)  | (1/12)   | (7/16)   | (3/8)    | (2/16)   | (1/4)    |

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children
Target response: PQ: \( ^\cdot \)OSV(\( ^\cdot \)OSV); NQ: \( ^\cdot \)OSV(\( ^\cdot \)OSV); NNQ-WH: *OSV*/OSV; NNQ-Y/N: vSOV/*OSV

Table 7. Acceptance rates (%) of SOV from the acceptability-judgment task by adult and child L2ers in each proficiency group

|      | L1 group | L1 group | L2 group | L2 group | L2 group | L2 group | L2 group | L2 group | L2 group | L2 group | L2 group | L2 group | L2 group |
|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|      | L1A      | L1C      | Low      | Low      | Intermediate | Intermediate | High    | High    | High    | High    | High    | High    | High    | High    |
|      | (n=15)   | (n=23)   | L2A      | L2C      | L2A      | L2C      | L2A      | L2C      | L2A      | L2C      | L2A      | L2C      | L2A      | L2C      |
|      |          |          | (n=4)    | (n=5)    | (n=3)    | (n=2)    | (n=4)    | (n=2)    | (n=4)    | (n=1)    |
| PQ   | 100%     | 97.8%    | 12.5%    | 15.0%    | 100%     | 87.5%    | 87.5%    | 87.5%    | 93.8%    | 100%    |
| NQ   | 100%     | 96.7%    | 0.0%     | 10.0%    | 100%     | 100%     | 87.5%    | 100%     | 87.5%    | 100%    |
|      | (9/16)   | (9/16)   | (0/16)   | (0/16)   | (12/12)  | (8/8)    | (14/16)  | (8/8)    | (14/16)  | (4/4)   |
| NNQ-WH | 6.7%  | 31.5%    | 12.5%    | 15.0%    | 91.7%    | 87.5%    | 37.5%    | 37.5%    | 12.5%    | 25.0%   |
| NNQ-Y/N | 100%  | 68.5%    | 0.0%     | 10.0%    | 91.7%    | 87.5%    | 62.5%    | 62.5%    | 87.5%    | 75.0%   |
|      | (60/60)  | (63/92)  | (0/16)   | (2/20)   | (11/12)  | (7/8)    | (10/16)  | (5/8)    | (14/16)  | (3/4)   |

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children
Target response: PQ: \( ^\cdot \)OSV(\( ^\cdot \)OSV); NQ: \( ^\cdot \)OSV(\( ^\cdot \)OSV); NNQ-WH: *OSV*/OSV; NNQ-Y/N: vSOV/*OSV
Tables 6 and 7 show that in each proficiency group, the acceptance rates (%) of OSV and SOV responses of L2 children are parallel to those of L2 adults across all four experimental conditions. Therefore, the acceptance rates (%) of scrambled (OSV) and in-situ (SOV) orders in the four conditions of the acceptability-judgment task by L2 proficiency group are presented in Figure 7.
Figure 7a. Acceptance rate of OSV in the acceptability-judgment task (by proficiency)

![Chart showing acceptance rate by proficiency level for different proficiency groups.]

<table>
<thead>
<tr>
<th>Group</th>
<th>Acceptance Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1A (n=15)</td>
<td>100.0</td>
</tr>
<tr>
<td>L1C (n=23)</td>
<td>91.3</td>
</tr>
<tr>
<td>L2-L (n=9)</td>
<td>97.2</td>
</tr>
<tr>
<td>L2-LI (n=5)</td>
<td>5.0</td>
</tr>
<tr>
<td>L2-I (n=6)</td>
<td>87.5</td>
</tr>
<tr>
<td>L2-H (n=5)</td>
<td>95.0</td>
</tr>
<tr>
<td>PQ (k=4)</td>
<td>98.3</td>
</tr>
<tr>
<td>NQ (k=4)</td>
<td>90.2</td>
</tr>
<tr>
<td>NNQ-WH (k=4)</td>
<td>93.3</td>
</tr>
<tr>
<td>NNQ-Y/N (k=4)</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Note: L1A=L1 adults; L1C=L1 children; L2-L=Low L2ers; L2-LI=Low-Intermediate L2ers; L2-I=Intermediate L2ers; L2-H=High L2ers

Target response:  
PQ: √SOV/√OSV; NQ: √SOV/√OSV; NNQ-WH: *SOV/√OSV; NNQ-Y/N: √SOV/*OSV
Figure 7b. Acceptance rate of SOV in the acceptability-judgment task (by proficiency)

Acceptability-judgment task, by proficiency: SOV

<table>
<thead>
<tr>
<th></th>
<th>L1A (n=15)</th>
<th>L1C (n=23)</th>
<th>L2-L (n=9)</th>
<th>L2-LI (n=5)</th>
<th>L2-I (n=6)</th>
<th>L2-H (n=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PQ (k=4)</td>
<td>100.0</td>
<td>97.8</td>
<td>13.9</td>
<td>95.0</td>
<td>87.5</td>
<td>95.0</td>
</tr>
<tr>
<td>NQ (k=4)</td>
<td>100.0</td>
<td>96.7</td>
<td>5.6</td>
<td>100.0</td>
<td>91.7</td>
<td>90.0</td>
</tr>
<tr>
<td>NNQ-WH (k=4)</td>
<td>6.7</td>
<td>31.5</td>
<td>13.9</td>
<td>90.0</td>
<td>37.5</td>
<td>15.0</td>
</tr>
<tr>
<td>NNQ-Y/N (k=4)</td>
<td>100.0</td>
<td>68.5</td>
<td>5.6</td>
<td>90.0</td>
<td>62.5</td>
<td>85.0</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2-L=Low L2ers; L2-LI=Low-Intermediate L2ers; L2-I=Intermediate L2ers; L2-H=High L2ers
Target response: PQ: √SOV(√OSV); NQ: √SOV(√OSV); NNQ-WH: *SOV/√OSV; NNQ-Y/N: √SOV/*OSV
As expected, the L1 adults accepted both SOV and OSV in PQ and NQ, but in NNQ-WH (wh-question reading) they strongly rejected SOV and strongly accepted OSV, and in NNQ-Y/N (yes/no-question reading) they strongly rejected OSV and strongly accepted SOV. Most of the L1 children showed a similar pattern to that of the L1 adults.

As for the L2ers, those in the low proficiency group almost always accepted OSV and almost always rejected SOV, across all conditions. By contrast, the low-intermediate L2ers almost always rejected OSV and almost always accepted SOV, across all four conditions. The intermediate L2ers, like the L1 children, showed a relatively similar pattern to that of the L1 adults. And the high L2ers had the same pattern as the L1 adults: In both PQ and NQ, they allowed scrambling; in NNQ-WH, they almost always accepted OSV but almost always rejected SOV; and in NNQ-Y/N, they almost always rejected OSV but almost always accepted SOV.

The acceptance rates (%) of scrambled (OSV) and in-situ (SOV) orders in the fillers of the acceptability-judgment task are provided in Tables 8 and 9, respectively (see Appendix M for the results from the fillers by adult and child L2ers in each proficiency group). Again, answers were YES or NO, and there were no DON'T KNOW responses.

<table>
<thead>
<tr>
<th>Fillers (k=16)</th>
<th>L1A (n=15)</th>
<th>L1C (n=23)</th>
<th>L2A + L2C (n=25)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>L2-L (n=9)</td>
</tr>
<tr>
<td>Fillers</td>
<td>99.2% (238/240)</td>
<td>96.7% (356/368)</td>
<td>4.2% (10/144)</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children; L2-L=Low L2ers; L2-LI=Low-Intermediate L2ers; L2-I=Intermediate L2ers; L2-H=High L2ers

Target response: Fillers: √SOV(√OSV)
Table 9. Acceptance rate (%) of SOY fillers in the acceptability-judgment task (by proficiency)

<table>
<thead>
<tr>
<th></th>
<th>L1A (n=15)</th>
<th>L1C (n=23)</th>
<th>L2A + L2C (n=25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fillers</td>
<td>100% (240/240)</td>
<td>97.8% (360/368)</td>
<td>100% (144/144)</td>
</tr>
<tr>
<td></td>
<td>98.8% (79/80)</td>
<td>93.8% (90/96)</td>
<td>100% (80/80)</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children; L2-L=Low L2ers; L2-LI=Low-Intermediate L2ers; L2-I=Intermediate L2ers; L2-H=High L2ers

Target response: Fillers: √SOV(√OSV)

All Korean adult and child natives almost always accepted both OSV and SOV on the fillers. As for the L2 groups’ performance on the fillers, the intermediate and high L2ers almost always accepted both OSV and SOV, like L1 participants. On the other hand, the low and low-intermediate L2ers almost never accepted OSV and virtually always accepted SOV, indicating that they seemed not to have acquired knowledge of scrambling in Korean. This will be discussed further in the next section.

3.4.3. Discussion

Let us consider the first research question about L1 transfer effects. The low proficiency L2 participants almost always produced and accepted OSV across all four conditions (see Figures 4 and 7a) but not in the fillers (see Tables 4 and 8), which, recall; were simple positive yes/no-questions, and they almost never accepted SOV in the experimental conditions, even in PQ and NQ (see Figure 7b), but in the fillers they both produced (see Table 4) and accepted (see Table 9) SOV. These results argue for the explanation offered earlier, namely that for them, the fronted object wh-phrase of wh-questions stems not from scrambling but rather from wh-movement (L1 transfer).
This hypothesis is supported by two findings, both coming from performance on the fillers, i.e., simple yes/no-questions without either a wh-phrase or an NPI. First, in line with the finding that the low L2ers almost never produced OSV on these fillers in the elicited-production task (see Table 4), they virtually never accepted OSV on the fillers in the acceptability-judgment task, as shown in Table 8. However, they consistently allowed only OSV in the four experimental conditions, irrespective of the presence/absence of subject NPIs. Second, the low-intermediate L2ers almost always produced and accepted SOV (see Figures 4 and 7b) and virtually never accepted OSV (see Figure 7a) across all four experimental conditions, and in the filler sentences, they also almost never produced or accepted OSV (see Tables 4 and 8) while they always accepted SOV (see Table 9). In other words, the low-intermediate L2ers almost never fronted wh-words across all types of sentences in this study. This observation indicates that the low-intermediate L2ers do not know Korean has scrambling (but that they do know it does not have wh-movement). Thus, based on the results from both the elicited-production task and the acceptability-judgment task, it can be safely argued that the low L2ers produced and accepted OSV sentences in all the experimental conditions due to wh-movement, not scrambling.

The second research question is concerned with whether participants have knowledge of scrambling in Korean. The findings that adult and child native speakers, the high and intermediate L2ers accepted both OSV and SOV in PQ and NQ at a high rate (see Figures 7a and 7b) and in the fillers (see Tables 8 and 9) indicate that they have acquired knowledge of scrambling in Korean. However, as mentioned above, the low and low-intermediate L2ers did not seem to know that there is scrambling in Korean, because in PQ and NQ where both SOV and OSV are possible, the low L2ers strongly accepted
OSV and strongly rejected SOV and the low-intermediate L2ers strongly accepted SOV and strongly rejected OSV; in addition, these two groups only produced/accepted SOV in the fillers.

In order to consider more carefully the question of whether participants have knowledge of scrambling, the results from the acceptability-judgment task are summarized in Table 10.

<table>
<thead>
<tr>
<th></th>
<th>L1A</th>
<th>L1C</th>
<th>L2A + L2C</th>
<th>Reason for fronting wh-phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>Wh-movement</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>Low</td>
<td>+</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>Low-Intermediate</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Some</td>
<td>Intermediate</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>5</td>
<td>All</td>
<td>Most</td>
<td>High</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children

Individual L2 participants were categorized according to whether they did (“+”) or did not (“−”) show L1-transferred wh-movement and according to whether they did (“+”) or did not (“−”) know that there is scrambling in Korean. As described in Table 10, it can be suggested that (i) the low L2ers have L1-transferred wh-movement; (ii) the low-intermediate L2ers show no fronting (neither wh-movement nor scrambling); (iii) the intermediate L2ers have started to acquire knowledge of scrambling because they mostly accepted scrambled filler sentences (see Table 8) in addition to scrambled experimental
sentences (see Figure 7a); (iv) the high L2ers, like native adults and most native children, came to acquire knowledge of scrambling.

We turn now to the last research question for this task – whether the participants know that scrambling of wh-phrases is obligatory in NNQ-WH but prohibited in NNQ-Y/N. Let us first consider Korean adult natives’ responses. In NNQ-WH, the L1 adults almost always accepted OSV and almost always rejected SOV, and in NNQ-Y/N, they always accepted SOV and almost always rejected OSV. The high L2ers and most of the L1 children perform like the adult natives. Thus, L1 adults, most L1 children, and high L2ers seem to know that scrambling of wh-phrases is obligatory in negative wh-questions with NPIs and is prohibited in negative yes/no-questions with NPIs. However, the low and low-intermediate L2ers showed non-targetlike performance: The low L2ers strongly accepted OSV and strongly rejected SOV in both NNQ-WH and NNQ-Y/N; the low-intermediate L2ers strongly accepted SOV and rejected OSV in both NNQ-WH and NNQ-Y/N. This shows that the L2ers in the low and low-intermediate proficiency groups did not know that scrambling of wh-phrases is obligatory in NNQ-WH but is prohibited in NNQ-Y/N.

We now know which participants did or did not come to know the first property of wh-constructions with NPIs (i.e., the Intervention Effect) – scrambling of wh-phrases is obligatory in negative wh-questions with NPIs. However, we still do not know how participants, in particular those who have scrambling (i.e. L1 adults, L1 children, intermediate L2ers, and high L2ers) actually interpreted scrambled (OSV) and non-scrambled (SOV) sentences in the constructions with NPIs (NNQ-WH and NNQ-Y/N). In addition, it is unclear whether the low and low-intermediate L2ers, who haven’t
acquired the first property (the Intervention Effect), know that in wh-constructions with NPIs, the non-scrambled (SOV) order has only the yes/no-question reading.

In sum, combining these results from the acceptability-judgment task with those from the elicited-production task, we know what participants allow and disallow in PQ, NQ, NNQ-WH, and NNQ-Y/N. However, we cannot determine for the conditions with NPIs (NNQ-WH and NNQ-Y/N) whether participants correctly assign the one with OSV the wh-question reading only and the one with SOV the yes/no-question reading only. Thus, an interpretation-verification task was conducted to ascertain this.

3.5. Interpretation-verification task

The aim of the interpretation-verification task is to investigate whether participants know that each of the two interpretations of negative questions with NPIs is a function of word order, i.e. OSV vs. SOV. The research questions for the interpretation-verification task are shown below.

(18) The research questions addressed in the interpretation-verification task

a. In negative questions with an object wh-phrase and a subject NPI, do participants assign the scrambled order (OSV) the wh-question reading only?

b. In negative questions with an object wh-phrase and a subject NPI, do participants assign the in-situ order (SOV) the yes/no-question reading only?
3.5.1. Method

3.5.1.1. Materials

Two kinds of experimental items from the elicited-production task were used: NNQ-WH and NNQ-Y/N. Questions in Set I (NNQ-WH) are OSV and have only the <wh-question reading>; questions in Set II (NNQ-Y/N) are SOV and have only the <yes/no-question reading>. In each set, the same context figured in 4 separate trials, for which “YES” was the target response only once in each set (i.e., to a true NP-answer in Set I and to a true <yes/no-answer in Set II). Table 11 presents the experimental design for Sets I and II.

<table>
<thead>
<tr>
<th>Set I – Scrambled sentences (OSV)</th>
<th>Set II – Non-scrambled sentences (SOV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;wh-question reading&gt;</td>
<td>&lt;yes/no-question reading&gt;</td>
</tr>
<tr>
<td>True NP-answer (k=4)</td>
<td>Target: YES</td>
</tr>
<tr>
<td>False NP-answer (k=4)</td>
<td>Target: NO</td>
</tr>
<tr>
<td>Yes/No-answer (k=8)</td>
<td>Target: NO</td>
</tr>
<tr>
<td></td>
<td>True Yes/No-answer (k=4)</td>
</tr>
<tr>
<td></td>
<td>Target: YES</td>
</tr>
<tr>
<td></td>
<td>False Yes/No-answer (k=4)</td>
</tr>
<tr>
<td></td>
<td>Target: NO</td>
</tr>
</tbody>
</table>

As the same context in each trial is provided 4 times in the interpretation-verification task, various kinds of adverbial phrase were used within one trial (e.g., Did no one hit somebody before?; Did no one hit somebody in the room?), and I changed clothing, colors, appearances, and names of characters across the 4 trials for the same context. For example, if I used a pig as one of the characters in the 4 trials, different appearances of a pig are provided to add variety and to distract participants’ attention as follows.

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This task consists of 32 experimental items (16 in Set I; 16 in Set II) and 32 fillers; fillers are \textit{wh}-questions without NPIs (16 in Set I) and \textit{yes/no}-questions without either \textit{wh}-phrases or NPIs (16 in Set II). In each set, the experimental items were interspersed between the fillers. A sample protocol for each set in the interpretation-verification task is presented in Figures 9 and 10 (see Appendices N and O for the other protocols of the interpretation-verification task).

Figure 9. A sample protocol for the interpretation-verification task: Set I

\textbf{Set I: NNQ-WH (OSV: ok only on \textit{wh}-question reading)}

\begin{itemize}
  \item \textit{Picture 1} <in English for L2ers> The family was hunting for bugs. Although they felt hungry at lunch time, they did not eat any food because it was so fun.
\end{itemize}
<in English for L2ers> The family wanted to have lunch after bug hunting. Father ate sausage, mother ate a hamburger, Tom ate bread, and Jenny ate chicken. Nobody ate a sandwich.

Experimenter: I will ask BBUNG BBUNG (the puppet) a question, using these four cards. If his answer is right, please say “YES,” but if it is wrong, please say “NO.”

Experimenter: <OSV: in Korean, using cards>
Mwues-ul onul amwuto mek-ci anh-ass-ni?
what-Acc today anyone eat-ci Neg-Past-Q
‘What did no one eat today?’

(i) **True NP-answer**
BBUNG BBUNG: A sandwich (True NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant:
If the participant says “YES” → targetlike response
If the participant says “NO” → non-targetlike response

(ii) **False NP-answer**
BBUNG BBUNG: A hamburger (False NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant:
If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iii) **Yes/no-answer**
BBUNG BBUNG: No (Yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant:
If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iv) **Yes/no-answer**
BBUNG BBUNG: Yes (Yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant:
If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response
Figure 10. A sample protocol for the interpretation-verification task: Set II

**Set II: NNQ-Y/N (SOV: ok only on yes/no-question reading)**

Picture 1  
<in English for L2ers> The family was hunting for bugs. Although they felt hungry at lunch time, they did not eat any food because it was so fun.

Picture 2  
<in English for L2ers> The family wanted to have lunch after bug hunting. Father ate sausage, mother ate a hamburger, Tom ate bread, and Jenny ate chicken. Nobody ate a sandwich.

Experimenter: I will ask BBUNG BBUNG (the puppet) a question, using these four cards. If his answer is right, please say "YES," but if it is wrong, please say "NO."

Experimenter: <SOV: in Korean, using cards>  
Amwuto akka mwues-ul mek-ci anh-ass-ni?  
Anyone before something-Acc eat-ci Neg-Past-Q  
'Did no one eat something before?'

(i) **True yes/no-answer**  
BBUNG BBUNG: No (True yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says "YES" → targetlike response  
If the participant says "NO" → non-targetlike response

(ii) **False yes/no-answer**  
BBUNG BBUNG: Yes (False yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says "NO" → targetlike response  
If the participant says "YES" → non-targetlike response
(iii) NP-answer
BBUNG BBUNG: A sandwich (NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “NO” \(\rightarrow\) targetlike response
If the participant says “YES” \(\rightarrow\) non-targetlike response

(iv) NP-answer
BBUNG BBUNG: Sausage (NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “NO” \(\rightarrow\) targetlike response
If the participant says “YES” \(\rightarrow\) non-targetlike response

An example of a scrambled filler sentence (a \textit{wh}-question without an NPI) on Set I and an example of a non-scrambled filler sentence (a simple \textit{yes/no}-question without either a \textit{wh}-phrase or an NPI) on Set II in the interpretation-verification task are provided in Figures 11 and 12, respectively. A full list of filler sentences from this task are given in Appendix P.

Figure 11. An example of a filler sentence on Set I in the interpretation-verification task

\[<\text{Picture 1}>\]

\[<\text{Picture 2}>\]

Picture 1  \(<\text{in English for L2ers}>\) The rabbit, the pig, and the cat were talking on the phone about the monkey’s birthday. The cat told them that he did not prepare a birthday gift for the monkey. The rabbit realized that she did not buy any gift for the monkey. The rabbit called her best friend, the squirrel, and asked him to go shopping.
Experimenter: I will ask BBUNG BBUNG (the puppet) a question, using these four cards. If his answer is right, please say "YES," but if it is wrong, please say "NO."

<OSV: in Korean, using cards>
Mues-ul cangnankam kakey-eyse thokki-ka koll-ass-ni?
What-Acc toy store-Loc rabbit-Nom pick-Past-Q
‘What did the rabbit pick at the toy store?’

(i) True NP-answer
BBUNG BBUNG: A teddy bear (True NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “YES” → targetlike response
If the participant says “NO” → non-targetlike response

(ii) False NP-answer
BBUNG BBUNG: Robot (False NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iii) Yes/no-answer
BBUNG BBUNG: No (NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iv) Yes/no-answer
BBUNG BBUNG: Yes (NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response
Figure 12. An example of a filler sentence on Set II in the interpretation-verification task

Picture 1

<in English for L2ers> The fox walking past the forest happened to see a tiger and a bear fighting each other over a rabbit. When the fox saw the rabbit, he suddenly felt hungry and wanted to eat it. However, the fox was hesitating to take the rabbit because he was afraid of the tiger and the bear.

Picture 2

<in English for L2ers> The fox knew that the tiger and the bear did not know that he was looking at them. So, he took the rabbit quickly and ran away. However, the tiger and bear were still fighting and did not know that the fox stole the rabbit.

Experimenter: I will ask BBUNG BBUNG (the puppet) a question, using these four cards. If his answer is right, please say “YES,” but if it is wrong, please say “NO.”

Experimenter: <SOV: in Korean, using cards>
Yewu-ka mollay thokki-lul kacyecka-ass-ni?
Fox-Nom secretly rabbit-Acc take-Past-Q
‘Did a fox take a rabbit secretly?’

(i) True yes/no-answer
BBUNG BBUNG: Yes (True yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “YES” → targetlike response
If the participant says “NO” → non-targetlike response

(ii) False yes/no-answer
BBUNG BBUNG: No (False yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response
(iii) **NP-answer**
BBUNG BBUNG: A rabbit (NP-answer)

Experimenter: Is BBUNG BBUNG's answer right?

Participant: If the participant says "NO" → targetlike response
If the participant says "YES" → non-targetlike response

(iv) **NP-answer**
BBUNG BBUNG: A bear (NP-answer)

Experimenter: Is BBUNG BBUNG's answer right?

Participant: If the participant says "NO" → targetlike response
If the participant says "YES" → non-targetlike response

3.5.1.2. Procedure

For all participants, the interpretation-verification task started with a short training session designed to familiarize them with this task. The training session included 3 items similar to the fillers. Participants listened to each context (in English for L2ers) while viewing two pictures. The experimenter asked BBUNG BBUNG (the puppet) the questions using four Korean word/phrase cards per item, and BBUNG BBUNG provided either an NP-answer or a yes/no-answer. After that, the participants were instructed to say "YES" when BBUNG BBUNG's answer was right and "NO" when it was wrong. When the participants said "NO," they were also asked to justify their answers by explaining why they thought that the puppet's answer was wrong.

3.5.2. Results

Tables 12 and 13 provide the accuracy rates of participants' responses on Set I (OSV) and Set II (SOV), respectively, by adult and child L2ers in each proficiency group.
Table 12. Accuracy rate on Set I (OSV as *wh*-question reading) by adult and child L2ers in each proficiency group

<table>
<thead>
<tr>
<th>L1 group</th>
<th>L2 group</th>
<th>Low</th>
<th>Low-Intermediate</th>
<th>Intermediate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1A (n=15)</td>
<td>L1C (n=23)</td>
<td>L2A (n=4)</td>
<td>L2C (n=5)</td>
<td>L2A (n=3)</td>
<td>L2C (n=2)</td>
</tr>
<tr>
<td>NP (k=8)</td>
<td>96.7% (116/120)</td>
<td>91.3% (168/184)</td>
<td>100% (32/32)</td>
<td>100% (40/40)</td>
<td>91.7% (22/24)</td>
</tr>
<tr>
<td>Yes/No (k=8)</td>
<td>95.0% (114/120)</td>
<td>92.4% (170/184)</td>
<td>100% (32/32)</td>
<td>100% (40/40)</td>
<td>100% (24/24)</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children
NP=NP-answer; Yes/No=Yes/No-answer
Target response: True NP-answer: \(^*\)YES/*NO; False NP-answer: \(^*\)YES/\(^*\)NO
Yes/No-answer: \(^*\)YES/\(^*\)NO

Table 13. Accuracy rate on Set II (SOV as *yes/no*-question reading) by adult and child L2ers in each proficiency group

<table>
<thead>
<tr>
<th>L1 group</th>
<th>L2 group</th>
<th>Low</th>
<th>Low-Intermediate</th>
<th>Intermediate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1A (n=15)</td>
<td>L1C (n=23)</td>
<td>L2A (n=4)</td>
<td>L2C (n=5)</td>
<td>L2A (n=3)</td>
<td>L2C (n=2)</td>
</tr>
<tr>
<td>Yes/No (k=8)</td>
<td>91.7% (110/120)</td>
<td>59.8% (110/184)</td>
<td>0% (0/32)</td>
<td>0% (0/40)</td>
<td>0% (0/24)</td>
</tr>
<tr>
<td>NP (k=8)</td>
<td>90.0% (108/120)</td>
<td>64.1% (118/184)</td>
<td>0% (0/32)</td>
<td>0% (0/40)</td>
<td>8.3% (2/24)</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children
Yes/No=Yes/No-answer; NP=NP-answer
Target response: True yes/no-answer: \(^*\)YES/*NO; False yes/no-answer: \(^*\)YES/\(^*\)NO; NP-answer: \(^*\)YES/\(^*\)NO

Tables 12 and 13 show that in each proficiency group, the accuracy rates (%) of L2 children's responses on Set I and Set II are parallel to those of L2 adults in all experimental conditions. Therefore, the accuracy rates (%) of the participants' responses on Set I (OSV: *wh*-question reading) and Set II (SOV: *yes/no*-question reading) by L2 proficiency group are provided in Figure 13.
Figure 13a. Accuracy rate of responses on Set I (OSV as wh-question reading)

Interpretation-verification task, by proficiency: OSV

<table>
<thead>
<tr>
<th></th>
<th>L1A</th>
<th>L1C</th>
<th>L2-L</th>
<th>L2-L1</th>
<th>L2-L1</th>
<th>L2-L1</th>
<th>L2-H</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n=15)</td>
<td>(n=23)</td>
<td>(n=9)</td>
<td>(n=5)</td>
<td>(n=6)</td>
<td>(n=6)</td>
<td>(n=5)</td>
</tr>
<tr>
<td>NP-answer</td>
<td>96.7</td>
<td>91.3</td>
<td>100.0</td>
<td>90.0</td>
<td>87.5</td>
<td>95.0</td>
<td></td>
</tr>
<tr>
<td>Yes/No-answer</td>
<td>95.0</td>
<td>92.4</td>
<td>100.0</td>
<td>100.0</td>
<td>87.5</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2-L=Low L2ers; L2-L1=Low-Intermediate L2ers; L2-I=Intermediate L2ers; L2-H=High L2ers
Target response: True NP-answer: √YES/√NO; False NP-answer: *YES/√NO; Yes/no-answer: *YES/√NO
Figure 13b. Accuracy rate of responses on Set II (SOV as yes/no-question reading)

Interpretation-verification task, by proficiency: SOV

<table>
<thead>
<tr>
<th>Group</th>
<th>Accuracy Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1A (n=15)</td>
<td>91.7</td>
</tr>
<tr>
<td>L1C (n=23)</td>
<td>59.8</td>
</tr>
<tr>
<td>L2-L (n=9)</td>
<td>0.0</td>
</tr>
<tr>
<td>L2-LI (n=5)</td>
<td>0.0</td>
</tr>
<tr>
<td>L2-I (n=6)</td>
<td>12.5</td>
</tr>
<tr>
<td>L2-H (n=5)</td>
<td>80.0</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2-L=Low L2ers; L2-LI=Low-Intermediate L2ers; L2-I=Intermediate L2ers; L2-H=High L2ers
Target response: True yes/no-answer: √YES/√NO; False yes/no-answer: *YES/√NO; NP-answer: *YES/√NO
With respect to Set I, recall that scrambled questions (OSV) should be assigned a *wh*-question reading; therefore, when deciding whether BBUNG BBUNG’s answer is appropriate or not, participants should say YES to true NP-answers, but NO to false NP-answers and, importantly, to all *yes/no*-answers. Furthermore, it was crucial to know the reason behind “NO” answers. For example, in Figure 9 (Set I: *wh*-question reading), participants could say “NO” for two possible correct reasons: (a) they thought what no one ate was a sandwich, not a hamburger, suggesting that they had an accurate evaluation of the *wh*-question (see (ii) False NP-answer trial in Figure 9); (b) they thought the puppet’s *yes/no*-answers were wrong because the given sentence was a *wh*-question (see (iii) and (iv) *Yes/no*-answers trials in Figure 9). Therefore, it was important to examine the justifications the participants provided in order to determine whether or not they gave “NO” responses to the puppet’s answers for the right reasons. Only the responses with correct justifications were considered accurate.

Figure 13a shows that all participants performed accurately on Set I of the interpretation-verification task, assigning OSV orders the *wh*-question reading. The L1 adults and L1 children assigned scrambled OSV orders the *wh*-question reading exclusively (at rates ≥ 91.3%). All L2ers also performed accurately (at rates ≥ 87.5%).

As for Set II, non-scrambled questions (SOV) should be assigned a *yes/no*-question reading; thus, when deciding whether BBUNG BBUNG’s answer is appropriate or not in this set, participants should say YES to true *yes/no*-answers, but NO to false *yes/no*-answers and, importantly, to all NP-answers. Again, when participants gave “NO” answers, it was important to know the reason behind them. For example, in Figure 10 (Set II: *yes/no*-question reading), participants could say “NO” for two possible correct
reasons: (a) they thought that all family members ate different things, indicating that they had an accurate evaluation of yes/no-questions (see (ii) False yes/no-answer trial in Figure 10); (b) they thought the puppet’s NP-answers were wrong because the given sentence was a yes/no-question (see (iii) and (iv) NP-answers trials in Figure 10). Thus, the justifications that the participants provided were examined to know whether they said “NO” to the puppet’s answers for the right reasons. Only the responses with correct justifications were considered accurate.

Figure 13b shows that the L1 adults performed accurately: They assigned in-situ SOV orders the yes/no-question reading exclusively (at rates ≥ 90%). As for the L1 children, they showed a relatively similar pattern to the L1 adult pattern even though their targetlike rates were lower.

Let us now turn to the L2 participants’ performance. The L2ers in the low and low-intermediate proficiency groups almost never performed accurately on assigning SOV the yes/no-question reading. In stark contrast, the accuracy rates of the high L2ers were almost as high as those of the adult controls.

As for the fillers, the accuracy rates of participants’ responses on scrambled wh-questions without NPIs in Set I (OSV) and on non-scrambled yes/no-questions without either wh-phrases or NPIs in Set II are provided in Tables 14 and 15, respectively (see Appendix Q for the results from the fillers by adult and child L2ers in each proficiency group).
Table 14. Accuracy rate (%) of responses on filler sentences on Set I (by proficiency)

<table>
<thead>
<tr>
<th></th>
<th>L1A (n=15)</th>
<th>L1C (n=23)</th>
<th>L2A + L2C (n=25)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>L2-L (n=9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L2-LI (n=5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L2-I (n=6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L2-H (n=5)</td>
</tr>
<tr>
<td>NP-answers (k=8)</td>
<td>98.3%</td>
<td>96.2%</td>
<td>97.2%</td>
</tr>
<tr>
<td></td>
<td>(118/120)</td>
<td>(177/184)</td>
<td>(70/72)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(36/40)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>91.7%</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>(44/48)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>97.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(39/40)</td>
</tr>
<tr>
<td>Yes/No-answers (k=8)</td>
<td>99.2%</td>
<td>97.8%</td>
<td>94.4%</td>
</tr>
<tr>
<td></td>
<td>(119/120)</td>
<td>(180/184)</td>
<td>(68/72)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>92.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(37/40)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>95.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(46/48)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>97.5%</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children; L2-L=Low L2ers; L2-LI=Low-Intermediate L2ers; L2-I=Intermediate L2ers; L2-H=High L2ers

Target response: True NP-answer: √YES/√NO; False NP-answer: *YES/√NO;
Yes/no-answer: *YES/√NO

Table 15. Accuracy rate (%) of responses on filler sentences on Set II (by proficiency)

<table>
<thead>
<tr>
<th></th>
<th>L1A (n=15)</th>
<th>L1C (n=23)</th>
<th>L2A + L2C (n=25)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>L2-L (n=9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L2-LI (n=5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L2-I (n=6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L2-H (n=5)</td>
</tr>
<tr>
<td>Yes/No-answers (k=8)</td>
<td>98.3%</td>
<td>97.3%</td>
<td>97.2%</td>
</tr>
<tr>
<td></td>
<td>(118/120)</td>
<td>(179/184)</td>
<td>(70/72)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>97.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(39/40)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>93.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(45/48)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>NP-answers (k=8)</td>
<td>100%</td>
<td>98.9%</td>
<td>98.6%</td>
</tr>
<tr>
<td></td>
<td>(120/120)</td>
<td>(182/184)</td>
<td>(71/72)</td>
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<td>97.5%</td>
</tr>
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<td></td>
<td></td>
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<td>(39/40)</td>
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<td></td>
<td></td>
<td></td>
<td>95.8%</td>
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<td></td>
<td></td>
<td>(46/48)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>97.5%</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children; L2-L=Low L2ers; L2-LI=Low-Intermediate L2ers; L2-I=Intermediate L2ers; L2-H=High L2ers

Target response: True yes/no-answer: √YES/√NO; False yes/no-answer: *YES/√NO;
NP-answer: *YES/√NO

These results show that all the participants performed accurately across all filler trials on Set I and Set II (at rates ≥ 90%).

3.5.3. Discussion

The results of native adults confirm what is indicated in the literature, i.e., that the two different interpretations of negative wh-constructions with NPIs are a function of word order. With respect to the L2ers, those in the low and low-intermediate proficiency groups do not seem to know that non-scrambled sentences have the yes/no-question...
reading. Possible explanations for this might include (a) lack of knowledge of scrambling, and (b) lack of knowledge that Korean *wh*-words can function as *wh*-indefinites as well as *wh*-interrogatives.

With respect to the first possible explanation, let us first consider the results from both the acceptability-judgment task and the interpretation-verification task, which are summarized in Table 16.

Table 16. Development sequence from the acceptability-judgment task and the interpretation-verification task

<table>
<thead>
<tr>
<th></th>
<th>L1A</th>
<th>L1C</th>
<th>L2A + L2C</th>
<th>Reason for fronting <em>wh</em>-phrases</th>
<th>Assigning targetlike readings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><em>Wh</em>-movement</td>
<td>Scrambling</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children

All participants were categorized according to whether they did (“+”) or did not (“−”) know that there is scrambling in Korean in the acceptability-judgment task and whether they never assigned (“−”), sometimes assigned (“±”), or almost always assigned (“+”) a targetlike reading in the interpretation-verification task. Table 16 suggests that knowledge of scrambling should be acquired first in order to know that negative *wh*-constructions with NPIs have two different meanings. Table 16 shows that the low and low-intermediate L2ers never assigned the non-scrambled sentences the *yes/no*-question
reading, at least partly because they had not acquired knowledge of scrambling yet. This proposal can be supported by the intermediate L2ers' performance. The intermediate L2ers, who know that Korean allows scrambling (as shown in Table 16), seem to start to differentiate the *wh*-question reading and the *yes/no*-question reading, although the accuracy rate of their responses on the *yes/no*-question reading is much lower than those of the adult natives and the high L2ers. Thus, I speculate that knowledge of scrambling should be acquired in order to come to know the two properties of Korean *wh*-constructions with NPIs. Nevertheless, even when knowledge of scrambling is in place, it seemed to take time for the SOV questions with an NPI to be assigned the *yes/no*-question reading.

With respect to the second possible explanation, it is unfortunately impossible to determine at what proficiency level L2ers know that *wh*-words can be interpreted as *wh*-indefinites as well as *wh*-interrogatives, since I did not independently test whether the participants knew that Korean *wh*-words have the two meanings. Nevertheless, what is clear is that in contrast to the high L2ers and some intermediate L2ers who did already know that, unlike *wh*-words in their L1, Korean *wh*-words can be *wh*-indefinites (because they had to know this in order to be able to interpret SOV questions with an NPI as *yes/no*-questions), the low and low-intermediate L2ers always considered *wh*-words as *wh*-interrogatives, not *wh*-indefinites, in the SOV questions with NPIs. We know this from the justifications they supplied for their “NO” answers. For instance, when the low and low-intermediate L2ers were given the test item below (see Figure 10), they said “NO” to true *yes/no*-answers (target response: YES) and provided justifications such as the following.
Almost all of the low and low-intermediate L2ers provided this type of (incorrect) justification. In addition, they incorrectly said “YES” to one of the NP-answers (e.g., a sandwich in Figure 10) and “NO” to the other NP-answer (e.g., a sausage in Figure 10), precisely because they interpreted mwues as ‘what’, not ‘something’. Thus, it is clear that the low and low-intermediate L2ers had only the wh-question reading in negative wh-constructions with NPIs, irrespective of word order (SOV, OSV).

Interestingly, the production and comprehension data from the three tasks support Beck’s transparency requirement for S-structure — the intended scope relations are made clear at S-structure, not LF, through scrambling (see Section 2.1.1). First, let us consider the production data of the Korean native adults. Given two quantifications (object wh-phrase and subject NPI) in one question, the Korean natives used word order to disambiguate two possible interpretations of the sentence (wh-question reading and yes/no-question reading). They scrambled object wh-phrases across subject NPIs for object wh-phrase wide scope reading (i.e., wh-question reading) and left object wh-phrases in situ for subject NPI wide scope reading (i.e., yes/no-question reading).

Furthermore, the comprehension data of the Korean native adults are in accordance with their production data, again confirming the claim that Korean S-structure
should be to a large extent transparent with respect to intended scope interpretations.

They assigned the in-situ sentence, (20a), subject NPI wide scope reading, and assigned the scrambled sentence, (20b), the object wh-phrase wide scope reading.

(20) a. Amwuto mwues-ul mek-ci anh-ass-ni?
   Anyone something-Acc eat-ci Neg-Past-Q
   ‘Did no one buy something?’ \( \rightarrow \) (NPI \( > \) wh-word; \*NPI \( < \) wh-word)

b. Mwues-ul amwuto mek-ci anh-ass-ni?
   What-Acc anyone eat-ci Neg-Past-Q
   ‘What did no one buy?’ \( \rightarrow \) (wh-word \( > \) NPI; \*wh-word \( < \) NPI)

In other words, the Korean native adults allowed only surface scope reading and disallowed the inverse scope reading, both in sentences such as (20a) and (20b). Whether or not this conclusion can be extended to scope interpretations in all Korean quantified sentences (e.g., universal quantifiers, numeral quantifiers, and so on) cannot be determined on the basis of this study, however.

Likewise, the production and comprehension data from the high L2ers also confirm the transparency requirement for S-structure in Korean. They perform like native adult controls: In production, the high L2ers scrambled object wh-words across subject NPIs for the object wide scope reading and left them in situ for the NPI subject wide scope reading; in comprehension, they assigned the wh-constructions with NPIs the surface scope readings only. This indicates that the high L2ers came to know the transparency requirement for S-structure — the intended scope relations are realized at S-structure, not LF, through scrambling — in Korean wh-constructions with NPIs.
For English-speaking learners, acquisition of the S-structure transparency requirement for Korean wh-constructions with NPIs represents an L2 poverty-of-the-stimulus problem because the requirement is underdetermined by the TL input, by the learners' L1 grammar, and by classroom instruction. Therefore, the fact that the high L2ers produced and comprehended wh-constructions with NPIs, in accordance with the transparency requirement, in such a way that the intended scope relations are shown at S-structure, suggests that UG constrains (adult) L2 acquisition.
CHPATER 4
GENERAL DISCUSSION

There are two main motivations for this study: (i) to examine whether English-speaking learners of Korean can overcome L2 poverty-of-the-stimulus problems; (ii) to compare adult and child L2 development.

4.1. L2 Poverty-of-the-stimulus effects

First, let us look at whether the L2ers come to know the two properties of Korean wh-constructions with NPIs: (i) for wh-questions, scrambling of object wh-phrases across subject NPIs is obligatory (i.e., the Intervention Effect) and (ii) there are two interpretations (wh-question reading and yes/no-question reading) as a function of word order. According to the results from all three tasks, the L2ers in the high proficiency group (1 L2 child and 4 L2 adults) showed nativelike responses across all experimental conditions, indicating that they can overcome these two L2 poverty-of-the-stimulus problems of Korean wh-constructions with NPIs. In order to look at their performance on the three tasks (except for Set I (OSV: wh-question reading) of the interpretation-verification task), the results from the L1 adults and the high L2ers are provided in Figure 14.
Figure 14. The results from the L1 adults and the high L2ers on the three tasks

a. Elicited-production task

<table>
<thead>
<tr>
<th>Task</th>
<th>L1A (n=15)</th>
<th>L2-H (n=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSV in the elicited-production task</td>
<td><img src="image1.png" alt="Graph" /></td>
<td><img src="image2.png" alt="Graph" /></td>
</tr>
<tr>
<td>OSV response (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>80.0</td>
</tr>
<tr>
<td></td>
<td>60.0</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>20.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

b. Acceptability-judgment task (OSV)

<table>
<thead>
<tr>
<th>Task</th>
<th>L1A (n=15)</th>
<th>L2-H (n=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptability-judgment task (OSV)</td>
<td><img src="image3.png" alt="Graph" /></td>
<td><img src="image4.png" alt="Graph" /></td>
</tr>
<tr>
<td>Acceptance rate (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>80.0</td>
</tr>
<tr>
<td></td>
<td>60.0</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>20.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

c. Acceptability-judgment task (SOV)

<table>
<thead>
<tr>
<th>Task</th>
<th>L1A (n=15)</th>
<th>L2-H (n=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptability-judgment task (SOV)</td>
<td><img src="image5.png" alt="Graph" /></td>
<td><img src="image6.png" alt="Graph" /></td>
</tr>
<tr>
<td>Acceptance rate (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>80.0</td>
</tr>
<tr>
<td></td>
<td>60.0</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>20.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

d. Interpretation-verification task (NNQ-Y/N)

<table>
<thead>
<tr>
<th>Task</th>
<th>L1A (n=15)</th>
<th>L2-H (n=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpretation-verification task: NNQ-Y/N</td>
<td><img src="image7.png" alt="Graph" /></td>
<td><img src="image8.png" alt="Graph" /></td>
</tr>
<tr>
<td>Accuracy rate (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>80.0</td>
</tr>
<tr>
<td></td>
<td>60.0</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>20.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Note.  L1A=L1 adults; L2-H=High L2ers
Target response: PQ: √SOV(/√OSV); NQ: √SOV(/√OSV); NNQ-WH: *SOV/√OSV; NNQ-Y/N: √SOV/*OSV
Target response: True yes/no-answer: √YES/*NO; False yes/no-answer: *YES/√NO; NP-answer: *YES/√NO

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4.2. Comparing adult and child L2 acquisition

On the basis of the results from all tasks, it was found that the more proficient the L2ers, the more targetlike their performances. On the one hand, some L2ers with very low Proficiency Scores almost always produced OSV, accepted OSV, and rejected SOV across all the experimental conditions. Since in English wh-questions, unlike in Korean wh-questions, wh-movement is obligatory, it can be concluded that their predominant use of OSV order is transferred from their L1 grammar. Thus, L1 transferred wh-movement must constitute a property of the L2 initial state in English-speaking learners’ acquisition of Korean. On the other hand, high L2ers did overcome the L2 poverty-of-the-stimulus problems of Korean wh-constructions with NPIs (see Figure 14).

Using the L2 proficiency measure as a guideline and combining Tables 5, 10, and 16, it is possible to infer the developmental sequence given in Table 17 below for all the tasks. All the participants (“C” stands for child; “A” stands for adult) were categorized according to whether they did (“+”) or did not (“−”) know that Korean allows scrambling in the acceptability-judgment task and whether they never assigned (“−”), sometimes assigned (“±”), or almost always assigned (“+”) a targetlike interpretation in the interpretation-verification task.
Table 17. Developmental sequence for Korean *wh*-constructions with NPIs by L1-English L2ers

<table>
<thead>
<tr>
<th>Stage</th>
<th>EPT</th>
<th>AJT</th>
<th>IVT</th>
<th>L1A</th>
<th>L1C</th>
<th>L2C</th>
<th>L2A</th>
<th>L2 proficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OSV</td>
<td>OSV</td>
<td>OSV</td>
<td>OSV</td>
<td>–</td>
<td>Wh-Q reading</td>
<td>+</td>
<td>C1 C2 A1 A2</td>
</tr>
<tr>
<td>2</td>
<td>OSV SOV</td>
<td>OSV SOV</td>
<td>OSV SOV</td>
<td>OSV SOV</td>
<td>–</td>
<td>Wh-Q reading</td>
<td>+</td>
<td>C3 C4 C5 A3 A4</td>
</tr>
<tr>
<td>3</td>
<td>SOV</td>
<td>SOV</td>
<td>SOV</td>
<td>SOV</td>
<td>–</td>
<td>Wh-Q reading</td>
<td>+</td>
<td>C6 C7 A5 A6 A7</td>
</tr>
<tr>
<td>4</td>
<td>SOV</td>
<td>SOV</td>
<td>OSV SOV</td>
<td>OSV SOV</td>
<td>+</td>
<td>Wh-Q reading</td>
<td>+</td>
<td>Some C8 C9 A8 A9 A10 A11</td>
</tr>
<tr>
<td>5</td>
<td>SOV</td>
<td>SOV</td>
<td>OSV</td>
<td>SOV</td>
<td>+</td>
<td>Wh-Q reading</td>
<td>+</td>
<td>All Most C10 A12 A13 A14 A15</td>
</tr>
</tbody>
</table>

Note. EPT=Elicited-Production Task; AJT=Acceptability-Judgment Task; IVT=Interpretation-Verification Task
PQ=positive *wh*-question without NPI; NQ=negative *wh*-question without NPI
NNQ-WH=negative *wh*-question with NPI; NNQ-Y/N=negative yes/no-question with NPI
L1A=L1 adults; L1C=L1 children; L2C=L2 children; L2A=L2 adults
Consistent performance is observed across tasks for all proficiency levels. In the low proficiency group, 4 L2ers (C1, C2, A1, and A2) produced OSV, accepted OSV, and rejected SOV for all the experimental conditions, and the 5 others (C3, C4, C5, A3, and A4) did so for most of the experimental conditions. It can be argued that, as described above, the OSV order of Stage 1 and Stage 2 results not from scrambling but rather from transfer from their L1 grammar (wh-movement). The low-intermediate L2ers (C6, C7, A5, A6, and A7) did not produce OSV, rejected OSV, and accepted only SOV for all the experimental conditions, indicating that at Stage 3 wh-movement has been relinquished but there is still no scrambling. The intermediate L2ers, at Stage 4, mostly produced only scrambled questions (OSV) for the experimental items in NNQ-WH, accepted scrambling in PQ, NQ and NNQ-WH but less so in NNQ-Y/N, and started differentiating between the wh-question reading (OSV) and the yes/no-question reading (SOV). Interestingly, some L1 children have this pattern, too, albeit more robustly. Finally, as shown in Figure 14, the high L2ers (C10, A12, A13, A14, and A15), at Stage 5, almost always produced and accepted only OSV in NNQ-WH and almost never produced or accepted OSV in NNQ-Y/N, in a targetlike way. Furthermore, like L1 Korean adults, they showed nativelike performance on assigning scrambled and in-situ questions with NPIs targetlike interpretations.

Importantly, every stage in this developmental sequence consists of adult L2ers and child L2ers. These results are also in step with the L2 proficiency scores. Developmental sequences of Korean wh-constructions with NPIs were established for all three groups (L2 adults, L2 children, and L1 children), and it was found that L2 adults and L2 children go through the same stages, providing evidence for UG involvement in
adult L2 acquisition. This developmental sequence of the acquisition of Korean wh-constructions with NPIs by English speakers initially starts with L1-transferred wh-movement, showing the OSV order consistently in all the conditions. However, this pattern was not shown in the performance of the L1 children in this thesis.\textsuperscript{17}

\textsuperscript{17} L1 Korean children here fall into only Stages 4 and 5. As their ages at time of testing ranged from 5:0 to 7:9, their data are uninformative as to whether L1 Korean children initially (dis)allow scrambling (note that the experiments used in this study could not be conducted with children (much) younger than 5, given that the materials are all in written Korean). Still, it is true that scrambled utterances are rare in very early child L1 Korean production (see, e.g., Cho, 1981; Kim, O'Grady, & Cho, 1995), a fact which might suggest extrapolation to an earlier stage – corresponding to our Stage 3 – in L1 Korean development.
CHAPTER 5
CONCLUSION

This thesis examined the acquisition of *wh*-constructions with NPIs by English-speaking learners of Korean in two ways — for the purpose of identifying the role of UG in (adult) L2 acquisition — (i) demonstrating L2 poverty-of-the-stimulus effects, and (ii) comparing three different groups of learners — L2 adults, L2 children, and L1 children — to determine whether their developmental paths are similar/dissimilar.

As for the L2 poverty-of-the-stimulus effects, the results demonstrate that some adult and child L2ers in the high proficiency group came to know the two properties of Korean *wh*-constructions with NPIs: (i) that scrambling of object *wh*-phrases across the NPI subject is obligatory to obviate the Intervention Effect (on *wh*-question reading), and (ii) that there are two different interpretations, such that a scrambled question (OSV) is assigned a *wh*-question reading and an in-situ question (SOV) a yes/no-question reading. Thus, it is concluded that the high L2ers overcame those two L2-poverty-of-the-stimulus problems in the acquisition of *wh*-constructions with NPIs, thereby providing evidence for UG involvement in adult L2 acquisition.

With respect to the development of Korean *wh*-constructions with NPIs, L2 children and L2 adults were found to pass through the same developmental sequence. The higher the proficiency scores of the L2 participants, the more targetlike their performance, for both L2 children and L2 adults. The performance of the adult and child L2ers at Stages 1 and 2 is due to L1-transferred *wh*-movement. The L2ers at Stages 1, 2, and 3 have not acquired knowledge of scrambling yet, but at Stage 4 scrambling is in place. At
Stage 5, English-speaking L2ers of Korean came to know the interpretive restrictions on scrambled vs. in-situ wh-phrases in Korean wh-constructions with NPIs. Adult and child L2ers in the high proficiency group showed the same patterns as the adult native controls did, in all the tasks. However, the L2 developmental sequence of Korean wh-constructions with NPIs is different from that of L1 Korean because the adult and child L2ers’ L1 grammar has obligatory wh-movement, and this mechanism, transferred from their L1 grammar, is present at the initial stage in their L2 developmental sequence of Korean wh-constructions with NPIs.

These two main findings, i.e., (i) that some adult and child L2ers overcame the poverty-of-the-stimulus problems and (ii) that in production and comprehension, adult and child L2ers pass through the same developmental sequence, provide strong support for the hypothesis that adult L2 acquisition is constrained by UG.
APPENDIX A: Picture-narration task

Three sets of four pictures used in the picture-narration task

1.

2.
APPENDIX B: Elicited-production task: PQ condition

PQ condition (Positive wh-question without NPI)

1. PQ condition – I

Context: The family came to a store to buy snacks.
All of them bought different things.

Experimenter <in Korean, using SOV order>:
Mother bought cookies. Cheolsoo bought candy.
Younghee bought ice cream. Father bought this at the store.

<in English for L2ers> BBUNG BBUNG (the puppet) knows what it is.
Ask him about it. You can use these four cards to ask him.

Participant:  

\[
\begin{array}{|c|c|c|c|c|}
\hline
\text{appa-ka} & \text{kakey-ye} & \text{mwues-ul} & \text{sa-ass-nil} \\
\text{father-Nom} & \text{store-Loc} & \text{what-Acc} & \text{buy-Past-Q} \\
\hline
\end{array}
\]

\(\Rightarrow\) SOV (targetlike)

\[
\begin{array}{|c|c|c|c|c|}
\hline
\text{mwues-ul} & \text{kakey-ye} & \text{appa-ka} & \text{sa-ass-nil} \\
\text{what-Acc} & \text{store-Loc} & \text{father-Nom} & \text{buy-Past-Q} \\
\hline
\end{array}
\]

\(\Rightarrow\) OSV (targetlike)

‘What did father buy at the store?’

2. PQ condition – II

Context: Younghee’s family wanted to play hide-and-seek.
Younghee lost the toss, so she had to find the three people.

Experimenter <in Korean, using SOV order>:
Her mother hid near a house. Cheolsoo hid next to a big rock.
Younghee couldn’t see them. However, she found this person behind a tree.

<in English for L2ers> BBUNG BBUNG (the puppet) knows who s/he is.
Ask him about it. You can use these four cards to ask him.

Participant:  

\[
\begin{array}{|c|c|c|c|c|}
\hline
\text{Youngee-ka} & \text{namwu-tw} & \text{nwukwu-lul} & \text{chac-ass-nil} \\
\text{Youngee-Nom} & \text{tree-behind} & \text{who-Acc} & \text{find-Past-Q} \\
\hline
\end{array}
\]

\(\Rightarrow\) SOV (targetlike)

\[
\begin{array}{|c|c|c|c|c|}
\hline
\text{nwukwu-lul} & \text{namwu-tw} & \text{Youngee-ka} & \text{chac-ass-nil} \\
\text{who-Acc} & \text{tree-behind} & \text{Youngee-Nom} & \text{find-Past-Q} \\
\hline
\end{array}
\]

\(\Rightarrow\) OSV (targetlike)

‘Who did Younghee find behind the tree?’

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3. PQ condition - III

Context: The cat, the squirrel, and the rabbit wanted to buy a birthday gift for the monkey together. So, they went to a toy store. When seeing many kinds of toys, they were very excited. They decided that each of them would bring the toy which s/he wanted to buy, and then they would choose the best one.

Experimenter <in Korean, using SOV order>:
The cat picked a basketball. The squirrel picked a robot. The rabbit picked this.

<in English for L2ers> BBUNG BBUNG (the puppet) knows what it is. Ask him about it. You can use these four cards to ask him.

Participant:

<table>
<thead>
<tr>
<th>thokki-ka</th>
<th>cangnankam kakey-eyse</th>
<th>mwues-ul</th>
<th>koll-ass-ni?</th>
</tr>
</thead>
<tbody>
<tr>
<td>rabbit-Nom</td>
<td>toy store-Loc</td>
<td>what-Acc</td>
<td>pick-Past-Q</td>
</tr>
</tbody>
</table>

→ SOV (targetlike)

<table>
<thead>
<tr>
<th>mwues-ul</th>
<th>cangnankam kakey-eyse</th>
<th>thokki-ka</th>
<th>koll-ass-ni?</th>
</tr>
</thead>
<tbody>
<tr>
<td>what-Acc</td>
<td>toy store-Loc</td>
<td>rabbit-Nom</td>
<td>pick-Past-Q</td>
</tr>
</tbody>
</table>

→ OSV (targetlike)

'What did the rabbit pick at the toy store?'

4. PQ condition – IV

Context: On a mountain, the tiger, the lion, and the bear were fighting each other over a rabbit. They hit each other and were very angry. As time went by, the lion looked very exhausted. However, he couldn’t give up the rabbit and had to do something.

Experimenter <in Korean, using SOV order>:
The lion suddenly bit the bear. So, the bear bit the lion. Very furious, the lion mistook the tiger for the bear and bit the tiger. The angry tiger bit this animal.

<in English for L2ers> BBUNG BBUNG (the puppet) knows who s/he is. Ask him about it. You can use these four cards to ask him.

Participant:

<table>
<thead>
<tr>
<th>holangi-ka</th>
<th>san-eyse</th>
<th>nwukwu-lul</th>
<th>mwul-ess-ni?</th>
</tr>
</thead>
<tbody>
<tr>
<td>tiger-Nom</td>
<td>mountain-Loc</td>
<td>who-Acc</td>
<td>bite-Past-Q</td>
</tr>
</tbody>
</table>

→ SOV (targetlike)

<table>
<thead>
<tr>
<th>nwukwu-lul</th>
<th>san-eyse</th>
<th>holangi-ka</th>
<th>mwul-ess-ni?</th>
</tr>
</thead>
<tbody>
<tr>
<td>who-Acc</td>
<td>mountain-Loc</td>
<td>tiger-Nom</td>
<td>bite-Past-Q</td>
</tr>
</tbody>
</table>

→ OSV (targetlike)

'Who did the tiger bite on the mountain?'
APPENDIX C: Elicited-production task: NQ condition

NQ condition (Negative *wh*-question without NPI)

1. NQ condition – I

Context: Mother prepared lunch for her family in the kitchen. Father also helped her cook some food.

Experimenter <in Korean, using SOV order>:
Mother made a chicken and a big sandwich in the kitchen. Mother did not make this in the kitchen.

<in English for L2ers> BBUNG BBUNG (the puppet) knows what it is. Ask him about it. You can use these four cards to ask him.

Participant:

\[
\begin{array}{c|c|c|c|c}
\text{emma·ka} & \text{pwuek·eyse} & \text{mwues·ul} & \text{mantul·ci anh-ass-ni?} \\
\text{mother-Nom} & \text{kitchen-Loc} & \text{what-Acc} & \text{make-ci Neg-Past-Q} \\
\end{array}
\]

→ SOV (targetlike)

\[
\begin{array}{c|c|c|c|c}
\text{mwues·ul} & \text{pwuek·eyse} & \text{emma·ka} & \text{mantul·ci anh-ass-ni?} \\
\text{what-Acc} & \text{kitchen-Loc} & \text{mother-Nom} & \text{make-ci Neg-Past-Q} \\
\end{array}
\]

→ OSV (targetlike)

‘What didn’t mother make in the kitchen?’

2. NQ condition – II

Context: Sunny had fun by herself at a playground. Later, some friends came to the playground. Sunny was very happy to meet them because she could play with them.

Experimenter <in Korean, using SOV order>:
Sunny met Younghee and Mary. She also met Minhee. However, she did not meet this friend because she was angry at him for fighting.

<in English for L2ers> BBUNG BBUNG (the puppet) knows who he is. Ask him about it. You can use these four cards to ask him.

Participant:

\[
\begin{array}{c|c|c|c|c}
\text{Sunny·ka} & \text{nolithe·eyse} & \text{nwukwu-lul} & \text{manna-ci anh-ass-ni?} \\
\text{Sunny-Nom} & \text{playground-Loc} & \text{who-Acc} & \text{meet-ci Neg-Past-Q} \\
\end{array}
\]

→ SOV (targetlike)

\[
\begin{array}{c|c|c|c|c}
\text{nwukwu-lul} & \text{nolithe·eyse} & \text{Sunny·ka} & \text{manna-ci anh-ass-ni?} \\
\text{who-Acc} & \text{playground-Loc} & \text{Sunny-Nom} & \text{meet-ci Neg-Past-Q} \\
\end{array}
\]

→ OSV (targetlike)

‘Who didn’t Sunny meet at the playground?’
3. NQ condition – III

Context: The cat was late for the party, and his friends in the room teased him a lot.

Experimenter <in Korean, using SOV order>:
Very angry, the cat hit the rabbit and the squirrel. However, the cat didn’t hit this friend in the room because this friend didn’t tease him.

<in English for L2ers> BBUNG BBUNG (the puppet) knows who s/he is. Ask him about it. You can use these four cards to ask him.

Participant:

\[
\begin{array}{|c|c|c|c|}
\hline
\text{koyangi-ka} & \text{pang-eyse} & \text{nwukwu-lul} & \text{ttayli-ci anh-ass-nil} \\
\text{cat-Nom} & \text{room-Loc} & \text{who-Acc} & \text{hit-ci Neg-Past-Q} \\
\hline
\end{array}
\]

→ SOV (targetlike)

\[
\begin{array}{|c|c|c|c|}
\hline
\text{nwukwu-lul} & \text{pang-eyse} & \text{koyangi-ka} & \text{ttayli-ci anh-ass-nil} \\
\text{who-Acc} & \text{room-Loc} & \text{cat-Nom} & \text{hit-ci Neg-Past-Q} \\
\hline
\end{array}
\]

→ OSV (targetlike)

‘Who didn’t the cat hit in the room?’

4. NQ condition – IV

Context: The bear and the tiger made up and become friends. They suddenly felt very hungry. The tiger told the bear that they could go to his house. So, they went to the tiger’s house. The tiger gave the bear four kinds of food.

Experimenter <in Korean, using SOV order>:
The bear ate chicken and then he ate pork. In addition, the bear ate fish. However, the bear didn’t eat this at the tiger’s house.

<in English for L2ers> BBUNG BBUNG (the puppet) knows what it is. Ask him about it. You can use these four cards to ask him.

Participant:

\[
\begin{array}{|c|c|c|c|}
\hline
\text{kom-i} & \text{holangi cip-eyse} & \text{mwues-ul} & \text{mek-ci anh-ass-nil} \\
\text{bear-Nom} & \text{tiger’s house-Loc} & \text{what-Acc} & \text{eat-ci Neg-Past-Q} \\
\hline
\end{array}
\]

→ SOV (targetlike)

\[
\begin{array}{|c|c|c|c|}
\hline
\text{mwues-ul} & \text{holangi cip-eyse} & \text{kom-i} & \text{mek-ci anh-ass-nil} \\
\text{what-Acc} & \text{tiger’s house-Loc} & \text{bear-Nom} & \text{eat-ci Neg-Past-Q} \\
\hline
\end{array}
\]

→ OSV (targetlike)

‘What didn’t the bear eat at the tiger’s house?’
APPENDIX D: Elicited-production task: NNQ-WH condition

NNQ-WH condition (Negative wh-question with NPI)

1. NNQ-WH condition – I

Context: The family wanted to have lunch when they arrived after bug hunting. Mother brought sausage, a hamburger, chicken, bread, and something else.

Experimenter <in Korean, using SOV order>:
Father ate sausage, mother ate a hamburger, Cheolsoo ate bread, and Younghee ate chicken. Nobody ate this.

<in English for L2ers> BBUNG BBUNG (the puppet) knows what it is. Ask him about it. You can use these four cards to ask him.

Participant:  

```
```

‘What did no one eat today?’

→ OSV (targetlike)

```
```

→ SOV (non-targetlike)

2. NNQ-WH condition – II

Context: The store sold four kinds of snacks. Mother, Cheolsoo, and Younghee bought what they wanted to eat before father came back.

Experimenter <in Korean, using SOV order>:
Cheolsoo bought candy. Younghee bought ice cream. Mother bought cookies. However, nobody bought this.

<in English for L2ers> BBUNG BBUNG (the puppet) knows what it is. Ask him about it. You can use these four cards to ask him.

Participant:  

```
```

‘What did no one buy at the store?’

→ OSV (targetlike)

```
```

→ SOV (non-targetlike)
3. NNQ-WH condition – III

Context: The pig, the rabbit, and the cat met one day before the monkey's birthday party. They bought a cake and inflated balloons. They planned to invite more friends.

Experimenter <in Korean, using SOV order>:
The pig invited a mouse, the rabbit invited a blue bear, and the cat invited a squirrel. However, nobody invited this friend.

<in English for L2ers> BBUNG BBUNG (the puppet) knows who s/he is. Ask him about it. You can use these four cards to ask him.

Participant:  

nwukwu-lul sayngilphathi-ey amwuto chotayha-ci anh-ass-ni?
who-Acc birthday party-to anyone invite-ci Neg-Past-Q

‘Who did no one invite to the birthday party?’
→ OSV (targetlike)

amwuto sayngilphathi-ey nwukwu-lul chotayha-ci anh-ass-ni?
anyone birthday party-to who-Acc invite-ci Neg-Past-Q

→ SOV (non-targetlike)

4. NNQ-WH condition – IV

Context: Cheolsoo, Sunny, Joe, and this friend pretended not to fight each other when their teacher came back because they did not want to be punished. However, in fact, they fought and hit each other several times while the teacher was gone.

Experimenter <in Korean, using SOV order>:
Cheolsoo hit Sunny. Very angry, Sunny hit Cheolsoo and Joe. Joe also hit Sunny. However, nobody hit this friend because she cried in the corner of the classroom.

<in English for L2ers> BBUNG BBUNG (the puppet) knows who s/he is. Ask him about it. You can use these four cards to ask him.

Participant:  

nwukwu-lul kyosi-eyse amwuto ttae-li-ci anh-ass-ni?
who-Acc classroom-Loc anyone hit-ci Neg-Past-Q

‘Who did no one hit in the classroom?’
→ OSV (targetlike)

amwuto kyosi-eyse nwukwu-lul ttae-li-ci anh-ass-ni?
anyone classroom-Loc who-Acc hit-ci Neg-Past-Q

→ SOV (non-targetlike)
APPENDIX E: Elicited-production task: NNQ-Y/N condition

NNQ-Y/N (Negative yes/no-question with NPI)

1. NNQ-Y/N – I

Context: Father, mother, Cheolsoo, and Younghee were hunting for bugs in a forest. They were trying to catch a butterfly, a grasshopper, and a dragonfly. They seemed to have a lot of fun.

Experimenter <in Korean, using SOV order>:
Although they felt hungry at lunch time, they didn’t seem to want to have lunch because bug hunting was so fun.

<in English for L2ers> BBUNG BBUNG (the puppet) knows whether they ate food or not. Ask him about it. You can use these four cards to ask him.

Participant: amwuto akka mwues-ul mek-ci anh-ass-ni?
anyone before what-Acc eat-ci Neg-Past-Q

‘Did no one eat something before?’
→ SOV (targetlike)

2. NNQ-Y/N – II

Context: Mother, Cheolsoo and Younghee said that they were hungry while father was driving a car. They decided to go buy snacks at a store. When they arrived at the store, father wanted to go to the restroom. He told them that they had to buy what they would have for their snack before he came back. He expected them to have bought snacks.

Experimenter <in Korean, using SOV order>:
However, when he returned, they did not seem to have bought any snacks.

<in English for L2ers> BBUNG BBUNG (the puppet) knows whether they bought them or not. Ask him about it. You can use these four cards to ask him.

Participant: amwuto yekeyse mwues-ul sa-ci anh-ass-ni?
anyone here what-Acc buy-ci Neg-Past-Q

‘Did no one buy something here?’
→ SOV (targetlike)
3. NNQ-Y/N – III

Context: One month ago, the pig, the rabbit, and the cat promised to prepare a birthday party for their friend, a monkey, and invite other friends. Two days before the birthday party, they realized that they forgot about the birthday party when talking about it at school.

Experimenter <in Korean, using SOV order>:
They didn’t seem to invite any friends.

<in English for L2ers> BBUNG BBUNG (the puppet) knows whether they invited people or not. Ask him about it. You can use these four cards to ask him.

Participant: 

\[
\begin{array}{|c|c|c|c|}
\hline
\text{nwukwu-lul} & \text{ceney} & \text{amwuto} & \text{chotayha-ci anh-ass-ni?} \\
\text{who-Acc} & \text{before} & \text{anyone} & \text{invite-ci Neg-Past-Q} \\
\hline
\end{array}
\]

‘Did no one invite someone before?’
→ OSV (targetlike)

\[
\begin{array}{|c|c|c|c|}
\hline
\text{amwuto} & \text{ceney} & \text{nwukwu-lul} & \text{chotayha-ci anh-ass-ni?} \\
\text{anyone} & \text{before} & \text{who-Acc} & \text{invite-ci Neg-Past-Q} \\
\hline
\end{array}
\]

→ SOV (non-targetlike)

4. NNQ-Y/N – IV

Context: Cheolsoo, Sunny, Joe, and Minhee were having fun with building blocks in a classroom. Suddenly, Cheolsoo and Joe complained that Sunny and Minhee had more blocks than they had. Sunny and Minhee looked angrily at them. A teacher told them that they should not fight with friends. The teacher had to leave the classroom to bring books for 10 minutes. Walking in the hall, she heard noise from her classroom and thought they were hitting each other.

Experimenter <in Korean, using SOV order>:
When she opened the door, they did not seem to be hitting each other.

<in English for L2ers> BBUNG BBUNG (the puppet) knows whether they hit each other or not. Ask him about it. You can use these four cards to ask him.

Participant:

\[
\begin{array}{|c|c|c|c|}
\hline
\text{nwukwu-lul} & \text{cokumceney} & \text{amwuto} & \text{ttayli-ci anh-ass-ni?} \\
\text{who-Acc} & \text{just before} & \text{anyone} & \text{hit-ci Neg-Past-Q} \\
\hline
\end{array}
\]

‘Did no one hit someone just before (the teacher returned)?’
→ OSV (targetlike)

\[
\begin{array}{|c|c|c|c|}
\hline
\text{amwuto} & \text{cokumceney} & \text{nwukwu-lul} & \text{ttayli-ci anh-ass-ni?} \\
\text{anyone} & \text{just before} & \text{who-Acc} & \text{hit-ci Neg-Past-Q} \\
\hline
\end{array}
\]

→ SOV (non-targetlike)
APPENDIX F: Filler sentences in the elicited-production task

16 Filler sentences (simple positive yes/no-questions) made with four word cards

1) 여우가 물래 토끼를 가져갔니?
yewu-ka mollay thokki-lul kacyeka-ass-ni?
fox-Nom secretly rabbit-Acc take-Past-Q
‘Did the fox take a rabbit secretly?’

2) 아빠가 숲에서 토끼를 봤니?
appa-ka swuph-eyse thokki-lul po-ass-ni?
father-Nom forest-Loc rabbit-Acc see-Past-Q
‘Did the father see a rabbit in the forest?’

3) 미니가 점심으로 바나나를 먹었니?
Mini-ka cemsim-ulo panana-lul mek-ess-ni?
Mini-Nom lunch-for banana-Acc eat-Past-Q
‘Did Mini eat a banana for lunch?’

4) 영희가 부엌에서 빵을 먹었니?
Youngehee-ka pwuekh-eyse ppang-ul mek-ess-ni?
Youngehee-Nom kitchen-Loc bread-Acc eat-Past-Q
‘Did Younghee eat bread in the kitchen?’

5) 엄마가 숲에서 나비를 잡았니?
emma-ka swuph-eyse napi-Iul cap-ass-ni?
mother-Nom forest-Loc butterfly-Acc catch-Past-Q
‘Did the mother catch a butterfly in the forest?’

6) 천수가 방에서 우유를 마셨니?
Cheolsoo-ka pang-eyse wuyu-lul masi-ess-ni?
Cheolsoo-Nom room-Loc milk-Acc drink-Past-Q
‘Did Cheolsoo drink milk in the room?’

7) 영희가 아가 차를 탔니?
Youngehee-ka akka cha-lul tha-ass-ni?
Youngehee-Nom before car-Acc take-Past-Q
‘Did Younghee take a car before?’

8) 영수가 화장실에서 손을 씻었니?
Youngsoo-ka hwacangsil-eyse son-ul ssis-ess-ni?
Youngsoo-Nom restroom-Loc hand-Acc wash-Past-Q
‘Did Youngsoo wash his hands in the restroom?’
9) 미나가 미리 숙제를 했니?
Mina-ka mili swukce-lul ha-yess-ni?
Mina-Nom in advance homework-Acc do-Past-Q
‘Did Mina do homework in advance?’

10) 호랑이가 여기에서 여우를 봤니?
holangi-ka yekieyse yewu-lul po-ass-ni?
tiger-Nom here fox-Acc see-Past-Q
‘Did the tiger see the fox here?’

11) 곰이 지면으로 통닭을 먹었니?
kom-i cenyek-ulo thongtalk-ul mek-ess-ni?
bear-Nom dinner-for chicken-Acc eat-Past-Q
‘Did the bear eat chicken for dinner?’

12) 민희가 어제 편지를 썼니?
Minhee-ka cecy phyenci-lul ssse-css-ni?
Minhee-Nom yesterday letter-Acc write-Past-Q
‘Did Minhee write a letter yesterday?’

13) Joe가 교실에서 만화책을 읽었니?
Joe-ka kyosil-eyse manhwachayk-ul ilk-ess-ni?
Joe-Nom classroom-Lac comic book-Acc read-Past-Q
‘Did Joe read a comic book in the classroom?’

14) Sunny가 집에서 쿠키를 만들었니?
Sunny-ka cip-eyse khwukhi-lul mantul-ess-ni?
Sunny-Nom home-Lac cookies-Acc make-Past-Q
‘Did Sunny make cookies at home?’

15) Tom이 방에서 신발을 신었니?
Tom-i pang-eyse sinpal-ul sin-ess-ni?
Tom-Nom room-Lac shoes-Acc wear-Past-Q
‘Did Tom wear shoes in the room?’

16) 돼지가 올래 케익을 먹었니?
twayci-ka mollay kheyikh-ul mek-ess-ni?
pig-Nom secretly cake-Acc eat-Past-Q
‘Did the pig eat cake secretly?’
APPENDIX G: Results by adult and child L2ers in each proficiency group in the elicited-production task (Fillers)

<table>
<thead>
<tr>
<th>L1 group</th>
<th>L2 group</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1A (n=15)</td>
<td>L1C (n=23)</td>
</tr>
<tr>
<td>L2A (n=4) &amp; L2C (n=5)</td>
<td>L2A (n=3) &amp; L2C (n=2)</td>
</tr>
<tr>
<td>Fillers (k=16)</td>
<td>4.2% (10/240)</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children
Target response: Fillers: √SOV/√OSV
APPENDIX H: Acceptability-judgment task: PQ condition

PQ condition (Positive *wh*-question without NPI)

1. PQ condition – I

Context: The family came to a store to buy snacks. All of them bought different things.

Experimenter <in Korean, using SOY order>:
Mother bought cookies. Cheolsoo bought candy. Younghee bought ice cream. Father bought this at the store.

<in English to L2ers> BBUNG BBUNG (the puppet) knows what it is. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.

(Scrambled: OSV)

Experimenter: 

\[
\begin{array}{c}
\text{mwues-ul} \quad \text{kakey-eyse} \quad \text{appa-ka} \quad \text{sa-ass-nil?} \\
\text{what-Acc} \quad \text{store-Loc} \quad \text{father-Nom} \quad \text{buy-Past-Q}
\end{array}
\]

Participant: YES NO DON'T KNOW

(Non-scrambled: SOV)

Experimenter: 

\[
\begin{array}{c}
\text{appa-ka} \quad \text{kakey-eyse} \quad \text{mwues-ul} \quad \text{sa-ass-nil?} \\
\text{father-Nom} \quad \text{store-Loc} \quad \text{what-Acc} \quad \text{buy-Past-Q}
\end{array}
\]

Participant: YES NO DON'T KNOW

2. PQ condition – II

Context: Younghee’s family wanted to play hide-and-seek. Younghee lost the toss, so she had to find the three people.

Experimenter <in Korean, using SOY order>:
Her mother hid near a house. Cheolsoo hid next to a big rock. Younghee couldn’t see them. However, Younghee found this person behind a tree.

<in English to L2ers> BBUNG BBUNG (the puppet) knows who s/he is. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.
3. PQ condition – III

Context: The cat, the squirrel, and the rabbit wanted to buy a birthday gift for the monkey together. So, they went to a toy store. When seeing many kinds of toys, they were very excited. They decided that each of them would bring the toy which s/he wanted to buy, and then they would choose the best one.

Experimenter <in Korean, using SOV order>:
The cat picked a basketball. The squirrel picked a robot. The rabbit picked this.

<in English to L2ers> BBUNG BBUNG (the puppet) knows what it is. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.
4. PQ condition – IV

Context: On a mountain, the tiger, the lion, and the bear were fighting each other over a rabbit. They hit each other and were very angry. As time went by, the lion looked very exhausted. However, he couldn’t give up the rabbit and had to do something.

Experimenter <in Korean, using SOV order>:
The lion suddenly bit the bear. So, the bear bit the lion. Very furious, the lion mistook the tiger for the bear and bit the tiger. The angry tiger bit this animal.

<in English to L2ers> BBUNG BBUNG (the puppet) knows who s/he is. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.

(Scrambled: OSV)

Experimenter: 

| nwukwu-lul | san-eyse | holangi-ka | mwl-ess-nil? |
| who-Acc   | mountain-Loc | tiger-Nom   | bite-Past-Q  |

Participant: YES NO DON’T KNOW

(Non-scrambled: SOV)

Experimenter: 

| holangi-ka | san-eyse | nwukwu-lul | mwl-ess-nil? |
| tiger-Nom | mountain-Loc | who-Acc | bite-Past-Q  |

Participant: YES NO DON’T KNOW
APPENDIX I: Acceptability-judgment task: NQ condition

NQ condition (Negative wh-question without NPI)

1. NQ condition – I

Context: Mother prepared lunch for her family in the kitchen. Father also helped her cook some food.

Experimenter <in Korean, using SOY order>: Mother made a chicken and a big sandwich in the kitchen. Mother did not make this in the kitchen.

<in English to L2ers> BBUNG BBUNG (the puppet) knows what it is. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.

(Scrambled: OSV)

Experimenter: [mwues-ul pwuek-eyse emma-ka mantul-ci anh-ass-ni?]
what-Acc kitchen-Loc mother-Nom make-ci Neg-Past-Q

Participant: YES NO DON'T KNOW

(Non-scrambled: SOV)

Experimenter: [emma-ka pwuek-eyse mwues-ul mantul-ci anh-ass-ni?]
mother-Nom kitchen-Loc what-Acc make-ci Neg-Past-Q

Participant: YES NO DON'T KNOW

2. NQ condition – II

Context: Sunny had fun by herself at a playground. Later, some friends came to the playground. Sunny was very happy to meet them because she could play with them.

Experimenter <in Korean, using SOV order>: Sunny met Younghee and Mary. She also met Minhee. However, she did not meet this friend because she was angry at him for fighting.

<in English to L2ers> BBUNG BBUNG (the puppet) knows who he is. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.
(Scrambled: OSV)
Experimenter: nwukwu-lul nolithe-eyse Sunny-ka manna-ci anh-ass-ni?
who-Acc playground-Loc Sunny-Nom meet-ci Neg-Past-Q

Participant: YES NO DON'T KNOW

(Non-scrambled: SOV)
Experimenter: Sunny-ka nolithe-eyse nwukwu-lul manna-ci anh-ass-ni?
Sunny-Nom I playground-Loc who-Ace meet-ci Neg-Past-Q

Participant: YES NO DON'T KNOW

3. NQ condition – III

Context: The cat was late for the party, and his friends in the room teased him a lot.

Experimenter <in Korean, using SOV order>:
Very angry, the cat hit the rabbit and the squirrel. However, the cat didn’t hit this friend in the room because this friend didn’t tease him.

<in English to L2ers> BBUNG BBUNG (the puppet) knows who s/he is. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.

(Scrambled: OSV)
Experimenter: nwukwu-lul pang-eyse koyangi-ka ttayli-ci anh-ass-ni?
who-Acc room-Loc cat-Nom hit-ci Neg-Past-O

Participant: YES NO DON'T KNOW

(Non-scrambled: SOV)
Experimenter: I koyangi-ka pang-eyse nwukwu-lul ttayli-ci anh-ass-ni?
cat-Nom room-Loc who-Ace hit-ci Neg-Past-O

Participant: YES NO DON'T KNOW

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4. NQ condition – IV

Context: The bear and the tiger made up and became friends. They suddenly felt very hungry. The tiger told the bear that they could go to his house. So, they went to the tiger’s house. The tiger gave the bear four kinds of food.

Experimenter <in Korean, using SOV order>:
The bear ate chicken and then he ate pork. In addition, the bear ate fish. However, the bear didn’t eat this at the tiger’s house.

<in English to L2ers> BBUNG BBUNG (the puppet) knows what it is. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.

(Scrambled: OSV)
Experimenter: mwues-ul holangi cip-eyse kom-i mek-ci anh-ass-ni?
what-Acc tiger’s house-Loc bear-Nom eat-ci Neg-Past-Q

Participant: YES NO DON’T KNOW

(Non-scrambled: SOV)
Experimenter: kom-i holangi cip-eyse mwues-ul mek-ci anh-ass-ni?
bear-Nom tiger’s house-Loc what-Acc eat-ci Neg-Past-Q

Participant: YES NO DON’T KNOW
APPENDIX J: Acceptability-judgment task: NNQ-WH condition

NNQ-WH condition (Negative wh-question with NPI)

1. NNQ-WH condition – I

Context: The family wanted to have lunch when they arrived after bug hunting. Mother brought sausage, a hamburger, chicken, bread, and something else.

Experimenter <in Korean, using SOY order>:
Father ate sausage, mother ate hamburger, Cheolsoo ate bread, and Younghee ate chicken. Nobody ate this.

<in English to L2ers> BBUNG BBUNG (the puppet) knows what it is. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.

(Scrambled: OSV)

Experimenter: mwues-ul onul amwuto mek-ci anh-ass-ni?
what-Acc today anyone eat-ci Neg-Past-Q

Participant: YES NO DON’T KNOW

(Non-scrambled: SOV)

Experimenter: amwuto onul mwues-ul mek-ci anh-ass-ni?
anyone today what-Acc eat-ci Neg-Past-Q

Participant: YES NO DON’T KNOW

2. NNQ-WH condition – II

Context: The store sold four kinds of snacks. Mother, Cheolsoo, and Younghee bought what they wanted to eat before father came back.

Experimenter <in Korean, using SOV order>:
Cheolsoo bought candy. Younghee bought ice cream. Mother bought cookies. However, nobody bought this.

<in English to L2ers> BBUNG BBUNG (the puppet) knows what it is. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.
3. NNQ-WH condition – III

Context: The pig, the rabbit, and the cat met one day before the monkey's birthday party. They bought a cake and inflated balloons. They planned to invite more friends.

Experimenter <in Korean, using SOY order>: The pig invited a mouse, the rabbit invited a blue bear, and the cat invited a squirrel. However, nobody invited this friend.

<in English to L2ers> BBUNG BBUNG (the puppet) knows who s/he is. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.

(Scrambled: OSV)


Participant: YES NO DON'T KNOW

(Non-scrambled: SOV)


Participant: YES NO DON'T KNOW
4. NNQ-WH condition – IV

Context: Cheolsoo, Sunny, Joe, and this friend pretended not to fight each other when their teacher came back because they did not want to be punished. However, in fact, they fought and hit each other several times while the teacher was gone.

Experimenter <in Korean, using SOV order>: Cheolsoo hit Sunny. Very angry, Sunny hit Cheolsoo and Joe. Joe also hit Sunny. However, nobody hit this friend because she cried in the corner of the classroom.

<in English to L2ers> BBUNG BBUNG (the puppet) knows who she is. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.

(Scrambled: OSV)


Participant: YES  NO  DON'T KNOW

(Non-scrambled: SOV)


Participant: YES  NO  DON'T KNOW
APPENDIX K: Acceptability-judgment task: NNQ-Y/N condition

NNQ-Y/N (Negative yes/no-question with NPI)

1. NNQ-Y/N – I

Context: Father, mother, Cheolsoo, and Younghee were hunting for bugs in a forest. They were trying to catch a butterfly, a grasshopper, and a dragonfly. They seemed to have a lot of fun.

Experimenter <in Korean, using SOY order>:
Although they felt hungry at lunch time, they didn’t seem to want to have lunch because bug hunting was so fun.

<in English to L2ers> BBUNG BBUNG (the puppet) knows whether they ate food or not. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.

(Scrambled: OSV)


Participant: YES NO DON'T KNOW

(Non-scrambled: SOV)


Participant: YES NO DON'T KNOW

2. NNQ-Y/N – II

Context: Mother, Cheolsoo and Younghee said that they were hungry while father was driving a car. They decided to go buy snacks at a store. When they arrived at the store, father wanted to go to the restroom. He told them that they had to buy what they would have for their snack before he came back. He expected them to have bought snacks.

Experimenter <in Korean, using SOV order>:
However, when he returned, they did not seem to have bought any snacks.

<in English to L2ers> BBUNG BBUNG (the puppet) knows whether they bought them or not. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.
3. NNQ-Y/N – III

Context: One month ago, the pig, the rabbit, and the cat promised to prepare a birthday party for their friend, a monkey, and invite other friends. Two days before the birthday party, they realized that they forgot about the birthday party when talking about it at school.

Experimenter <in Korean, using SOV order>:
They didn’t seem to invite any friends.

<in English to L2ers> BBUNG BBUNG (the puppet) knows whether they invited people or not. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.

(Scrambled: OSV)

Experimenter: nwukwu-lul | ceney | amwuto | chotayha-ci anh-ass-ni?
who-Acc | before | anyone | invite-ci Neg-Past-Q

Participant: YES NO DON’T KNOW

(Non-scrambled: SOV)

Experimenter: amwuto | ceney | nwukwu-lul | chotayha-ci anh-ass-ni?
anyone | before | who-Acc | invite-ci Neg-Past-Q

Participant: YES NO DON’T KNOW
4. NNQ-Y/N − IV

Context: Cheolsoo, Sunny, Joe, and Minhee were having fun with building blocks in a classroom. Suddenly, Cheolsoo and Joe complained that Sunny and Minhee had more blocks than they had. Sunny and Minhee looked angrily at them. A teacher told them that they should not fight with friends. The teacher had to leave the classroom to bring books for 10 minutes. Walking in the hall, she heard noise from her classroom and thought they were hitting each other.

Experimenter <in Korean, using SOV order>: When she opened the door, they did not seem to be hitting each other.

<in English to L2ers> BBUNG BBUNG (the puppet) knows whether they hit each other or not. Using these four cards, I will ask BBUNG BBUNG about it. Please tell me whether it feels okay to use this question in the context.

(Scrambled: OSV)

Experimenter: nwukwu-lul cokumceney amwuto ttayli-ci anh-ass-ni?
who-Acc just before anyone hit-ci Neg-Past-Q

Participant: YES NO DON’T KNOW

(Non-scrambled: SOV)

Experimenter: amwuto cokumceney nwukwu-lul ttayli-ci anh-ass-ni?
anyone just before who-Acc hit-ci Neg-Past-Q

Participant: YES NO DON’T KNOW
APPENDIX L: Filler sentences in the acceptability judgment task

Filler sentences (simple positive yes/no-questions)

I. Scrambled sentences (OSV)

1) 토끼를 몰래 여우가 가져갔나?
   thokki-lul mollyay yewu-ka kacyecka-ass-ni?
   ‘Did the fox take a rabbit secretly?’

2) 토끼를 숲에서 아빠가 봤나?
   thokki-lul swuph-eyse appa-ka po-ass-ni?
   ‘Did the father see a rabbit in the forest?’

3) 바나나를 점심으로 미니가 먹었나?
   panana-lul cemsim-uló Mini-ka mek-ess-ni?
   ‘Did Mini eat a banana for lunch?’

4) 빵을 부엌에서 영희가 먹었나?
   ppang-ul pwuekh-eyse Younghee-ka mek-ess-ni?
   ‘Did Younghee eat bread in the kitchen?’

5) 나비를 숲에서 엄마가 잡았나?
   napi-lul swuph-eyse emma-ka cap-ass-ni?
   ‘Did the mother catch a butterfly in the forest?’

6) 우유를 방에서 칠수가 마셨나?
   wuyu-lul pang-eyse Cheolssoo-ka masi-ess-ni?
   ‘Did Cheolssoo drink milk in the room?’

7) 차를 아까 영희가 땡나?
   cha-lul akka Younghee-ka tha-ass-ni?
   ‘Did Younghee take a car before?’

8) 손을 화장실에서 엽수가 씻었나?
   son-ul hwucangsil-eyse Youngsoo-ka ssis-ess-ni?
   ‘Did Youngsoo wash his hands in the restroom?’
9) 속제를 미리 미나가 했니?
swukce-lul mili Mina-ka ha-yess-ni?
homework-Acc in advance Mina-Nom do-Past-Q
‘Did Mina do homework in advance?’

10) 여우를 여기에서 호랑이가 봤니?
yewu-lu yekieyse holangi-ka l po-ass-ni?
fox-Acc here tiger-Nom see-Past-Q
‘Did the tiger see the fox here?’

11) 통닭을 저녁으로 곧이 먹었니?
thongtalk-ul cenyek-ulok kom-i mek-ess-ni?
chicken-Acc Acc for bear-Nom eat-Past-Q
‘Did the bear eat chicken for dinner?’

12) 편지를 어제 민희가 썼니?
phyenci-lul ecey Minhee-ka sse-ess-ni?
letter-Acc yesterday Minhee-Nom write-Past-Q
‘Did Minhee write a letter yesterday?’

13) 만화책을 교실에서 Joe가 읽었니?
manhwachayk-ul kyosil-eyse Joe-ka ilk-ess-ni?
comic book-Acc classroom-Loc Joe-Nom read-Past-Q
‘Did Joe read a comic book in the classroom?’

14) 쿠키를 집에서 Sunny가 만들었니?
Sunny-ka cip-eyse khwukhi-lul mantul-ess-ni?
Sunny-Nom home-Loc cookies-Acc make-Past-Q
‘Did Sunny make cookies at home?’

15) 신발을 방에서 Tom이 신었니?
sinpal-ul pang-eyse Tom-i sin-ess-ni?
shoes-Acc room-Loc Tom-Nom wear-Past-Q
‘Did Tom wear shoes in the room?’

16) 케익을 몸래 돼지가 먹었니?
kheyikh-ul mollay twayci-ka mek-ess-ni?
cake-Acc secretly pig-Nom eat-Past-Q
‘Did the pig eat cake secretly?’
II. Non-scrambled sentences (SOV)

1) 여우가 물레 토끼를 가져갔나?
yewu-ka mollay thokki-lul kacyeka-ass-ni?
fox-Nom secretly rabbit.Acc take-Past-Q
‘Did the fox take a rabbit secretly?’

2) 아빠가 숲에서 토끼를 봤니?
appa-ka swuph-eyse thokki-lul po-ass-ni?
father-Nom forest-Loc rabbit.Acc see-Past-Q
‘Did the father see a rabbit in the forest?’

3) 미니가 점심으로 바나나를 먹었니?
Mini-ka cemsim-ulo panana-lul mek-ess-ni?
Mini-Nom lunch-for banana.Acc eat-Past-Q
‘Did Mini eat a banana for lunch?’

4) 영희가 부엌에서 밥을 먹었니?
Youngeeh-ka pwuekh-eyse ppang-ul mek-ess-ni?
Youngeeh-Nom kitchen-Loc bread.Acc eat-Past-Q
‘Did Younghee eat bread in the kitchen?’

5) 엄마가 숲에서 나비를 잡았니?
emma-ka swuph-eyse napi-lul cap-ass-ni?
mother-Nom forest-Loc butterfly.Acc catch-Past-Q
‘Did the mother catch a butterfly in the forest?’

6) 철수가 방에서 우유를 마셨니?
Cheolsoo-ka wuyu-lul masi-ess-ni?
Cheolsoo-Nom room-Loc milk.Acc drink-Past-Q
‘Did Cheolsoo drink milk in the room?’

7) 영화가 아까 차를 탔니?
Youngeeh-ka akka cha-lul tha-ass-ni?
Youngeeh-Nom before car.Acc take-Past-Q
‘Did Younghee take a car before?’

8) 영수가 화장실에서 손을 씻었니?
Youngsoo-ka hwacangsil-eyse son-ul ssis-ess-ni?
Youngsoo-Nom restroom-Loc hand.Acc wash-Past-Q
‘Did Youngsoo wash his hands in the restroom?’
9.) 미나가 미리 숙제를 했니?
Mina-ka mili swukce-lul ha-yess-ni?
Mina-Nom in advance homework-Acc do-Past-Q
‘Did Mina do homework in advance?’

10.) 호랑이가 여기에서 여우를 볼니?
holangi-ka yekieyse yewu-lul po-ass-ni?
tiger-Nom here fox.Acc see-Past-Q
‘Did the tiger see the fox here?’

11.) 곧이 저녁으로 통닭을 먹었니?
kom-i cenyek-ulo thongtalk-ul mck-ess-ni?
bear-Nom dinner-for chicken.Acc eat-Past-Q
‘Did the bear eat chicken for dinner?’

12.) 민희가 어제 편지를 써셨니?
Minhee-ka ecey phyenci-lul sse-ess-ni?
Minhee-Nom yesterday letter.Acc write-Past-Q
‘Did Minhee write a letter yesterday?’

13.) Joe가 교실에서 만화책을 읽었니?
Joe-ka kyosil-eysye manhwachayk-ulo ilk-ess-ni?
Joe-Nom classroom-Loc comic book.Acc read-Past-Q
‘Did Joe read a comic book in the classroom?’

14.) Sunny가 집에서 쿠키를 만들었니?
Sunny-ka cip-eysye khwukhi-lul mantul-ess-ni?
Sunny-Nom home-Loc cookies.Acc make-Past-Q
‘Did Sunny make cookies at home?’

15.) Tom이 방에서 신발을 신았니?
Tom-i pang-eysye sinpal-ul sin-ess-ni?
Tom-Nom room-Loc shoes.Acc wear-Past-Q
‘Did Tom wear shoes in the room?’

16.) 돼지가 물래 케익을 먹었니?
twayci-ka mollay kheyikh-ul mck-ess-ni?
pig-Nom secretly cake.Acc eat-Past-Q
‘Did the pig eat cake secretly?’
APPENDIX M: Results by adult and child L2ers in each proficiency group in the acceptability-judgment task (Fillers)

a) Acceptance rate of OSV filler sentences

<table>
<thead>
<tr>
<th>L1 group</th>
<th>L2 group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>L1A (n=15)</td>
<td>L1C (n=23)</td>
</tr>
<tr>
<td>Fillers (k=16)</td>
<td></td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children
Target response: Fillers: vSOV/vOSV

b) Acceptance rate of SOV filler sentences

<table>
<thead>
<tr>
<th>L1 group</th>
<th>L2 group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>L1A (n=15)</td>
<td>L1C (n=23)</td>
</tr>
<tr>
<td>Fillers (k=16)</td>
<td></td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children
Target response: Fillers: vSOV/vOSV
APPENDIX N: Interpretation-verification task: Set I (NNQ-WH)

Set I (NNQ-WH: OSV ok on wh-question reading)

1. NNQ-WH – I

Picture 1: <in English for L2ers> The family was hunting for bugs. Although they felt hungry at lunch time, they did not eat any food because it was so fun.

Picture 2: <in English for L2ers> The family wanted to have lunch after bug hunting. Father ate sausage, mother ate a hamburger, Tom ate bread, and Jenny ate chicken. Nobody ate a sandwich.

Experimenter: I will ask BBUNG BBUNG (the puppet) a question, using these four cards. If his answer is right, please say “YES,” but if it is wrong, please say “NO.”


(i) True NP-answer
BBUNG BBUNG: A sandwich (True NP-answer)
Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “YES” → targetlike response
If the participant says “NO” → non-targetlike response

(ii) False NP-answer
BBUNG BBUNG: A hamburger (False NP-answer)
Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iii) Yes/no-answer
BBUNG BBUNG: Yes (Yes/no-answer)
Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iv) Yes/no-answer
BBUNG BBUNG: No (Yes/no-answer)
Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response
2. NNQ-WH – II

Picture 1  <in English for L2ers> Mother, Cheolsoo and Younghee were hungry while father was driving a car. So, they went to a store. When they arrived at the store, father wanted to go to the restroom. He told them that they had to buy what they would have for snack before he came back. He expected them to have bought things. However, when he returned, he thought that they did not seem to have bought their snacks at the store.

Picture 2  <in English for L2ers> Actually, mother, Cheolsoo, and Younghee had bought what they wanted to eat before father came back. If did not take a long time to shop. Cheolsoo bought candy. Younghee bought ice cream. Mother bought cookies. However, nobody bought a donut.

Experimenter: I will ask BBUNG BBUNG (the puppet) a question, using these four cards. If his answer is right, please say “YES,” but if it is wrong, please say “NO.”

Experimenter: <OSV: in Korean, using cards>
Mwues-ul kakey-eyes anwuto sa-ci anh-ass-ni? what-Acc store-Loc anyone buy-ci Neg-Past-Q 'What did no one buy at the store?'

(i) True NP-answer
BBUNG BBUNG: A donut (True NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “YES” → targetlike response
If the participant says “NO” → non-targetlike response

(ii) False NP-answer
BBUNG BBUNG: Ice cream (False NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iii) Yes/no-answer
BBUNG BBUNG: No (Yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iv) Yes/no-answer
BBUNG BBUNG: Yes (Yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response
One month ago, the monkey, the rabbit, and the cat promised to prepare a birthday party for the dog, and invite other friends. However, they forgot about the birthday party when talking about it at school. They did not invite anybody.

The monkey, the rabbit, and the cat met one day before the birthday party. They bought a cake and inflated balloons. In addition, they planned to invite more friends. The monkey invited a mouse, the rabbit invited a blue bear, and the cat invited a squirrel. However, nobody invited a pig.

I will ask BBUNG BBUNG (the puppet) a question, using these four cards. If his answer is right, please say “YES,” but if it is wrong, please say “NO.”

Who did no one invite to the birthday party?

(i) True NP-answer
BBUNG BBUNG: A pig (True NP-answer)

Participant: If the participant says “YES” → targetlike response
If the participant says “NO” → non-targetlike response

(ii) False NP-answer
BBUNG BBUNG: A mouse (False NP-answer)

Participant: If BBUNG BBUNG’s answer right?

If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iii) Yes/no-answer
BBUNG BBUNG: No (Yes/no-answer)

Participant: Is BBUNG BBUNG’s answer right?

If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iv) Yes/no-answer
BBUNG BBUNG: Yes (Yes/no-answer)

Participant: Is BBUNG BBUNG’s answer right?

If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response
4. NNQ-WH – IV

Picture 1  
<in English for L2ers> While playing with building blocks in a classroom, Cheolsoo and Joe complained that Sunny and Minhee had more blocks than they had. A teacher told them that they should not fight with friends. The teacher had to leave the classroom to bring books for 10 minutes. Walking in the hall, she heard noise from her classroom. She thought they were hitting each other. When she opened the door, they did not seem to be hitting anybody.

Picture 2  
<in English for L2ers> Cheolsoo, Sunny, Joe, and Minhee pretended not to fight with each other when their teacher came back because they did not want to be punished. However, in fact, they fought each other. Cheolsoo hit Sunny. Very angry, Sunny hit Cheolsoo and Joe. Joe also hit Sunny. However, nobody hit Minhee because she cried in the corner of the classroom.

Experimenter: I will ask BBUNG BBUNG (the puppet) a question, using these four cards. If his answer is right, please say "YES," but if it is wrong, please say "NO."

Experimenter: <OSV: in Korean, using cards>  
Nwukwu-lul kyosil-eysen amwuto ttayli-ci anh-ass-ni?  
who-Acc classroom-Loc anyone hit-ci Neg-Past-Q  
"Who did no one hit in the classroom?"

(i) True NP-answer  
BBUNG BBUNG: Minhee (True NP-answer)

Experimenter: Is BBUNG BBUNG's answer right?

Participant: If the participant says "YES"  \(\rightarrow\) targetlike response  
If the participant says "NO"  \(\rightarrow\) non-targetlike response

(ii) False NP-answer  
BBUNG BBUNG: Cheolsoo (False NP-answer)

Experimenter: Is BBUNG BBUNG's answer right?

Participant: If the participant says "NO"  \(\rightarrow\) targetlike response  
If the participant says "YES"  \(\rightarrow\) non-targetlike response

(iii) Yes/no-answer  
BBUNG BBUNG: Yes (Yes/no-answer)

Experimenter: Is BBUNG BBUNG's answer right?

Participant: If the participant says "NO"  \(\rightarrow\) targetlike response  
If the participant says "YES"  \(\rightarrow\) non-targetlike response

(iv) Yes/no-answer  
BBUNG BBUNG: No (Yes/no-answer)

Experimenter: Is BBUNG BBUNG's answer right?

Participant: If the participant says "NO"  \(\rightarrow\) targetlike response  
If the participant says "YES"  \(\rightarrow\) non-targetlike response
APPENDIX O: Interpretation-verification task: Set II (NNQ-Y/N)

Set II (NNQ-Y/N: SOV ok on yes/no-question reading)

1. NNQ-Y/N – I

Picture 1  
<in English for L2ers> The family was hunting for bugs. Although they felt hungry at lunch time, they did not eat any food because it was so fun.

Picture 2  
<in English for L2ers> The family wanted to have lunch after bug hunting. Father ate sausage, mother ate a hamburger, Tom ate bread, and Jenny ate chicken. Nobody ate a sandwich.

Experimenter: I will ask BBUNG BBUNG (the puppet) a question, using these four cards. If his answer is right, please say “YES,” but if it is wrong, please say “NO.”


(i) True yes/no-answer
BBUNG BBUNG: No (True yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “YES” → targetlike response
If the participant says “NO” → non-targetlike response

(ii) False yes/no-answer
BBUNG BBUNG: Yes (False yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iii) NP-answer
BBUNG BBUNG: A sandwich (NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iv) NP-answer
BBUNG BBUNG: Sausage (NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response
2. NNQ-Y/N – II

Picture 1  <in English for L2ers> Mother, Cheolsoo and Younghee were hungry while father was driving a car. So, they went to a store. When they arrived at the store, father wanted to go to the restroom. He told them that they had to buy what they would have for a snack before he came back. He expected them to have bought things. However, when he returned, he thought that they did not seem to have bought their snacks at the store.

Picture 2  <in English for L2ers> Actually, mother, Cheolsoo, and Younghee had bought what they wanted to eat before father came back. It did not take a long time to shop. Cheolsoo bought candy. Younghee bought ice cream. Mother bought cookies. However, nobody bought a donut.

Experimenter: I will ask BBUNG BBUNG (the puppet) a question, using these four cards. If his answer is right, please say “YES,” but if it is wrong, please say “NO.”


(i) True yes/no-answer
BBUNG BBUNG: No (True yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “YES” → targetlike response
If the participant says “NO” → non-targetlike response

(ii) False yes/no-answer
BBUNG BBUNG: Yes (False yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iii) NP-answer
BBUNG BBUNG: A donut (NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response

(iv) NP-answer
BBUNG BBUNG: Cookies (NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says “NO” → targetlike response
If the participant says “YES” → non-targetlike response
3. NNQ-Y/N – III

Picture 1

<in English for L2ers> One month ago, the monkey, the rabbit, and the cat promised to prepare a birthday party for the dog, and invite other friends. However, they forgot about the birthday party when talking about it at school. They did not invite anybody.

Experimenter: I will ask BBUNG BBUNG (the puppet) a question, using these four cards. If his answer is right, please say "YES," but if it is wrong, please say "NO."

Experimenter: <SOV: in Korean, using cards>

Amwuto ceney nwukwu-lul chotayha-ci anh-ass-ni?
Anyone before someone-Acc invite-ci Neg-Past-Q
'Did no one invite someone before?'

(i) True yes/no-answer
BBUNG BBUNG: No (True yes/no-answer)

Experimenter: Is BBUNG BBUNG's answer right?

Participant: If the participant says "YES" → targetlike response
If the participant says "NO" → non-targetlike response

(ii) False yes/no-answer
BBUNG BBUNG: Yes (False yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says "NO" → targetlike response
If the participant says "YES" → non-targetlike response

(iii) NP-answer
BBUNG BBUNG: A pig (NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says "NO" → targetlike response
If the participant says "YES" → non-targetlike response

(iv) NP-answer
BBUNG BBUNG: A squirrel (NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?

Participant: If the participant says "NO" → targetlike response
If the participant says "YES" → non-targetlike response
4. NNQ-Y/N – IV

Picture 1  
<in English for L2ers> While playing with building blocks in a classroom, Cheolsoo and Joe complained that Sunny and Minhee had more blocks than they had. A teacher told them that they should not fight with friends. The teacher had to leave the classroom to bring books for 10 minutes. Walking in the hall, she heard noise from her classroom. She thought they were hitting each other. When she opened the door, they did not seem to be hitting anybody.

Picture 2  
<in English for L2ers> Cheolsoo, Sunny, Joe, and Minhee pretended not to fight with each other when their teacher came back because they did not want to be punished. However, in fact, they fought each other. Cheolsoo hit Sunny. Very angry, Sunny hit Cheolsoo and Joe. Joe also hit Sunny. However, nobody hit Minhee because she cried in the corner of the classroom.

Experimenter: I will ask BBUNG BBUNG (the puppet) a question, using these four cards. If his answer is right, please say “YES,” but if it is wrong, please say “NO.”

Experimenter: <SOV: in Korean, using cards>  
Amwuto cokumceney nwukwu-lul ttayli-ci anh-ass-ni?  
Anyone just before someone-Acc hit-ci Neg-Past-Q  
‘Did no one hit someone just before?’

(i) True yes/no-answer
BBUNG BBUNG: No (True yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “YES” → targetlike response  
If the participant says “NO” → non-targetlike response

(ii) False yes/no-answer
BBUNG BBUNG: Yes (False yes/no-answer)

Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “NO” → targetlike response  
If the participant says “YES” → non-targetlike response

(iii) NP-answer
BBUNG BBUNG: Minhee (NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “NO” → targetlike response  
If the participant says “YES” → non-targetlike response

(iv) NP-answer
BBUNG BBUNG: Sunny (NP-answer)

Experimenter: Is BBUNG BBUNG’s answer right?
Participant: If the participant says “NO” → targetlike response  
If the participant says “YES” → non-targetlike response
APPENDIX P: Filler sentences in the interpretation-verification task

1. Fillers in Set I (wh-questions without NPIs)

1) 무엇을 가게에서 아빠가 샀니?
mwues-ul kakey-eyse appa-ka sa-ass-ni?
What-Acc store-Loc father-Nom buy-Past-Q
‘What did the father buy at the store?’

2) 누구를 나무 뒤에서 영희가 찾았니?
nwukwu-lul namwu-twiey Younghee-ka chac-ass-ni?
Who-Acc tree-behind Younghee-Nom find-Past-Q
‘Who did Younghee find behind the tree?’

3) 무엇을 장난감 가게에서 토끼가 골랐니?
mues-ul cangnankam kakey-eyse thokki-ka koll-ass-ni?
What-Acc toy store-Loc rabbit-Nom pick-Past-Q
‘What did the rabbit pick at the toy store?’

4) 누구를 산에서 호랑이가 물었니?
nwukwu-lul san-eyse holangi-ka mwul-ess-ni?
Who-Acc mountain-Loc tiger-Nom bite-Past-Q
‘Who did the tiger bite on the mountain?’

2. Fillers in Set II (simple yes/no-questions without either wh-phrases or NPIs)

1) 여우가 옥레 토끼를 가져갔니?
yewu-ka mollay thokki-lul kacyeka-ass-ni?
fox-Nom secretly rabbit-Acc catch-Past-Q
‘Did the fox take a rabbit secretly?’

2) Tom이 방에서 신발을 신었니?
Tom-i pang-eyse sinpal-ul sin-ess-ni?
Tom-Nom room-Loc shoes-Acc wear-Past-Q
‘Did Tom wear shoes in the room?’

3) 첫수가 방에서 우유를 마셨니?
Cheolsoo-ka pang-eyse wuyu-lul masi-ess-ni?
Cheolsoo-Nom room-Loc milk-Acc drink-Past-Q
‘Did Cheolsoo drink milk in the room?’

4) 엄마가 숲에서 나비를 잡았니?
emma-ka swuph-eyse napi-lul cap-ass-ni?
mother-Nom forest-Loc butterfly-Acc catch-Past-Q
‘Did the mother catch a butterfly in the forest?’
APPENDIX Q: Results by adult and child L2ers in each proficiency group in the interpretation-verification task (Fillers)

a. Accuracy rate of responses on fillers (wh-questions without NPIs) in Set I

<table>
<thead>
<tr>
<th></th>
<th>L1 group</th>
<th>L2 group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L1A (n=15)</td>
<td>L1C (n=23)</td>
</tr>
<tr>
<td>NP</td>
<td>(k=8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>98.3%</td>
<td>96.2%</td>
</tr>
<tr>
<td></td>
<td>(118/120)</td>
<td>(177/184)</td>
</tr>
<tr>
<td>Yes/No</td>
<td>(k=8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>99.2%</td>
<td>97.8%</td>
</tr>
<tr>
<td></td>
<td>(119/120)</td>
<td>(180/184)</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children
NP=NP-answer; Yes/No=Yes/No-answer
Target response: True NP-answer: √YES/NO; False NP-answer: *YES/NO; Yes/No-answer: *YES/NO

b. Accuracy rate of responses on fillers (simple yes/no-question without either wh-words or NPIs) in Set II

<table>
<thead>
<tr>
<th></th>
<th>L1 group</th>
<th>L2 group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L1A (n=15)</td>
<td>L1C (n=23)</td>
</tr>
<tr>
<td>NP</td>
<td>(k=8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>98.9%</td>
</tr>
</tbody>
</table>

Note. L1A=L1 adults; L1C=L1 children; L2A=L2 adults; L2C=L2 children
Yes/No=Yes/No-answer; NP=NP-answer
Target response: True yes/no-answer: √YES/NO; False yes/no-answer: *YES/NO; NP-answer: *YES/NO
REFERENCES


