Scrambling in Korean Parasitic Gap Constructions and its Cross-linguistic Implications

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Parasitic gap constructions have been observed to fall into two subtypes across languages: adjunct clause type and subject clause type. Previous research on Korean parasitic gaps has either assumed that both subtypes exist in Korean as in English, or analyzed the movement properties of scrambling as in Japanese. This paper is about the argument that the previous studies have not considered the specific properties of the clausal boundaries and scrambling patterns in Korean. In this paper, the distinct properties of adjunct clauses and subject clauses in Korean were examined to see how their differences structurally affect the pattern of scrambling. I propose that the subject clause type of the parasitic gap construction exists in Korean, but what has been analyzed as the adjunct clause in the literature should be analyzed as containing a null pronoun. This claim is empirically supported by comparing the properties of a parasitic gap with those of a null pronoun. On the basis of the observed pattern in Korean parasitic gap constructions, I discuss its cross-linguistic implications on the parasitic gap hierarchy proposed by Culicover (2017). **(Sungkyunkwan University)**

Key words: parasitic gap constructions, Korean parasitic gaps, clausal boundary, scrambling, null pronoun

1. Introduction

A parasitic gap is a type of gap which exists only when another gap, which refers to as the real gap, appears in the same sentence (Engdal, 1983). The central property of parasitic gap construction (PGC) is that a single filler (i.e. an antecedent) controls more than one gap (Chomsky, 1986; Culicover, 2001, 2017); given the filler-gap dependency, a filler generally licenses one gap. As illustrated in (1), the antecedent *which articles* licenses both the real gap *t* and the parasitic gap *pg*. Moreover, it has been observed that PGC falls into two types of construction with respect to the clausal category: adjunct clause type and subject clause type (Engdahl, 1983; Culicover, 2001). This is illustrated in (1a) and (1b)

respectively.

(1) a. Which articles*i* did John file *ti* without reading *pgi*?
[Adjunct clause type]
b. Which boy*i* did Mary's talking to *pgi* bother *ti* most?
[Subject clause type]

Given the cross-linguistic observation of PGC (Culicover, 2017), the Korean language has been expected to employ both adjunct clause and subject clause type constructions (K. H. Lee, 1998, 2011; Y. H. Lee, 2010; E. J. Lee, 2007), as illustrated in (2).

(2) a. enu chayk-lul*i* Yumi-ka [ecey Jisu-ka *pgi*
Which book-ACC Yumi-NOM yesterday Jisu-NOM
ilk-ki ceney] *ti* peli-ess-ni?
read-NOM before throw away-PST-QUE?
'Which book*i* did Yumi throw away *ti* before Jisu (got the chance to) read *pgi* yesterday?'
[Adjunct clause type]
b. enu chayk-lul*i* [ecey *pgi* kkuth-kkaci ilk-un]
Which book-ACC yesterday end-until read-RC
haksayng-i *ti* chwuchenha-ess-ni?
student-NOM recommend-PST-QUE?
'Which book*i* did the student who read *pgi* until the end yesterday recommend *ti*?'
[Subject clause type]

In analyzing the parasitic gaps, the previous literature has mainly focused on two questions (Engdahl, 1983; Chomsky, 1986; Culicover, 2001; Postal, 1994): 1) Which conditions should be met in order to license a parasitic gap?; 2) Which properties does a parasitic gap demonstrate? The first question is concerned about the distinctive condition in which a parasitic gap is licensed in comparison to other gaps in general. It focuses on the observation that parasitic gaps are totally dependent on the real gap. The second question seeks to clarify the different properties that the parasitic gap displays, when compared to the real gap. It also focuses on whether these properties differ between the adjunct clause and the subject clause type constructions.

Previously, there has been no doubt that both clausal types of PGC exist in Korean. However, these accounts do not seem to sufficiently support the existence of Korean PGC. Some accounts have dealt with both

types of constructions; yet, no research clarifies that their different properties also hold for Korean (K. H. Lee, 1998, 2011); the two types of PGC are known to express distinct properties (Kayne, 1983; Postal, 2001; Munn, 1994). Other accounts have only accounted for adjunct clause type construction as Korean PGC (Y. H. Lee, 2010; E. J. Lee, 2007).

The purpose of this paper is to reexamine the licensing condition of Korean PGC. Also, it provides the data which supports whether the Korean PGC demonstrates the same properties as English. In consideration of the observation that parasitic gap appears cross-linguistically (it follows Culicover's (2017) account on Parasitic Gap Hierarchy which will be explained in detail in section 4.1), this paper disproves the previous claim that a parasitic gap appears in both clausal type constructions in Korean. I argue that only subject clause type is identified as real Korean PGC. However, the adjunct clause type construction is in fact a scrambled sentence containing a null pronoun within the embedded clause (i.e. adjunct clause). As illustrated in (3), the empty gap in (3a) is a null pronoun rather than a parasitic gap, while the empty gap in (3b) is a real parasitic gap in Korean.

(3) a. enu chayk-lul*i* Yumi-ka [ecey Jisu-ka *proi*
Which book-ACC Yumi-NOM yesterday Jisu-NOM
ilk-ki ceney] *ti* peli-ess-ni?
read-NOM before throw away-PST-QUE?
'Which book*i* did Yumi throw away *ti* before Jisu (got the chance to) read *pgi* yesterday?'
[Adjunct clause type]

b. enu chayk-lul*i* [ecey *pgi* kkuth-kkaci ilk-un]
Which book-ACC yesterday end-until read-RC
haksayng-i *ti* chwuchenha-ess-ni?
student-NOM recommend-PST-QUE?
'Which book*i* did the student who read *pgi* until the end yesterday recommend *ti*?'
[Subject clause type]

Moreover, this novel account on Korean PGC will provide a counter-example toward the cross-linguistic account proposed by Culicover (2017); in brief, Culicover has claimed that no language has been observed to display only the subject clause type construction.

This paper is organized as follows. In section 2, there is a review on previous studies regarding the licensing condition and distinctive

properties of PGC, mostly based on English data. Section 3 provides the novel account on Korean PGC by discussing whether the licensing condition and the properties summarized in section 2 also hold for Korean PGC. This is mainly supported by identifying the property of scrambling and the nature of clausal boundary in Korean. Also, I apply three tests in order to support evidence for the properties of PGC: 1) island-sensitivity, 2) case-matching, and 3) reconstruction effect. In section 4, I discuss the cross-linguistic implications of this paper. Section 5 summarizes the previous sections.

2. Previous Studies

2.1. Licensing Condition

There are two conditions which should be saturated in order to license a parasitic gap. These conditions show that a parasitic gap completely depends on a real gap. The prime condition is that a parasitic gap appears only when a real gap exists (Engdahl, 1983; Chomsky, 1986; Culicover, 2001). When a real gap is filled up with a full NP, a sentence becomes ungrammatical because there is no real gap, as illustrated in (4).

(4) a. *Which chapter*i* did John buy [NP the book] [without reading *pgi*]?
b. *Which boy*i* did [Mary's talking to *pgi*] bother [NP John] most?

In (4a) and (4b), the position of a real gap is filled with an NP, e.g. *the book* and *John,* respectively; the only gap which the antecedent *wh*-phrase binds is the parasitic gap. This construction indicates that the *wh*-phrase has undergone a movement from the inside of an embedded clause. In (4a), *Which chapter* has been base-generated in the complement of *reading* and moved out to the specifier position of CP of the matrix clause. Similarly, in (4b), *which boy* has been base-generated in the complement of *talking to* and moved out to the specifier position of CP of the matrix clause. Evidently, both examples are ungrammatical.

This ungrammaticality in (4) correlates with the observation that a parasitic gap appears in a position that does not allow any extraction; nonetheless, the real gap appears in a position that normally permits extraction. Recall the example (1) repeated below in (5).

(5) a. Which articles$_i$ did John file t_i without reading pg_i?
b. Which boy$_i$ did Mary's talking to pg_i bother t_i most?

In (5a) and (5b), the *wh*-phrases (e.g. *which articles* and *which boy*) are extracted from their base-generated position (i.e. the real gap *t*): *wh*-movement. It becomes clearer in sentences without parasitic gaps: e.g. *which articles did John file t* and *which boy did Mary bother t most,* respectively. In contrast, the extraction of a parasitic gap causes an island constraint violation. In (5a), the parasitic gap *pg* is positioned within an adjunct clause, e.g. *without reading pg*; in (5b), it is positioned within a subject clause, e.g. *Mary's talking to pg.* The adjunct clause and the subject clause each forms an adjunct island and a subject island. Thus, the extraction out of an island is illicit unless it is legitimized by the presence of a real gap.

The next licensing condition is that a parasitic gap depends on the type of movement which ingenerates a real gap; it is licensed by an overt A'-movement. First, since a real gap is necessary for a parasitic gap, only the overt movement which leaves traces can license a parasitic gap. As illustrated in (6), a *wh*-phrase in-situ cannot be a licensor of a parasitic gap (Culicover, 2001).

(6) *John filed which articles$_i$ without reading pg_i?
(Engdahl, 1983)

Secondly, a parasitic gap is only licensed by an A'-movement (Chomsky, 1977). An A-movement does not yield another gap (i.e. a parasitic gap); yet, this gap position is rather substituted with over pronouns in order to be grammatically correct. This is illustrated in (7).

(7) a. Which articles$_i$ did John file t_i without reading pg_i?
[A-bar movement]
b. John was killed t_i by a tree falling on *pg_i/him$_i$.
[A-movement]

In (7a), the *wh*-phrase, *which articles,* has undergone an A-bar movement, i.e. *wh*-movement. The parasitic gap within an adjunct clause is licensed via the real gap which is a trace of the *wh*-phrase. In contrast, in (7b), when the real gap *t* is a trace of an A-movement (i.e. NP-movement), a parasitic gap is not allowed; this movement is a move

operation to an A-position, an argument position. The overt pronoun *him* should be used to refer the antecedent *John* in the matrix clause. Thus, even though, in both (7a) and (7b), one antecedent *John* binds two syntactic position (i.e. one is its trace *t,* and the other is that inside an embedded clause), only the former allows another gap *pg* within the embedded clause.

2.2. Peculiar Properties

Parasitic gaps display three distinctive properties which are not demonstrated in other gaps in general: 1) parasitic gaps can exist within one island, but not inside of more than one island; 2) a parasitic gap should match its case with a real gap; 3) parasitic gaps do not show any reconstruction effects in adjunct clause type PGC, while they do in subject clause type PGC.

In general, it is observed that parasitic gaps are island-insensitive to one island, but not more (Kayne, 1983). This property holds true not for both types of clausal categories: adjunct clause and subject clause type of PGC. This is illustrated in (8).

(8) a. Which paper$_i$ did John read t_i [before Tom filed pg_i]?
b. He's a man$_i$ that [anyone who talks to pg_i] usually likes t_i?

This observation contrasts with the general property of gaps; in general, gaps are completely island-sensitive, as illustrated in (9).

(9) a. *Which chapter$_i$ did John read the book [before Tom filed e_i]?
b. *He's a man$_i$ that [anyone who talks to e_i] usually likes the conversation.

In (9a), the gap inside an adjunct island cannot be bound to its antecedent *which chapter*; similarly, in (9b), the antecedent *a man* cannot bind the gap within a subject island. These examples correlate with the finding discussed above that a parasitic gap cannot exist by itself without a real gap.

Nonetheless, parasitic gaps demonstrate island-sensitivity to more than one island. Examples (10a) and (10b) show that a parasitic gap cannot be licensed inside of two islands: a subject island inside an adjunct island, and a *wh*-island inside a subject island, respectively.

(10) a. *the books*i* you read *ti* [before [talking about *pgi*] becomes difficult].
(Kayne, 1983)
b. *He's a man*i* that [anyone who asks [when to talk to *pgi*]] usually likes *ti*.
(Chomsky, 1986)

Initiated by Kayne (1983), many studies have provided the theoretical background to this observation about island-sensitivity. To briefly summarize, Kayne has proposed the connectedness theory; it assumes that a gap (i.e. an empty category) forms a chain with its antecedent. The antecedent governs all of its chains which are inside the boundary of g-projection; this projection explains the locality condition. In applying to PGC, a parasitic gap forms a chain with the antecedent of a real gap. Since the two gaps are bound by the same antecedent, that single antecedent licenses each of the other chains containing a real gap and a parasitic gap.

However, the connectedness theory has appeared to be insufficient to explicate all types of islands (e.g. *wh*-islands). Chomsky (1986) has then provided an account of subjacency. It has focused on the locality property of parasitic gaps with respect to the barriers. The account avoids presupposing the direct connection between the operator (i.e. the antecedent) and the parasitic gap; it rather assumes the notion of null operator for licensing the parasitic gap. Chomsky has claimed that "no barrier should intervene between the null operator and some member of the real gap dependency" (as cited in. Manzini, 1994). Thus, a null operator moves to the highest position of parasitic gap dependency in order to elude any barriers in between.

Chomsky's account has then been criticized for its insufficiency to explain other locality constraints: for instance, the ill-formedness of construction in which a parasitic gap is inside two adjuncts, or in which a parasitic gap is inside an adjunct but without any presence of a real gap (Manzini, 1994). Frampton (1990) and Manzini (1994) have suggested the expanded version of Chomsky's (1986) account in order to sufficiently explicate the locality constraint of parasitic gaps. Frampton has proposed a revision of Chomsky's locality approach, the Head Government Condition on Adjunctions (HGCA). Manzini has criticized that Chomsky has merely considered the locality property and thus claimed

for overarching the two independent notions, i.e. locality and ordering.

The second property of a parasitic gap is that its case should match with a real gap. Postal (2001) has provided empirical evidence from Hungarian, supporting the case-matching requirement for English. The evidence of case-matching in English PGC is supported by the data from Abe (2011), as illustrated in (11).

(11) a. It was John*i* that Mary believed *ti* to be a genius before Susan proved *ei* to be (a genius).
b. ?*It was John*i* that Mary believed *ti* was a genius before Susan proved *ei* to be (a genius).

A final property observed is that parasitic gaps do not demonstrate any reconstruction effect in adjunct clause type construction, but they do in subject clause types. Founded on Chomsky's minimalist program (2014), the target phrase (i.e. antecedent) is reconstructed into the gap position at LF. Whether the reconstructed gap position shows a reconstruction effect or not is judged by the grammaticality of the sentence after the reconstruction. If the interpretation at LF is acceptable, then the gap position shows a reconstruction effect. If the interpretation is not acceptable, then the position does not show any reconstruction effect. The reconstruction effect of Binding Condition A is tested through the antecedent phrase containing a reflexive pronoun (e.g. *himself*). This derivation is illustrated in (12); the data are collected from Munn (1994).

(12) a. [pictures of himself*i*]*j* that John*i* likes *tj*.
b. [pictures of himself*i*] that John*i* likes [pictures of himself*i*].

Example (12a) demonstrates a relative clause in which the complement of the verb *likes, pictures of himself,* is raised to the NP position adjoined to the embedded CP. The reconstruction of (12a) is illustrated in (12b); the NP *pictures of himself* is reconstructed into the gap position *t* at LF. After reconstruction, the antecedent *John* grammatically binds its anaphor *himself* in its binding domain. Judging by the grammaticality of (12b), it demonstrates that relative clauses show a reconstruction effect of Binding Condition A.

In PGC, the reconstruction effect of Binding Condition A can also be judged by an antecedent phrase with a reflexive pronoun. It is tested by whether the reflective pronoun in the reconstructed phrase is

grammatically bound to its antecedent. In adjunct clause type PGC, Kearney (1983) has claimed that a parasitic gap position does not show any reconstruction effect, as in (13).

(13) a. [Which books about himself$_i$]$_j$ did John$_i$ file t_j [before Tom read pg_j]?
b. *[Which books about himself$_i$]$_j$ did John file t_j [before Tom$_i$ read pg_j]?

In both examples, the antecedent phrase *which books about himself* is reconstructed into the real gap position *t* and the parasitic gap position *pg*. When the anaphor *himself* is bound to the antecedent *John* in the matrix clause, as in (13a), the sentence is acceptable; it shows a reconstruction effect in the real gap position. In contrast, when the anaphor *himself* is bound to the antecedent *Tom* in the adjunct clause, as in (13b), the sentence is unacceptable; it does not show any reconstruction effect in the parasitic gap position.

The strict opposite behavior is detected in a subject clause type PGC; data is collected from Munn (1994), as in (14).

(14) a. *[Which picture of himself$_i$]$_j$ did [every boy who saw pg_j] say John$_i$ liked t_j?
b. [Which picture of himself$_i$]$_j$ did [every boy$_i$ who saw pg_j] say John liked t_j?

Similarly, the antecedent phrase *which picture of himself* is reconstructed into both gap positions, *t* and *pg*. Since the anaphor *himself* is incorrectly bound to the antecedent *John* in the matrix clause, as seen in (14a), there is no reconstruction effect in the real gap position. However, a reconstruction effect is seen in the parasitic gap position, because the anaphor *himself* is grammatically bound to the antecedent *every boy* in the subject clause, as in (14b). To summarize, given the reconstruction effect of Binding Condition A, there is no such effect in the parasitic gap position for adjunct clause type PGC; while, for subject clause type PGC, it shows the reconstruction effect when in the parasitic gap position.

3. Proposal: Korean Parasitic Gap Constructions

The following section mainly discusses the question mentioned in the previous account above: regarding the two subtypes of PGC, are the gaps

in the parasitic gap position identified as real parasitic gaps in Korean?

3.1. Licensing Condition

Recall that two licensing conditions are taken into account: 1) a parasitic gap depending on the presence of a real gap; and 2) a parasitic gap licensed by an overt A'-movement. However, the Korean language, in general, exhibits significant characteristics which are distinct from languages such as English: Korean allows both scrambling and *wh*-phrases in-situ.

Korean is a language with "free word order," like other languages such as German, Japanese and Hindi. It permits scrambling that derives non-canonical word order without altering the central meaning of the sentence, as in (15). Given that both (15a) and (15b) are grammatical, scrambling is normally an optional operation. Similarly, in languages such as Japanese, Hindi and Korean, but not German, it allows *wh*-in-situ in questions, as in (16).

(15) a. Yumi-ka ku chayk-lul peli-ess-ni?
Yumi-NOM that book-ACC throw away-PST-QUE?
'Did Yumi throw away that book?'
[Canonical word order]

b. ku chayk-lul*i* Yumi-ka *ti* peli-ess-ni?
that book-ACC Yumi-NOM throw away-PST-QUE?
'Did Yumi throw away that book?'
[Scrambled sentence]

(16) a. Yumi-ka enu chayk-lul peli-ess-ni?
Yumi-NOM which book-ACC throw away-PST-QUE?
'Which book did Yumi throw away?'
[*Wh*-in-situ]

b. enu chayk-lul*i* Yumi-ka *ti* peli-ess-ni?
which book-ACC Yumi-NOM throw away-PST-QUE?
'Which book did Yumi throw away?'
[Overt *wh*-movement or Scrambling]

Studies on these languages have claimed that scrambling is able to license parasitic gaps (Abe & Nakao, 2009; Abe, 2011); furthermore, some have argued that parasitic gaps can be licensed by *wh*-in-situ (Manetta, 2013). Likewise, in Korean, previous studies have paid much attention to the same question; yet, the analyses are equivocal. K. H. Lee (1998) has

maintained that parasitic gaps can be licensed by *wh*-*p*in-situ. K. H. Lee (2011) has identified that the scrambled *wh*-phrase possesses either an A-property or A'-property. E. J. Lee (2007) has limited the data into parasitic gaps in long-distance scrambling; the reason has been stated that long-distance scrambling is uniformly perceived as A'-movement (Saito, 1992).

Thus, the analysis starts by reviewing the property of scrambling, mainly based on Saito (1992). Then, there will be an application of the licensing condition to Korean PGC. To begin with, it will examine whether the Korean parasitic gap is licensed by an overt A'-movement based on two questions: 1) Is it licensed by an overt movement or also by *wh*-in-situ?; 2) Is it licensed by a scrambling of A-property or A'-property? Secondly, it will examine whether Korean parasitic gap depends on the existence of a real gap.

3.1.1. The Nature of Scrambling

The account on scrambling has been evolved starting from Ross (1967) who has viewed scrambling as a stylistic component in grammar. Then, Saito (1985) has introduced a syntactic structure in scrambling, analyzing it as an adjunction operation. Later studies have focused on figuring out the nature of scrambling: whether it is a movement with an A-property or an A'-property, or possibly another. Specifically, the property of the position of scrambled phrase has been heavily discussed.

Two hypotheses have been suggested each by Mahajan (1989) and Webelbuth (1989). First, Mahajan makes a separation between A-position and A'-position; this separation explains the distinction between clause-internal scrambling and long-distance scrambling. Long-distance scrambling is always an A'-movement, whereas clause internal scrambling can be either an A-movement or an A'-movement. In contrast, Webelhuth has uniformly assumed a third type of NP position other than A-position and A'-position: a non-operator, non-A position. Thus, the scrambled phrase in this third type of position can be not only an A-binder, but also an A'-binder.

Saito (1992) has gained great attention for the account which incorporates Mahajan (1989) and Webelbuth's (1989) analysis; the analysis is primarily based on Japanese scrambling. The assumption is that the position of a scrambled phrase is analyzed differently in the

S-structure and at LF. The analysis of S-structure relies on Tada's (1990) hypothesis that the third type of position is only licensed at S-structure; thus, Webelhuth's account is applied. It claims that scrambling is an invariant movement to a non-operator, non-A position. In applying Mahajan's analysis, Saito argues that the other two types of position (i.e. A-position and A'-position) exist at LF. Thus, the key idea is that scrambled phrase is positioned uniformly in a non-operator, non-A-position; and the phrase can be moved back to its position at LF in which its property of the position is reanalyzed as an A or an A'. Saito refers this process of moving back as "being undone at LF".

Therefore, an explanation now is given on why the scrambled position is a non-operator, non-A position at S-structure. Since scrambling differs from typical A-movement, the first question arises: Is scrambling an A'-movement? The problem is that the standard overt A'-movement cannot be undone at LF while scrambling can. For instance, an overt *wh*-movement in English cannot be undone in LF because the *wh*-phrase can no longer c-command its trace left in its scrambled position (i.e. the specifier of CP); the Proper Binding Condition is violated. However, according to Webelhuth, scrambling is unlike other filler-gap constructions. It can be undone without leaving its trace, which does not violate the Proper Binding Condition.

To answer this property, Saito cites Chomsky's (1976) account on "standard conception of movement operation": a movement establishes "semantically significant operator-variable relations" (cited in Saito, 1992). A'-movement cannot be undone at LF because an operator should always bind a variable in an operator position. In contrast, scrambling does not have this strong operator-variable relation; it can be undone without altering semantic interpretation of the sentence. Thus, since the landing site of a scrambled phrase differs from typical A'-movement, it is analyzed as a non-operator position.

The second question arises since scrambling is assumed to be a movement to a non-operator position: How can it be explained that scrambling is not an A-movement? The problem is that an A-movement is generally a non-operator movement. To answer this property, Saito explains that A-property arises only when it is subject to A-binding; thus, it cannot be undone at LF. For example, given an anaphor binding (i.e. an A-binding), an antecedent cannot be lowered at LF because it violates anaphor binding. Since scrambling involves the process of LF-lowering,

it generally does not serve as an A-binder. This implies that scrambling has a non-A property (i.e. A'-property).

Given the analysis of S-structure above, Saito (1992) provides the reanalysis of the scrambled position at LF. Firstly, it assumes that clause-internal scrambling can be reanalyzed as A-chain at LF. Even though the process of reconstruction itself infers A'-property (a detailed explanation is provided in Saito (1992)), a certain behavior of clause-internal scrambling related to anaphor binding demonstrates an A-chain when it is undone at LF. The data is illustrated in (17) and (18).

(17) Zibunzisin-o*i* [Hanako-ga *ti* hihansita] (koto)
self-ACC Hanako-NOM criticized fact
'Herself*i*, Hanako criticized *ti*.'
[Japanese, Saito (1992)]

(18) ?[Karera-o*i* [[otagai*i*-no sensei] -ga [*ti* hihansita]]] (koto)
they-ACC each other-GEN teacher-NOM criticized fact
'Them*i*, each other's*i* teachers criticized *ti*.'
[Japanese, Saito (1992)]

Example (17) involves an optional scrambling; the object is scrambled from its original canonical order, e.g. *Hanako-ga zibunzisin-o hihansita*. In the S-structure, the antecedent *Hanako* does not c-command its co-indexed anaphor *zibunzisin*. The sentence should be ungrammatical with respect to the anaphor binding condition, but it is in fact grammatical. Saito argues that a scrambled phrase *zibunzisin-o* can be undone to its D-structure position at LF. Thus, the antecedent and the anaphor meet the anaphor binding condition at LF, forming an A-chain.

Contrastingly, in (18), the object is needed to be scrambled to the IP-adjoined position because in its canonical order e.g. **Otagai-no sensei-ga karera-o hihansita*, the antecedent *karera* cannot c-command its co-indexed anaphor *otagai-no*. In the S-structure, the antecedent and the anaphor meet the anaphor binding condition. According to Saito, when an antecedent and an anaphor form a strong relation at S-structure, the scrambled phrase is not undone at LF. If it is undone, the anaphor binding condition is violated; thus, the scrambling in (18) remains, and it forms an A-chain at LF. To summarize, both examples indicate that clause-internal scrambling can be reanalyzed as an A-chain at LF; note that, at S-structure, it forms an A'-chain.

Secondly, Saito claims that this mechanism of LF reanalysis also holds

for long-distance scrambling. According to the LF reanalysis, long-distance scrambling should form an A-chain at LF. However, following Chomsky's (1986) Chain Condition, A-chain must be 0-subjacent; "no barrier can intervene between two members of a shingle A chain". In long-distance scrambling, a barrier necessarily intervenes between the scrambled phrase and its trace. Thus, since it cannot be reanalyzed to an A-chain, long-distance scrambling remains as an A'-chain at LF.

Later, Boskovic & Takahashi (1998) has commented on Saito's (1992) account which assumes scrambling as an optional movement; Saito insufficiently explicates the driving force of scrambling. The analysis has modified Saito's account with respect to the Last Resort. Whereas Saito has argued that scrambling is an overt movement, Boskovic &Takahashi has claimed that a scrambled phrase is base-generated in the IP-adjoined position and undergoes a LF-lowering in order to get its theta-role assigned.

PGC takes the construction of one matrix clause containing either an adjunct clause or a subject clause; thus, this paper mainly examines the property of clause-internal scrambling. As mentioned above, I apply Saito's (1992) account to Korean scrambling; at S-structure, the scrambled phrase is in a non-operator, non-A positon, whereas the property of chain is reanalyzed at LF. The case of clause-internal scrambling is illustrated in (19).

(19) a. cakicasin-uy chayk-lul*i* Yumi-ka *ti* peli-ess-e.
self-GEN book-ACC Yumi-NOM throw away-PST-DEC
'Yumi threw away the book of herself (her book).'
b. enu chayk-lul*i* Yumi-ka *ti* peli-ess-ni?
which book-ACC Yumi-NOM throw away-PST-QUE?
'Which book did Yumi throw away?'

Similar to Japanese in (17), example (19a) demonstrates the scrambled phrase involving an anaphor *cakicasin-uy*. As the scrambled phrase is undone at LF, its position is reanalyzed as an A-chain. Similarly, as in (18), the scrambled *wh*-phrase *enu chayk-lul* can be interpreted as an A-movement in (19b).

Previous studies have uniformly assumed that clause-internal scrambling in PGC exhibits A-property, which directly follows Saito's (1992) account: Abe (2011) for Japanese and E. J. Lee (2007) for Korean.

Nonetheless, I argue that the property of scrambling differs in PGC. A PGC is structurally different from a simple clause-internal scrambling construction; it contains a gap (i.e. parasitic gap) which is co-indexed with the scrambled phrase within an embedded clause. Specifically, this paper claims that, in Korean, Saito's LF reanalysis applies differently by the clausal type of PGC (i.e. an adjunct clause and a subject clause). The clause-internally scrambled *wh*-phrase can be analyzed as an A-chain in adjunct clause type construction, and as an A'-chain in subject clause type.

3.1.2. The First Licensing Condition

The first examination is whether a parasitic gap in Korean PGC is only licensed by an overt movement, which is scrambling, or also by a *wh*-phrase in-situ. As I mentioned above, the answer has been varied (K. H. Lee, 1998, 2011; E. J. Lee, 2007). Thus, I provide experimental evidence which support the acceptability judgement. The experiment examines the grammatical status of two factors: 1) an adjunct clause type and a subject clause type; 2) *wh*-in-situ and overt *wh*-phrase scrambling. These are illustrated in (20)-(22).

(20) Simple clause-internal scrambling
a. Yumi-ka sensayngnim-kkey enu chayk-lul
Yumi-NOM teacher(HON)-to(HON) which book-ACC
tuli-ess-ni?
give(HON)-PST-QUE?
'Which book did Yumi give to the teacher?'
[*Wh*-in-situ; Canonical word order]
b. enu chayk-lul*i* Yumi-ka sensayngnim-kkey *ti*
which book-ACC Yumi-NOM teacher(HON)-to(HON)
tuli-ess-ni?
give(HON)-PST-QUE?
'Which book did Yumi give to the teacher?'
[*Wh*-phrase scrambling]

(21) *Wh*-in-situ (with a gap in the embedded clause)[1)]

1) A reviewer pointed out that a sentence is grammatical (or more natural) whenever a *wh*-phrase precedes an adjunct clause or a subject clause; and it is not restricted to sentences in which a *wh*-phrase is scrambled to the left-most position. This is illustrated as below.

a. *Yumi-ka sensayngnim-kkey [ecey Jisu-ka *ei*
Yumi-NOM teacher(HON)-to(HON) yesterday Jisu-NOM
ilk-ki ceney] enu chayk-lul*i* tuli-ess-ni?
read-NOM before which book-ACC give(HON)-PST-QUE?
'Which book did Yumi give the teacher before Jisu read yesterday?'
[Adjunct clause type]

b. *swuepsikan-ey sensayngnim-kkey [ecey *ei*
class-in teacher(HON)-to(HON) yesterday
ilk-un] haksayng-i enu chayk-lul*i*
read-RC student-NOM which book-ACC
chwuchenha-ess-ni?
recommend-PST-QUE?
'Which book did the student who read yesterday recommend?'
[Subject clause type]

(22) *Wh*-phrase scrambling (with a gap in the embedded clause)

a. enu chayk-lul*i* Yumi-ka sensayngnim-kkey
which book-ACC Yumi-NOM teacher(HON)-to(HON)
[ecey Jisu-ka *ei* ilk-ki ceney] *ti*
yesterday Jisu-NOM read-NOM before
tuli-ess-ni?
give(HON)-PST-QUE?
'Which book did Yumi give the teacher before Jisu read yesterday?'
[Adjunct clause type]

b. enu chayk-lul*i* swuepsikan-ey sensayngnim-kkey
which book-ACC classin teacher(HON)-to(HON)
[ecey *ei* ilk-un] haksayng-i *ti* chwuchenha-ess-ni?
yesterday read-RC student-NOM recommend-PST-QUE?
'Which book did the student who read yesterday recommend?'
[Subject clause type]

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(1) Yumi-ka sensayngnim-kkey enu chayk-lul
Yumi-NOM teacher(HON)-to(HON) which book-ACC
[ecey Jisu-ka ilk-ki ceney] tuli-ess-ni?
yesterday Jisu-NOM read-NOM before give(HON)-PST-QUE?
'Which book did Yumi give the teacher before Jisu read yesterday?'

I believe the example above sounds more natural because a *wh*-phrase *enu chayk-lul* is perceived to be interpreted within the embedded clause: *enu chayk-lul ecey Jisu-ka ilk-ki ceney*. Thus, the naturalness of (1) has little relevance to the issue of this paper.

Example (20) demonstrates a simple sentence in which both *wh*-in-situ and the scrambled *wh*-phrase are grammatical. In (21a), an adjunct clause with a gap is added to the example (20a); and, in (21b), a subject clause with a gap is added to (20a). In (22a), an adjunct clause with a gap is added to the example (20b); and, in (22b), a subject clause with a gap is added to (20b). As illustrated above, when there is a gap inside the embedded clause, *wh*-in-situ yields an ungrammatical sentence in both clausal categories, as in (21). Nonetheless, as in (22), a *wh*-phrase is grammatically scrambled in both clausal categories. Thus, it is observed that Korean parasitic gap is necessarily induced by an overt scrambling.

The observation is corroborated by the data below. The only difference between (21)-(22) and (23)-(24) is that the latter involves no gap inside the embedded clause. As in (20), it is observed that both (23) and (24) are grammatical. In consequence, only an overt scrambling is allowed in order to license a gap inside the embedded clause; clearly, the gap should be bound to a scrambled *wh*-phrase in the matrix clause.

(23) *Wh*-in-situ (without a gap in the embedded clause)

a. Yumi-ka sensayngnim-kkey [ecey Jisu-ka hakkyo-ey tochakha-ki ceney] enu chayk-lul tuli-ess-ni?
Yumi-NOM teacher(HON)-to(HON) yesterday Jisu-NOM school-at arrive-NOM before which book-ACC give(HON)-PST-QUE?
'Which book did Yumi give the teacher before Jisu arrived at school yesterday?'
[Adjunct clause]

b. swuepsikan-ey sensayngnim-kkey [ecey hakkyo-ey ilccik ka-n] haksayng-i enu chayk-lul chwuchenha-ess-ni?
class-in teacher(HON)-to(HON) yesterday school-to early go-RC] student-NOM which book-ACC recommend-PST-QUE?
'Which book did the student who went to school early recommend?'
[Subject clause]

(24) *Wh*-phrase scrambling (without a gap in the embedded clause)

a. enu chayk-lul*i* Yumi-ka sensayngnim-kkey [ecey Jisu-ka hakkyo-ey tochakha-ki ceney] *ti*
which book-ACC Yumi-NOM teacher(HON)-to(HON)

yesterday Jisu-NOM school-at arrive-NOM before
tuli-ess-ni?
give(HON)-PST-QUE?
'Which book did Yumi give the teacher before Jisu arrived at school yesterday?'
[Adjunct clause]

b. enu chayk-lul$_i$ swuepsikan-ey sensayngnim-kkey
which book-ACC class-in teacher(HON)-to(HON)
[ecey hakkyo-ey ilccik ka-n] haksayng-i *t$_i$*
yesterday school-to early go-RC] student-NOM
chwuchenha-ess-ni?
recommend-PST-QUE?
'Which book did the student who went to school early recommend?'
[Subject clause]

The next examination is whether this overt scrambling exhibits an A-property or an A'-property. Recall that a phrase, which is scrambled clause-internally, has an A-property, whether it is undone at LF or not; also, the *wh*-phrase necessarily undergoes a scrambling in both adjunct clause type and subject clause type constructions in Korean. Here, I argue that the nature of the barrier of the clausal boundary influences the LF reanalysis; when the clausal boundary exhibits the property as a barrier, it inhibits the scrambling to be reanalyzed as an A-property and scrambling remains to exhibit an A'-property. Thus, I provide an analysis of the nature of the clausal boundary in Korean below; specifically, the adjunct clause which is mono-clausal is not defined as a barrier, whereas the subject clause which is bi-clausal is defined as a barrier.

(25) a. enu chayk-lul$_i$ Yumi-ka [ecey Jisu-ka *e$_i$*
which book-ACC Yumi-NOM yesterday Jisu-NOM
ilk-ki ceney] *t$_i$* peli-ess-ni?
read-Nom before throw away-PST-QUE?
'Which book did Yumi throw away before Jisu read yesterday?'
[Adjunct clause; Tenseless]

b. *enu chayk-lul$_i$ Yumi-ka [ecey Jisu-ka e$_i$
which book-ACC Yumi-NOM yesterday Jisu-NOM
ilk-ess-ki ceney] *t$_i$* peli-ess-ni?
read-PST-Nom before throw away-PST-QUE?
'Which book did Yumi throw away before Jisu read yesterday?'

[Adjunct clause; Tensed]

(26) a. enu chayk-lul*i* sensayngnim-kkey [ecey *ei*
which book-ACC teacher(HON)-to(HON) yesterday
kkuth-kkaci ilk-Ø-un] haksayng-i *ti*
end-until read-PRS-RC student-NOM
chwuchenha-ess-ni?
recommend-PST-QUE?
'Which book did the student who read until the end recommend?'

[Subject clause; Tensed (present)]

b. enu chayk-lul*i* sensayngnim-kkey [ecey *ei*
which book-ACC teacher(HON)-to(HON) yesterday
kkuth-kkaci ilk-esstu-n] haksayng-i *ti*
end-until read-PST-RC student-NOM
chwuchenha-ess-ni?
recommend-PST-QUE?
'Which book did the student who read until the end recommend?'

[Subject clause; Tensed (past)]

As illustrated above, an adjunct clause in Korean is formed as a mono-clausal phrase, a verb phrase which is nominalized, as in (25a); the nominalized *ki* is used. As in (25b), when it is tensed, the sentence becomes ungrammatical. In contrast, Korean relative clause, as in (26a) and (26b), is a bi-clausal phrase of TP and CP; the embedded clause in (26a) has a present tense feature, and a past tense feature as seen in (26b). This analysis is supported by the observation of Korean island effects with respect to scrambling.

According to Jung, Kim & Kim (2017), previous analyses on the nature of island and its effect in Korean scrambling have not yet reached an agreement (H. Lee, 2009; J. S. Lee, 1995; K. Lee, 1989). Hence, the experiment aims to obtain more appropriate empirical background. Among the derived results, I rely on two data: adjunct islands and complex NP islands. Note that subject clauses type takes the form of a relative clause (i.e. the complement clause) attached to an NP (i.e. the head noun); it refers to the complex NP island, as in (27).

(27) [COMPLEX NP ISLAND [RC ecey ku chayk-lul ilk-un]
yesterday that book-ACC read-RC
[NOUN haksayng]] -i wa-ss-ta.
student-NOM come-PST-DEC
'The student who read that book yesterday came.'

[Complex NP island; Subject island]

In example above, the head noun *haksayng* is modified by the relative clause *ecey ku chayk-lul ilk-un*, forming a complex NP island. Thus, the complex NP island dealt in the experiment will be referred as a subject island from below. Example (28a) and (28b) illustrate the *wh*-phrase extraction out of an adjunct island and a subject island, respectively.

(28) a. mwues-lul*i* Yumi-nun [Jisu-ka *ei* senmwulha-ki ceney] what-ACC Yumi-TOP Jisu-NOM give present-NOM before mikwuk-ulo ttena-ss-ni?
America-to leave-PST-QUE?
'What did Yumi leave to America before Jisu gave (a present)?'
[Adjunct island]

b. ?*mwues-lul*i* onul [ecey Jisu-ka honca *ei* what-ACC today yesterday Jisu-NOM alone mek-ess-ta-nun] sasil-i Yumi-lul nollakey eat-PST-DEC-RC fact-NOM Yumi-ACC surprise ha-ess-ni?
do-PST-QUE?
'What did the fact that Jisu ate alone yesterday surprise Yumi today?'
[Subject island]

In example (28a), it allows the *wh*-phrase to be extracted out of an adjunct island *Jisu-ka e senmwulha-ki ceney*; however, it is less accepted when it is extracted from a subject island, as seen in (28b). The examples reveal that Korean scrambling is island-insensitive to an adjunct island, but island-sensitive to a subject island.

Given the island effect discussed above, this analysis follows that the trace should be 0-subjecent to its bound *wh*-phrase in English in order to not induce an island violation (Chomsky, 1986). Since I assume that an adjunct clause is not a barrier in Korean, it hardly induces any violation for the chain between the gap inside an adjunct clause and its antecedent in the matrix clause. This property implies that the gap and the antecedent across an adjunct island are analyzed to be 0-subjecent in Korean. Thus, in the case of adjunct clause type of construction, the clausal boundary does not hinder the LF reanalysis of an A'-chain to an A chain, similarly to the case of clause-internal scrambling analyzed by Saito (1992).

In contrast, the subject clause is observed to be a barrier in Korean;

thus, it thwarts the gap inside a subject clause and its antecedent in the matrix clause to be 0-sujacent. Hence, in the case of subject clause type of construction, the clausal boundary inhibits the landing position (i.e. *wh*-phrase) to be reanalyzed as an A-chain, similarly to the case of long-distance scrambling (Saito, 1992). In summary, in Korean, only the scrambling in adjunct clause type construction is reanalyzed as A-chain at LF, and as A'-chain in subject clause type. This analysis of scrambling implies that the gaps within an adjunct clause and a subject clause reveal different properties. Specifically, in Korean, only the latter gap is a real parasitic gap and not the former. The parasitic gap might only exist for subject clause type construction in Korean.

3.1.3. The Second Licensing Condition

This account is corroborated by analyzing the second licensing condition: the dependency of a parasitic gap on a real gap. The analysis also significantly depends on the island sensitivity of Korean scrambling. Recall that a parasitic gap is fully dependent upon a real gap, and thus, it does not exist independently in a sentence. Moreover, a parasitic gap is in a position in which extraction is normally prohibited. Hence, it is crucial whether the gap in an embedded clause is completely dependent or independent on the real gap. This condition can be tested by filling the positon of the real gap with the full NP, leaving the parasitic gap as the only gap in the sentence, as in (29). The scrambled *wh*-phrase binds only one gap which is positioned inside an embedded clause.

(29) a. enu os-lul*i* Yumi-ka [ecey Jisu-ka *ei*
which clothes-ACC Yumi-NOM yesterday Jisu-NOM
chayngki-ki ceney] cim-lul ssapeli-ess-ni?
take-NOM before belongings-ACC pack-PST-QUE?
'Which clothes did Yumi pack the belongings before Jisu took yesterday?'
[Adjunct clause type]

b. *enu chayk-lul*i* onul toksetayhoy-eyse [ecey
which book-ACC today reading contest-at yesterday
caceng-i toyeseya *ei* ta ilk-un] haksayng-i sang-lul
midnight-until all read-RC student-NOM prize-ACC
tha-ss-ni?
win-PST-QUE?
'Which book did the student who read all until midnight

yesterday win the prize?'

[Subject clause type]

It is observed that, in example (29a), filling the full NP *cim-lul* does not change the sentence to be ungrammatical. The *wh*-phrase inside the adjunct clause can be grammatically extracted. In contrast, example (29b) illustrates that filling the full NP *sang-lul* yields an ungrammatical sentence. The *wh*-phrase cannot be extracted out from the subject clause. The observation correlates with the data on island effects provided above (Jung et al., 2017). Given that an adjunct clause shows island-insensitivity in Korean, the gap in (29a) is in the position in which extraction is permitted. In contrast, since Korean scrambling is island-sensitive to a subject clause, the gap in (29b) is in the position in which extraction is prohibited. Thus, the condition reveals a strict difference in comparison with PGC in English.

Consequently, I claim that the empty gap within subject clauses is a real parasitic gap in Korean, whereas the gap within adjunct clauses should be analyzed as an empty category other than a parasitic gap. I consider its categorical property when analyzing the identity of this empty category. It is known that the antecedent of parasitic gaps must be an NP (Engdahl, 1983; Culicover, 2001). The observation that a parasitic gap is licensed by an NP indicates that a parasitic gap must have a nominal property. Similarly, both types of construction (i.e. previously analyzed PGC) in Korean are observed to have NP as an antecedent (K. H. Lee, 1998, 2011; E. J. Lee, 2007). Thus, I claim that the empty gap inside subject clauses is a null pronoun co-indexed with a scrambled *wh*-phrase rather than a parasitic gap. The analysis will be further supported in the following section; parasitic gaps do not appear in adjunct clauses but only in subject clauses.

3.2. Testing the Properties

In this section, three properties that have been used in demonstrating English parasitic gaps are directly applied for Korean PGC: 1) sensitivity to island constraint, 2) sensitivity to case-match, and 3) showing of a reconstruction effect for subject clause types. Since the gap has been analyzed as a null pronoun in adjunct clauses and as a parasitic gap in subject clauses, I will specifically account for each property whether it

matches with the general property of null pronoun or parasitic gaps, respectively. In comparison with parasitic gaps, null pronoun exhibits the properties as below: 1) insensitivity to island constraint, 2) insensitivity to case-match, and 3) no showing of any reconstruction effect.

First, parasitic gaps are sensitive to island constraints; they exist within an island but not more than one island (Kayne, 1983). Example (30a) demonstrates the standard construction of a real parasitic gap in Korean. The *wh*-phrase *enu chayk-lul* is scrambled to the IP-adjoined position in which it binds both the real gap *t* and the parasitic gap *pg* inside a subject clause. The scrambled phrase is grammatically co-indexed with the parasitic gap as it is positioned in one clausal boundary of subject clause. However, the example (30b) is ungrammatical because the parasitic gap is inside two subject clauses. The scrambled *wh*-phrase *enu-chayk-lul* has to cross two clausal boundaries in order to bind the parasitic gap, which is not allowed.

(30) a. enu chayk-lul*i* swuepsikan-ey chinkwu-eykey
which book-ACC class-at friend-to
[yelepen *pgi* ilk-un] haksayng-i *ti*
several times read-RC student-NOM
chwuchenha-ess-ni?
recommend-PST-QUE?
'Which book did the student who read several times recommend to the friend at class?'

b. ?*enu chayk-lul*i* swuepsikan-ey haksayng-tul-eykey
which book-ACC class-at student-PL-to
[ecey [yelepen *pgi* ilk-un] haksayng-lul
yesterday several times read-RC student-ACC
chingchanha-n] sensayngnim-i *ti* chwuchenha-ess-ni?
praise-RC teacher-NOM recommend-PST-QUE?
'Which book did the teacher who praised the student who read several times yesterday to students at class?'

In contrast, a null pronoun can exist not only within an island, but also within more than one island. It is insensitive to islands. Example (31a) illustrates the construction which has been previously analyzed as Korean PGC. The scrambled *wh*-phrase *enu chayk-lul* grammatically binds the co-indexed gap inside an adjunct clause. However, the grammaticality of example (31b) arises the question in the previous analysis. Given the reanalysis of the null pronoun proposed above, the scrambled *wh*-phrase

enu chayk-lul is grammatically co-indexed with the gap inside two clausal boundaries of adjunct clause. The observation correctly fits with the property of a null pronoun.

(31) a. enu chayk-lul*i* Yumi-ka [ecey Jisu-ka *proi*
which book-ACC Yumi-NOM yesterday Jisu-NOM
ilk-ki ceney] *ti* peli-ess-ni?
read-NOM before throw away-PST-QUE?
'Which book did Yumi throw away before Jisu read yesterday?'

b. enu chayk-lul*i* Yumi-ka [tongsayng-i [ecey
which book-ACC Yumi-NOM sister-NOM yesterday
Jisu-ka *proi* ilk-ki ceney] ccic-ess-ki
Jisu-NOM read-RC before tear-PST-NOM
ttaymwuney] *ti* peli-ess-ni?
because throw away-PST-QUE?
'Which book did Yumi throw away because (her) sister tore before Jisu read yesterday?'

Second, a parasitic gap should match its case with a real gap (Postal, 2001; Abe, 2011). Example (32a) demonstrates the PGC in which the parasitic gap matches its accusative case *-lul* with the real gap. Nonetheless, the grammaticality of example (32b) seems to be considerably degraded in that the case of the parasitic gap and real gap is not consistent; the case of the real gap is an accusative, *-lul*, whereas the case of the parasitic gap is a dative, *-ekey*.

(32) a. enu haksayng-lul*i* tonglyo-eykey [ecey *pgi* (-lul)
which student-ACC colleague-to yesterday (-ACC)
hakkyo-ese manna-n] sensayngnim-i *ti* (-lul)
school-at meet-RC teacher(HON)-NOM (-ACC)
sokayha-ess-ni?
introduce-PST-QUE?
'Which student did the teacher who met at school yesterday introduce?'

b. ??enu haksayng-lul*i* tonglyo-eykey [ecey *pgi* (-ecey)
which student-ACC colleague-to yesterday (-DAT)
chwuchense-lul ssecwu-n] sensayngnim-i
recommendation letter-ACC write-RC teacher(HON)-NOM
ti (-lul) sokayha-ess-n?
(-ACC) introduce-PST-QUE?
'Which student did the teacher who wrote the recommendation letter yesterday introduce to (her/his) colleague?'

In contrast, a null pronoun does not obligatorily match its case with other co-indexed elements. Example (33a) illustrates the construction in which the gap inside an adjunct clause and the gap in the matrix clause *t* match the accusative case *-lul*. However, in example (33b), two gaps do not match their case; the case of one gap is an accusative, *-lul*, whereas the case of the other gap is a dative, *-eykey*. Thus, the reanalysis to a null pronoun below correctly predicts the examples in (33) to be grammatical.

(33) a. enu haksayng-lul*i* Yumi-ka [Jisu-ka *proi* (-lul)
which student-ACC Yumi-NOM Jisu-NOM (-ACC)
sensayngnim-kkey sokayha-ki ceney] *ti* (-lul)
teacher(HON)-to(HON) introduce-NOM before (-ACC)
teyliko naka-ss-ni?
(with) went out-PST-QUE?
'Which student did Yumi go out with before Jisu introduce to the teacher?'

b. enu haksayng-lul*i* Yumi-ka [sensayngnim-I *proi*
which student-ACC Yumi-NOM teacher(HON)-NOM
(-ekey) chwuchense-lul ssecwu-ki ceney] *ti*
(-DAT) recommendation letter-ACC write-NOM before
(-lul) teyliko naka-ss-ni?
(-ACC) (with) went out-PST-QUE?
'Which student did Yumi go out with before the teacher write the recommendation letter?'

Third, in consideration of subject type of PGC, the antecedent only shows the reconstruction effect in the parasitic gap position, but not in the real gap. In both examples (34) and (35), the antecedent phrase *zasini-uy enu sacin-lul* includes an anaphor *zasin* which is bind to its antecedent NP. Given that the scrambled phrase is reconstructed, it is ungrammatical for the anaphor *zasin* to be bound by the antecedent *Yumi* in the real gap position, as in (34a). But, in example (34b), the anaphor *zasin* is grammatically bound by the antecedent *haksayng* in the parasitic gap position.

(34) a. *[zasin*i*-uy enu sacin-lul]*j* hakkyo-ese
self-GEN which picture-ACC school-at
sensayngnim-kkey [ecey *pgj* ccik-un]
teacher(HON)-to(HON) yesterday take-RC

haksayng-i Yumi*i*-ka *tj* cohahanta-ko malha-ess-ni?
student-NOM Yumi-NOM like-COMP say-PST-QUE?
'Which picture of herself did the student who took yesterday said to the teacher at school that Yumi liked?'

b. [zasin*i*-uy enu sacin-lul]*j* hakkyo-ese
self-GEN which picture-ACC school-at
sensayngnim-kkey [ecey *pgj* ccik-un] haksayng*i*-i
teacher(HON)-to(HON) yesterday take-RC student-NOM
Yumi-ka *tj* cohahanta-ko malha-ess-ni?
Yumi-NOM like-COMP say-PST-QUE?
'Which picture of herself did the student who took yesterday said to the teacher at school that Yumi liked?'

In contrast, given the property of a null pronoun, the antecedent does not show any reconstruction effect in the gap inside an adjunct clause, but only in the gap of matrix clause. After the scrambled phrase *zasin-uy enu sacin-lul* is reconstructed, the anaphor *zasin* is grammatically bound to the antecedent *Yumi* in the gap position of matrix clause, as in (35a). Nonetheless, example (35b) is ungrammatical because the anaphor *zasin* is bound by the antecedent *Jisu* in the gap inside an adjunct clause. In fact, such property directly corresponds to the reconstruction effect shown in the adjunct type of PGC. However, the observation still supports the reanalysis of a parasitic gap to a null pronoun.

(35) a. [zasin*i*-uy enu sacin-lul]*j* Yumi*i*-ka
self-GEN which picture-ACC Yumi-NOM
sensayngnim-kkey [Jisu-ka *proj* kacyeka-ki ceney]
teacher(HON)-to(HON) Jisu-NOM take-NOM before
tj tuli-ess-ni?
give-PST-QUE?
'Which picture of herself did Yumi give the teacher before Jisu took?'

b. . *[zasin*i*-uy enu sacin-lul]*j* Yumi-ka
self-GEN which picture-ACC Yumi-NOM
sensayngnim-kkey [Jisu*i*-ka *proj* kacyeka-ki ceney]
teacher(HON)-to(HON) Jisu-NOM take-NOM before
tj tuli-ess-ni?
give-PST-QUE?
'Which picture of herself did Yumi give the teacher before Jisu took?'

In consequence, the testing above supports the reanalysis of Korean

PGC that a parasitic gap only appears in the subject clause type of PGC. Since the adjunct clause type of PGC does not hold in Korean, the gap inside the embedded clause is reanalyzed as a null pronoun.

4. Cross-linguistic Implications

As stated above, the present study has argued toward the cross-linguistic pattern of PGC. This section deals with the main inquiry of this paper: Does Korean follow the cross-linguistic pattern of PGC? If not, which pattern does Korean PGC demonstrate?

Previous analyses claim that parasitic gaps are also observed in languages other than English and have been aimed to identify PGC as a language universal phenomenon rather than a language-specific construction in English and a few others. Given the two types of PGC based on the clausal categories in which a parasitic gap occurs, Culicover (2017) has formulated a Parasitic Gap Hierarchy, as illustrated in (36) this parasitic gap pattern summarizes ten languages including English, Mandarin, Spanish, French, and German.

(36) Parasitic Gap Hierarchy
ATB only > Subordinate > Subject/relative (Culicover, 2017)

The Parasitic Gap Hierarchy is divided into three stages: 1) ATB only, 2) Subordinate, and 3) Subject/relative. Culicover mentions that ATB extraction is found in all languages; thus, the notation "ATB only" (i.e. the first stage) refers to the languages in which parasitic gaps do not appear at all. For instance, German has been claimed to allow none of the parasitic gaps (Kathol, 2001). The second stage indicates languages that allow parasitic gaps only in subordinate clauses; it corresponds to the adjunct clause type construction discussed above. Languages such as Spanish and French fall into this category. The third stage indicates languages that permit parasitic gaps in both subordinate and subject/relative clauses, such as English and Mandarin. Thus, according to this hierarchical order, there are no languages that only allow the subject clause type PGC.

Nonetheless, throughout this paper, I have argued that only the subject clause type PGC exists in Korean, and not in any other adjunct clause type. This analysis is supported by the different nature of clausal

boundary and scrambling in Korean, a non-Germanic language; specifically, it has examined the scrambling involved in a PGC. The unique nature of clauses with respect to a barrier has influenced scrambling to possess distinct properties. Thus, this novel analysis of Korean PGC suggests the possibility of a new category of language in the cross-linguistic pattern of PGC. It implies that the parasitic gap hierarchy does not hold and that there are four types of languages with respect to PGC, including those similar to Korean.

5. Conclusion

In the analysis above, I argued specifically about the existence of the parasitic gap construction in Korean. It accounted for the previous analyses and the cross linguistic account proposed by Culicover (2017). The goal of this paper was to question the general pattern of PGC across languages and to examine whether the Korean language falls into the three categories of parasitic gap hierarchy. Given the typological differences of Korean from other Germanic languages, I analyzed the properties of scrambling in comparison to the nature of clausal boundary. This paper argued that the different nature of clausal boundary in Korean determines scrambling to exhibit either an A-property or an A'-property; specifically, scrambling in the adjunct clause types is analyzed as an A-property, whereas scrambling in the subject clause types is analyzed as an A'-property. Thus, I claimed that only the subject clause type construction holds for the real parasitic gap construction in Korean; yet, the gap in the adjunct clause type construction is a null pronoun. The detailed examination of each properties of a parasitic gap and a null pronoun was provided to corroborate the argument, supported by the empirical data and their grammaticality judgements. I proposed this analysis as a counterexample for the general cross-linguistic pattern of parasitic gap construction which has not taken into account this type of language. Further study is anticipated to provide a specific framework for the analysis of the identity of Korean parasitic gap construction.

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