Syntactic and semantic identity in Korean sluicing: A direct interpretation approach

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Abstract

Sluicing in Korean allows to unexpress clausal material, but the unexpressed, elided material needs to be recovered in a proper way. The recovering process makes use of either syntactic or semantic identity or parallelism between the elided expression and its antecedent. The paper discusses two different types of sluicing (*merger* and *sprouting*) in Korean and offers an account of sluicing in the matrix as well as in the embedded clause, based on the framework of construction-based HPSG and an independently motivated theory of dialogue context. In particular, the paper offers a direct interpretation approach couched upon this framework that can account for the recovering process, while avoiding pitfalls that affect both syntactically based and semantically based accounts.
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1. Introduction

Sluicing in English is a type of ellipsis introduced by a *wh*-expression, whereby everything except the *wh*-expression is elided from the clause and its interpretation is supplied by the surrounding context (see, among others, Ross, 1969; Chung et al., 1995, 2010; Ginzburg and Sag, 2000; Merchant, 2001, 2006; van Craenenbroeck and Merchant, 2013; Larson, 2013). It has been observed that there are two different types of sluicing in English with respect to the property of the correlate (antecedent) that the remnant *wh*-expression is linked to. For example, in English, the first type, as illustrated by the attested corpus examples in (1), is *merger*, where the remnant *wh*-phrase has an overt correlate (in italics) and the expression within the bracket is understood to be missing or elided:

(1)   a.   He looked like *someone* I know, but I can't think **who** \<he looked like\>.
       b.   We always knew he would succeed at *something*, but we didn't know **what** \<he would succeed at\>.
       c.   He came in here *somewhere*, but we don't know **where** \<he came in\>.

The second type, exemplified in (2), is *sprouting*, in which the first clause includes no overt correlate for the *wh*-remnant:

(2)   a.   She is complaining, but we don't know about **what** \<she is complaining\>.
       b.   Unfortunately, the supply seems to have dried up. I don't know **why** \<the supply has dried up\>.
       c.   They know it is coming, but they don't know **when** \<it is coming\>.

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Given the observation that sluicing is widespread cross-linguistically (see, among others, Lobeck, 1995; Merchant, 2001, 2006; van Craenenbroeck and Lipták, 2006; van Craenenbroeck and Merchant, 2013), we would expect that the typologically different language Korean may also employ two different types of sluicing. As illustrated in (3), we first observe that Korean has the merger type of sluicing where the *wh*-remnant (or sluice) is associated with an overt correlate in the preceding clause (see, among others, Kim, 1997; Park, 2001; Sohn, 2000, 2004; Jo, 2005; Kim and Sells, 2013a,b):[1]

(3)   a.   ku-nun *nwukwunka-lul* talm-ass-nuntey, **nwukwu**-i-nci molu-keyss-ta.
           he-TOP someone-ACC resemble-PST-but who-COP-QUE not.know-PRES-DECL
           'He resembled someone, but I do not know who.'
   b.   kapcaki *mwuesinka-ka* nal-a o-ass-nuntey, **mwues**-i-nci molu-keyss-ta.
           suddenly something-NOM fly-CONN come-PST-but what-COP-QUE not.know-PRES-DECL
           'Something suddenly flew in, but I do not know what.'

The second clause of the examples here contains a *wh*-phrase associated with the overt correlate *nwukwunka-lul* 'someone-ACC' and *mwuesinka-ka* 'something-NOM', respectively. In addition, Korean also allows sprouting with no correlate in the preceding clause, as illustrated in (4):

(4)   a.   ches khisu-lul ha-yess-nuntey, **nwukwu-wa**-i-nci molu-keyss-ta.
           first kiss-ACC do-PST-but who-with-COP-QUE not.know-PRES-DECL
           '(I) did the first kiss, but I don't know with whom.'
   b.   mwullyang-i patakna-ss-nuntey, **way**-i-nci molu-keyss-ta.
           stock-NOM bottom-PST-but why-COP-QUE not.know-PRES-DECL
           'The item is out of stock, but I do not know why.'

Unlike the examples in (3), the preceding clause here includes no overt correlate linked to the *wh*-remnant in the matrix clause. Despite this difference from merger, such sprouting examples also include a *wh*-remnant in the second conjunct whose interpretation depends on the previous clause or context. In addition, as seen from the English translations, the understood material appears to be a clause, which is a canonical property of the sluicing construction.

In the analysis of sluicing, much of the previous literature has focused on three main questions: syntactic, identity, and licensing questions (see, among others, Merchant, 2012; van Craenenbroeck and Merchant, 2013; van Craenenbroeck and Lipták, 2013, and Phillips and Parker, 2014). The syntactic question inquires if there is any syntactic structure for the elided parts in sluicing that are given in the context. The identity question concerns the relationship between the understood material in ellipsis and its antecedent, focusing on the question of whether the identity relation is syntactic or semantic. The licensing question looks into what allows for the ellipsis of the missing material in sluicing. The previous literature, paying much attention to some or all of these questions, can be classified into three main approaches: PF-deletion (Ross, 1969; Merchant, 2001; Fox and Lasnik, 2003), LF-copying (Lobeck, 1995; Chung et al., 1995, 2010; Chung, 2006, 2013), and the Direct Interpretation (DI) approach (Ginzburg and Sag, 2000; Culicover and Jackendoff, 2005; Sag and Nykiel, 2011; Nykiel, 2013). Both the PF-deletion and LF-copying approach assume that the ellipsis site has internally structured material through the derivation. The difference lies in the fact that the deletion approach posits ordinary syntax which undergoes some kind of deletion and renders the syntax unpronounced. Meanwhile, the LF copying approach posits a null lexical element which is replaced or identified at some level of representation, say, LF. Unlike these two, the DI approach assumes that there is no syntactic structure at the ellipsis site other than the *wh*-phrase. In this paper, we try to show that the DI approach can be a feasible alternative in accounting for syntactic/semantic identity conditions as well as other concerning grammatical properties observed in Korean sluicing.

The paper will unfold as follows. Section 2 discusses an overview of Korean sluicing, comparing two different types of sluicing, merger and sprouting. These two types behave alike in many respects, but display intriguing differences demanding a sophisticated analysis. Section 3 offers a discussion of the three competing approaches for sluicing, focusing on Korean. This section considers pros and cons of the three approaches in dealing with merger and sprouting in Korean. Section 4 focuses on syntactic and semantic identity issues between the elided parts and the putative sources. The section shows that merger and sprouting require both syntactic and semantic identity conditions. Section 5 provides a DI approach for Korean sluicing while answering the three main research questions for sluicing (is there syntax in the ellipsis site, is the missing material syntactically or semantically identical to its antecedent and what licenses the ellipsis?)

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[1] The abbreviations we use for glossing Korean data include ACC (accusative), CL (classifier), COMIT (comitative), COMP (complementizer), CONN (connective), COP (copula), DAT (dative), DECL (declarative), DEL (delimiter marker), GEN (genitive), PNE (prenominal ending), NOM (nominative), PASS (passive), PRES (present), PST (past), QUE (question), and TOP (topic).

In this section, after laying out a brief introduction of the formal apparatus we adopt, we discuss sluicing in the matrix clause (matrix sluicing) from sluicing in the embedded clause (embedded sluicing). The DI approach we defend here hinges on discourse for proper interpretations of the given construction and argues that there is no additional structure needed for the elided structure in sluicing in the matrix as well as embedded clause environments. It further shows that in terms of the identity condition, Korean sluicing requires both semantic and syntactic identity conditions, depending on the updated information of discourse (or recoverability). As for the licensing condition, it does not refer to deletion or movement operations, but asks for tight interactions among the lexicon, constructional constraints, and the discourse processor.

2. The data: merger and sprouting in Korean

We have seen that there are two different subtypes of (embedded) sluicing: one with an overt correlate and the other with a covert correlate. This section discusses how these two subtypes behave alike and in what respect they are different.

2.1. Similarities

One intriguing property that distinguishes embedded sluicing in Korean from its English counterpart is that the former has the obligatory presence of the copula verb *i-* followed by the interrogative-clause marker *-(nu)nci* (or *-nyako*). The absence of the copula makes sentences like (3) or (4) ungrammatical (see, among others, Sohn, 2000; Chung, 2003; Choi, 2012; Ok and Kim, 2012; Kim, 2012b; Kim and Sells, 2013a). The complementizer suffix *-(nu)nci* in these two examples occurs when the matrix predicate requires it. This can be observed from the following two examples. The matrix verb *molu-* 'not.know' in (5a) selects an interrogative clause (marked with *-nunci*) as its sentential complement, while a predicate like *malha-* 'say' in (5b) requires a declarative sentential complement marked with the complementizer *-ko*.

(5) a. John-un [Mary-ka mwues-ul sa-ss-nunci/*ta-ko] molla-ss-ta.
         John-TOP Mary-NOM what-ACC buy-PST-QUE/DECL-COMP not.know-PST-DECL
         'John didn't know what Mary bought.'

     b. John-un [Mary-ka ku chayk-ul sa-ss-ta-ko/*nunci] malha-yess-ta.
         John-TOP Mary-NOM the book-ACC buy-PST-DECL-COMP/QUE say-PST-DECL
         'John told us that Mary bought the book.'

As such, the interrogative complementizer *-(nu)nci* is attached only to the head of a clausal expression selected by interrogative verbs like *molu* 'not.know' or *kwungkumha-* 'wonder'. This in turn means that the Korean counterpart of English embedded sluicing is licensed only by such an interrogative predicate. With these in mind, let us consider a typical sluicing example again:

(6) Mimi-ka ecey nwukwunka-lul manna-ss-nuntey, **nwukwu**-i-nci molu-keyss-ta.
     Mimi-NOM yesterday someone-ACC meet-PST-but who-COP-QUE not.know-PRES-DECL
     'Mimi met someone yesterday, but I do not know who.'

The properties of the copula *i-*, complementizer *-(nu)nci* and matrix predicate *molu-* 'not.know' renders the single *wh*-remnant in the matrix clause as an interrogative clause selected by the matrix predicate, yielding a structure like (7) (see Kim and Sells, 2013a,b):

(7)
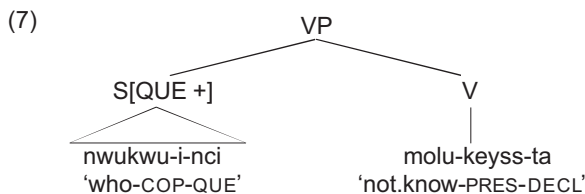
The interrogative sentence here ([QUE +]) is projected from the interrogative complementizer *-(nu)nci* and selected by the matrix predicate. In this paper, we argue for this kind of base-generated structure with no other underlining structures.

Another language peculiarity concerns the possible subject in the *wh*-remnant clause. As noted in the previous literature (Sohn, 2000; Park, 2001; Kim and Sells, 2013a), the unrealized subject of the *wh*-remnant clause can be replaced by the pronoun *kukey* 'it' (short form of *ku kes-i* 'the thing-NOM') in both merger and sprouting, as illustrated in (8).

(8)   a.   Mimi-ka   *nwukwunka-lul*   manna-ss-nuntey, (kukey) **nwukwu-i-nci**   molu-keyss-ta.
               Mimi-NOM someone-ACC   meet-PST-but   it   who-COP-QUE   not.know-PRES-DECL
               'Mimi met someone, but I do not know who (it is).'

         b.   Mimi-ka   senmwul-ul pat-ass-nuntey, (kukey) **nwukwu-lopwuthe-i-nci** molu-keyss-ta.
               Mimi-NOM present-ACC receive-PST-but   it   who-from-COP-QUE   not.know-PRES-DECL
               'Mimi received a present (from someone), but I do not know from whom.'

Note that the pronoun *kukey* in (8a) appears to refer to the animate correlate *nwukwunka-lul* 'someone-ACC'. A complication arises from the fact that the pronoun *kukey* in non-sluicing environments does not refer to an animate individual: it refers to either a nonanimate entity or a situation. This contrast is observed in the following (see Sohn, 2000; Park, 2001 for further discussion):

(9)   a.   Mimi-ka   nwukwunka-lul manna-se, *kukes-kwa   iyakiha-yess-ta.
               Mimi-NOM someone-ACC   meet-CONN the.thing-with talk-PST-DECL
               'Mimi met someone, and talked with him.'

         b.   Mimi-ka   mwuesinka-lul cwuw-ese,   kukes-ul   yelepo-ass-ta.
               Mimi-NOM something-ACC pick.up-CONN the.thing-ACC open-PST-DECL
               'Mimi picked up something, and opened it.'

         c.   Mimi-ka   sihem-ey ttelecy-ess-nuntey, kukey mit-e   ci-ci   anh-nun-ta.
               Mimi-NOM exam-at fail-PST-but   it   believe-CONN become-CONN not-PRES-DECL
               'Mimi failed the exam, but it was unbelievable.'

In the non-sluicing example (9a), *kukes/kukey* cannot refer to an animate individual. In (9b), it is linked to the nonanimate NP *mwuesinka* 'something' while in (9c), it refers to the previous state of affairs.

    To account for the property of the optional subject in embedded sluicing, there are three possible analyses: an expletive, a pronominal (Sohn, 2000, 2004; Park, 2001, 2012; Ahn, 2012), or an inverted predicate analysis (Kim, 2012b). The possibility of replacing the expression with a personal pronoun like *ku-ka* 'he-NOM' or a common noun *ku salam* 'the person' indicates its referential property:

(10)   Mimi-ka nwukwunka-lul mannass-nuntey, kukey / ku salam-i   / ku-ka nwukwu-i-nci molu-keyss-e
         Mimi-NOM someone-ACC met-but,   it-NOM the person-NOM he-NOM who-COP-QUE not.know-PRES-DECL
         'Mimi met someone, but I do not know who the person is.'

The inverted predicate analysis assumes that the expression *kukey* with no referential power originates as the predicate of a small clause and moves to the surface position, Spec-TP.[2] However, the possibility of replacing it with a common noun phrase like *ku salam* 'person' or the pronoun *ku-ka* 'he-NOM' makes it hard to take the expression *kukey* as a predicative expression. It is more viable to treat it as a referential pronominal expression whose referent (animate or nonanimate) is determined by context, as observed by Sohn (2000) and Park (2001). For example, consider the following example from Sohn (2000):

(11)   nwukwunka-ka taythonglyeng samwusil-ul tochenghako issta-nun kisa-lul   ilkessta-nuntey, kukey
         someone-NOM president   office-ACC   tapping   exist-PNE news-ACC read-but   it
         nwukwu-i-nci ani?
         who-COP-QUE   know
         'Someone read a newspaper article saying that someone is tapping the president's office, do you know who it is?'

In this context, *kukey* refers either to someone who is tapping the president's office or someone who reads an article about this. Context thus plays a key role in determining the referent of *kukey*.
    The anaphoric nature of the expression *kukey* can be further supported from reverse sluicing examples:

(12)   kukey nwukwu-i-nci molu-ciman, samchon-i nwukwunka-wa kyelhonha-n-tey
         it   who-COP-QUE not.know-but uncle-NOM who-with   marry-PRES-DECL
         'I do not know who it is, but my uncle is going to marry someone.'

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[2] For the detailed discussion of the analysis, refer to Kim (2012b).

The expression *kukey* is rather cataphoric in the sense that its referent is found from the matrix clause that follows it.[3]

In English sluicing, the correlate of a *wh*-remnant is in general an indefinite, introducing a variable (see, among others, Merchant, 2001, 2012; Chung et al., 2010; Sag and Nykiel, 2011):

(13) a. John gave the book to someone, but I don't know to whom.
    b. *John gave the book to his sister, but I don't know to whom.

The ill-formedness of (13b) arises from the fact that the correlate of *whom* is *his sister*, not being able to introduce a variable. The same situation holds in Korean, as observed from the following contrast (Sohn, 2000, 2004; Park, 2001):

(14) a. Mimi-ka *nwukwunka-eykey* ku chayk-ul cwu-ess-nuntey, nwukwu-i-nci molu-keyss-ta.
        Mimi-NOM someone-DAT the book-ACC give-PST-but who-COP-QUE not.know-PRES-DECL
        'Mimi gave the book to someone, but I do not know who.'
    b. *Mimi-ka *chesccay tongsayng-eykey* ku chayk-ul cwu-ess-nuntey, nwukwu-eykey-i-nci
        Mimi-NOM first sister-DAT the book-ACC give-PST-but who-DAT-COP-QUE
        molu-keyss-ta.
        not.know-PRES-DECL
        '*Mimi gave the book to the first sister, but I do not know who.'

The example (14b) is illicit due to the fact that the putative correlate of the *wh*-expression *nwukwu* 'who' is a definite NP *the first sister*, not being able to introduce a variable. In Section 5, we show that this indefinite condition has to do with a question-under-discussion that introduces a variable which is linked to the *wh*-remnant.

The literature has noted that multiple sluicing has a marginal status in English, as shown in (15) (Merchant, 2006; Lasnik, 2007, 2014; van Craenenbroeck and Merchant, 2013):[4]

(15) a. ?Someone talked about something, but I can't remember who about what.
    b. ?Mary showed something to someone, but I don't know exactly what to whom. (Lasnik, 2014: 8)

Korean is much more generous in allowing multiple sluicing (see, among others, Sohn, 2000; Park, 2007; Kim, 2012b; Kim and Sells, 2013a,b; Yoo, 2013):

(16) a. Mimi-ka ecey mwuesinka-lul nwukwunka-eykey cwu-ess-nuntey, **mwues-ul**
        Mimi-NOM yesterday something-ACC somebody-DAT give-PST-but what-ACC
        nwukwu-eykey-i-nci molu-keyss-ta.
        who-DAT-COP-QUE not.know-PRES-DECL
        'Mimi gave something to someone yesterday, but I do not know what to whom.'
    b. pemin-i cap-hi-ess-nuntey, **encey nwukwu-eykey**-i-nci molu-keyss-ta.
        criminal-NOM catch-PASS-PST-but when who-by-COP-QUE not.know-PRES-DECL
        'The criminal was caught, but I don't know by whom and when.'

Theoretically, there is no limit to the number of *wh*-remnants in the second clause of merger or sprouting examples. Multiple sluicing in Korean thus marks a clear difference between English and Korean sluicing.

Sluicing also requires case matching effects, displaying a connectivity effect between the *wh*-remnant and its correlate, as noted by Ross (1969) for German and restated in Merchant (2001, 2006, 2012).

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[3] See Gullifer (2004) for the detailed discussion of reverse sluicing in English.
[4] It has been observed that multiple sluicing is allowed in languages with multiple *wh*-fronting (Merchant, 2001: 110). English does not allow multiple *wh*-movement, but it may license multiple sluicing in limited environments. Observe the following contrast noted by Lasnik (2014) and others:

(i) a. ?Someone talked about something, but I can't remember who about what.
    b. *Someone talked about something, but I can't remember who what. (Lasnik, 2014: 8)

The contrast here tells us that multiple sluicing is possible only when the second *wh*-phrase is a heavy PP. Lasnik's direction to account for such a contrast relies on the assumption that the second *wh*-expression undergoes a rightward movement. We conjecture that the present analysis can also adopt Lasnik's idea of moving a heavy expression (*wh*-remnant) rightward. For the details of the analysis or an alternative, see Lasnik (2014).

(17) Er will jemandem schmeicheln, aber sie wissen nicht, wem/*wen.
  he wants someone.DAT to.flatter   but they know   not who.DAT/who.ACC
  'He wants to flatter someone, but they don't know who.'

The *wh*-remnant, as observed here, needs to have the same case value as the correlate *jemandem*. Such a case matching effect between the *wh*-remnant and its correlate can be observed from merger and sprouting in Korean too:[5]

(18)   a.   Mimi-nun *nwukwunka-eykey* honna-ss-nuntey, **nwukwu-eykey/*lul-i-nci** molu-keyss-ta.
     Mimi-TOP   someone-DAT   be.scolded-PST-but who-DAT/*ACC-COP-QUE   not.know-PRES-DECL
     'Mimi was scolded by someone, but I don't know by whom.'
   b.   Mimi-nun   honna-ss-nuntey, **nwukwu-eykey/*lul-i-nci** molu-keyss-ta.
     Mimi-TOP   be.scolded-PST-but who-DAT/*ACC-COP-QUE   not.know-PRES-DECL
     'Mimi was scolded, but I don't know by whom.'

In the merger example (18a), the *wh*-remnant and its correlate must be identical in the case value (when the case value is overtly realized). The situation is similar in the sprouting example (18b). The *wh*-remnant here agrees with the covert correlate in terms of the case value. The case matching condition in both examples thus displays a strong connectivity effect in Korean sluicing too.[6]

2.2. Differences

In spite of such similarities between merger and sprouting types of sluicing in embedded environments, there are several differences between the two, in particular, with respect to island repair and preposition stranding. It has been observed that the merger type of sluicing in English is insensitive to islands (Ross, 1969; Chung et al., 1995; Merchant, 2001, 2006, 2012; Fox and Lasnik, 2003). Consider the following island examples whose data are drawn from Merchant (2001, 2006):[7]

(19)   a.   Bo talked to the people who discovered something, but we don't know what (*Bo talked to the people who discovered __). (Complex Noun Phrase Constraint)
   b.   Terry wrote an article about Lee and a book about someone else from East Texas, but we don't know who (*Terry wrote an article about Lee and a book about __). (Coordination Structure Constraint)

Meanwhile, sprouting fails to repair syntactic island violations, known as Albert's Generalization (reported by Chung et al., 1995). Unlike merger examples, sprouting in (20) shows that island violations are not repaired (see, among others, Chung et al., 1995; Merchant, 2001, 2006; Larson, 2013, and Sag and Nykiel, 2011).

(20)   a.   *I saw the movie that showed Ivy eating, but I just can't remember what. (Complex Noun Phrase Constraint)
   b.   *Agnes wondered how John could eat, but it is not clear what. (*Wh*-island Constraint)

The question that follows is whether sluicing can repair islands in Korean. As Sohn (2000), Park (2001), Kim (2010) point out, Korean merger examples appear to repair islands as seen from the following examples (data from Sohn, 2000):

(21)   a.   Shally-ka   kunye-uy tongsayng-i nwukwunka-lopwuthe cenhwa-lul pat-un   twiey
     Shally-NOM she-GEN   sister-NOM   someone-from   phone-ACC receive-PNE after
     ttenass-nuntey, na-nun nwukwu-i-nci molu-keyss-ta.
     left-but,   I-TOP   who-COP-QUE not.know-PRES-DECL
     'Shally's sister left after receiving a phone call from someone, but I don't know from whom.'

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[5] The case values in Korean, attached to the preceding nominal host, can be classified into grammatical (or structural) and semantic cases. The former includes NOM (*-i/ka*), ACC (*-ul/lul*), and GEN (*-uy*) while the latter has DAT (*-eykey*), GOAL (*-ey/lo*), SRC (*-lopwuthe*), and so forth. The grammatical case marking is typically assigned by structural configurations or grammar rules while the semantic ones are licensed by a predicate (verb or adjective). See Section 5.2 for further elaboration.

[6] Case matching phenomena in Korean are much more complicated than this. For instance, NOM and ACC cannot be realized in embedded sluicing because of the copula verb. See Sections 3 and 4 for further detailed discussion.

[7] There is an issue of whether sluicing can really repair LBE (left branching extraction) violations as pointed out by Merchant (2001). For example, it is questionable if (19d) is an LBE repair or an extraction out of a full DP followed by an NP ellipsis. Seeing the ungrammaticality of the NP ellipsis as in *She bought an expensive car but I want a cheap __*, (19d) can be taken to be an LBE repair by sluicing. See Merchant (2001), Grebenyova (2005) and Barros et al. (2014) for further discussion.

b.   Shally-ka   kemchal-i   etten cengchika-lul noymwulswuswu hyemuy-lo   kisohayessta-nun
     Shally-NOM   prosecutor-NOM some politician-ACC bribe.acceptance accusation-for indicted-PNE
     nyusu-lul tulessta-ko malhayess-nuntey   etten cengchika-i-nci   kiekina-ci   anhnunta
     news-ACC   heard-COMP   said-but   which politician-COP-QUE recollect-COMP not
     'Shally said that she heard the news that the DA indicted a politician for the suspicion of accepting a bribe,
     but I do not remember which politician.'

It is natural to utter sentences like (21a) and (21b) where the *wh*-remnant is linked to the correlate, violating island
constraints. Considering sprouting cases in Korean (where the null object is marked as *pro*), we observe that island
constraints are hard to repair, similar to their English counterparts (see Park, 2001 for a similar point):

(22) a.   ??/*Mimi-ka *pro* masisskey mek-ess-ten siktang-ul   chach-ass-nuntey, (kukey) mwues-i-nci
           Mimi-NOM   deliciously eat-PST-PNE   restaurant-ACC find-PST-but   it   what-COP-QUE
           molu-keyss-ta.
           not.know-PRES-DECL
           'I found the restaurant where Mimi ate (something) deliciously, but we do not know what.'
      b.   ??/*Mimi-ka *pro* haykoha-yess-ta-nun sosik-ul   tut-ko   nolla-ss-nuntey, na-nun (kukey)
           Mimi-NOM   lay.off-PST-DECL-PNE   news-ACC   hear-and   surprise-PST-but   I-TOP   it
           nwukwu-i-nci molu-keyss-ta.
           who-COP-QUE   not.know-PRES-DECL
           'I was surprised at the news that Mimi laid off (someone), but I don't know who.'

Different from merger examples, regardless of the presence of the optional subject *kukey*, these sentences are quite
unacceptable to most of the speakers. There thus seems to be a contrast between merger and sprouting in terms of
repairing island configurations.

     Note, however, that island repair in Korean sluicing varies depending on context. The acceptability of examples like (22a)
can be improved when we have a *wh*-remnant like *etten umsik* 'which food' instead of *mwues* 'what'. The improvement
appears to have to do with whether the covert correlate is in the 'awareness of the hearer' (see Kim and Kuno, 2013). That is,
'which food' is more easily accessible by the hearer than the simple phrase 'what'. As suggested by Kim (2010) and Ok and
Kim (2012), these variations among sluicing examples as well as among speakers hint that context plays a key role in
licensing sluicing. That is, the amount of information evoked by a covert or overt correlate influences the acceptability of
sluicing in Korean. Such a discourse-based approach is in fact the direction we take in Section 5.

     Of the observed connectivity effects between the elided expression and the correlate, consider the so-called
P-stranding generalization. Merchant (2001, 2006) observes a strong correlation between the availability of preposition
stranding with *wh*-movement and the possibility for sluicing a *wh*-phrase without a preposition, illustrated from the
following English and Greek data:

(23) a.   Peter was talking with someone, but I don't know (with) who. (Merchant, 2006: (9))
      b.   Who was he talking with?

(24) a.   I   Anna milise me   kapjon,   alla dhe kesero *(me) pjon. (Merchant, 2006: (13))
           the Anna spoke   with   someone   but   not I.know with   who
      b.   *Pjon milise   me?
           who   she.spoke   with

The data illustrate that unlike Greek, English allows preposition stranding under sluicing because it allows preposition
stranding under regular *wh*-movement. This P-stranding generalization seems to be quite robust, attested in many
languages as observed by Merchant (2006). Consider the following data in which the marker *-wa* behaves like the English
preposition *with*:

(25) a.   Mimi-ka   *nwukwunka-wa* nolko-iss-nuntey, nwukwu-(wa)-i-nci molu-keyss-ta.
           Mimi-NOM   someone-with   play-PRES-but   who-with-COP-QUE   not.know-PRES-DECL
           'Mimi is playing with someone, but I don't know with whom.'
      b.   *nwukwu Mimi-ka   -wa   nolko-iss-ni?
           who   Mimi-NOM with play-PRES-QUE
           'int. Whom is Mimi playing with?'

(25b) indicates that Korean is a non-postposition stranding language. One additional fact concerning the postposition comes from the possibility of omitting it. As illustrated in (25a), it is possible to omit the postposition (*-wa*) under embedded sluicing. Note that there is a contrast between merger and sprouting in this respect:

(26) a. Mimi-ka *nwukwunka-lopwuthe* senmwul-ul pat-ass-nuntey, nwukwu-**(lopwuthe)-i-nci**
          Mimi-NOM someone-from   present-ACC receive-PST-but who-(from)-COP-QUE
          molu-keyss-ta.
          not.know-PRES-DECL
          'Mimi received a present from someone, but I do not know from whom.'
      b. Mimi-ka pinan pat-ass-nuntey, **nwukwu-*(lopwuthe)-i-nci** molu-keyss-ta.
          Mimi-NOM criticism receive-PST-but who-(from)-COP-QUE not.know-PRES-DECL
          'Mimi received a criticism (from someone), but I do not know from whom.'

In the merger example (26a), the semantic case marking *-lopwuthe* (corresponding to the preposition 'from' in English) of the *wh*-remnant is optional whereas in the sprouting example (26b) with no overt correlate, the semantic case or postposition is obligatory. The difference here thus comes from the status of the correlate. The obligatory presence of the case marking in sprouting has to do with the fact that the *wh*-remnant needs to be linked to a proper antecedent so that we are able to recover the interpretation of the understood missing material. In Section 5, we provide the detailed analysis in this direction.[8]

In sum, this section has shown that merger and sprouting in Korean behave alike with respect to the obligatory presence of the copula and interrogative marker, the optional subject (*kukey*) of the *wh*-remnant, the indefiniteness of the correlate, and case matching effects. Yet, they are different in terms of island repair and postposition omission. In what follows, we will consider three possible approaches to account for these similarities and differences between merger and sprouting we find in Korean sluicing.

3. Three possible approaches

One of the integral questions in the study of sluicing concerns the existence of syntactic structure for the unpronounced material. This so-called 'structure' question have led three different approaches, as noted by Merchant (2001, 2012). This section briefly considers these three possible approaches for Korean sluicing while referring to English sluicing when needed.

3.1. Deletion approach

In accounting for sluicing in English, the most prominent approach is to assume movement of a *wh*-phrase followed by deletion, as originated with Ross (1969) and developed further by Merchant (2001, 2012), and others. The deletion approach basically maintains that there is an underlying and elided structure in embedded sluicing. Considering that the sluiced construction in English is interpreted as an indirect question, the assumption that English sluicing involves a *wh*-movement process seems to be quite intuitive (Chomsky, 1995):

(27) a. Mary met somebody, but I don't know who.

      b. ..., but I don't know [$_{CP}$ who$_i$ [~~Mary met t$_i$~~]].

As represented in (27b), the *wh*-movement followed by the deletion of the remaining clause-level expression can give us the desirable surface output given in (27a) (see Ross, 1969; Merchant, 2001; Lasnik, 2007). Adopting this deletion idea, Korean sluicing can be also taken to include a movement of a *wh*-phrase and a deletion process. For example, the second conjunct in (28a) is derived from the putative source in (28b), as suggested by Kim (1997):

(28) a. Mimi-ka nwukwunka-lul manna-ss-nuntey, na-nun nwukwu-i-ess-nunci molu-keyss-ta.
          Mimi-NOM who-ACC   meet-PST-but   I-TOP   who-COP-PST-QUE   not.know-PRES-DECL
          'Mimi met someone, but I don't know who.'
      b. ..., na-nun [$_{FocP}$ nwukwu$_i$-~~lul~~ [$_{TP}$ [$_{VP}$ ~~Mimi-ka t$_i$ manna~~]-ss]-(nu)nci] molu-keyss-ta.

---

[8] A similar fact is observed in Greek sluicing. See V Vlachos, 2011:277).

According to Kim's analysis the *wh*-remnant in embedded sluicing first undergoes syntactic focus movement to the position within the FocP (located above VP and TP) and then VP can be deleted (TP can be deleted too when there is no tense suffix). If VP is deleted, the copula is inserted to support the tense feature in T, and subsequently raised to Foc to check off its V-feature (see Kim, 2000: 281 for details). The primary support for the deletion approach for Korean sluicing can come from case matching connectivity effects we have discussed in Section 2.1. However, the deletion approach for sluicing in Korean raises an immediate question of why the construction introduces the obligatory copular verb whose presence is not allowed in the putative source sentence, as seen from the following:

(29)   nwukwu-lul   Mimi-ka   manna-ss-(*i)-nunci   molu-keyss-e.
       who-ACC   Mimi-NOM   meet-PST-COP-QUE   not.know-PRES-DECL
       '(I) do not know who Mimi met.'

The insertion of the copula verb to support the stranded T, however, raises another complication when the *wh*-remnant is untensed as in (30), different from the tensed *wh*-remnant in (28a):

(30)   Mimi-ka   nwukwunka-lul   manna-ss-nuntey,   na-nun   **nwukwu-i-nci**   molu-keyss-ta.
       Mimi-NOM   who-ACC   meet-PST-but   I-TOP   who-COP-QUE   not.know-PRES-DECL
       'Mimi met someone, but I don't know who.'

Kim's analysis suggests that such an example with the untensed *wh*-remnant would have TP deletion after the focus movement.[9] The problem, however, is then that the absence of a tense suffix expects no copula insertion, contrary to the fact.[10] The copula insertion analysis to strand the stranded T thus has no empirical support.

   Avoiding the issues of introducing the copula to the sluicing construction in the deletion approach and positing rather complex processes of deletion, some works in literature have taken the pseudocleft as the putative source for Korean sluicing.[11] Within this view, the source sentence of the sluicing is a type of pseudocleft, and the application of a deletion process to the cleft would generate a sluicing structure like the following (see Park, 2001, 2012; Kim, 2012a):

(31)   na-nun   [~~Mimi-ka~~   ~~manna-n~~   ~~kes-un~~]   nwukwu-i-nci   molu-keyss-ta.
       I-TOP   Mimi-NOM   meet-PNE   KES-TOP   who-COP-QUE   not.know-PRES-DECL
       'I do not know who (Mimi met).'

This position, compared to the movement and deletion rule, can explain the obligatory presence of the copula. Consider a canonical pseudocleft example:

(32)   [Mimi-ka   manna-n   kes-un]   Nami-i-ta.
       Mimi-NOM   meet-PNE   KES-TOP   Nami-COP-DECL
       'Who Mimi met is Nami.'

This cleft example has two parts: the presuppositional cleft clause introduced by the bound pronoun *kes*, and the highlighted or focused expression *Nami* followed by the copula.[12]

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[9] Kim's analysis is silent about the deletion of the ACC marking on the *wh*-remnant. Note that we cannot simply delete the ACC because in a multiple sluicing example like (16), the *wh*-remnant is case-marked.

[10] The form *nwukwu-nci* 'who-QUE' is also possible as the *wh*-remnant in such an example.

[11] The pseudocleft analysis for sluicing constructions is also suggested by Merchant (1998, 2001) for Japanese, Almeida and Yoshida (2007) for Brazilian Portuguese, van Craenenbroeck (2010) for English and German.

[12] The expression *kes* is an inanimate noun and is usually translated as 'fact' or 'thing'. Yet, in the pseudocleft construction, the phrase headed by *kes* appears to denote either an inanimate or animate individual, as illustrated by the following two examples (see Kang, 2006; Kim, 2016:

(i)   a.   [John-i   sa-n   kes]-un   i   chayk-i-ta.
           [John-NOM buy-PNEPAST KES]-TOP this book-COP-DECL
           'What John bought is this book.'
      b.   [John-i   manna-n   kes]-un   i   yeca-i-ta.
           [John-NOM meet-PNEPAST KES]-TOP this woman-COP-DECL
           'Who John met is this woman.'

Along the line of proposal set forth by Kim and Sells (2007) and Kim (2016), we assume that examples like these belong to specificational clefts in which the cleft clause introduces a variable and the precopular expression specifies the value for this variable. See Kim (2016) for details.

The presence of the copula is obligatory in the pseudocleft. In addition, no structural case, NOM or ACC, can appear in the precopula position of the pseudocleft, as shown in (33a).[13] This constraint also holds in sluicing as given in (33b)[14]:

(33) a. [Mimi-ka manna-n kes-un] Nami-*ka/*lul-i-ta.
          Mimi-NOM meet-PNE KES-TOP Nami-NOM/ACC-COP-DECL
          'Who Mimi met is Nami.'
      b. na-nun nwukwu-*ka/*lul-i-nci molu-keyss-ta.
          I-TOP   who-NOM/ACC-COP-QUE   not.know-PRES-DECL
          'I don't know who.'

Appealing though this pseudocleft analysis seems to be, it raises questions about how to capture discrepancies between pseudocleft and sluicing. If pseudocleft is the source of sluicing, we would not expect any difference between the two. However, there are several differences between the two constructions. For example, one clear difference comes from the possibility of multiple remnants in sluicing and the impossibility of multi-pivot clefts, as seen from the following contrast (see Sohn, 2000, 2004; Park, 2007):[15]

(34) a. *[John-i   ecey   cwu-n   kes-un] Mimi-eykey chayk-i-ta.
          John-NOM yesterday give-PNE KES-TOP Mimi-DAT   book-COP-DECL
          '(int.) What John gave yeterday is to Mary a book.'
      b. John-i   ecey   nwukwunka-eykey mwuesinka-lul   cwuess-nuntey, nwukwu-eykey
          John-NOM yesterday someone-DAT   something-ACC   gave-but   who-DAT
          mwues-i-nci   molukeyssta
          what-COP-QUE   not.know
          'John gave something to someone yesterday, I wonder to whom and what.'

The contrast here indicates that we cannot have multiple-pivots in cleft as in (34a), but it is possible to have multiple *wh*-remnants in sluicing as in (34b).[16]

We can also observe that there are sluicing examples with no cleft counterpart. (35a) indicates that the adverbial *wh*-expression *how* can function as a sluice. However, note in (35b) and (35c) that the *wh*-adverbial expression or the adverbial cannot be in the focus position of the pseudocleft (Sohn, 2000; Jo, 2005).[17]

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[13] There is a wide range of possible analyses for the source of the case marking on the predicative argument of the copulas (see Maling and Sprouse, 1995). As for Korean and Japanese, a further issue comes from the case assigning ability of copulas together with their semantics. As for the negative copula *ani-* 'not.be', the predicative expression can receive NOM either by a default case assignment or last resort, or by a coindexing relation with the subject NP (Lee, 1992). However, an issue arises from the predicative complement of the positive copula *i-ta.*, which cannot get either NOM or ACC. As pointed out by Schütze (2001), Kim et al. (2008), and others, this is just simply a lexical property of its predicative complement.

[14] As a reviewer points out, Takano, 2002: 294) notes that the Japanese cleft sounds unnatural when the copula is immediately preceded by an accusative-marked expression and is unacceptable when the copula is preceded by a nominative-marked expression. As for Korean, only Jella dialect speakers we have consulted marginally allow a NOM-case marked expression in the pre-copula XP in the cleft. We conjecture that these variations may stem from the interaction between lexical properties of the copula verbs and focus properties of the precopular expression. For example, we may assume, following Sohn (2000), that a case-marked NP needs to be checked for case features, but the copula cannot assign the case feature to its second argument. This case assignment may be overridden in the cleft construction due to the constructional focus marking on the precopular expression.

[15] As a reviewer points out, there appear to be variations in the judgements here too. Unlike Japanese (Takano, 2002; Hiraiwa and Ishihara, 2002), Korean typically do not license multiple clefts, as noted by Sohn (2000), Park (2001), Kim and Lee (2008). Meanwhile, Cho et al. (2008) suggest that Korean and Japanese behave alike in allowing multiple clefts. Most of the speakers we have consulted do not license multiple clefts, but there are two consultants who marginally allow multiple clefts. These speakers speaking Jella dialect also marginally allow a nominative-marked precopular expression in the cleft. Our conjecture is that these speakers allow the assignment of NOM to the precopular focus position. The discussion in this paper restricts to the majority speakers and literature not allowing multiple clefts.

[16] We may adopt a different direction to account for the difference between multiple clefts and multiple sluices. As discussed by Barros et al. (2014), there may be three non-isomorphic sources for ellipsis: short sources, cleft (or psuedocleft) sources, and predicational sources. Each source has its merits in accounting for sluicing, but more sophisticated studies are needed for the predictions of each source. For example, the pseudocleft source cannot work for fragments in Korean (see Park, 2005).

[17] When the focused (pivotal) part is contrastive, a manner adverbial expression can be clefted too. The same holds in English, as discussed in Patten (2012) in detail.

(35) a. Mimi-ka   cha-lul   kochy-ess-nuntey, ettehkey-i-nci molu-keyss-ta.
          Mimi-NOM   car-ACC   fix-PST-but   how-COP-QUE   not.know-PRES-DECL
          'Mimi fixed the car, but I don't know how.'
      b. ?*[Mimi-ka   cha-lul   kochi-n   kes-un] ettehkey-i-ci?
          Mimi-NOM   car-ACC fix-PNE   KES-TOP how-COP-QUE
          '(Int.) The thing that Mimi fixed the car is how?'
      c. ?*[Mimi-ka   cha-lul   kochi-n   kes-un] acwu swipkey-i-ta.
          Mimi-NOM   car-ACC fix-PNE   KES-TOP really easy-COP-DECL
          '(Int.) The way Mimi fixed the car is really easy.'

The so-called floated numeral classifier also displays a difference between pseudocleft and sluicing (see Sohn, 2000 for a similar point and Kim, 2013 for the properties of floated numeral classifier in Korean). (36a) shows that in the pseudocleft it is possible to focus the classifier and its associate NP together. Note that we can sluice the numeral classifier, as given in (36b), but it is not possible to focus it alone in the pseudocleft, as shown in (36c):[18]

(36) a. [Mimi-ka   sa-n   kes-un] [chayk sey   kwen]-i-ta.
          Mimi-NOM buy-PNE KES-TOP [book   three CL]-COP-DECL
          'What Mimi bought was three books.'
      b. Mimi-ka   chayk-ul   myech kwen sa-ss-nuntey, na-nun   myech   kwen-i-nci molu-n-ta
          Mimi-NOM book-ACC some CL   buy-PST-but   I-TOP   how-many CL-COP-QUE not.know-PRES-DECL
          'Mimi bought some books, but I do not know how many.'
      c. *[Mimi-ka   chayk-ul   sa-n   kes-un] sey   kwen-i-ta.
          Mimi-NOM book-ACC buy-PNE KES-TOP three CL-COP-DECL
          'What Mimi bought books is three (volumes).'

The obvious discrepancies between pseudocleft and sluicing in Korean thus tell us that deriving sluicing from a pseudocleft structure runs into several empirical issues. In what follows, we discuss alternatives to the movement approach.

3.2. LF copying and re-use approach

The LF copying approach introduces a null element (or elements) at the ellipsis site in the syntax. This null element is replaced by an operation of structure copying before the structure is interpreted (see Chung et al., 1995, 2010; Lappin, 1996; Fortin, 2007).

(37) a. I don't know [CP what [IP e]] (Spell-Out)
      b. I don't know [CP what_i [IP John plays t_i]] (LF copying/interpreted structure)

The LF analysis is most elaborated by Chung et al. (2010) with the name of 'covert re-use' analysis. The merit of this re-use analysis comes from the following contrast for sprouting (known as Chung's generalization):

(38) a. They are jealous, but it is unclear of whom.
      b. *They are jealous, but it is unclear who.

---

[18] As a reviewer correctly points out, when the FQ (floating quantifier) accompanies a focus-enhancing discourse expression like *chong* 'total' or *isang* or *-ina*, it can be clefted. Note that as Kim (2013) points out, the FQ with a focus-enhancing discourse marker behaves differently from the bare FQ (data from Kang, 2002:376-378):

(i)   a. *?sey-pyeng(-ul) haksaying-i   photocwu-lul   masiessta.
          3-CL-ACC   student-NOM wine-ACC   drank
      b. sey-pyeng-ina   haksaying-i   photocwu-lul   masiessta.
          3-CL-DEL   student-NOM wine-ACC   drank
          'Students drank (surprisingly) as many as three bottles of wine.'

As seen from the contrast, one general restriction of the FQ in Korean is that an FQ cannot occur in the sentence initial position, preceding its associate NP. However, this restriction can be overridden with a discourse (focus) marker, as pointed out by Kang (2002). This means that the discrepancies between sluicing and cleft exist only with the pure FQ.

The sprouting example with no overt correlate requires the selected preposition. The re-use analysis would have the following derivations for the grammatical one (38a):

(39)   a.   It is unclear [CP of whom [IP]] ⇒
       b.   It is unclear [CP of whom [IP they are jealous]] ⇒
       c.   It is unclear [CP of whom [IP they are jealous [of whom]]].

The interrogative CP complement in (39a) has an 'empty' complement, devoid of any syntactic or semantic import. In order to get the proper interpretation of the clause, the antecedent IP is re-deployed in the empty complement position as in (39b). Lastly, the *wh*-PP moves downward to the original position, rendering (38a) an licit surface form. Since this process occurs covertly, all that is pronounced is the grammatical sentence in (38b). Note the derivational differences of the ungrammatical sentence (38b):

(40)   a.   It is unclear [CP who [IP]] ⇒
       b.   It is unclear [CP who [IP they are jealous]] ⇒
       c.   It is unclear [CP who [IP they are jealous who]].

The difference lies in (39c) and (40c). As noted in Chung et al. (2010), the derivation in (40c) 'subsumes a violation of the lexical requirements of the adjective *jealous*', yielding the ungrammatical sentence (38b).
    The same re-use analysis can be applied for Korean. Consider the following example again:

(41)   Mimi-ka   pinan.pat-ass-nuntey,   **nwukwu-*(lopwuthe)-i-nci** molu-keyss-ta.
        Mimi-NOM criticism.receive-PST-but who-(from)-COP-QUE   not.know-PRES-DECL
        'Mimi received a criticism (from someone), but I do not know from whom.'

The re-use analysis will have the following copying processes for the second clause of (41):

(42)   a.   [CP [IP e] nwukwu-lopwuthe-i-nci] molu-keyss-ta.   ⇒
                  who-from-COP-QUE   not.know-PRES-DECL
        'I do not know from whom.'
       b.   [CP [IP Mimi-ka   pinan.pat-ass]   nwukwu-lopwuthe-i-nci] molu-keyss-ta.   ⇒
                  Mimi-NOM criticism.receive-PST who-from-COP-QUE   not.know-PRES-DECL
       c.   [CP [IP Mimi-ka   nwukwu-lopwuthe pinanpat-ass]-nunci]   molu-keyss-ta.
                  Mimi-NOM who-from   criticism.receive-PST-QUE not.know-PRES-DECL
        'I do not know from whom Mimi got criticism.'

Leaving out the issue concerning the constituenthood of the re-used information here (for instance, in (42b), the re-used antecedent clause needs to ignore the connector *nuntey*), the re-use analysis has advantages to account for cases requiring syntactic identity. However, note that this syntax-based re-use analysis runs into problems for examples requiring semantic identity in both English and Korean. Consider the following data from Larson (2013):

(43)   a.   John likes someone, but I don't know who.
       b.   John likes someone, but I don't know [who [John likes someone]].

If the antecedent *John likes someone* is re-used, there is a danger for the indefinite *someone* to refer to a different person, as also pointed out by Larson (2013). The re-use analysis would thus do good for examples requiring syntactic identity, but encounters issues with semantic identity.

3.3. Direct-interpretation approach

    Unlike these deletion and re-use analyses, we can adopt a nonstructural, Direct Interpretation (DI) perspective that can generate the meanings of the unpronounced material with no underlying syntactic structures (Ginzburg and Sag, 2000; Kehler, 2002; Culicover and Jackendoff, 2005; Sag and Nykiel, 2011). This view directly generates sluiced clauses with the *wh*-remnant being indirectly licensed by elements of the surrounding context. In terms of syntax, it follows the philosophy of Simpler Syntax Hypothesis (Culicover and Jackendoff, 2005) in the sense that there is no syntactic structure

at the ellipsis site and the *wh*-phrase is the sole daughter of an S-node. For example, consider the following exchange involving a fragment answer, which we call matrix sluicing to differentiate it from embedded sluicing:

(44)   A: Mimi-ka   ecey   manna-ss-e.
             Mimi-NOM   yesterday   meet-PST-DECL
             'Mimi met yesterday.'
        B: nwukwu-lul?
             who-ACC?

Within the DI perspective, B's response in (44B) would have the following simple structure:

(45)   S[QUE +]
                   |
                  NP
                 / \
        nwukwu-lul 'who-ACC'
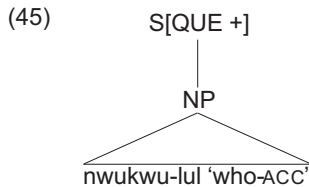
The interrogative sentential fragment here ([QUE +]) includes only the expression *nwukwu-lul* 'who-ACC'. There is no syntactic material corresponding to the clausal source for *wh*-phrases, but additional featural machinery helps ellipsis resolution. For example, in Culicover and Jackendoff (2005: 270), the S node is noted as IL (indirect licensing) and the *wh*-phrase is an orphan:

(46)   a.   Syntax: [$_S$ nwukwu-lul^{ORPH}]^{IL}
        b.   Semantics: Q[F(what)]

The semantics of a sluicing construction contains a question operator Q, binding the semantics of a *wh*-word and the free variable F (propositional content of a question) which is constructed from the context via 'indirect licensing'. Within the grammar of HPSG, Ginzburg and Sag (2000) also offer a direct-interpretation process in a formal feature-based system which we adopt in this paper. In Section 5, we lay out a more meticulous DI approach with the notion of question-under-discussion and dialogue-game board developed by Ginzburg and Fernandez (2010) and Ginzburg (2012).

As such, the DI approach to sluicing generates the *wh*-remnant clause 'as is' and assigns an interpretation on the basis of the surrounding context (see Ginzburg and Sag, 2000; Culicover and Jackendoff, 2005; Nykiel, 2013; Kim and Sells, 2013a, b). The DI receives a strong support from the fact that sluicing is a fundamentally semantic phenomenon whose remnant constituents are directly generated without extraction or deletion. Merchant (2004), while supporting the deletion approach, question the DI approach in predicting connectivity effects in case-matching, binding, complementizer deletion, and so forth. However, we have seen that the deletion approach has difficulties in dealing with discrepancies between the purported fully sentential sources and the *wh*-remnant. In Section 5, we set forth a DI approach that enables us to deal with connectivity effects in a systematic way as well as with empirical facts that the deletion approach cannot adequately handle.

4. The identity issue

Before we offer a DI approach for sluicing in Korean, let us consider the so-called identity issue. In the previous section, we discussed three possible approaches that can answer the question about the representation of the unpronounced parts in sluicing. The second research question is about the identity issue between the sluice and its putative antecedent. It is clear that the missing expression has an overt or covert antecedent from which its meaning is obtained. It has been a general assumption that the elided material must be identical in some way or other to a putative antecedent available in the discourse. As for the nature of the identity condition and its precise formulation, there have been two main views on ellipsis: the semantic view (Sag and Hankamer, 1984; Ginzburg and Sag, 2000; Winkler, 2005; Culicover and Jackendoff, 2005; Reich, 2008; van Craenenbroeck, 2010; Aelbrecht, 2010, among others) and the syntactic view (Sag, 1976; Williams, 1977; Fiengo and May, 1994; Chung et al., 1995, 2010; Kehler, 2002; Merchant, 2013).[19] This section discusses pros and cons of these two main views.

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[19] As a reviewer points out, there is also an information-structure based view on the identity question. Based on experimental studies, Kertz (2013) suggests a link between ellipsis licensing and more general principles governing well-formedness at the discourse level (information structure). The present analysis also places the discourse structure (more specifically, dialogue structure) in the key licensing factor for sluicing.

4.1. Semantic identity

The semantic identity condition accepts the view that there is a semantic relation between E (elided clause) and A (antecedent clause) to license sluicing (see Dalrymple et al., 1991; Hardt, 1999; Ginzburg and Sag, 2000; Merchant, 2001; van Craenenbroeck, 2010; van Craenenbroeck and Merchant, 2013, among others). The semantic view, elaborated by Merchant (2001) and others, requires a mutual entailment relationship between the elided material and its antecedent.[20] The semantic entailment condition allows examples like (47a) (see (3) for the corresponding Korean example) since the antecedent clause in (47b) and the elided clause in (47c) entail each other and thus the latter can be deleted:

(47) a. He resembled someone, but I do not know who.
   b. Antecedent clause [[A]] = $\exists$x(He resembled x)
   c. Elided clause [[E]] = $\exists$x(He resembled x)

In a variety of authentic examples where there is no overt linguistic antecedent, the semantic identity seems to work well (see Ginzburg and Sag, 2000 for similar discussion with English data). Consider a case of sluicing licensed in a discourse reporting a conversation between two bilingual speakers of English and Korean (see Merchant, 2001, 2012 for a similar point):

(48) A: Mimi-ka   nwukwunka-wa ssaw-ess-e?
      Mimi-NOM someone-with   fight-PST-QUE
      'Did Mimi fight with someone?'
   B: Yes, but I don't know with whom.

It is clear that the English ellipsis in B's response cannot refer to the syntactic identity of the antecedent, but is sensitive to the semantic representation of the antecedent.

As such, the semantic identity condition is crucial in accounting for cases where syntactic identity is not possible. Consider also the following example where we have a *wh*-fragment with no overt antecedent (Ahn and Cho, 2009; Ahn, 2012; Kim and Sells, 2013a,b):

(49) A: phyenci-ka wa-ss-e.
      letter-NOM   come-PST-DECL
      'A letter arrived.'
   B: nwukwu-eykey-i-nci?
      who-DAT-COP-QUE?
      'To whom?'

In such an exchange, there is simply no syntactic material for the understood, unpronounced material to refer to. It is the context, not the unavailable syntactic structure, that determines the interpretation of the understood material. In addition, consider the following dialogue:

(50) A: nwukwunka-ka na-lul   ttalao-ko   iss-e.
      someone-NOM   me-ACC   follow-CONN be-DECL
      'Someone is following me.'
   B: nwukwu-i-nci   kwungkumha-ney.
      who-COP-QUE   wonder-DECL
      'I wonder who is following you ≠ who is following me.'

If the antecedent of the *wh*-remnant in B's response were based on syntactic identity, we would obtain a wrong interpretation here (see Sag and Nykiel, 2011 for similar points in English).

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[20] Merchant's (2001:31) entailment condition is more sophisticated than the one sketched here, but the main idea is that an expression can be deleted if it is e-given where e-given is defined as following:

(i) An expression E counts as e-given iff E has a salient antecedent A and modulo $\exists$-type shifting.
   a. A entails F-clo(E) and
   b. E entails F-clo(A)

See Merchant (2001) for further details.

Also observe the examples in (51) including an R-expression and a pronoun in the putative antecedent (see Dalrymple et al., 1991; Fiengo and May, 1994 for English):

(51)   a.   kyengchal-i   Mimi$_i$-lul   cheyphoha-yess-nuntey, kunye$_i$-nun way-i-nci   molu-n-ta.
            policeman-NOM   Mimi-ACC   arrest-PST-but   she-TOP   why-COP-QUE   not.know-PRES-DECL
            'The policemen arrested Mimi, but she doesn't know why.'
       b.   *kunye$_i$-nun kyengchal-i   way   Mimi$_i$-lul cheyphoha-yess-nunci molu-n-ta.
            she-TOP   policemen-NOM   why   Mimi-ACC   arrest-PST-QUE   not.know-PRES-DECL
            'She does not know why the policemen arrested Mimi.'

The examples here illustrate the so-called pronoun/name 'vehicle' change fact. In sluicing (51a), there can be a coreference relationship between the R-expression *Mimi* and the pronoun *kunye*, but this is not possible in the non-elliptical equivalent in (51b). This contrast thus supports the semantic identity in handling the coreference relationship in sluicing.

4.2. Syntactic identity

The observation we have just made does not mean that semantic identity is enough in all the examples. As noted by Merchant (2006, 2008, 2013) and many others, sluicing requires certain structural identity. For example, unlike VP Ellipsis, sluicing does not tolerate voice mismatches. Consider the following data from Merchant (2008, 2013):[21]

(52)   a.   The problem was to have been looked into, but obviously nobody did <look into the problem>.
       b.   I have implemented it with a manager, but it doesn't have to be <implemented with a manager>.

(53)   a.   *Someone shot Ben, but I don't know by whom <Ben was shot>.
       b.   *Someone was shot, but I don't know whom <they shot>.

As pointed out by Chung et al. (1995, 2010) and Merchant (2006), among others, sluicing does not tolerate argument structure mismatches involving raising, ditransitive, and *tough* predicates:

(54)   a.   *Ben believes that someone is insane, but I cannot tell whom <Ben believes to be insane>.
       b.   ??Ben gave someone the bike, but I cannot tell to whom <Ben gave the bike>.
       c.   *Someone is impossible for Ben to please, but I don't know whom <it is impossible for Ben to please>.

Korean sluicing also includes examples where syntactic identity is required. For example, sluicing does not tolerate voice mismatches:

(55)   a.   *nwukwunka-ka Mimi-lul   ttayly-ess-nuntey, nwukwu-eykey-i-nci molu-keyss-ta.
            someone-NOM   Mimi-ACC   hit-PST-but   who-by-COP-QUE   not.know-PRES-DECL
            '*Someone hit Mimi, but I don't know by whom <Mimi was hit>.'
       b.   Antecedent clause [[A]] = $\exists$x(x hit Mimi)
       c.   Elided clause [[E]] = $\exists$x(Mimi was hit by x)

The mutual entailment condition in ellipsis would predict that examples like (55a) are acceptable since 'someone hit Mimi' and 'Mimi was hit by someone' entail each other as represented in (55b) and (55c). The voice matching requirement thus calls for some form of structural identity, not covered by the simple semantic identity condition.

As we have seen earlier in Section 2.2, merger in Korean allows the *wh*-remnant to have an optional semantic case. However, if the *wh*-remnant has a semantic case, the case value is optional but must match with that of the correlate if it is realized. This can be observed from the following data:

(56)   a.   Mimi-nun *nwukwunka-eykey* phyenci-lul ponay-ss-nuntey, **nwukwu-(eykey/*lopwuthe)-i-nci**
            Mimi-TOP someone-to   letter-ACC   send-PST-but   who-(to/*from)-COP-QUE
            molu-keyss-ta.
            not.know-PRES-DECL
            'Mimi sent a letter to someone, but I don't know to whom.'

---

[21] For the discussion of VP Ellipsis, see Johnson (2001), Hardt and Romero (2004), Goldberg (2005), Lipták (2012), among others.

b.   kong-i   kapcaki   *etinka-lopwuthe*   nalao-ass-nuntey,   **eti-(*ey/lopwuthe)-i-nci**   molu-keyss-ta.
      ball-NOM   suddenly   somewhere-from   fly-PST-but   where-(*to/from)-COP-QUE   not.know-PRES-DECL
      '(lit.) A ball suddenly flew in from somewhere, but I don't know from where.'

Further complication arises from the fact that unlike merger examples, sprouting requires the presence of a semantic case on the *wh*-remnant matching with the case value of the covert correlate:

(57)   a.   pise-ka   hwa-lul   nay-ss-nuntey,   **nwukwu-*(eykey)-i-nci**   molu-keyss-ta.
          secretary-NOM   anger-ACC   raise-PST-but   who-DAT-COP-QUE   not.know-PRES-DECL
          'The secretary got angry, but I don't know at whom.'
    b.   cek-i   hwutoy-lul   ha-yess-nuntey,   **eti-*(kkaci)-i-nci**   molu-keyss-ta.
          enemy-NOM   retreat-ACC   do-PST-but   where-to-COP-QUE   not.know-PRES-DECL
          'The enemy retreated, but I do not know up to where.'

The unrealized, covert correlate is a dative and a goal argument respectively and the case value on the *wh*-remnant is obligatory and needs to be identical with the one on the covert correlate.

     As we have seen here, merger and sprouting are basically anaphoric and licensed by semantic conditions, but there are also instances where each of these phenomena are controlled by syntactic conditions. In particular, identity conditions in sprouting indicate that we need to have access to syntactic information as well, e.g., about argument-structure. In what follows, we offer a hybrid analysis in which both syntactic and semantic identity conditions are required for merger and sprouting. In the process of arguing for this direction, we in particular adopt Ginzburg and Sag's (2000) discourse-based analysis of sluicing within the framework of Construction-based HPSG and an independently motivated theory of dialogue context. In doing so, we discuss short answers in matrix environments (matrix sluicing) as well as sluicing in embedded environments (embedded sluicing).

5. An analysis: direct interpretation and question under discussion

     This section first offers a brief sketch of the Construction-based HPSG whose framework we adopt to develop a DI approach to account for sluicing in Korean. We then discuss how the DI approach, together with the notion of question under discussion, can handle various grammatical complexities we observe in embedded as well as matrix sluicing in Korean.

5.1. Basic assumptions and theory of dialogue

     In accounting for the grammatical properties of the sluicing construction, we accept the philosophy of Construction-based HPSG. Within the philosophy of Construction Grammar (CxG), all levels of description (including morpheme, word, phrase, and clause) are understood to involve pairings of form with semantic or discourse functions, andnoented in the following feature system (Goldberg, 2006; Sag, 2012):

$$(58) \quad \begin{bmatrix} construction \\ \text{FORM} [...] \\ \text{SYN} [...] \\ \text{SEM} [...] \\ \text{CXT} [...] \end{bmatrix} \rightarrow \begin{bmatrix} construction \\ \text{FORM} [...] \\ \text{SYN} [...] \\ \text{SEM} [...] \\ \text{CXT} [...] \end{bmatrix} ... \begin{bmatrix} construction \\ \text{FORM} [...] \\ \text{SYN} [...] \\ \text{SEM} [...] \\ \text{CXT} [...] \end{bmatrix}$$

Table 1
Examples of constructions, varying in size and complexity (Goldberg, 2006).

Constructions	Examples
Morpheme	*pre-, -ing*
Word	*avocado, anaconda, and*
Complex word	*daredevil, shoo-in*
Complex word (partially filled)	[N-*s*] (for regular plurals)
Idiom (filled)	*going great guns, give the Devil his due*
Idiom (partially filled)	*jog (someone's) memory, send (someone) to the cleaners*
Covariational conditional	The X-er the Y-er (*The more you have, the better you are.*)
Ditransitive	Subj V Obj1 Obj2 (*He gave her a fish taco.*)
Passive	Subj Aux VP (PP[by]) (*The armadillo was hit by a car.*)

Constructions also vary in size and complexity, and form and function are specified if not readily transparent, as seen from Table 1.

As seen from Table 1, in the CxG perspective, there is no principled distinction between words, phrases, and even rules: a lexical entry is more word-like to the extent that it is fully specified, and more rule-like to the extent that it can also have variables that have to be filled by other items in the sentence. Within CxG, any linguistic pattern is recognized as a construction as long as some aspect of its form or function is not strictly predictable from its component parts or from other constructions recognized to exist (see Goldberg, 2006; Goldberg and Jackendoff, 2004). In this paper, we show that fragments as well as sluicing exist in Korean as independent constructions, though they are closely related to other family of constructions.[22]

In representing interrogative expressions including sluicing, we follow Ginzburg and Sag's (2000) view that 'questions' are basic semantic entities such as individuals and propositions (Karttunen, 1977; Ginzburg and Sag, 2000). Questions are distinguished from other messages in terms of a feature called PARAMS (parameters), whose set value is empty for yes-no questions but non-empty for *wh*-questions. The *wh*-phrase, as given in (59), represents a parameter consisting of an index and a set of restricting propositions for what the referent of the parameter refers to:

(59)   Semantic content of *who*: $\pi^{i}_{\{person(i)\}}$

This position would give us the following semantic representation for interrogatives.

(60)   a.   Polar question: $\lambda\{\ \}$ [love(*k, l*)] (Does Kim love Lee?)
        b.   Unary *wh*-question: $\lambda\{\pi^{j}\}$ [love(*k, i*)] (Who does Kim love?)
        c.   Multiple *wh*-question: $\lambda\{\pi^{i}\ \pi^{j}\}$ [love(*i, j*)] (Who loves who?)

Each *wh*-question is thus treated as being about a proposition in question, with a set of parameters (or variables) to be determined in an answer. Given Ginzburg and Sag's system, we can represent the semantic composition process of the Korean *wh*-question (61a) as in (61b):[23]

(61) a.   Mimi-ka   nwukwu-lul manna-ss-ni?
           Mimi-NOM   who-ACC   meet-PST-QUE
           'Who did Mimi meet?

    b.
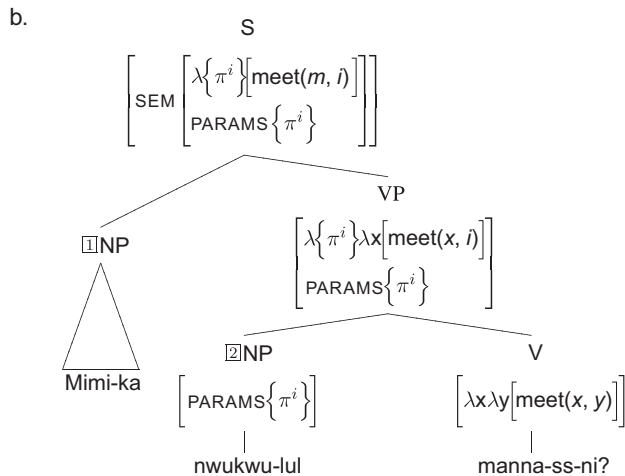
Together with Ginzburg and Sag's treatment of questions, we assume that the interpretation of a sluiced clause depends on the notion of 'question-under-discussion (QUD)' in the dialogue. Dialogues are described via a Dialogue Game Board

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[22] The CxG approaches are generally 'usage-based' in the sense that facts about the actual use of linguistic expressions such as frequencies and individual patterns are recorded alongside more traditional linguistic generalizations, aiming at fully accounting for both broad generalizations and more limited patterns (see Goldberg, 2006 and references therein). In doing so, multiple inheritance hierarchies play a key role. The hierarchies allow broad generalizations to be captured by constructions that are inherited by many other constructions whereas subregularities are accounted for by positing constructions that are at various midpoints of the hierarchical network. Meanwhile, low level constructions represent exceptional patterns. For the detailed theoretical foundations, refer to Goldberg (2006), Sag (2012), among others.
[23] For the detailed feature structure system in HPSG, see Ginzburg and Sag (2000) and Sag et al. (2004).

(DGB) where the contextual parameters are anchored and where there is a record of who said what to whom, and what/who they were referring to (see Ginzburg, 1996; Ginzburg and Fernandez, 2010). DGB monitors which questions are under discussion, what answers have been provided by whom, etc. The conversational events are tracked by various conversational 'moves' that have specific preconditions and effects. The main claim is that non-sentential utterances are resolved to the contextual parameters of the DGB. Since the value of QUD is constantly being updated as a dialogue progress, the relevant context offers the basis of the interpretation for sluicing. Interpreting this system in terms of the feature-structure based system, DGB, as part of contextual information, would have at least the two attributes, SAL-UTT (salient-utterance) and MAX-QUD (maximal-question-under-discussion):

$$(62) \quad \left[\text{DGB} \begin{bmatrix} \text{SAL-UTT ...} \\ \text{MAX-QUD ...} \end{bmatrix} \right]$$

The feature MAX-QUD, representing the question currently under discussion, takes as its value *questions*. Meanwhile, SAL-UTT, taking as its value syntactic as well as semantic information, represents the utterance which receives the widest scope within MAX-QUD. For example, uttering the question *Who did Kim meet?* will activate the following feature structure with the appropriate DGB information:

$$(63) \quad \begin{bmatrix} \text{FORM} \left\langle \text{Who did Kim meet?} \right\rangle \\ \text{SYN S} \\ \text{SEM } \lambda \left\{ \pi^i \right\} \left[\text{meet}(k, i) \right] \\ \text{DGB} \begin{bmatrix} \text{MAX-QUD } \lambda \left\{ \pi^i \right\} \left[\text{meet}(k, i) \right] \\ \text{SAL-UTT} \begin{bmatrix} \text{SYN NP} \\ \text{SEM } \pi^i \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

One important constraint working here is that resolved questions cannot be under discussion (Ginzburg and Sag, 2000; Sag and Nykiel, 2011):

(64) Question Introduction Condition (QIC)
      A question q can be introduced into QUD by A only if there does not exist a fact τ such that $\tau \in$ FACTS and τ resolves q.

This condition basically rules out sentences with resolved questions, explaining the fact that any indexed NP can be a correlate in the sluicing construction:

(65) a. Indefinite NP: **Some senator** is arriving. Who?
      b. Quantified NP: I talked to **most of the players**. Oh yeah, who, exactly?
      c. Definite NP: **The tallest guy of the team** is here. Who else?
      d. Proper Noun: I met **Kim**. Who else?
      e. Pronoun: **She** came to the party. Who else?

As seen here, an indefinite NP as well as a definite or quantified NP can function as a correlate as long as it can accommodate a compatible MAX-QUD environment. However, note the following:

(66) a. **No one** arrived. *Who?
      b. **Kim** arrived. *Who?
      c. **Kim and Lee** will visit Pat. *Who?

In all these examples, the question of who arrived or who will visit Pat is no longer under discussion. Note that an additional or different expression can change the MAX-QUD:

(67) a. **Kim** arrived. Who else?
      b. **Kim or Lee** will visit Pat. Which one?

The expression *else* in (67a) changes the MAX-QUD so that the question of whether Kim arrived can be introduced whereas the conjunction *or* in (67b) allows us to introduce the question of who (Kim or Lee) will visit Pat. We observe that the QIC also holds in the typologically different language, Korean.

(68) a. Mimi-lul   manna-ss-e.   kupakkey   nwukwu?
          Mimi-ACC   meet-PST-DECL else   who?
          '(I) met Mimi. Who else?'
      b. *amwuto   an   o-ss-e.   nwukwu?
          nobody   not come-PST-DECL who
          'Nobody came. *Who?'

Just like English, the definite NP *Mimi-lul* in (68a) can function as the correlate of the *wh*-expression accompanied with *kupakkey* 'else' since this can evoke a compatible MAX-QUD environment. However, the negative quantifier *amwuto* 'nobody' in (68b) cannot function as the correlate since in uttering this sentence, the question of who came is no longer under discussion.

5.2. Matrix sluicing as nominal fragments

In English, in terms of the morphosyntactic properties, the *wh*-remnant in embedded environments (*I wonder who*) does not differ from the one in matrix clauses (*Who?*). However, in Korean there are clear differences between the *wh*-remnant in (68a) matrix sluicing and the one in embedded sluicing: as we have seen so far, the latter requires the copula and the interrogative complementizer to be followed. Before we discuss embedded sluicing, let us consider matrix sluicing.

Similar to English, Korean has a variety of fragment utterances including short answers. Examples in (69) illustrate predicate fragments with no subject expression (see Ahn, 2012 for detailed discussion of fragments in Korean):

(69) A: Kim-i   yeki-ey iss-ni?
          Kim-NOM   here-at   exist-QUE
          'Is Kim here?'
      B: iss-e.   / eps-e.
          exist-DECL. / not.exist-DECL
          '(He) is.' '(He) isn't.'

The language also allows nominal fragments as short answers, as illustrated in (70):

(70) A: Kim-i   nwukwu-lul   manna-ss-ni?
          Kim-NOM   who-ACC   meet-PST-QUE
          'Who did Kim meet?'
      B: Mimi. /   Mimi-lul. / *Mimi-ka.
          Mimi /   Mimi-ACC / Mimi-NOM

B's response in (70) is a nominal fragment serving as a short answer to the given question. The *wh*-phrase in A's question is accusative (*nwukwu-lul* 'who-ACC') and its corresponding nominal fragment is either bare (*Mimi*) or accusative (*Mimi-lul*), but cannot be nominative (**Mimi-ka*).

The short answer fragment can be an interrogative *wh*-expression (which we call matrix sluicing), similar to English sluicing. Consider cases with an overt correlate (see, among others, Park, 2005; Ahn, 2012; Kim and Sells, 2013a,b; Yoo, 2013):

(71) A: Mimi-ka   nwukwunka-lul   manna-ss-e.
          Mimi-NOM   someone-ACC   meet-PST-DECL
          'Mimi met someone.'
      B: nwukwu? / nwukwu-lul? / *nwukwu-ka?
          who?   who-ACC?   who-NOM

As an answer to A's question, the *wh*-fragment can be either accusative or bare-case marked, but not nominative-marked. This means that the case-marked *wh*-fragment needs to agree in case features with the overt correlate, which we will account for in due course. We can further observe the *wh*-fragment requires neither the copula verb nor the interrogative complementizer, different from the *wh*-fragment in embedded environments.

Similar to embedded sluicing, we can also observe that matrix sluicing can repair island violations. Consider the following dialogue adopted from Park (2005), who discusses island repair in fragments in details:

(72) A: John-un [casin-uy tongsayng-ekey mwuesinka-lul cwu-n salam]-ul manna-ss-ni?
          John-TOP self-GEN brother-to something-ACC give-PNE person-ACC meet-PST-QUE
          '*What did John meet a person who gave something to his brother?'
     B: mwues-ul?
          what-ACC

The question in (72A) includes an indefinite NP within the complex NP, but the fragment question can refer to this phrase, repairing the CNPC island violation. As such, matrix sluicing behaves just like embedded sluicing in many respects. This similarity calls for a uniform analysis for sluicing and fragment in Korean. What we assume here is that the interpretation of a matrix sluicing fragment, a non-sentential utterance, also depends on the notion of QUD in the given context. In pursuing this line of direction, as suggested by Kim and Sells (2013a,b), we first introduce the following construction for Korean, similar to English (Ginzburg and Sag, 2000):[24]

(73)   Head-Fragment Construction

$$
\begin{bmatrix} \text{SYN} & S \\ \text{DGB} & \begin{bmatrix} \text{SAL-UTT} & \begin{bmatrix} \text{SYN} & [\text{CAT} & \boxed{1}[\textit{nominal}]] \\ \text{SEM} & [\text{IND} & i] \end{bmatrix} \end{bmatrix} \end{bmatrix} \rightarrow \begin{bmatrix} \text{SYN} & [\text{CAT} & \boxed{1}[\textit{nominal}]] \\ \text{SEM} & [\text{IND} & i] \end{bmatrix}
$$

A variety of fragments, including nominal fragments in (70) and matrix sluicing in (71), belongs to this nominal Head-Fragment construction. The construction allows the head daughter to be a *nominal* and it corresponds to the category specified by the contextually provided SAL-UTT. The mother is an S, allowing such a phrase to serve as a stand-alone clause.

To see what this constructional constraint implies for matrix sluicing, let us consider the dialogue in (71) in which the correlate (*nwukwunka-lul* 'someone-ACC') is accusative-marked while the fragment answer can be bare-case marked (*nwukwu* 'who') or accusative-marked (*nwukwu-lul* 'who-ACC'). Within the present system, the accusative-marked fragment is a stand-alone clause, forming a Head-Fragment Construction, as represented in the following structure:

(74)

$$
\text{S}
$$

$$
\begin{bmatrix} \text{SYN} & \boxed{2} \\ \text{SEM} & \boxed{3} \\ \text{DGB} & \begin{bmatrix} \text{MAX-QUD} & \lambda\{\pi^i\}[meet(m,i)] \\ \text{SAL-UTT} & \begin{bmatrix} \text{SYN} & [\text{CAT} & \boxed{1}] \\ \text{SEM} & \begin{bmatrix} \text{IND} & i \\ \text{PARAMS} & \{\pi^i\} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix}
$$

$$
\text{NP}
$$

$$
\begin{bmatrix} \text{SYN} & \boxed{2}\begin{bmatrix} \text{CAT} & \boxed{1}\begin{bmatrix} \text{POS} & \textit{nominal} \\ \text{CASE} & \textit{acc} \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \boxed{3}\begin{bmatrix} \text{IND} & i \\ \text{PARAMS} & \{\pi^i\} \end{bmatrix} \end{bmatrix}
$$

nwukwu-lul 'who-ACC'?

The *wh*-fragment *nwukwu-lul* 'who-ACC' carries syntactic (SYN) information about its POS (parts of speech) and CASE value, and its semantic information introduces a parameter with the index value *i*. Note the role of DGB here. Uttering the sentence A in the dialogue introduces the information about QUD as well as SAL-UTT (in accordance with the QIC in (64)). The QUD
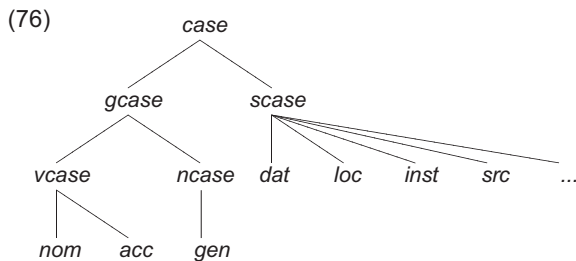
---

[24] The value *nominal* is just for nominal fragments. For other phrasal fragments, this value is unspecified.

concerns the information such that there is someone (*nwukwunka-lul* 'someone-ACC') that Mimi met. The index value of this *wh*-expression functions as the SAL-UTT, linked to that of the fragment *nwukwu-lul* 'who-ACC'. The Head-Fragment Construction in (73) requires the CAT value of the fragment to be identified with that of the SAL-UTT. Since the CAT value includes the CASE and POS values, we thus expect the case matching effect between the overt correlate and the fragment.

The bare-case marked *nwukwu* 'who' is also a possible matrix sluicing fragment here. This availability is due to the case system in Korean in which the unmarked case value subsumes the structural case values (NOM and ACC) (see Kim, 2004; Kim and Choi, 2004). In Korean, different from semantic cases (*scase*), the structural or grammatical case (*gcase*) values can be optional, as illustrated in the following contrast:

(75) a.   Mimi-(ka)   Mina-(lul)   manna-ss-e.
           Mimi-NOM   Mina-ACC   meet-PST-DECL
           'Mimi met Mina.'
      b.   Mimi-(ka)   Mina-*(wa)   nol-ko   iss-e.
           Mimi-NOM   Mina-with   play-CONN   exist-DECL
           'Mimi is playing with Mina.'

Distinguishing the grammatical case values (assigned by grammar rules of configurations) from the semantic case values, the case values in Korean can be organized as given in the following hierarchy:

(76)

```
                        case
                      /      \
                 gcase        scase
                /     \      / | | \   \
           vcase    ncase  dat loc inst src  ...
           /   \        |
        nom    acc     gen
```

The grammatical case (*gcase*) has two subtypes *vcase* (verbal case) and *ncase* (nominal case) in which the former has NOM and ACC while the latter has *gen* as its single member. The subtypes of the semantic case (*scase*) vary, depending the semantic role that each argument performs. One key property of the hierarchical system is that the a supertype value like *gcase*, subsumes all its subtypes including both *nom* and *acc*. Within this kind of Korean case system developed by Kim (2004), the correlate *nwukwunka-lul* 'someone-ACC', the bare nominal fragment *nwukwu* 'who', will have at least the following lexical information:

(77) a.
$$
\begin{bmatrix}
\text{FORM } \langle \textit{nwukwunka-lul} \rangle \\
\text{SYN } \begin{bmatrix} \text{CAT } \begin{bmatrix} \text{POS} & \textit{nominal} \\ \text{GCASE} & \textit{acc} \end{bmatrix} \end{bmatrix}
\end{bmatrix}
$$

b.
$$
\begin{bmatrix}
\text{FORM } \langle \textit{nwukwu} \rangle \\
\text{SYN } \begin{bmatrix} \text{CAT } \begin{bmatrix} \text{POS} & \textit{nominal} \\ \text{GCASE} & \textit{gcase} \end{bmatrix} \end{bmatrix}
\end{bmatrix}
$$

The correlate's GCASE value os *acc* while the *wh*-remnant's GCASE value is *gcase*, but these two can be unified with no case feature conflict because of the subsumption relation. This in turn means that there is no conflict (no failure in the feature unification) between the CAT value of the two expressions, inducing the case connectivity effect in matrix sluicing.[25]

---

[25] As an anonymous reviewer points out, further complexities may arise with respect to an asymmetry in the omission of the subject and object case markings as well as the interpretation of bare *wh*-expressions. As discussed by Ahn and Cho (2009, 2012a), the omission of the subject NOM is less preferred than that of the object ACC marking. In addition, Ahn (2012) and Ahn and Cho (2012a) note that there is a difference in the D-linked interpretation of caseless *wh*-expressions. The detailed discussion of these two complexities are rather beyond the scope of this paper, but we conjecture that the asymmetries and differences in the D-linked interpretation may arise depending on contextual cues. See Ahn (2012) and Ahn and Cho (2012a) for further discussion in this direction within a Minimalist Program perspective.

Note that with an overt correlate, the *wh*-remnant or fragment answer can be bare-case marked even when the correlate is semantic-case marked. This is possible since there is also no conflict in the case features. Consider the following dialogue:

(78) A: Mimi-ka   nwukwunka-lopwuthe senmwul-ul pat-ass-e.
      Mimi-NOM   someone-SRC   gift-ACC   receive-PST-DECL
      'Mimi received a gift from someone.'
    B: nwukwu?/ nwukwu-lopwuthe? / nwukwu-eykey? / *nwukwu-wa?
      who   who-SRC   who-SRC   who-COMIT
      'Who?/From whom? /To whom? /*With whom?'

The correlate *nwukwunka-lopwuthe* 'someone-from' here is marked with the source semantic case *-lopwuthe*, and there are several options when it comes to be form of the fragment answer to (78A). The fragment can be bare-case marked (*nwukwu* 'who') whose grammatical and semantic case values (*gcase* and *scase*) are unspecified as in (79b):

(79) a.
$$\begin{bmatrix} \text{FORM } \langle\, nwukwunka\text{-}lopwuthe\,\rangle \\ \text{SYN} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{POS} & nominal \\ \text{GCASE} & gcase \\ \text{SCASE} & src \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

b.
$$\begin{bmatrix} \text{FORM } \langle\, nwukwu\,\rangle \\ \text{SYN} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{POS} & nominal \\ \text{GCASE} & gcase \\ \text{SCASE} & scase \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

There is thus no case feature conflict between the correlate and the bare-case marked fragment. The fragment answer can also be *nwukwu-lopwuthe* or *nwukwu-eykey* since the semantic case *src* (*source*) in the language can be independently realized either as *-lopwuthe* or *-eykey* (see Chang, 1996; Sohn, 1999). However, *nwukwu-wa* 'who-with' cannot be a licit answer because its semantic case value (*comit* (*comitative*)) conflicts with the value *src* (*source*). The Head Fragment Construction, interacting with the case assignment system in Korean, can account for the case feature connectivity in a systematic way.

Now consider the following sprouting example with no overt correlate.

(80) A: Mimi-ka   pinan.pat-ass-e.
      Mimi-NOM   criticism.receive-PST-DECL
      'Mimi was criticized.'
    B: nwukwu-lopwuthe?/*nwukwu?
      who-from/who

As seen from B's response, the fragment with no case value *nwukwu* is not possible here. We suggest that this contrast (syntactic identity with no overt correlate) has to do with context updating or recoverability of the covert correlate.

Before we spell out the context-updating analysis in detail, let us consider the properties of null arguments since sprouting examples involve at least one null argument. Ruppenhofer and Michaelis (2014) distinguish two major types of null complements in English, definite and indefinite null complements, as illustrated by the following:

(81) a. John loves to read [*e*].
     b. No doubt, mistakes were made [*e*].
     c. We arrived [*e*] at 8 pm.

The unexpressed argument in (81a) and the one in (81b) behave alike in that the material that John loves to read or the agent making the mistake need not be mutually known to the interlocutors, whose omission can thus be said to be an instance of indefinite null instantiation (INI). By contrast, the unexpressed goal argument in (81c) is known to the interlocutors in the given context and the omission of the argument is thus an instance of definite null instantiation (DNI).

One clear distinction between the INI and DNI, noted by Ruppenhofer and Michaelis (2014), is whether we can reconstruct the missing argument by an indefinite expression like *something, someone* or a definite expression like *it* or *him*.

Incorporating this idea within the type feature system (where types are in italics), we can introduce two signs *overt* and *ini*, the latter of which can be resolved to a covert argument or an instance of INI. Given this type system, we may represent the omitted or unrealized argument of *read* as following (see Ruppenhofer and Michaelis, 2014 also):

(82)   Lexical entry for *read*:

$$\begin{bmatrix} \text{FORM } \langle read \rangle \\ \text{ARG-ST} \left\langle \text{NP}_i, \text{NP}_x \right\rangle \\ \text{SYN} \begin{bmatrix} \text{SUBJ} \left\langle \text{NP}[overt] \right\rangle \\ \text{COMPS} \left\langle \text{NP}[ini] \right\rangle \end{bmatrix} \\ \text{SEM } read(i, x) \end{bmatrix}$$

The lexical information specifies that the second argument of *read* can be an indefinite null instantiation (an unrealized indefinite NP) while the first argument needs to be an overt one.

Similar to English null arguments, the null arguments in Korean can also appear in several environments, as illustrated in the following (see Ahn and Cho, 2012b; Park, 2012 for detailed discussion):

(83)   a.   [*e*]   cham   cal   talli-n-ta.
                 really   fast   run-PRES-DECL
           '(I/He/She/They/It) really runs fast.'
       b.   Mimi-nun   Nana-ka   [*e*/caki/ku-lul]   ttayly-ess-ta-ko   malha-yess-ta.
             Mimi-TOP   Nana-NOM   e/self/he-ACC   hit-PST-DECL-COMP   say-PST-DECL
             'Mimi said that Nana hit herself/him.'

The null subject in (83a) refers to someone physically present, whose reference is provided in the discourse context. Meanwhile, the null object in (83b) is in variation with the overt resumptive pronouns, *caki-lul* 'self-ACC' or *ku-lul* 'he-ACC'. Its coindexing relation is controlled (A-bound) by the matrix argument, suggesting it is a *pro*, but not a variable. Null arguments in Korean can also be classified into two types, DNI and INI. Sprouting examples we discuss here all include INI cases as evidenced from the fact that we cannot replace the implicit argument by a definite NP:

(84)   a.   ches   khisu-lul   (*ku-wa)   ha-yess-nuntey,   **nwukwu-wa-i-nci**   molu-keyss-ta.
             first   kiss-ACC   he-with   do-PST-but   who-with-COP-QUE   not.know-PRES-DECL
             '*(I) did the first kiss with him, but I don't know with whom.'
       b.   Mimi-ka   (*ku-lopwuthe)   pinan.pat-ass-nuntey,   **nwukwu-*(lopwuthe)-i-nci**   molu-keyss-ta.
             Mimi-NOM   he-from   criticism.receive-PST-but   who-(from)-COP-QUE   not.know-PRES-DECL
             'Mimi received a criticism from him, but I do not know from whom.'

This then implies that the unrealized argument of the matrix verb *pinan.pat-* 'be criticized' in (80A) and the one in (80b), both of which are sprouting examples, is realized not as a definite but as an indefinite instantiation, as represented in the following:

(85)   Lexical information for *pinan.pat-*'be.criticized'

$$\begin{bmatrix} \text{FORM } \langle pinan.pat\text{-} \rangle \\ \text{ARG-ST} \left\langle \text{NP}_i, \text{NP}_x[\text{SCASE } src] \right\rangle \\ \text{SYN} \begin{bmatrix} \text{SUBJ} \left\langle \text{NP}[overt] \right\rangle \\ \text{COMPS} \left\langle \text{NP}[ini] \right\rangle \end{bmatrix} \\ \text{SEM } be.criticized(i, x) \end{bmatrix}$$

The verb selects two arguments. The first argument is realized as the overt subject while the second one whose semantic role (semantic case) is *src* is realized as a complement. But note that this complement is not an overt one but a covert indefinite null instantiation (*ini*).

Now consider the dialogue in (80). Uttering the sentence with A would then update the DGB as following, triggered from the verb *pinan.pat-* 'be criticized':

(86)

$$\left[\text{DGB} \left[\text{SAT-UTT} \left[\text{SYN NP} \begin{bmatrix} ini \\ \text{SCASE } src \\ \text{INDEX } x \end{bmatrix} \\ \text{SEM } be.criticized(m,x) \right]\right]\right]$$

Our direct interpretation with the Head-Fragment Construction would then project the following structure for the fragment *nwukwu-lopwuthe* 'who-from':

(87)

S

$$\begin{bmatrix} \text{SYN } \boxed{2} \\ \text{SEM } \boxed{3} \\ \text{DGB} \left[\begin{bmatrix} \text{MAX-QUD } \lambda\left\{\pi^i\right\}\left[be.criticized(m,i)\right] \\ \text{SAL-UTT} \left[\begin{matrix} \text{SYN} \left[\text{CAT } \boxed{1} \begin{bmatrix} ini \\ \text{SCASE } src \\ \text{INDEX } i \end{bmatrix}\right] \\ \text{SEM} \begin{bmatrix} \text{IND} \quad i \\ \text{PARAMS} \quad \left\{\pi^i\right\} \end{bmatrix} \end{matrix} \right] \end{bmatrix} \right] \end{bmatrix}$$

|

NP

$$\begin{bmatrix} \text{SYN } \boxed{2}\left[\text{CAT } \boxed{1} \begin{bmatrix} \text{POS} \quad nominal \\ \text{SCASE} \quad src \end{bmatrix}\right] \\ \text{SEM } \boxed{3}\begin{bmatrix} \text{IND} \quad i \\ \text{PARAMS} \quad \left\{\pi^i\right\} \end{bmatrix} \end{bmatrix}$$

nwukwu-lopwuthe 'who-from'?

A's utterance in (80) includes no covert correlate but is realized as an implicit argument triggered from the expression *pinan.pat-* 'be criticized'. This unrealized argument is introduced in discourse when one utters the proposition 'Mimi is being criticized'. B's fragment makes this unrealized argument as a member of the salient utterance (SAL-UTT). Since the Head-Fragment Construction ensures that this salient member matches with the fragment in terms of the CAT value, the fragment and the SAL-UTT both need to have the identical CASE value, part of the CAT information. This means that we cannot have fragments like *nwukwu-ka* 'who-NOM' as a fragment answer because of the conflicts in the case feature (*nom* and *src*).

The remaining question is why the bare-case marked NP is not licensed with no overt correlate (see (80)). That is, unlike examples with an overt correlate (see (78)), the syntactic or semantic case marking in the fragment (or matrix sluicing) cannot be omitted. How can we ensure this exact syntactic identity between the covert correlate and the matrix sluice? What we can observe here is that the case marker of the covert or unexpressed NP whose syntactic information is contextually updated must be present. This condition can be phrased as following:

(88)   Full Instantiation Constraint (FIC):
        The syntactic information (e.g., case features) not available at surface but updated in the DGB needs to be
        fully specified in the subsequent syntax.

This condition has the effect of Chung's (2006) 'no new word constraint' specifying that an ellipsis site cannot contain any
'new' words, as we have seen in the *jealous* example in (38). Chung's condition is to capture the pattern in which the
English preposition may be absent provided that the corresponding PP is realized. Note thus that Chung's constraint is a
lexical requirement, while the FIC is rather discourse-based account.
    The motivations of the FIC can be found in the anaphoric nature of sluicing and the question of identifying what is an
issue (question under the discussion). We have seen that merger type of sluicing examples contain an indefinite correlate
in the antecedent clause which introduces an issue (QUD) into the discourse and an interrogative clause which
anaphorically retrieves this issue (see AnderBois, 2010, 2014 also). The linguistic or contextual discourse thus needs to
make salient this issue. With the merger case with an overt correlate, we have no difficulties in identifying this issue.
However, sprouting examples with no overt correlate make it difficult to pick out the issue, as seen from the following
contrastive English examples:

(89)   a.   *[The cake was eaten], and I want to find out [who] <ate the cake>.
        b.   [The cake was eaten by someone], and I want to find out [who] <the cake was eaten by>.

The overt indefinite in (89b) raises the issue of what individual ate the cake, but (89a) has no such an overt indefinite. The
sentence (89a) with an implicit passive agent cannot raise this issue, not being able to make salient the issue of which
alternatives hold. The FIC thus helps the interlocutors to identify the issue in question by making the relevant syntactic
information salient. That is, with an overt correlate, the issue is easier to be evoked in the awareness of the hearer (see
Kim and Kuno, 2013 too). With a covert correlate, the hearer needs to have syntactic and semantic information that
enables him or her to identify the issue.
    With this motivation for the FIC in mind, consider the following dialogue in Korean:

(90)   A: John-i   ecey   pam   salhaytoy-ess-e.
             John-NOM   yesterday night be.murdered-PST-DECL
             'John was murdered last night.'
        B: nwukwu-eyuyhay? / *nwukwu?
             who-by /   who
             'By whom?'

The fragment answer here cannot omit the postpositional semantic case *eyuyhay* since there is no overt correlate. Our
discourse-based theory would update the following DGB information:

$$(91)\quad \left[\text{DGB} \left[\text{SAT-UTT} \left[\begin{array}{l} \text{SYN NP} \left[\begin{array}{l} ini \\ \text{SCASE } agt \\ \text{INDEX } x \end{array} \right] \\ \text{SEM } be.murdered\,(j,x) \end{array} \right] \right] \right]$$

The FIC in (88) ensures that the syntactic information of the unrealized agentive NP be specified at the subsequent
syntax, linking the contextually updated information with syntax (or morphosyntactic) information. This is why we cannot
omit the postpositional semantic case in (90), supporting the rationale for the proposed FIC in (88). This processing-based
account can also account for the disambiguation of possible correlates. Consider the following dialogue:

(92)   A: namhaksayng-i   yehaksayng-eykey   senmwulha-yess-e.
             male.student-NOM   female.student-DAT   present.do-PST-DECL
             'A male student gave a present to a female student.'
        B: nwukwu-eykey? / nwukwu?
             who-DAT   who?
             'To whom/Who?'

Note that the fragment answer can be either dative-case marked or bare-case marked, but the interpretation is different.
The DAT fragment is linked to the covert DAT correlate 'to which female student' while the bare-case fragment is linked to the

subject 'which male student' (since the NOM marking can be optionally realized). The FIC thus plays a key role in recovering the correlate. For example, the specified syntactic information by the FIC allows us to disambiguate from potential correlates what the proper correlate is.

The motivation for the FIC can be also found in sprouting examples. When there is no correlate for the *wh*-remnant, and its correlate is evoked at the discourse level, the grammar needs to refer to the full grammatical information of the evoked correlate to minimize the processing load. Consider the following sprouting example:

(93) A: han   haksayng-i   senmwul-ul   pat-ass-e.
          a   student-NOM   present-ACC   receive-PST-DECL
          'A student received a present.'
      B: nwukwu-lopwuthe?/nwukwu?
          who-SRC/who?
          'From whom?/Who?'

The unrealized argument of the matrix verb *pat-ass-e* 'receive' is a source argument. There are thus two possible fragment answers for (93A): one with the semantic case marking *src* and the other with no case marking. The case-marked NP *nwukwu-lopwuthe* 'who-SRC' is asking from whom the student received a present, while the bare-case marked NP *nwukwu* 'who' is linked to the indefinite NP subject *a student*. This implies that the omission of the case marking or syntactic information also depends on the context as stated in the FIC.

5.3. Embedded sluicing as predicate fragments

Now let us turn to embedded sluicing with a *wh*-remnant in the embedded clause. In offering an analysis for Korean embedded sluicing, the first thing to remember, as we have discussed in Section 2.1, is that a nominal fragment cannot be embedded or serve as the complement of a verb selecting an interrogative clause because of language independent reason: an (indirect or direct) interrogative clause needs to be marked with a Q-particle like *-(nu)nci*. In Section 3.1 (the discussion around (31)), we have also seen that embedded sluicing cannot be derived from pseudocleft constructions, mainly because of the overt discrepancies between the two. The embedded sluicing, merger and sprouting alike, can license the optional subject *kukey* 'it' here, but this is not possible in matrix (short answer) fragments. This difference gives us the following contrast:

(94) Mimi-ka   pinan.pat-ass-nuntey,   kukey nwukwu-lopwuthe-i-nci   molu-keyss-ta.
      Mimi-NOM   criticism.receive-PST-but   it   who-from-COP-QUE   not.know-PRES-DECL
      'Mimi received a criticism, but I do not know from whom it is.'

(95) A: Mimi-ka   pinan.pat-ass-e.
          Mimi-NOM   criticism.receive-PST-DECL
          'Mimi was criticized.'
      B: *kukey   nwukwu-lopwuthe?
          it   who-from?

Unlike matrix sluicing, embedded sluicing can introduce the optional subject *kukey*, which we have discussed in Section 2.1. This difference implies that we cannot treat embedded sluicing as a full interrogative clause with a subject (either *kukey* or a *pro*). A more tenable direction is to treat the embedded sluice as a subtype of fragment – predicate fragment, as suggested by Kim and Sells (2013a,b).

The assumption we thus accept is that matrix sluicing in Korean is a nominal fragment while embedded sluicing is a predicate fragment. The key difference between embedded and matrix sluicing is that the former is headed by the copula verb. English sluices are fragments which can have a clausal interpretation, in main or embedded clauses. Meanwhile, in Korean, only nominal expressions can be main clause (matrix) fragments: they cannot occur in the embedded contexts due to the lexical requirement of the matrix predicate. Hence the embedded context, due to the lexical properties of the matrix predicate, requires not only the embedding complementizer but also the copula verb attached to the *wh*-remnant. Reflecting such independent properties of embedded sluicing, we introduce the following construction as a subtype of fragment constructions[26]:

---

[26] This constructional constraint follows the one suggested for the English sluicing construction by Ginzburg and Sag (2000), Sag and Nykiel (2011), and Kim and Sells (2013a,b) for Korean.

(96)   Embedded Sluicing Construction in Korean:

$$
\begin{bmatrix}
\text{FORM} & \boxed{3}+\boxed{4} \\
\text{SYN} & \text{CAT } \boxed{6} \\
\text{SEM} & \lambda\Sigma\Phi \\
\text{DGB} & \begin{bmatrix} \text{SAT-UTT} & \begin{bmatrix}\text{CAT } \boxed{1}\\ \text{SEM } \boxed{2}\end{bmatrix} \\ \text{MAX-QUD} & \lambda\{\ \}\ \Phi \end{bmatrix}
\end{bmatrix}
\rightarrow
\boxed{5}\text{XP}
\begin{bmatrix}
\text{FORM} & \boxed{3} \\
\text{CAT} & \boxed{1} \\
\text{SEM} & \boxed{2} \\
\text{PARAMS} & neset \\
\text{WH} & \Sigma
\end{bmatrix}
\ \mathbf{H}\
\begin{bmatrix}
\text{FORM } \boxed{4} \\
\text{SYN} \ \begin{bmatrix}\text{CAT} & \boxed{6} \begin{bmatrix}\text{POS} & copula\\ \text{MOOD} & que\\ \text{IC} & -\end{bmatrix}\end{bmatrix} \\
\text{SUBJ} \quad \langle(\text{NP}[pro])\rangle \\
\text{COMPS} \quad \langle\boxed{5}\text{XP}\rangle
\end{bmatrix}
$$

The key difference from the nominal Head-Fragment Construction is that the head of embedded sluicing is the copula verb *i-*. According to this constructional constraint, the sluicing construction thus consists of two expressions: a *wh*-expression and a copula marked with the Q-particle. The FORM value here is meant to reflect the clitic-like property of the copula: the Korean copula forms a phonological and morpho-syntactic unit with its preceding N host (see Kim et al., 2008).

Let us consider what this constructional constraint implies for Korean sluicing. As we have discussed in Section 2, sluicing has two types: merger and sprouting. We have seen that the two types behave differently with respect to the realization of case markings. In particular, with no overt correlate, the *wh*-remnant must have the case value corresponding to that of the covert correlate. Consider the following dialogue:

(97)   A: Mimi-ka   pinan.pat-ko   iss-e.
            Mimi-NOM   be.criticized-CONN   exist-DECL
            'Mimi is being criticized.'
        B: (kukey)   **nwukwu-lopwuthe**-i-nci   al-ni?
            it   who-from-COP-QUE   know-QUE
            'Do you know from whom?'

The sluicing constructional constraint in (96) eventually generates a structure like the following:

(98)

As illustrated in the structure, the copula verb (*i-*) has two arguments: subject (realized as the optional subject *kukey*) and a complement. The copula verb is followed by the interrogative complementizer adding the *que* value for the feature MOOD and the negative value for the IC (independent clause). The CAT information including such values is projected up to the S level. The *wh*-expression *nwukwu-lopwuthe* 'who-from' here serves as the complement of the copula, but at the same time the expression is linked to a covert correlate. The *wh*-expression, as the salient utterance (SAL-UTT), also introduces a parameter value, evoking the question under discussion – the question of whom Mimi is criticized by. This ensures that the *wh*-remnant is linked to the salient utterance which essentially defines the form that the remnant has to be compatible with.

The present system thus relies on the discourse update, implying that the precedence relationship with the clause including a correlate is not a key issue. That is, the system can easily account for reverse sluicing (see Section 2.1) where the *wh*-remnant or embedded sluicing precedes the clause with its correlate (see Gullifer, 2004 for reverse sluicing in English):

(99) a. nwukwu-i-nci molu-ciman, nwukwun-ka nay cha-lul kocangnay-ss-e.
          who-COP-QUE not.know-but someone-NOM my car-ACC break-PST-DECL
          'I don't know who, but someone broke my car.'
      b. way-i-nci molu-ciman, Mimi-ka ttena-ss-e.
          why-COP-QUE not.know-but Mimi-NOM leave-PST-DECL
          'I don't know why, but Mimi left.'

Until meeting the second clause in each of these examples, there is no information about the QUD. The overt indefinite *nwukwun-ka* of the matrix clause in (99a) and the covert indefinite correlate of the matrix clause in (99b) helps to evoke the appropriate QUD for each case. The interpretation of such reverse sluicing examples thus also hinges on the availability of the relevant discourse information, supporting the present analysis.

In Section 3 (see the example (34)), we have seen that Korean sluicing allows multiple *wh*-remnants, which is not possible either in pseudocleft or in canonical copula constructions. The following contrast shows that typical copula constructions also do not allow multiple complements:

(100) a. i kes-un mwues-i-pnikka?
          this thing-TOP what-COP-QUE
          'What is this?'
       b. *i kes-un mwues-i way-i-pnikka?
          this thing-TOP what-NOM why-COP-QUE

There is only one pre-copular expression licensed as the copula's complement. This is different from the sluicing construction in which more than one *wh*-sluiced phrase can appear, assigning distinctive properties to sluicing in Korean and leading to the postulation of sluicing in Korean as an independent construction. The possibility of licensing multiple *wh*-remnants can be attributed to the construction property. The only thing we need to do is to revise the Embedded Sluicing Construction in (96), as simplified in the following:

(101) Embedded Sluicing Construction in Korean
       [] $\Rightarrow$ XP$^+$ copula

This revised construction rule with the Kleene plus operator allows the *wh*-remnant XP to be more than one, whose option is not allowed in languages like English. This language particular availability as the constructional property would then license examples like (103):

(102) catongcha-ka wancenhi paksalna.iss-e. encey nwu-ka way-i-nci molu-keyss-e.
       car-NOM completely destroyed-DECL when who-NOM why-COP-QUE not.know-PRES-DECL
       '(int.) The car was completely destroyed. I don't know when, who, and why.'

5.4. Further welcoming consequences

Since the analysis set forth here defines the ellipsis resolution in terms of DGB including the MAX-QUD and SAL-UTT information, it provides a semantic/pragmatic account of sluicing. That is, the dialogue plays an important role in shaping the questions under discussion, and the value of MAX-QUD is constantly being updated as a dialogue progresses, including the record of the denotation of any given referring expression. This explains the indexical resolution in sluicing we discussed in Section 4.1, as repeated in the following:

(103)   A: nwukwunka-ka   na-lul   ttalao-ko   iss-e.
            someone-NOM   me-ACC   follow-CONN   be-DECL
            'Someone is following me.'
        B: nwukwu-i-nci   kwungkumha-ney.
            who-COP-QUE   wonder-DECL
            'I wonder who is following you ≠ who is following me.'

A's utterance here would evoke the following DGB:

(104)

$$\left[\text{DGB} \left[\begin{array}{l} \text{MAX-QUD } \lambda\left\{\pi^i\right\}\left[follow(i,\,spk)\right] \\ \text{SAL-UTT} \left[\begin{array}{l} \text{SYN NP} \\ \text{SEM } someone^i \end{array} \right] \end{array} \right] \right]$$

B's question is who is the one following the speaker A, not B. That is, the parameter evoked here is not linked to the speaker B. The present analysis thus requires no syntactic identity, easily blocking the unintended reading in which the parameter is linked to B, as we have seen in Section 4.1.

   Island repair for merger type of sluicing has been an issue for the deletion approach that involves the application of *wh*-movement: the movement cannot violate island constraints, but sluicing examples license island repair. As a solution, the deletion approach has suggested that the deletion and movement processes in sluicing are relevant to PF representations (see Merchant, 2001, 2004 and subsequent papers). By contrast, our DI approach, following Ginzburg and Sag (2000), Culicover and Jackendoff (2005), and Sag and Nykiel (2011), avoids this issue: the remnants are directly generated, and no island-sensitive operations are thus involved. That is, the remnant clause involves no filler-gap dependency and hence no expectation that properties of *wh*-movement will be projected into the grammar of sluicing. This direction, as shown by Frazier and Clifton (2005, 2006) and Kim and Kuno (2013), also reflects the observations that island repair in merger and sprouting displays great variations in acceptability, and that the variations depend on the context, rather than on syntactic conditions. This is what we have observed for merger cases in Korean too.[27]

   A question arises why island repair in sprouting is in general more difficult to be repaired than island repair in merger, as we have seen in Section 2. Let us consider a CNPC violating example in English here again since the same account can be applied for Korean too:

(105) *I saw the movie that showed Ivy eating, but I just can't remember what.

This sentence, including no overt correlate for the *wh*-remnant, would update the following DGB, triggered by the lexical expression *eating*:

(106)

$$\left[\text{DGB} \left[\text{SAT-UTT} \left[\begin{array}{l} \text{SYN NP} \left[\begin{array}{l} ini \\ \text{INDEX } x \end{array} \right] \\ \text{SEM } eat(i,x) \end{array} \right] \right] \right]$$

The second argument of the verb *eat* is realized as an *ini* argument. Note that the FIC in (88) requires that the syntactic information of the INI NP is fully specified since the correlate's information is not available at surface. If we specify the

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[27] As an anonymous reviewer points out, the proposal that ellipsis (sluicing and fragments) can repair island violations has recently been challenged by several literature (see, among others, Abe, 2014; Griffiths and Lipták, 2014; Barros et al., 2014). Abe (2014) argues that the *wh*-remnant stays in situ, rather than undergoes a movement. His analysis, adopting Kimura (2010), is similar to ours in that there is no *wh*-movement operations, but differs from us in terms of the postulation of deletion processes. For instance, Abe (2014) assumes the following derivation for sluicing:

(i)   ..., you can't imagine [CP [TP ~~he is writing~~ what]]

As seen from this, the in-situ analysis involves no overt wh-movement, but it uses an operation deleting non-constituent expressions. Since there is no overt wh-movement involved in the derivation, the analysis nullifies the mechanism of island repair. See Abe (2014) for detailed discussion of this in-situ analysis for Japanese ellipsis.

syntactic information of this NP, we can easily notice that the NP is positioned within the complex NP, violating the CNPC requiring that no syntactic operation should refer to an expression within the island.[28]

The FIC is not a syntactic-based but a discourse-based constraint. This discourse-based direction can be supported by island repair examples like the following (data from Kim and Kuno, 2013):

(107) a. Mary met a man who claimed he could turn copper into gold, but she couldn't find out from him with what kind of technique.
       b. (Tony has been painting with two kinds of brushes: badger-hair brushes and horse-hair brushes.) Yesterday, he showed Mary a picture that he had just painted, but he didn't tell her with which kind of brushes.

Kim and Kuno (2013) show that these island repairing examples even with no overt correlate are possible since what the *wh*-remnant refers to is 'in the awareness of the hearer'. We can then conjecture that when the correlate is in the awareness of the hearer, the correlate need not be an INI argument anymore, thus not evoking the relevant syntactic information. This is possible because the issue is already salient in the discourse even if there is no overt correlate. This kind of discourse-based account is in parallel with the observations made by Frazier and Clifton (2005) and Frazier and Clifton (2006). They point out that with an overt correlate, the discourse correlate is allowed to relate the sluice to the correlate in islands whereas with an implicit correlate, the comprehender needs the syntactic processor, which must obey island constraints, to sprout the missing correlate. This is what the FIC suggests. However, island sensitivity in sprouting can be relaxed when the discourse processor identifies the issue even though there is no overt correlate. This is what the examples in (107) illustrate.

Even though the present analysis is basically discourse-based, it also allows for the existence of connectivity phenomena in which we find a certain syntactic parallelism between the sluicing target and source. Note that as the constructional constraints of the sluicing construction, the category (e.g., POS and CASE values) of the *wh*-remnant must match the category of the correlate. This is ensured by the feature SAL-UTT functioning as the focus establishing constituent. We have seen that the CASE feature is part of the feature CAT value, and the present analysis ensures the CASE 'compatibility' between the *wh*-remnant and the putative correlate. The CASE compatibility requirement can also account for the voice matching effect in sluicing. Let us consider the following English and Korean examples:

(108) a. *Someone shot Ben, but I don't know by whom <Ben was shot>.
       b. *nwukwunka-ka Mimi-lul   sso-ass-nuntey, na-nun **nwukwu-eykey**-i-nci molu-keyss-ta.
           someone-NOM   Mimi-ACC   shoot-PST-but   I-TOP   who-by-COP-QUE   not.know-PRES-DECL
           '*Someone shot Mimi, I don't know by whom.'

(109) a. *The criminal was caught, but I do not know who < caught the criminal>.
       b. ku pemin-i   cap-hi-yess-nuntey, **nwukwu-*(eykey)**-i-nci molu-keyss-ta.
           the criminal-NOM   catch-PASS-PST-but   who-by-COP-QUE   not.know-PRES-DECL
           'The criminal was caught, but I do not know by whom.'

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[28] Another important property that questions the (in)sensitivity of island violations concerns the role of 'contrastivity'. The effects of contrasitivity in fragments have been discussed in depth by Griffiths and Lipták (2014) and references therein. They show that contrastive fragments do not repair islands while non-fragments do, as seen from the following contrast (examples from Griffiths and Lipták, 2014):

(i)   A: I heard that Irv and a certain someone from your syntax class were dancing together last night.
      B: Yeah, Bill.
      B′: Really? Who?
(ii) A: I heard that Irv and JOHN were dancing together last night.
      B: *No BILL.

Sluicing is also similar in that it repairs islands when the *wh*-remnant is non-contrastive, but not otherwise.

(iii) a. Abby wants to hire someone who speaks a Balkan language, but I don't remember which.
       b. *Abby wants to hire someone who speaks GREEK fluently, but I don't remember what OTHER language.

As such, island sensitivity in fragments and sluicing has a close relation with the contrastivity of the fragment in question with respect to its correlate, which has been also discussed by Barros (2014) and Barros et al. (2014). To account for the role of contrastivity in ellipsis, Griffiths and Lipták (2014) appeals to the LF constraint of scopal 'Parallelism', which requires that variables in the antecedent and the elided clauses are bound from parallel positions. The present analysis does not address the role of contrastivity in ellipsis, but a possible extension of this analysis could adopt the scopal Parallelism condition suggested by Griffiths and Lipták (2014).

Let us consider the merger example (108b) first. The first clause here will activate the following DGB:

(110)
$$\left[\text{DGB} \begin{bmatrix} \text{MAX-QUD } \lambda\left\{\pi^i\right\}[shoot(i, m)] \\ \text{SAL-UTT} \begin{bmatrix} \text{SYN NP} \\ \text{SEM } someone^i \end{bmatrix} \end{bmatrix} \right]$$

Since the context here provides the overt correlate *nwukwunka-ka* 'someone-NOM', but the *wh*-remnant is *nwukwu-eykey* 'who-DAT'. The two thus cannot be linked because the Embedded Sluicing Construction requires the two to have the same CAT value including CASE. This is why the *wh*-remnant here cannot be either *nwukwu-eykey* 'who-DAT' or *nwukwu-lul* 'who-ACC'.[29] The interactions between the constructional constraints and updated DGB thus require tight syntactic identities in the merger case.

Now consider the sprouting example (109b). The matrix predicate in the first clause would have the following lexical information:

(111)   Lexical information for *be.caught-*

$$\begin{bmatrix} \text{FORM } \langle be.caught \rangle \\ \text{ARG-ST} \left\langle \text{NP}_i, \text{NP}_x[\text{SCASE } obl] \right\rangle \\ \text{SYN} \begin{bmatrix} \text{SUBJ} \left\langle \text{NP}[overt] \right\rangle \\ \text{COMPS} \left\langle \text{NP}[ini] \right\rangle \end{bmatrix} \\ \text{SEM } be.caught(c, i) \end{bmatrix}$$

The second argument carrying the semantic role of 'agent' with an oblique semantic case (SCASE) value is not realized as the complement. It is realized as an indefinite null argument as an instance of *ini*. The sentence in (109b) with the *wh*-remnant in the second clause would then update the DGB as following:

(112)
$$\left[\text{DGB} \begin{bmatrix} \text{SAT-UTT} \begin{bmatrix} \text{SYN NP} \begin{bmatrix} ini \\ \text{SCASE } obl \end{bmatrix} \\ \text{SEN } someone^i \end{bmatrix} \\ \text{MAX-QUD } \lambda\left\{\pi^i\right\}[be.caught(c, i)] \end{bmatrix} \right]$$

As noted, the salient-utterance information linked to the unrealized argument (*ini*) is introduced by context, entering into the QUD. That is, to refer to the context-providing correlate, the DGB needs to refer to the *ini* expression including both syntactic and semantic information. Otherwise, the *wh*-remnant cannot be linked to a proper antecedent. This is why we need to have syntactic as well as semantic identity in sprouting.

As we have seen, merger and sprouting are slightly different with respect to how the DGB is updated, due to the overt or covert correlate. That is, for merger with the overt correlate, we need to interpret the variable (parameter) evoked by the antecedent of the *wh*-remnant linked to the QUD. As for sprouting with a covert correlate, the context evokes a covert variable (parameter), the *wh*-remnant then asks the value of this variable under discussion. In doing so, we need to refer not only to the semantic but also to the syntactic information of the uninstantiated antecedent in accordance with the FIC.

6. Conclusion

We have seen that both matrix and embedded sluicing, each as a subtype of fragments, is basically an anaphoric phenomenon whose remnant constituents are directly generated without extraction and deletion. This paper shows that a construction-based account with the direct generation of sluicing can offer a satisfying account of syntactic and semantic

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[29] The English example in (109) can be accounted for with the same manner: the *wh*-remnant and its correlate need to have the same CAT value. See Sag and Nykiel (2011).

properties of sluicing in Korean. In particular, our account enables us to avoid certain pitfalls that affect both syntactically-based and semantically-based accounts.

The present analysis has shown that the QUD in the dialogue provides the basis for the interpretation of the fragments (including matrix sluicing) and sluices in embedded environments. Even though the analysis offers a discourse-based account of sluicing with constantly evolving questions-under discussion, it requires syntactic and semantic identity conditions when in need. This construction-based and direct-licensing approach to the Korean sluicing also presupposes less syntactic structure but offers a viable analysis for two types of sluicing in Korean. It shows that even with no postulation of hidden syntactic structures, we can offer a satisfactory account for intriguing properties of the sluicing in matrix and embedded environments.

Acknowledgements

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