STRICT VS. FREE WORD ORDER PATTERNS IN KOREAN NOMINAL PHRASES AND CYCLIC LINEARIZATION*

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Abstract. Korean nominal phrases display both flexibility in their internal word order and also rigidity in the sequencing of certain elements. This paper focuses on a linear ordering constraint on the occurrence of arguments of nouns which requires a strict relative sequencing of such elements, no matter where they are distributed across different locations within DPs. The paper suggests that the most appropriate mechanism to capture the complex patterns observed is Fox and Pesetsky's (2005) Cyclic Linearization approach, which records and compares the linear ordering of elements across different Spell-out domains. It is argued that the patterns found in Korean can be successfully captured in a Cyclic Linearization analysis if it is assumed that Korean nominal projections consist in two Spell-out domains–DP and nP – in a way resembling the bi-cyclic composition of clauses, and that Korean provides novel support from the syntax of *nominal* phrases for Cyclic Linearization, originally motivated by patterns found in *clausal* domains.

1. Introduction

Nominal phrases in Korean have been noted to exhibit a range of free word order possibilities, as illustrated in (1) from An (2014:384), in which adjectival relative clauses, numeral-classifier sequences, and demonstratives are seen to occur in all possible orderings relative to each other, before the final head noun:

(1) a. ku   twu-chay-uy saylowu-n kenmwul
       DEM 2-CL-GEN   new-PRT   building
       'these two new buildings'   (Dem > Num-CL > RC > N)
    b. ku saylowu-n twu-chay-uy kenmwul
                                 (Dem > RC > Num-CL > N)
    c. twu-chay-uy ku saylowu-n kenmwul
                                 (Num-CL > Dem > RC > N)
    d. twu-chay-uy saylowu-n ku kenmwul
                                 (Num-CL > RC > Dem > N)
    e. saylowu-n ku twu-chay-uy kenmwul
                                 (RC > Dem > Num-CL > N)
    f. saylowu-n twu-chay-uy ku kenmwul
                                 (RC > Num-CL > Dem > N)

However, other elements within nominal phrases show a strict order relative to each other, as again noted in An (2014:385) (see also Hong 2010 and Kim 2014 for positions of prenominal modifiers in Korean). Where numerals occur without the support of classifiers and the genitive marker *uy*, and where adjectives are bare and not introduced in a relative clause-like form, these elements follow a rigid sequencing, positioned between demonstratives and the head noun, as shown in (2):

(2) a. ku   twu say kenmwul   (Dem > Num > Adj > N)
       DEM 2   new building
       'these two new buildings'
   b. *ku say twu kenmwul   (Dem > Adj > Num > N)
   c. *twu ku say kenmwul   (Num > Dem > Adj > N)
   d. *twu say ku kenmwul   (Num > Adj > Dem > N)
   e. *say ku twu kenmwul   (Adj > Dem > Num > N)
   f. *say twu ku kenmwul   (Adj > Num > Dem > N)[1]

A strict ordering of elements also occurs when the Agent and Theme arguments of a noun are overtly realized, as illustrated in (3):

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[1] Certain adjectives and numerals in Korean can thus be introduced into nominal phrases in different ways. There are monomorphemic 'bare' numerals and adjectives, which require a strict ordering relative to each other and various other elements, as illustrated in (2), and multi-morphemic numeral phrases and adjectival relative clauses, as shown in (1). Quite generally, claims have been increasingly made in the literature that numerals *in certain languages* may be merged inside nominal phrases in different ways, either as heads or as phrasal specifiers or as phrasal adjuncts (Franks 1994, Bailyn 2004, Shlonsky 2004,Borer 2005, Ionin and Matushansky 2006, Pereltsvaig 2006, Danon 2012, Zhang 2013). There are also theories of language change which suggest that phrasal elements may come to grammaticalize as heads of functional projections as such projections come into existence following a process of linear regularization and size reduction (Simpson and Wu 2002, van Gelderen 2004). Given the fact that the numerals and adjectives in Korean which occur in fixed positions are monomorphemic, it is tempting to suppose that these are indeed the heads of new projections, whereas multi-morphemic numeral phrases and adjectival relative clauses are introduced as phrasal adjuncts. Korean would therefore be another language in which certain elements may be combined into nominal syntactic structures in two different ways, and where merging such elements as heads in the main projection line results in strict ordering relations and is lexically restricted to occurring with a limited set of words, as a result of processes of grammaticalization. Syntactically, we assume that the numerals and adjectives which occur in phrasal adjuncts do not originate as heads in the main projection line and somehow raise into relative clauses or numeral-classifier phrases, but are base-generated independently in such constituents, as such hypothetical raising would involve movement to a non-c-commanding position.

(3) a. Phikhaso-uy Sellesuthina(-uy) chosanghwa (AG > TH > N)
        Picasso-GEN Celestina-GEN   portrait
        'Picasso's portrait of Celestina'[2]
    b. *Sellesuthina-uy Phikhaso(-uy) chosanghwa (TH > AG > N)

A natural question which arises in the modeling of noun phrase structure
in Korean is how to reconcile such free and strict word ordering
properties in the nominal domain. With regard to the patterns of strict
word order seen in (2) and (3), there may appear to be two rather
different sub-cases of such rigid sequencing. The first, presented in (2),
involves elements (bare adjectives) which are very restricted in their
positioning, and when other modifiers such as relative clauses or
numeral-classifier pairs are added into nominal phrases containing such
elements, the former can only occur preceding the latter, as in (4a) and
(4c), and not in positions following bare adjectives, as in (4b) and (4d).

(4) a. ku   twu-chay-uy say kenmwul
        DEM 2-CL-GEN   new building
        'these two new buildings'

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[2] One reviewer of the paper finds (3a), where both Agent and Theme are marked with
genitive *uy* a little awkward. However, this awkwardness appears to disappear when the
linear adjacency of an *uy*-marked Agent and Theme is interrupted by the presence of a
demonstrative *ku*, as in example (ii) (later repeated in the paper as (23)):

(i) Phikhaso-uy ku   Sellesuthina-uy chosanghwa
     Picasso-GEN DEM Celestina-GEN   portrait
     'this portrait of Celestina by Picasso'

We believe that the awkwardness which the reviewer finds with (3a) is a linear adjacency
effect similar to a restriction on the placement of adverbs ending in –*ly* in English. Many
speakers of English find the linear adjacency of two adverbs ending in –*ly* to be less than
perfect, but when these adverbs are separated by the subject, the awkwardness of such
examples is removed:

(ii) ??Fortunately, cleverly John decided to admit defeat.'
(iii) Fortunately John cleverly decided to admit defeat.'

As adverbs such as *cleverly* can appear to the left of subjects, the unnaturalness of (ii)
appears to be a linearity effect which is best described by means of a low-level adjacency
filter and not a special syntactic modeling. We suggest the same may be true for (3a), for
those speakers who find it less than perfect when both Agent and Theme are marked with
genitive *uy*. Because examples such as (i) show that there are two genitive-licensing positions
available in Korean nominal phrases, and that both Agent and Theme can be marked with
genitive *uy* within the same nominal phrase, these genitive cases should be available for the
Agent and Theme in sequences such as (3a), so it is odd that (3a) is felt by some speakers to
be somewhat imperfect. We suggest that the difference between examples like (3a) and (i)
(for speakers who experience a difference) should be attributed to a simple adjacency filter,
similar to that with English –*ly* adverbs, specifying that the linear adjacency of an *uy*-
marked Agent and Themes is dispreferred, hence that Agent and Theme arguments should,
by preference, either be separated from each other linearly by some other element, or the
Theme argument should occur bare without *uy*. For all speakers, whether such a filter has
an effect on the sequencing of arguments marked *uy*, there is a very clear contrast between
(3a) and (3b), and no speakers tolerate the positioning of a Theme before an Agent, however
these elements are marked (or whether an intervening demonstrative occurs).

b. *ku   say   twu-chay-uy kenmwul
   DEM new 2-CL-GEN   building

c. ku   khu-n   say   kenmwul
   DEM big-PRT new building
   'that big new building'

d. *ku   say   khu-n   kenmwul
   DEM new big-PRT building

However, when Agent and Theme arguments of nouns are present, a variety of orders relative to other modifying relative clauses and numeral-classifier pairs is possible, as illustrated in (5). What constrains the positioning of Agent and Theme is their ordering relative to each other, and not to other elements such as relative clauses and numeral-classifier pairs.

(5) a. Phikhaso-uy ku   saylowu-n Sellesuthina-uy chosanghwa
        Picasso-GEN DEM new-PRT   Celestina-GEN   portrait

    b. *Sellesuthina-uy ku   saylowu-n Phikhaso-uy chosanghwa
        Celestina-GEN   DEM new-PRT   Picasso-GEN portrait

    c. Phikhaso-uy ku   Sellesuthina-uy saylowu-n chosanghwa
        Picasso-GEN DEM Celestina-GEN   new-PRT   portrait

    d. *Sellesuthina-uy ku   Phikhaso-uy saylowu-n chosanghwa
        Celestina-GEN   DEM Picasso-GEN new-PRT   portrait

    e. ku saylowu-n Phikhaso-uy Sellesuthina chosanghwa
        new-PRT   Picasso-GEN Celestina   portrait

    f. *ku saylowu-n Sellesuthina-uy Phikhaso chosanghwa
        new-PRT   Celestina-GEN   Picasso   portrait

    g. ku   Phikhaso-uy saylowu-n Sellesuthina chosanghwa
        DEM Picasso-GEN new-PRT   Celestina   portrait

    h. *ku   Sellesuthina-uy saylowu-n Phikhaso chosanghwa.
        DEM Celestina-GEN   new-PRT   Picasso   portrait
        'Picasso's portrait of Celestina'

The contrasts in (4) and (5) suggest that the ordering of Agent and Theme arguments is determined by a different kind of morpho-syntactic property than that responsible for the sequencing of bare adjectives. Agent and Theme arguments may seem to have a certain 'mobility' and tolerate a positioning in different locations relative to other modifiers so long as the relative sequencing of Agent before Theme is maintained, whereas bare adjectives appear to be fully immobile and restricted to a very fixed position inside nominal projections. The latter ordering of bare adjectives can straightforwardly be captured with the assumption that such elements are base-generated in a particular position, below the possible attachment-sites of other modifying elements, and can never move away from this base position to other higher locations preceding

modifiers such as relative clauses and numeral classifier pairs, as well as demonstratives.[3]

The ordering of Agent and Theme arguments of the noun is more challenging to analyze. As noted, such constituents can optionally occur in a number of positions relative to other elements such as relative clauses, numeral-classifier pairs and demonstratives, but wherever Agent and Theme are positioned around other elements within nominal phrases, their relative sequence must always be Agent before Theme, as schematized in (6a).

(6) a. . . .X. . .Agent. . .Y. . .Theme. . .Z ..Noun
    b. *. . .X. . .Theme. . .Y. . .Agent. . .Z ..Noun

This suggests that the strict ordering of Agent and Theme arguments is not simply a function of such elements occurring in fixed base-generated positions – such elements appear to be mobile and quite flexible in their positioning within nominal projections, as long as their relative ordering remains as Agent > Theme. There is hence some dynamic component to the ordering of arguments of the head noun, causing a specific ordering to be reproduced wherever such elements occur, either immediately adjacent to the head noun which selects them or alternatively in higher positions around other modifiers and demonstratives that may be present. Making such an ordering restriction more intriguing still is the observation that there are other languages in which this is not a necessary sequencing, such as Spanish and Hebrew, where either Agent > Theme or Theme > Agent orders are reported to be well-formed in similar nominal structures, as shown in (7) and (8).

(7) a. Pedro conocía [el retrato   [de las Meininas]
        Pedro knew   the portrait of the Meninas
       [de Velasquez]]. (TH > AG)
        of Velazquez
    b. Pedro conocía [el retrato   [de Velasquez]
       Pedro knew   the portrait of Velasquez
       [de las Meininas]]. (AG > TH)
        of the Meninas
       'Pedro was familiar with Velazquez's portrait of the Meninas.'
                                                         (Ticio 2005:232)

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[3] Other patterns to be reviewed later in the paper will suggest that the position of demonstratives is also fixed, and that demonstratives are not able to move to different positions within nominal projections. This will reference the observation that when a demonstrative occurs together with a genitive-marked Agent and a genitive-marked Theme, the demonstrative can only occur between the two arguments. It may not be positioned before both arguments or after both arguments. Parallel patterns occur when a genitive-marked Possessor occurs with a genitive-marked Agent or Theme. This demonstrates that the position of demonstratives relative to certain other elements is not free.

(8) a. ha-tmuma [Sel ha-xamaniot] [Sel van gox] (TH > AG)
       the-picture   of the-sunflowers   of Van Gogh
       ha-tmuma [Sel van gox]   [Sel ha-xamaniot] (AG > TH)
       the-picture   of Van Gogh   of the-sunflowers
       'Van Gogh's picture of the sunflowers'   (Sichel 2003:450)

As the paper develops, it will be argued that the analytical tool most naturally suited to capture the interesting ordering properties of arguments in nominal projections in Korean, as well as the cross-linguistic variation noted in (7) and (8), is the notion of Cyclic Linearization proposed in Fox and Pesetsky (2005), and that the Korean patterns provide novel support from the nominal domain for Fox and Pesetsky's approach to Spell-out domains and Cyclic Linearization, which was originally developed to model patterns found among elements in the clausal domain. Before the paper proceeds to present such an analysis, earlier sections of the paper will lay more of the groundwork necessary to motivate a modelling along these lines. Section 2 will first establish more of the complex empirical patterns of ordering of elements in Korean nominal phrases, and the connections between this ordering and the marking of elements with the genitive/modification marker *uy*, in a way that reveals more information about the underlying structure of nominal phrases in Korean. Section 3 moves to the analysis of the paper, and shows how a Cyclic Linearization approach has the ability to enforce a parallel ordering on certain elements whenever these occur relocated into different (Spell-out) domains, as well as the flexibility to allow for cross-linguistic variation when ordering restrictions appear to be different across different languages. Section 4 summarizes the conclusions of the paper and its contribution to ongoing discussions of how syntactic structure is incrementally sequenced via processes of Spell-Out.

2. Word order variation in nominal phrases: exploring the paradigm

2.1. *The positions of Agents and Themes within nominal projections*

The Agent and Theme arguments of nouns may occur in a range of positions within nominal projections relative to other elements, and this positioning exhibits a direct correlation with the presence or absence of genitive case-marking by means of the particle *uy*. Here we will probe the relation of argument position to *uy*-marking through a comparison of patterns found with the result nominal *chosanghwa* 'portrait'. We choose to focus on a result nominal of this type because it actually allows for three animate arguments all of which can be marked with *uy* if the syntactic configuration permits this – Agent, Theme, and Possessor. Such a nominal shows what seems to be *maximally possible* with regard to the

genitive-marking of nominal arguments, and how this is subsequently constrained by syntactic position and the location of arguments relative to other elements. Other argument-taking nominals may be more restricted in what they permit. For example, a process nominal such as *chimlayk* 'invasion' allows an Agent and a Theme but not a Possessor, and a noun such as *chayk* 'book' may not allow for an inanimate Theme to be *uy*-marked if a genitive-marked Agent occurs. It should therefore be borne in mind that what is being examined and reported here is the patterning of the most 'permissive' of nouns in Korean and how this provides a potentially useful and significant window into constraints on movement within DPs. With certain other nouns, additional restrictions on the appearance of a noun's arguments may apply and result in less DP-internal movement/placement possibilities, consequently providing less information and insight into syntactic processes which determine how movement may occur.[4,5]

When either an Agent or a Theme argument of the head noun of a nominal projection is immediately left-adjacent to the head noun, it may occur bare, without any genitive case-marking, as illustrated in (9) and (10), respectively for Agent and Theme arguments, or alternatively it may be optionally marked with the genitive case suffix *uy*:

(9) Phikhaso(-uy) chosanghwa
    Piccaso(-GEN) portrait
    'a/the portrait by Picasso'

(10) Sellesuthina(-uy) chosanghwa
    Celestina(-GEN) portrait
    'the/a portrait of Celestina'

When both Agent and Theme are present, both may occur marked with the genitive case-marker *uy* as in (11) (though some speakers may find *uy*-marking on the Theme a little awkward if it is linearly adjacent to a genitive-marked Agent – see footnote 2):

(11) Phikhaso-uy Sellesuthina-uy chosanghwa
    Picasso-GEN Celestina-GEN portrait
    'Picasso's portrait of Celestina'

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[4] The decision to focus on the nominal *chosanghwa* 'portrait' and follow its patterns consistently throughout the paper means that we are able to avoid any confounds arising from the use of different nouns, which might perhaps have idiosyncratic differences. It also allows us a more direct comparison with data from other languages using a noun such as 'portrait' or 'picture', as in the Spanish and Hebrew examples referred to in other works.

[5] Differences in the ability of nouns to license genitive *uy* on the full range of animate/inanimate arguments they permit most certainly still needs to be investigated. However, such an investigation is beyond the scope of the current paper, whose goal is to see how principles of syntax may be revealed with nouns that seem to have the greatest freedom in genitive-case-marking of their arguments.

It is also possible for the argument that is left-adjacent to the head noun to occur bare, without *uy*. However, the second argument that is not immediately adjacent to the head noun cannot be bare, and must be marked with *uy*, both when the argument adjacent to the head noun itself carries *uy*, as in (12), and when this argument is bare/not marked with *uy*, as in (13) (see Bak 2006 and Hong 2013):

(12) Phikhaso*(-uy) Sellesuthina-uy chosanghwa
     Picasso(-GEN)   Celestina-GEN   portrait
     'Picasso's portrait of Celestina'

(13) */??Phikhaso Sellesuthina chosanghwa
         Picasso   Celestina   portrait
         Intended: 'Picasso's portrait of Celestina'[6]

An (2014) suggests that bare Agents and Themes are located within the lexical core of extended nominal projections, and that any arguments marked with genitive-case/*uy* are located in higher

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[6] An (2014) actually states that both Agent and Theme may occur together without genitive marking, giving the example in (i) below.

(i) kongsankwun   namhan   chimlyak
    communist army South Korea invasion '
    'the communist army's invasion of South Korea'

However, the native speaker informants we have consulted have indicated that a sequence of a bare Agent and a bare Theme may (for them) only occur in a particular register of Korean reserved primarily for newspaper headlines, and that in other, regular spoken and written Korean only one argument of the noun may occur bare, without *uy*. The current paper describes this more widespread register, rather than that characteristic of newspaper headlines. It is also possible that the newspaper headline example in (i) may have a rather different underlying structure than assumed. The nominal element *chimlyak* regularly occurs combined with the light verb *hata* 'do' forming a predicate with the meaning 'invade', which occurs with a nominative-marked Agent and an accusative-marked Theme (see Park (2008) for detailed discussion). As newspaper headlines often involve ellipsis and clipping, example (i) might be derived from a sentential form in which *hata* is elided and nominative and accusative case on the Agent and Theme are dropped, not genitive case. One way of checking this is to block the light verb analysis by adding in a demonstrative to (i), forcing it to be a regular DP and not the complement of a light verb. When this is done, interestingly the Agent must in fact be marked with genitive case, whether it precedes or follows the demonstrative:

(ii) kongsankwun*(-uy)   ku namhan(-uy)   chimlyak
     communist army(-GEN) DEM South Korea(-GEN) invasion

(iii) ku   kongsankwun*(-uy)   namhan(-uy)   chimlyak
      DEM communist army(-GEN) South Korea(-GEN) invasion
      'the communist army's invasion of South Korea'

The stylistic form of Korean used in newspaper headlines, with its high occurrence of ellipsis, therefore needs to be analyzed carefully, and when controls are made, as above, the conclusion is that genitive-case-marking is actually subject to the same constraints as in spoken Korean – if both Agent and Theme occur with a noun, the Agent must be marked with *uy*.

positions, external to the core, which An takes to be NP. We believe this characterization to be largely appropriate and correct, though we choose to assume that the core containing Agent and Theme is actually *n*P rather than NP (for reasons of cross-categorial similarity – if Agents are merged in Spec*v*P positions in clauses, they may be suggested to be first merged in Spec*n*P positions in nominal projections). What (9)–(13) show is that when both Agent and Theme arguments occur, one of these must be licensed by the addition of the genitive marker *uy*. This suggests that Agent and Theme elements have a case-marking requirement, and that the head noun of a nominal projection is able to satisfy such a requirement for either the Agent or the Theme, but not both at the same time, so that when both Agent and Theme occur together, the former must raise outside the *n*P domain to be licensed with genitive *uy*.[7] The ordering of bare and *uy*-marked elements relative to bare adjectives, to be described below, will further clearly confirm that bare and *uy*-marked elements occur in different positions in nominal projections, and that any argument of the noun base-generated in a lower *n*P-internal position (allowing it to be optionally licensed by the head noun if no other argument occurs) must be repositioned in a higher portion of the nominal projection in order to receive genitive case.

Next, it can be noted that the availability of *uy*-marking and the possible occurrence of Agent and Theme without *uy* relates directly to the positions that Agent and Theme occupy relative to other elements – the demonstrative *ku* and bare adjectives such as *say* (adjectives that do not occur in relative clause-like forms). First, we will consider the patterning of Agent and Theme relative to *ku*. As (14) and (15) show, an Agent and a Theme argument may be positioned to the right of *ku* and occur either bare or marked with *uy* in such a position:[8]

(14) ku   Phikhaso(-uy) chosanghwa
     DEM Picasso(-GEN)   portrait
     'that portrait by Picasso'

(15) ku   Sellesuthina(-uy) chosanghwa
     DEM Celestina(-GEN)   portrait
     'that portrait of Celestina'

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[7] We provide details of how we believe case is technically licensed in a later section, once the structural distribution of arguments of nouns has been fully established.

[8] When *uy* is present on the Agent/Theme in (13) and (14), the processing of such examples appears to be easier if a slight pause occurs between the demonstrative and the Agent/Theme. Various other examples in the paper in which *ku* immediately precedes an argument of the noun marked with *uy* also benefit from a slight pause between *ku* and the following noun/NP.

The Agent and the Theme may also be positioned to the left of *ku*, but when this occurs, both must be marked with *uy*, and neither may occur bare/without the genitive case-marker:

(16) Phikhaso*(-uy)   ku   chosanghwa
     Piccaso(-GEN)   DEM   portrait
     'that portrait by Picasso'

(17) Sellesuthina*(-uy)   ku   chosanghwa
     Celestina(-GEN)   DEM   portrait
     'that portrait of Celestina'

Now considering the occurrence of Agent and Theme relative to a bare adjective such as *say* 'new', both Agent and Theme may be positioned between bare adjectives and the head noun, as in (18) and (19).[9] When

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[9]Other bare adjectives which pattern like *say* are *yeys* 'old', *ttan* 'other', and *mayn* 'bare', *hes* 'vain', *mopssul* 'bad', *kacun* 'all kinds of', *swun* 'pure'. These adnominal adjectives contrast with regular adjectives in three major respects. First, they constitute a closed restricted set of elements, amounting to just a small number, while the set of regular adjectives is open. Second, they don't have inflected forms, as opposed to regular adjectives. Third, they cannot occur as predicates and are only used as attributive modifiers, as opposed to regular adjectives that can also function as predicates, as illustrated in (i) and (ii) below. Adnominal adjectives instantiate direct modification of the noun, whereas regular adjectives form indirect modification derived from a (reduced) relative clause source (Sproat and Shih 1990, Kim 2014).

(i) a. say   cip   (ii) a. saylowu-n   cip
        new   house   new-PRT   house
        'new house'   'new house'
     b. *cip-i   say-ita   b. cip-i   saylop-ta.
        house-NOM   new-be   house-NOM   new-DC
                                       'The house is new.'

Somewhat further complicating this division between bare adjectives and those formed by means of a relative clause structure, it seems that for some speakers there may be certain apparently bare adjectives which are not subject to the same positional restrictions as illustrated here with *say*. For example, for one of the reviewers of the paper, *say* 'new' has a strict, fixed ordering relative to other elements, as described here, but the element *hen* 'old' does not (though *hen* for many other speakers does pattern like *say* and have a fixed low position). There would seem to be a natural historical explanation for this behavior of *hen* in the reviewer's variety of Korean. The bare adjective *hen* originated from the combination of an adjective *hel-* and an affixal ending *-un* forming a relative clause form *helun*. This multimorphemic form has become shortened to *hen* in modern Korean. For some speakers (such as the author of the paper who is a speaker of Korean), reduction of *helun* to *hen* has led to a reanalysis of this element as a bare adjective with a low fixed position, but for others such as the reviewer, *hen* may arguably retain its ability to be attached like other phrasal adjuncts. Interspeaker variation in the positioning of certain adjectival elements may thus be a result of the diachronic process of phrase-to-head reduction which occurs during many cases of grammaticalization, as referred to in footnote 1 (a process driven by economy for Van Gelderen 2004). Where apparently-bare adjectives do not occupy fixed positions within DPs (i.e. *hen* in the reviewer's speech), they do not serve as boundary-markers in the way that adjectives like *say* do and so cannot be used to investigate potential restrictions on DP-internal movement.

arguments occur in such a position, they must be bare, and cannot be marked with the genitive case-marker *uy*:[10]

(18) say   Phikhaso(*-uy)   chosanghwa
     new   Picasso(-GEN)   portrait
     'a/the new portrait by Picasso'

(19) say   Sellesuthina(*-uy)   chosanghwa
     new   Celestina(-GEN)   portrait
     'the/a new portrait of Celestina'

Agent and Theme arguments can also occur to the left of bare adjectives, and in such a position they must carry the genitive case-marker, and cannot be bare, as seen in (20) and (21):

(20) Phikhaso*(-uy)   say   chosanghwa
     Picasso(-GEN)   new   portrait
     'a/the new portrait by Picasso'

(21) Sellesuthina*(-uy)   say   chosanghwa
     Celestina(-GEN)   new   portrait
     'a/the new portrait of Celestina'

The generalization which emerges from the above patterns is that if an argument is bare, it must occur to the right of the demonstrative *ku* and any bare adjective, and if an argument of the noun is marked with *uy*, it must occur to the left of bare adjectives such as *say*. It can now be noted that an Agent or Theme marked with *uy* can also occur between a demonstrative and a bare adjective, as in (22):

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[10] Twenty-one native speakers of Korean, including three linguists, were asked to judge the acceptability of sequences in which the bare adjective *say* preceded (a) an Agent marked with *uy*, and (b) a Theme marked with *uy*, using a scale of acceptability ranging from 1 for ungrammatical through 5 for fully acceptable. The average rating of sequences of [*say* Agent-*uy* N] was 1.6, and that for sequences of [*say* Theme-*uy* N] was 1.4. This contrasted with a much higher rating for the same sequences without *uy*: 4 for [*say* Theme N] and 3.3 for [*say* Agent N], with many informants judging such sequences to be fully acceptable.

One reviewer of the paper suggests that in his/her variety of Korean, it would actually be possible for *say* to precede both a genitive-marked Agent and a genitive-marked Theme, as in (i):

(i) say   Kim-ssi-uy   Modigliani-uy   yein-uy   chosanghwa
    new   Kim-HON-GEN   Modigliani-GEN   woman-GEN   portrait
    'Mr. Kim's new portrait of a woman by Modigliani'

We have not been able to find any other speakers who accept such a positioning of *say*. For speakers who potentially might permit this positioning of *say*, such an adjective cannot be used to probe the underlying structure of nominal phrases, as it appears to pattern in a very unconstrained way, allowing for a largely free positioning like other phrasal adjunct elements such as relative clauses. Examining the variety of speakers who do enforce a strict positioning of *say* is much more informative, and we therefore focus on this variety, which we have found to be very widespread among speakers of Korean.

(22) ku   Phikhaso-uy/Sellesuthina-uy say   chosanghwa
    DEM Picasso-GEN Celestina-GEN   new portrait
    'that new portrait of Celestina/that new portrait by Picasso'

There is consequently a position available for an *uy*-marked argument both to the left of *ku* and between *ku* and *say*. Both these positions may be taken up by an *uy*-marked argument–when both Agent and Theme are overt and marked with *uy*, the Agent can occur to the left of a demonstrative and the Theme between the demonstrative and *say*, as in (23):

(23) Phikhaso-uy ku   Sellesuthina-uy chosanghwa
    Picasso-GEN DEM Celestina-GEN   portrait
    'that portrait of Celestina by Picasso'

It can also be noted that each of these positions may contain maximally one *uy*-marked argument, hence it is not possible for both Agent and Theme to precede a demonstrative, as shown in (24), nor is it possible for an *uy*-marked Agent and Theme to both occur between a demonstrative and *say*, as illustrated in (25):

(24) *Phikhaso-uy Sellesuthina-uy ku   chosanghwa
     Picasso-GEN Celestina-GEN   DEM portrait

(25) *ku   Phikhaso-uy Sellesuthina-uy chosanghwa
     DEM Picasso-GEN Celestina-GEN   portrait

There are consequently two positions for genitive case-marked arguments, one to the left of demonstratives, and one between demonstratives and bare adjectives such as *say*, and each position can license just one genitive case-marked argument.[11] This patterning and restriction on *uy*-marking indicates that the application of genitive case to an argument is not free, as might be expected by an analysis of *uy*-marked arguments as simply adjoined in to any higher portion of structure above NP. Rather, the difference in occurrence between *uy*-marked arguments in pre- and post-demonstrative positions suggests that a single specifier-like position is projected for the licensing of a genitive-marked argument to the left of demonstratives, and a second, lower specifier position licensing genitive case occurs between demonstratives and bare adjectives. Concretely, we assume that the higher genitive case is assigned by D to an element in

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[11] If both Agent and Theme are positioned to the right of the demonstrative *ku*, only one of these can be marked with *uy*. The other argument must be bare, as in (i). While such examples are not fully perfect, for some reason, they are much more acceptable than the attempt to position two genitive case-marked arguments between *ku* and the head noun/a bare adjective.

(i) ?ku Phikhaso-uy Sellesuthina chosanghwa
    DEM Picasso-GEN Celestina   portrait
    'this portrait of Celestina by Picasso'

SpecDP, and the lower genitive case is assigned by the head of an Agreement projection to an argument raised to SpecAgrP, with AgrP itself being located above the lexical core of nominal projections where theta roles are assigned to arguments, nP.[12]

Putting this information together results in the template in (26), which records where genitive-marked and bare Agent/Theme arguments of a noun may occur relative to other elements such as demonstratives, bare adjectives and the noun head.

(26) [$_{DP}$ ARG-*uy* DEM$_{(ku)}$ [$_{AgrP}$ ARG-*uy* ADJ-$_{BARE(say)}$ [$_{nP}$ ARG N]]]

The occurrence of a bare adjective such as *say* marks the internal division within nominal projections between positions that allow for *uy*-marked arguments and those that do not, as well as where bare arguments are permitted to occur. If an argument of the noun bears genitive case, it must be located in some position to the left of any bare adjective, either SpecAgrP or SpecDP, and if it occurs without *uy*, it must be positioned to the right of such adjectives. Adopting An's (2014) suggestion that bare arguments occur within the lexical core of nominal projections, in base positions theta-marked by N, the lower portion of the structure containing bare Agent and Theme arguments is identified as nP, and the higher, functional structure is taken to terminate in a DP projection.[13] Patterns to be presented and analyzed in section 3 of the paper will provide evidence that bare adjectives are attached higher than the lowest domain in which arguments combine with the head noun.

2.2. *The relative ordering of Agent and Theme arguments*

Section 2.1 has documented the various positions that Agent and Theme arguments may occur in, in principle, when marked in an appropriate way, either with or without *uy*. Any one of the full range of ARG positions in (26) may be instantiated by either an Agent or a Theme, and there is no restriction of the Theme argument to any lower ARG position *in the absence of an Agent argument*. However, significantly, when both Agent and Theme are overtly present, the important relative ordering restriction noted in section 1 applies, and the Agent argument must

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[12] Here we use AgrP as a simple convenient label for the case-assigning functional projection which we take to be located above *n*P/*n**P. It is possible that this projection has some other identity or could be labeled differently, but for present purposes we refer to it as AgrP.

[13] We are aware that the identity of the highest functional projection of nominal projections in Korean has been disputed, and is not universally recognized to be 'DP'. We henceforth use the label and term 'DP' for convenience, as a way to permit easy reference to the terminus of the functional structure assumed to be projected above the lexical core of nominal projections. The analysis of the paper would remain entirely the same were this highest functional projection of nominal phrases to be labeled differently.

always linearly precede the Theme argument, no matter which ARG positions in the structure these elements actually occupy – either preceding the demonstrative *ku*, between *ku* and a bare adjective, or following a bare adjective, as illustrated in the examples which follow.

First, when one of the Agent/Theme pair occurs to left of a demonstrative, and the other is positioned to its right, and marked with *uy*, this is only acceptable when the linear sequencing is Agent > (Dem >) Theme, as in (23), and is unacceptable when the Theme precedes *ku* and the Agent follows, i.e. Theme > (Dem >) Agent, as in (27):

(27) *Sellesuthina-uy ku   Phikhaso-uy chosanghwa
      Celestina-GEN   DEM Picasso-GEN portrait
      Intended: 'That portrait of Celestina by Picasso.'

Second, when one of the Agent/Theme pair occurs to the left of the demonstrative *ku* and the other occurs bare, without *uy*, to the right of *ku* (and to the right of a bare adjective, if it is present), this must similarly follow an Agent > Theme sequencing, as in (28), and is unacceptable if the Theme precedes the Agent, as in (29):

(28) Phikhaso-uy ku   Sellesuthina chosanghwa
      Picasso-GEN DEM Celestina   portrait
      'That portrait of Celestina by Picasso.'

(29) *Sellesuthina-uy ku   Phikhaso chosanghwa
      Celestina-GEN   DEM Picasso   portrait
      Intended: 'That portrait of Celestina by Picasso.'

Thus even though a Theme argument marker with *uy* may legitimately occur in pre- and post-demonstrative positions in the absence of an overt Agent, when the latter is present, a strict linear sequencing of these elements is imposed, which applies to Agent and Theme, regardless of where these elements occur relative to a demonstrative in any particular instance. Below, we will see that this ordering restriction extends further to determine legitimate sequences which involve not only Agent and Theme arguments of the noun, but also Possessor arguments, when combined with an Agent or a Theme, or both such elements.

2.3. *The occurrence of Possessor arguments in nominal projections*

A Possessor argument in nominal phrases can occur bare, as in (30), suggesting that its base position is within the lexical core of the nominal projection, allowing for licensing of the possessor by the head noun (when no other arguments occur).[14]

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[14] See Longobardi (2001) for further general description of the syntax of Possessors as arguments of the noun in DPs.

(30) Kim   sensayngnim   chosanghwa
     Kim   mister   portrait
     'a portrait belonging to Mr. Kim'

Assuming that there is a parallelism in structure between nominal phrases and clauses, and that Agent theta roles are assigned by verbal predicates to arguments in Spec*v*P, we suggest that Agent arguments of nouns are base-generated in a Spec*n*P position and Themes occur as the complements of N (following Radford 2000, Alexiadou et al 2007). As Possessors can co-occur with Agents (and Themes), these arguments must be base-generated in a position distinct from Spec*n*P, but still within the lexical core (again following Radford 2000, Alexiadou et al 2007, and others, who argue that Possessors regularly undergo raising from a lower thematic position to a higher case-licensing/case-checking position, in various languages this being Spec*DP*).[15] We label this position Spec*n**P, taking *n**P to be projected directly above *n*P and still being within the lexical domain of nominal phrases, below any functional structure projected. This is represented in (31).

(31) [$_{n*P}$ Possessor [$_{nP}$ Agent [$_{NP}$ Theme N]]]

Any single argument among the Possessor/Agent/Theme set may occur bare and be licensed within *n**P without the need to acquire genitive case from a higher functional head, either in Spec*DP* or Spec*AgrP*. We suggest that the head N may assign null case to one of its *n**P-internal arguments when it occurs in a Spec-head relation with this argument (this necessitating string vacuous rightward movement of N to *n* or *n** to assign null case to an Agent or a Possessor).

A Possessor can also occur marked with genitive case, co-occurring with an Agent or Theme argument of the noun, either bare or marked with genitive case, as shown in (32) and (33):

(32) kim   sensayngnim-uy Phikhaso(-uy) chosanghwa
     Kim   mister-GEN   Picasso(-GEN) portrait
     'a portrait by Picasso belonging to Mr. Kim'

(33) kim   sensayngnim-uy Sellesuthina(-uy) chosanghwa
     Kim   mister-GEN   celestina(-GEN)   portrait
     'a portrait of Celestina belonging to Mr. Kim'

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[15] Alexiadou et al (2007) assume that Possessors are base-generated in Spec*n*P. However, they only consider languages in which a single genitive-marked argument can occur. As Possessors can co-occur with Agents in many languages and both be marked with genitive case, it is clearly necessary to assume that Possessors and Agents originate in different base positions.

However, although a Possessor, an Agent, and a Theme argument may all be marked with genitive case when two arguments are present, it is not possible for all three arguments to occur together, each marked with genitive case. Example (34) below is ungrammatical when the attempt is made to mark Possessor, Agent and Theme each with genitive case:

(34) *kim sensayngnim-uy Phikhaso-uy Sellesuthina-uy chosanghwa
       Kim mister-GEN   Picasso-GEN Celestina-GEN   portrait
       Intended: 'Mr. Kim's portrait of Celestina by Picasso'

In order for all three such arguments to be present together, the Theme argument must be bare and occur without genitive case, as in example (35), which is regularly judged as acceptable and significantly better than (34), though somewhat affected by processing difficulty. Speakers report that the less-than-perfect judgement improves when a slight pause occurs between the possessor and the agent.

(35) ?(?)kim sensayngnim-uy, Phikhaso-uy Sellesuthina chosanghwa
       Kim mister-GEN   Picasso-GEN Celestina   portrait
       'Mr. Kim's portrait of Celestina by Picasso'

The above patterns indicate that there are maximally two instances of genitive-case available for arguments of a noun, and that any two arguments of the Possessor/Agent/Theme set may be case-marked with *uy*, through movement to SpecDP or SpecAgrP.[16]

  Interestingly, the observed restriction that genitive-case-marking may occur on maximally two arguments of the noun is independent of the application of *uy*/genitive-marking to other non-argument constituents such as numeral-classifier pairs. As (36) shows, it is indeed possible for three instances of the marker *uy* to occur within a single nominal projection, so long as only two of these are present on arguments of the noun:

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[16] A reviewer asks how the optionality of genitive-marking on an argument can be explained when only one argument occurs and hence could occur 'bare'. It might be assumed that no movement occurs when an argument appears bare, and that such an option should always be preferred for reasons of economy to genitive-case assignment in SpecDP/ AgrP, which does involve movement. In the account presented here, which has been developed further following the reviewer's remarks (and we thank the reviewer for this question), the hypothesized process of null case assignment to a bare argument also involves movement to occur, of N to a higher head position where it can assign null case to an argument in a Spec-Head relation (and this also commits us to the assumption that the Theme must also move to some specifier position within *n*P to receive null case). We therefore suggest that both genitive and null case assignment have some movement cost associated with them and this may allow for the optionality to occur. An alternative might be to propose that what we have called null case assignment here is actually a form of licensing via *incorporation* of an argument to N, and that such an operation again involves movement and is not costless.

(36) kim   sensayngnim-uy ku   twu-cang-uy Phikhaso-uy chosanghwa
     Kim mister-GEN   DEM 2-CL-GEN   Picasso-GEN portrait
     'Mr. Kim's two portraits by Picasso'

This distinction between argument and non-argument constituents with regard to genitive-case/*uy*-marking provides (further) evidence that *uy*-marked arguments are not simply base-generated in higher positions as adjunct-like modifiers, but are indeed moved from lower, argumental base positions within *n**P to higher case-licensing positions outside the lexical core. If it were to be the case that 'Agents' and 'Themes' marked with *uy* were simply to be base-generated as adjuncts in higher *n**P-external positions, it is entirely unexpected that one would find the observed distinction between 'Agent/Theme/Possessor' and other modifiers such as numeral-classifier pairs, and one would expect that three (or more) occurrences of *uy* should be freely available to mark any higher modifier/adjunct, but this is not the case. Instead, it can be concluded that two distinct systems of *uy*-marking are at play within nominal projections – one that applies to adjunct-like modifiers (and is not obviously limited in its application), and another which is available for arguments (maximally two) which originate in *n**P and then come to occupy higher positions in the DP.[17]

Just as was observed with the interaction of Agent and Theme arguments, Possessors are subject to a strict linear ordering requirement relative to other arguments, and must precede both Agents and Themes. Thus, in contrast to (32) above, which is fully acceptable with a Possessor-*uy* > Agent-*uy* order, (37) below with the inverse order of Agent-*uy* > Poss-*uy* > N is not possible:

(37) *Phikhaso-uy kim   sensayngnim-uy chosanghwa
      Picasso-GEN Kim mister-GEN   portrait
      'a portrait by Picasso belonging to Mr. Kim'

Similarly, in contrast to (33) which has a legitimate Possessor-*uy* > Theme-*uy* order, (38) with the inverse order of Theme-*uy* > Poss-*uy* is unacceptable:

(38) *Sellesuthina-uy kim   sensayngnim-uy chosanghwa
      Celestina-GEN   Kim mister-GEN   portrait
      'a portrait of Celestina belonging to Mr. Kim'

Finally, when all three arguments, Possessor, Agent and Theme, co-occur, this must be in the relative ordering of Possessor > Agent > Theme in order to be acceptable, as in (35), and alternate orderings of Possessor, Agent and Theme are ungrammatical.

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[17] For discussion of *uy*-marking on arguments and other modifiers, see Park (2014).

How such a strict relative ordering restriction may be accounted for, and still allow for: (a) the considerably free placement of other elements such as relative clauses, numeral-classifier pairs, and (b) the possibility for Possessors, Agents and Themes to either precede or follow elements such as demonstratives and bare adjectives, is an interesting and challenging question. On the one hand, a set of elements is subject to a rigid ordering relative to each other, no matter how these elements are marked (either with *uy* or bare, without genitive case) or where they occur, spread out within a nominal projection (inside *n**P or displaced higher). On the other hand, there seems to be considerably free ordering of these same elements relative to other components of nominal phrases.

In what follows, in section 3, it will be argued that the theoretical approach most suited to accommodate such a combination of strict and free word order of certain across different syntactic domains is the hypothesis presented in Fox and Pesetsky (2005) that syntactic structures in their realization are critically governed by a principle of Cyclic Linearization, regulating the positioning of elements within Spell-out domains. Section 3 will begin with an introduction to Fox and Pesetsky's rationale for the principle of Cyclic Linearization, and how such a mechanism works, and then show how such an approach is ideally suited for an analysis of the complex word order patterns found in Korean nominal phrases.

3. A Cyclic Linearization analysis

3.1. *Fox and Pesetsky (2005)*

Fox and Pesetky's proposal of a trans-derivational principle of Cyclic Linearization arises in part from a consideration of puzzles relating to object shift phenomena in mainland Scandinavian. As noted in Holmberg (1986, 1998), definite objects in Swedish can undergo optional raising to a position to the left of negation and low VP-adverbials providing the verb also occurs raised to a position to the left of the object, this being assumed to be raising of a finite main verb to Infl/T, as illustrated in (39):

(39) Jag kysste$_k$ henne$_m$ inte [$_{VP}$ t$_k$ t$_m$]
　　 I　 kissed　 her　　 not
　　 'I didn't kiss her.'

If an auxiliary verb is present in Infl/T, and raising of the verb to Infl/T is blocked, an object may not raise out of VP, as shown in (40):

(40) *Jag har　 henne inte [$_{VP}$ kysst t$_m$]
　　　 I　 have her　 not　　 kissed

The observation of such alternations has commonly become known as "Holmberg's Generalization". In Chomsky (1993), a formal analysis of object-shift was proposed, and subsequently widely accepted, which attempts to capture the apparently parasitic dependency of object-shift on movement of the verb. Chomsky suggests that raising of a finite verb from V to Infl/T critically extends the domain of movement available to an object, allowing it to reach higher positions outside vP and thus precede negation and other low VP-adverbs. However, Fox and Pesetsky point out that there are clear challenges to accounts which link the possibility of object shift simply to movement of the verb to Infl/T. In Holmberg (1998) it is noted that the overt presence of other elements inside VP (e.g. indirect objects and particles) in positions preceding the base position of a direct object also blocks the possibility of object shift, even if there is movement of the verb to Infl/T, as shown in (41), quoted in Fox and Pesetsky (2005):

(41) a. *Jag gav$_k$ den$_m$ inte [$_{VP}$ t$_k$ <u>Elsa</u> t$_m$]
         I   gave   it   not   Elsa
      b. *Dom kastade$_k$ mej   inte [$_{VP}$ t$_k$ <u>ut</u> t$_m$]
         they threw   me   not   out

It is added that if such interveners are themselves moved out of the VP, object-shift again becomes possible (Fox & Pesetsky 2005:21). Finally, object shift is also shown to be possible in the absence of movement of the verb to Infl/T, in instances where the verb is displaced to the left of the object via VP remnant movement to a sentence-initial position, as illustrated in (42). In such cases, an auxiliary verb occurs in Infl/T, and there is no movement of the verb to this position:

(42) [$_{VP}$ Sett t$_m$] har han mig$_m$ kanske t$_n$...
          seen   has   he   me   perhaps
      'He has perhaps seen me, (but)...'

   Fox and Pesetsky note that such patterns indicate that: (a) verb movement to Infl/T does not by itself license instances of object-shift (43), and (b) object-shift can legitimately occur in the absence of verb movement to Infl/T (44). It is argued that what the fuller paradigm of object-shift indicates is that there is a critical *linear sequencing* of the verb and the object that must be observed wherever such elements occur in the structure, and that the verb must always linearly precede the object (not necessarily c-command it, as there will be no c-command relation between the verb and the object in cases of VP-remnant movement such as (42)):

> What is relevant to the acceptability of Object Shift is the relative ordering of V and O at the various points of Spell-Out, not the nature of the syntactic processes that establish these orderings. (Fox & Pesetsky 2005:22)

Fox and Pesetsky suggest that such a linear ordering restriction on the application of Object Shift is an illustration of a broad principle that constrains the overt spelling-out at PF of all terminal elements present in a syntactic derivation. Adopting a model in which portions of syntactic structure incrementally interact with PF as 'Spell-out domains', it is suggested that information about the relative ordering of elements within each Spell-out domain is derivationally recorded and constrains all future ordering of such elements if later displaced to higher Spell-out domains. Whatever linear ordering of elements occurs in an initial Spell-out domain must critically be preserved in subsequent Spell-out domains. Hence if an element X precedes a second element Y when a lower Spell-out domain is formed, X must also precede Y when higher Spell-out domains are constructed.

   In the concrete case of Object Shift in Swedish, it is suggested that the verb and its object form a VP Spell-out domain with the relative ordering of V > O [$_{VP}$ V O], and consequently, if the object is to be raised to a higher position outside VP (via Object Shift), it is necessary for the verb to also move to some higher position where it will linearly precede the object and satisfy requirements for relative 'Order Preservation'.

   Such a process, in which the linear sequencing of elements is recorded at the completion of each Spell-out domain and must be reproduced as a sequencing within all later Spell-out domains is part of the general operation of 'Cyclic Linearization', which incrementally linearizes elements within each Spell-out domain. The Order Preservation constraint on Cyclic Linearization is shown to capture the full patterning of Object Shift patterns documented in Holmberg (1986, 1998) and provide a novel and interesting account of Successive Cyclic Movement without the need for Chomsky's Phase Impenetrability Condition on inter-phasal movement requiring movement through phase edge positions (see Fox & Pesetsky 2005:7–8). Elsewhere, in Ko (2007), the interaction of Order Preservation with Cyclic Linearization has been shown to allow for a new account of puzzles relating to quantifier float phenomena in Korean, and in Ko (2014) such an approach is extended to the analysis of small clause domains and secondary predication structures. Now in section 3.2 we will suggest that Order Preservation and Cyclic Linearization can be argued to have further effects in Korean, and regulate the distribution of elements within nominal phrases in very clear, expected ways.

3.2. *Cyclic Linearization and argument realization in Korean nominal phrases*

The patterns established in section 2 with regard to the positioning of Possessor, Agent and Theme arguments in Korean nominal projections display the signature property attributed to typical cases of Cyclic Linearization and Order Preservation, in that a particular order

associated with one part of a base structure must be reproduced when the elements involved occur displaced in a different, higher part of the structure. In order to see how the complex data naturally suggest a Cyclic Linearization analysis, we will review and summarize the key observations made about the ordering possibilities open to arguments of head nouns relative to other elements.

In the course of section 2, it was seen that the Possessor, Agent and Theme/'PAT' arguments of a noun can each occur in any of three 'zones/ fields' within nominal projections: (a) zone 1, between bare adjectives and the head noun, (b) zone 2, between demonstratives and bare adjectives, and (c) zone 3, preceding demonstratives, as illustrated in (43):

(43)   Positions available to arguments of N:

zone 3	demonstratives	zone 2	bare adjectives	zone 1	head noun
Poss/Ag/Th	*ku*	Poss/Ag/Th	*say*	Poss/Ag/Th	N

If any PAT argument occurs bare without the genitive-case marker *uy*, it must occur in zone 1, and maximally one bare PAT argument is permitted to occur here. If any PAT argument is marked with *uy*, it may occur either in zone 2 or zone 3, but not zone 1. A maximum of two arguments may occur marked with *uy* in any nominal phrase, and whenever two arguments are marked with *uy*, one must occur in zone 3 (in SpecDP) and the other in zone 2 (in SpecAgrP). It is not possible for more than one *uy*-marked argument to occur either in zone 2 or zone 3. Crucially, as highlighted in section 2, however PAT elements may be distributed across zones 1–3, this distribution must always conform with a fixed linear ordering of PAT relative to each other: Possessor > Agent > Theme. Such a template imposes itself whether zones 1–3 each contain one of the PAT set, or whether two PAT elements are distributed across zones 1 and 3, or 2 and 3, and any sequencing of PAT arguments which does not adhere to the Possessor > Agent > Theme template is unacceptable.

Such a linear ordering restriction cannot be accounted for if *uy*-marked PAT elements are taken to be adjuncts directly merged in whichever zone they overly appear in (a possibility already discounted for other reasons). Given that *uy*-marked Themes may legitimately occur in zone 3, and *uy*-marked Agents may occur in zone 2 (or occur bare in zone 1), there is no reason why an Agent should not be merged in zone 2 when a Theme is merged in zone 3 if both such elements are assumed to be base-generated as adjuncts when marked with *uy*. Similarly, as Possessors may occur bare in zone 1, and Agents and Themes can occur *uy*-marked in zones 2 and 3, under a base-generated adjunction analysis of the latter it is

expected that this should allow for the legitimate production of sequences such as [Agent-*uy*/Theme-*uy* Possessor N], yet this is not at all possible.

As an approach to *uy*-marked PAT elements as adjuncts merged directly within zones 2 and 3 clearly leads to predictions on ordering possibilities that are found not to be possible, and there is no obvious way in which an adjunct analysis could be adjusted to result in more accurate predictions about the permissible sequencing of PAT and other elements such as demonstratives, bare adjectives, *uy*-marked numeral-classifier pairs and relative clauses, a movement approach to such phenomena becomes necessary, with the dynamic interaction of PAT elements with each other conspiring to produce certain orders which are grammatical, and others which are not. What is then required to regulate the movement/external merge of *uy*-marked PAT elements to higher positions is a trans-derivational constraint which monitors the output of movement and maintains a certain ordering of elements relative to each other across different domains, while also allowing for other constituents (such as relative clauses, numeral-classifier pairs) to enjoy a free ordering relative to such elements.

Cyclic Linearization provides a mechanism of exactly this type, and can be shown to account straightforwardly and directly for all of the complex range of patterns involving arguments, adjuncts and other elements thus far observed, if the important assumption is made that nominal projections in Korean actually consist in *two* Spell-out domains feeding the process of Cyclic Linearization, rather than just one, in this respect resembling broad assumptions made about the division of clauses into two Spell-out domains (Fox & Pesetsky 2005, Ko 2007).

We suggest that these Spell-out domains are n*P, the lexical core of nominal phrases (or nP if there is no Possessor and n*P is not projected), and the highest projection of nominal phrases, here taken to be DP. Within the first Spell-out domain constructed as input to Cyclic Linearization, n*P/nP, arguments of the noun will be merged with the head noun as noted in (31), repeated below, this establishing a linear ordering of Possessor, Agent, Theme and head noun which will be derivationally recorded and compared with any further orderings of such elements as higher Spell-out domains are constructed and other elements are built into the structure either via internal or external merge.

(31) [$_{n*P}$ Possessor [$_{nP}$ Agent [$_{NP}$ Theme N]]]

Formally, Spell-out of the n*P domain in a structure containing all three arguments of the head noun will establish the ordering relations represented in (44), in which the relation > is defined in (45), slightly adjusting the definition provided in Fox and Pesetsky (2005:10).

(44)   **Spell-out of *n**P**

[$_{nP}$ Possessor Agent Theme N]

Ordering: Possessor > Agent

Agent > Theme

Theme > N

(45) **The relation >**

An ordering statement of the form α > β is understood by PF as meaning that the last element dominated by α and not dominated by a trace precedes the first element dominated by β and not dominated by a trace. (adjusted from Fox & Pesetsky 2005:10)

Consider a derivation in which just two arguments of the head noun are overtly realized, the Agent and the Theme. Spell-out of *n*P will produce the ordering relations in (46). As only one overt argument can be case-licensed by N within *n*P, the Agent will undergo movement to a higher position external to *n*P where it can be licensed with genitive case and marked with *uy*. This produces the continuation of the derivation depicted in (47), in which new ordering relations are established when the higher Spell-out domain DP is completed, and compared with ordering relations derivationally recorded at the *n*P level:

(46)   **Spell-out of *n*P**

[$_{nP}$ Agent Theme N]

Ordering: Agent > Theme

Theme > N

(47) **Spell-out of DP** (following leftward movement of the Agent to a position preceding the demonstrative *ku*)

[$_{DP}$ Agent-uy$_x$ *ku* [$_{nP}$ t$_x$ Theme N]]

Ordering: Agent > *ku*

ku > *n*P

The new ordering statements resulting when DP is constructed are derivationally consistent with those recorded when *n*P was completed. At the DP level, the Agent precedes *ku* which precedes the *n*P containing the Theme, hence (by transitivity) the Agent precedes the Theme. At the *n*P

level, the Agent precedes the Theme. If, instead of movement of the Agent to the left of the demonstrative, there had been movement of the Theme to such a position, this would result in a contradictory set of ordering relations produced at the points in the derivation when the two Spell-out domains *n*P and DP are constructed, as illustrated in (48). DP as a Spell-out domain will record an ordering in which the Theme precedes *ku,* which itself precedes the *n*P containing the Agent, hence (by transitivity) the Theme precedes the Agent. However, the *n*P as a Spell-out domain will record that the Agent precedes the Theme, as in (46). The two sets of ordering relations will be in conflict with each other, and result in a violation of Order Preservation. Consequently, it will not be possible to assign a legitimate pronunciation to the derivation produced by movement of the Theme in *n*P over the Agent.

(48)　**Spell-out of DP** (following movement of the Theme)

$$[_{DP} \text{Theme-uy}_x \; ku \; [_{nP} \; \text{Agent} \; t_x \; N]]$$

Ordering:　　　Theme > *ku*

ku > nP

　　Parallel accounts will rule out all derivations in which there is any inversion of the ordering of the elements Possessor > Agent > Theme which is established in *n**P via movement of one of these elements over any argument element to its left, allowing for the full range of patterns detailed in section 2 to be captured – all occurrences of Possessor/Agent/ Theme in both higher and lower portions of nominal phrases must accord with the base order of such elements in *n**P, as otherwise the resulting structures will fail to be pronounced due to conflicts in the ordering statements which are derivationally recorded.

　　The assumption that nominal projections contain two Spell-out domains relevant for the process of Cyclic Linearization allows for an account of both the fully rigid positioning of arguments relative to each other, and also the flexibility of positioning of arguments and other elements such as demonstratives and bare adjectives, as well as relative clauses and numeral-classifier pairs. With regard to the former elements – demonstratives and bare adjectives – it is assumed that these are merged in fixed positions in the structure of DPs, accounting for the observation that only bare, non-*uy*-marked arguments may occur to the right of bare adjectives, that only one *uy*-marked argument may occur between demonstratives and bare adjectives, and that one *uy*-marked argument may be positioned to the left of demonstratives – demonstratives and

bare adjectives establish the boundaries of the portions of DP referred to here as zones 1–3.

However, although demonstratives and bare adjectives can be assumed to occupy fixed locations within DPs, it is observed that arguments of all types may optionally either follow or precede all such elements if appropriately marked with/without *uy*. Adopting the perspective of Cyclic Linearization, this optional positioning of Possessor/Agent/ Theme arguments relative to *ku* and *say* follows naturally if *ku* and *say* are both merged above *n**P in the higher Spell-out domain constructed when nominal phrases are completed at the DP level. As no ordering relations will be established between *ku*/*say* and any argument of the noun within the first Spell-out domain *n**P, movement of arguments from *n**P into higher positions above *n**P can legitimately result in any of the Possessor/Agent/Theme set either preceding or following *ku* or *say* – such optional sequencing will not create any derivational conflict with ordering statements recorded earlier from the *n**P Spell-out domain.

Concerning the positioning of relative clauses and numeral-classifier pairs, these can be assumed to allow for merging in more than one adjunction-site in the higher portion of DPs, either preceding or following the position of demonstratives. As relative clauses and numeral-classifier pairs will not (necessarily) be first-merged within *n**P, such elements can also freely either precede or follow any arguments initially merged in *n**P and then raised into higher positions in the functional structure of nominal projections. Because no relative order of relative clauses and numeral-classifier pairs has to be established within *n**P, no fixed order of such elements has to be preserved in the higher Spell-out domain, and free ordering of such constituents is accommodated at the same time that the rigid linear ordering of Possessor/Agent/ Theme is captured in positions above *n**P.

In order for the above, arguably simple approach to the puzzle of mixed rigid and free word order patterns to produce a coherent account of the complex range of patterns attested and described in section 2, one further conclusion needs to be drawn about the possibilities of movement within Korean nominal phrases. Specifically, it needs to be assumed that optional scrambling of arguments within *n**P is not permitted, and that the first structural position available to arguments as a target of movement is the genitive case-licensing position located between bare adjectives and the position of demonstratives–SpecAgrP. Were it to be possible for arguments of the noun to simply undergo optional re-ordering within *n**P as the result of scrambling, it is clear that no fixed relative ordering of Possessor/Agent/Theme would be predicted to occur in higher locations, contra observation, as movement of, for example, a Theme to the left of a Possessor in *n**P as in (49) would produce an ordering relation of Theme > Possessor in the lower Spell-out domain

that would be consistent with the Theme preceding the Possessor in higher portions of the DP.

(49)   **Hypothetical scrambling of Theme over Possessor in *n**P Spell-out of *n**P**

[$_{nP}$ Theme$_x$ Possessor t$_x$ N]

Ordering: Theme > Possessor

Possessor > N

Scrambling of elements within *n**P must therefore be concluded not to be available as an option for arguments of the noun, and the initial movement of such elements can only be to a case-licensing position higher in the functional structure of DPs.[18]

This conclusion that Possessor/Agent/Theme arguments of the noun do not undergo any movement within *n**Ps has further consequences which highlight an important difference between Fox and Pesetsky's notion of Spell-out domain and Cyclic Linearization on the one hand, and Chomsky's theory of phase-based Cylic Spell-out. In the latter, the extraction of any element from a phase must pass through the edge of the phase (the head of the phase or a specifier position projected by the phasal head) due to the Phase Impenetrability Condition (Chomsky 2000). Elements which do not occur in the edge of a phase are taken to be invisible to probes in higher phases, and so ineligible for further movement. In Fox and Pesetsky's (2005) Cyclic Linearization approach, however, no equivalent to Chomsky's Phase Impenetrability Condition is assumed to condition Spell-out domains, and elements within Spell-out domains may be extracted into higher Spell-out domains directly from their base-generated positions, providing this conforms with Order Preservation. Extraction out of Spell-out domains is therefore not forced to take place through the edge of such constituents (and the successive cyclic movement effects through Spec*v*P type positions are captured by other means).

In the case of argument movement from within Korean *n**Ps to higher positions, it has been concluded that no movement/scrambling of Agents or Themes over Possessors to a left-peripheral position within *n**P is possible (otherwise one would expect Agents and Themes to be able to linearly precede Possessors in DP, contra observation). The lack of movement/scrambling of lower arguments to the edge of *n**P is therefore fully compatible with Fox and Pesetsky's claims about

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[18] In this property, *n**Ps and *v*Ps appear to show a difference in Korean, as it has been argued that arguments of verbs may undergo scrambling within *v*Ps – see Ko (2007) among others.

the operation of Cyclic Linearization, which allows extraction from Spell-out domains to occur without movement to the edge of such domains, but would be questionable in a phase-based account assuming the Phase Impenetrability Condition, which requires movement of elements to the edge of phases prior to extraction. A phase-based account would require significant modification to accommodate the linear ordering patterns of arguments of nouns described here, if the Phase Impenetrability Condition is assumed to be operative, and is much more straightforward for Fox and Pesetsky's Cyclic Linearization approach to capture.

In connection with a potential phase-based approach to the ordering phenomena considered here, a reviewer asks for clarification of whether an analysis in terms of probes, goals and phases might in fact lead to similar order preservation effects as the Cyclic Linearization approach proposed in the paper if it were assumed that the highest argument present has to be probed and attracted first. We actually think that incorrect predictions might be made by such a hypothetical mode of analysis. If there is indeed just one genitive case assigning/licensing head Agr located between the demonstrative *ku* and bare adjectives such as *say*, and a second, higher genitive-licensing head D to the left of *ku* (as indicated in the structure [$_{DP}$ D *ku* Agr *say* [Agent Theme N]]), this should result in a particular sequence of movement/attraction as DPs are incrementally constructed.

When the Agr head is introduced, if it has to probe the highest argument, it will attract the Agent to its specifier position resulting in (50). This raising of the Agent for case reasons should be assumed to make the Agent and Agr inactive and no longer visible for any further case-licensing processes.[19]

(50) [$_{AgrP}$ Agent$_k$ Agr *say* [$_{nP}$ ~~Agent$_k$~~ Theme N]]

After the demonstrative *ku* is introduced and D is present in the structure, the D head will then attract any other active element with unchecked case-features. D should locate the Theme and attract it to SpecDP, resulting in (51):

(51) [$_{DP}$ Theme$_m$ *ku* Agent Agr *say* [~~Agent$_k$~~ ~~Theme$_m$~~ N]]

However, such a derivation yields the opposite order to what is attested, suggesting that a Cyclic Linearization approach is better placed to account for the linearization patterns found with PAT elements in Korean.

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[19] Here we make the assumption that once structural case is checked, the corresponding case features are deleted as they cannot be interpreted at LF. Consequently, they should not be present in any form to cause any intervention effect and block the attraction of a lower argument to a higher position.

A second way in which the Cyclic Linearization model differs from Chomsky's view of phases is that Fox and Pesetsky suggest that Spell-out domains may potentially vary in their identity across languages, whereas Chomsky assumes that phases have a stable cross-linguistic identity, in clauses always being CP, and vP. Based on their observation of linear ordering effects (and sometimes the absence of these effects) in different languages, Fox and Pesetsky conclude that VP constitutes a Spell-out domain in English and mainland Scandinavian, but (following evidence presented in Ko 2007) in Korean the related low-clausal Spell-out domain is a somewhat larger constituent containing the base position of subjects, vP not VP. Such potential parametrization differences in the cross-linguistic identity of Spell-out domains in a Cyclic Linearization approach naturally allows for accounts of languages in which linearization patterns in similar domains appear to be different, and one way to account for the presence of linear Order Preservation effects in one language but their apparent absence in another language is to assume that the size of Spell-out domains may be different in the languages being compared.[20]

In the case of the phenomena under investigation in the present paper, this permits a potential account of the striking differences between Korean on the one hand, and Spanish and Hebrew on the other, with regard to the possibilities of positioning Agent and Theme arguments of a noun in different locations within DPs. As noted in section 1, Spanish and Hebrew contrast strongly with Korean in allowing for Agent and Theme arguments to occur in multiple positions in DPs without this being constrained by any linear sequencing restrictions of the type investigated here in Korean. It is reported (Sichel 2003, Ticio 2005) that arguments of nouns are essentially free to occur in any linear sequencing relative to each other, and that while certain sequencings may sometimes be preferred, the strict rigidity of linear ordering of arguments found in Korean is clearly

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[20] It can be noted that the approach to phases developed in Bošković (2014) does allow for certain cross-linguistic variation in the size of phases, due to the contextual determination of such constituents, resulting in nominal phases being either NP or QP in Serbo-Croat, and DP in English, according to Bošković. However, such an approach is different in kind from the parametrization of phase-size/spell-out domains assumed within Cyclic Linearization models. For Bošković, variation in the identity of phases occurs because different languages are assumed to project different amounts of structure in nominal and verbal domains, and it is always the highest projection present in such a domain that is determined as a phase. This contrasts with the Cyclic Linearization approach which allows, in theory, for a lower projection to be a spell-out domain in a particular verbal/nominal domain even if a higher level of structure is projected – hence VP may occur as a spell-out domain in English and mainland Scandinavian even in the presence of a vP, while vPs are always taken to be spell-out domains in Korean (Fox & Pesetsky 2005, Ko 2007). This potential parametrization of spell-out domain size assumed in Cyclic Linearization provides advantages, as discussed in the text, which aren't currently paralleled in more mainstream phase-based models (though, of course, it would not be impossible for such models to change their present orientation and allow for the parametrization of phasal size).

not present in Spanish and Korean, and much fluidity in linear ordering is naturally attested (as illustrated in examples (7) and (8)).

One way to model such contrasts is to suggest that this relates to differences in Spell-out domains in the languages concerned. It could be suggested that while Korean nominal phrases project two Spell-out domains – n*P and DP – so that orders of arguments merged in n*P must be retained when occupying higher positions in DP as the result of movement, DPs in Spanish and Hebrew may project only a single Spell-out domain, DP, hence no lower n*P Spell-out domain establishes a linear ordering of arguments that must be retained when such elements undergo repositioning within DPs.

An alternative to such a hypothesis would be to assume that the crucial difference between Korean and Spanish/Hebrew is not in fact a difference in the presence vs. absence of an n*P Spell-out domain, but a difference in the possibility of *scrambling* of arguments within n*P. If Agent and Theme arguments in Spanish and Hebrew may undergo scrambling in n*P and thus establish different linear orders relative to each other before n*P is completed as a Spell-out domain, such orders could re-occur elsewhere in the DP without violating Order Preservation, and it would be possible to maintain that Korean, Spanish and Hebrew all project parallel pairs of Spell-out domains in nominal phrases – n*P and DP – but the additional possibility of n*P-internal scrambling in Spanish/Hebrew masks the presence of the lower Spell-out domain, unlike Korean. Such comparisons between Korean and Spanish/Hebrew certainly require further investigation in order to establish where the precise locus of variation lies, but it is clear how a Cyclic Linearization approach will in theory allow for the accommodation of cross-linguistic variation in phenomena of this type.[21]

3.3. *Further consequences and questions*

Before closing the paper in the summary section 4, we would like to discuss three additional consequences and questions arising from its

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[21] A reviewer asks whether the difference in patterning observed in Korean vs. Spanish and Hebrew might relate to the fact that PAT elements in the latter two languages are postnominal PPs, whereas they are pre-nominal case-marked DPs in Korean. In order to check on this possibility, we examined two other languages not related to Korean, Spanish or Hebrew in which PAT elements are post-nominal and occur as PPs: Vietnamese and Thai. Both these languages were actually found to show linear ordering restrictions on PAT arguments similar to those found in Korean (as illustrated in (i) and (ii) below from Vietnamese). Consequently, it would seem that the pre-nominal/post-nominal position and DP/PP-coding of PAT elements cannot be used to predict the presence vs. absence of PAT linearization restrictions within DPs in a language, and is not an obvious cause of such effects.

(i) bức tranh của Mary của viện bảo tang   Possessor > Theme
    picture   of   Mary of   museum
    'The museum's picture of Mary.

(ii) */?? bức tranh của viện bảo tàng của Mary   Theme > Possessor
    picture   of   museum   of Mary

mode of analysis, following helpful questions and comments received from the two reviewers of the paper.

First, the treatment of ordering restrictions governing Possessor, Agent and Theme arguments in terms of Cyclic Linearization can be argued to lead to new conclusions about the syntactic status of certain DP-internal elements in Korean beyond those already mentioned here. A reviewer of the paper notes that PPs which encode relations such as Goal and Source are not subject to any strict ordering relation within DPs, and may either follow or precede Agents, as illustrated in (52) and (53):

(52) a. Mikwun-uy   hankwuk-ulo-uy hoykwun   Agent > Goal
       USA army-GEN   Korea-to-GEN   return

   b. hankwuk-ulo-uy Mikwun-uy   hoykwun   Goal > Agent
       Korea-to-GEN   USA army-GEN   return
       'The US army's return to Korea'

(53) a. Mikwun-uy   hankwuk-uloputhe-uy
       USA army-GEN   Korea-from-GEN
       chelkwun   Agent > Source
       withdrawal

   b. hankwuk-uloputhe-uy Mikwun-uy
       Korea-from-GEN   USA army-GEN
       chelkwun   Source > Agent
       withdrawal
       'the US army's withdrawal from Korea'

The reviewer asks how the account would analyze and account for such patterns.

If Goal and Source phrases were to be arguments base-generated within *n*P, it is clearly expected that they should be strictly ordered relative to Agent and Theme arguments, but this is not the case. The conclusion that we draw from the observation of free linear sequencing of Source and Goal phrases relative to PAT arguments is that the former are actually *not* arguments of the noun base-generated within *n*P, and are instead adjunct-like elements merged above *n**P. If Goal and Source PPs are first-merged in the higher Spell-out domain of the DP, it is expected that they should allow for free ordering relative to PAT arguments, in the same way that other elements merged above *n**P do, such as relative clauses, numeral-classifier phrases, and demonstratives.

Such a conclusion that the base-positions of Goal and Source phrases is external to *n**P leads to two further expectations. As the licensing of arguments via null case is only available to elements merged within *n**P, it is anticipated that Goal and Source phrases should not be able to occur bare without *uy*, and this is indeed the case – Goal and Source PPs must be marked with *uy*, unlike Possessor, Agent and Theme arguments:

(54) a. Mikwun-uy hankwuk-ulo*(-uy) hoykwun
      US army-GEN Korea-to(-GEN)   return
      'The US army's return to Korea'
   b. Mikwun-uy hankwuk-uloputhe*(-uy) chelkwun
      US army-GEN Korea-from(-GEN)   withdrawal
      'the US army's withdrawal from Korea'

The requirement that Goal and Source phrases be marked with *uy* thus indicates that they cannot be merged within *n**P, where null case licensing should allow them the option of occurring bare and without *uy*.

Additionally, if Goal and Source phrases were to be arguments, one would expect that they would require marking with one of the restricted pair of genitive *uy*s which is used for argument phrases. In section 2.3 it was noted that only two arguments can simultaneously be marked with genitive *uy* (see example (34) and discussion there), but this restriction on *uy*-marking does not affect adjuncts (see example (36))–when two arguments are marked with genitive *uy*, additional adjuncts can also be marked with *uy* resulting in the occurrence of three or four *uy*-marked phrases within a single DP. The prediction with regard to Source and Goal phrases is that if they are projected as syntactic arguments marked with genitive *uy*, this should restrict the number of other arguments that can occur with *uy*, but if Source and Goal phrases are merged as phrasal adjuncts, this will not affect the *uy*-marking of other PAT arguments and two other PAT arguments should be able to occur with *uy*. As illustrated in (55) and (56), the *uy*-marking of Source and Goal phrases does *not* affect the occurrence of genitive *uy* on PAT arguments, indicating that the former elements pattern like other phrasal adjuncts and not as arguments:

(55) mikwuk-uy hankwuk-uloputhe-uy kwuntay-uy chelswu
     USA-GEN   Korea-from-GEN   army-GEN   withdrawal
     'the US's withdrawal of the army from Korea'

(56) Chelswu-uy   chayk-uy tosekwan-ulo-uy panhwan
     Chelswu-GEN book-GEN library-to-GEN   return
     'Chelswu's return of the book to the library'

A Cyclic Linearization approach therefore provides a potential diagnostic for determining more about the base position and thematic status of elements occurring within DPs, and in the case of Goal and Source phrases results in the conclusion that not all elements which might

initially appear to be arguments (in virtue of their meaning) are in fact arguments merged in theta positions within n*P.[22]

Second, a reviewer asks whether it might be possible to suggest that the strict linear ordering of Possessor > Agent > Theme might in general be attributed to a *processing constraint* which blocks identically case-marked elements (such as Possessor, Agent and Theme carrying genitive *uy*) from being reordered as a way to eliminate potential ambiguity. While intuitively it might be natural to expect the grammar to favor derivations reducing ambiguity in interpretation, when the patterns found in Korean are placed in a cross-linguistic perspective, we believe that the fully rigid linear ordering of PAT elements should not be attributed to processing factors. There is a common assumption among psycholinguists (see, among others, Fodor 2002) that processing constraints should apply cross-linguistically in the same way, hence that such constraints should be *universal* and not vary in their application from language to language. With regards to the linear ordering of genitive-marked PAT elements, it has been noted that similar patterns, in which Possessor, Agent and Theme arguments are marked in an identical way, are possible in other languages, such as Spanish and Hebrew. If it were to be suggested that the rigidity of the Korean patterns could be attributed to processing factors, one would not expect parallel patterns to be acceptable in other languages. For this reason, we believe that a parametrizable syntactic approach, such as the Cyclic Linearization analysis presented here, is a more promising and plausible way of accounting for the presence/absence of linear sequencing restrictions across different languages.

Finally, the question arises as to how the proposed account might be able to accommodate patterns found among speakers which deviate from those described in the paper, which we believe to represent the majority variety of Korean, i.e. how the account might be able to handle certain dialectal/speaker variation. One reviewer of the paper reports that s/he and various informants consulted by the reviewer allow for a more permissive positioning of the bare adjective *say* 'new', which has been used as an important marker of the left edge of the lexical core (n*P) in the paper. Whereas the variety of Korean described in the paper enforces a strict positioning of *say* between genitive-marked and bare arguments (the former must occur to the left of *say*, the latter to its right), in the

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[22] Goal and Source PPs within Korean DPs would consequently have a similar syntactic status to the overt 'arguments' of verbs in polysynthetic languages as analyzed in Baker (1996). Baker suggests that verbs in such languages assign their theta roles to null pronominal elements (pros), and that the overt 'arguments' of verbs are base-generated in non-thematic positions and only acquire their interpretation as arguments via coindexation with a null pronominal which does receive a theta role. If such a syntactic process of construal were to be available and apply to certain 'arguments' in Korean DPs, Goal and Source phrases would be base-generated in n*P-external positions and receive their interpretation as 'arguments' through association with n*P-internal null pronominals which do receive Goal and Source theta roles from the noun.

variety spoken by the reviewer and certain others consulted by the reviewer, *say* may precede more than one genitive-marked PAT argument, as illustrated in example (57) provided by the reviewer:

(57) say Modigliani-uy yein-uy   chosanghwa
     new Modigliani-GEN woman-GEN portrait
     'a/the new portrait of a woman by Modigliani'

In order to accommodate such forms in the general approach proposed here, all that would actually be necessary is the assumption of a different lexical entry for the bare adjective *say* in the variety of certain speakers of Korean (such as the reviewer), not constraining it to be merged in a low position marking the boundary between the lexical core (*n*P*) and higher functional structure, and allowing it to be merged like other adjuncts in higher positions. As noted in footnote 9, there are in fact other apparently-bare adjectives which may have a distribution different from *say* for various speakers, for example *hen* 'old', which (for one reviewer of the paper) can freely attach higher up in the DP. Consequently, the difference between the reviewer's variety of Korean and the variety described in the paper would simply be that, in the former, *say* 'new' is lexically-specified to allow attachment like other apparently-bare adjectives such as *hen* 'old' in typical adjunct positions, whereas in the latter, it has to be merged low down in the DP in a fixed position immediately above the lexical core.

This variation in the lexical properties of *say* would not affect the analysis proposed in the paper. We assume that in the '*say*-as-high-adjunct' variety the same underlying syntactic structure and derivations occur as described in the paper, but the occurrence of DP-internal movement will be less easy to detect than in the variety of Korean modeled in the paper, due to the different and more flexible attachment properties of *say*. Strict linearization of PAT elements is present in all varieties of Korean, but it is only varieties with fixed markers of different portions of DP structure, such as the demonstrative *ku* and bare adjective *say* (and other bare adjectives like *say*) which provide a clear window into the underlying syntactic derivation and support for the conclusion that argument linearization patterns are determined by the interaction of Order Preservation and cyclic realization of successive Spell-out domains.[23]

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[23] One further difference between the reviewer's variety and the variety being reported on in the paper, is that the former seems to allow for all three PAT arguments to occur marked with genitive *uy* as illustrated in (i) below (where all PAT elements also follow *say*). We were not able to find any other speakers who would permit such patterns. However, modeling such a difference might only require the assumption that a third source of genitive case is available in nominal projections produced by any speakers with this variety, perhaps a second Agreement projection.

(i) say Kim-ssi-uy   Modigliani-uy yein-uy   chosanghwa
    new Kim-HON-GEN   Modigliani-GEN woman-GEN portrait
    'Mr. Kim's new portrait of a woman by Modigliani'

4. Summary and conclusions

This paper set out to analyze and develop an account of the contrast between flexibility and rigidity in word order patterns in Korean nominal phrases. The paper focused on the puzzling observation that arguments of nouns appear to enjoy great freedom of positioning within DPs, being able to occupy a wide range of positions when appropriately marked, but are heavily restricted in their relative sequencing with each other. As each PAT argument type can be merged in all three identified zones/fields partitioning Korean DPs, but access to these positions is restricted when multiple overt arguments are present, the distribution of arguments across these fields appears to be a constraint on linear ordering and should not be accounted for by syntactic restrictions which absolutely bar certain arguments from occurring in certain positions.

The paper has suggested that the mechanism best placed to account for linear ordering restrictions of this type is the approach to spell-out of syntactic structures known as Cyclic Linearization, initiated in Fox and Pesetsky (2005), and explored further in other works such as Ko (2007, 2014). During the process of Cyclic Linearization, the linear sequencing of elements is recorded when each Spell-out domain is completed and Order Preservation maintains this information as a constraint on the sequencing of elements in subsequent, higher Spell-out domains. To the extent that Cyclic Linearization provides a natural way to successfully model the complex patterns found in Korean nominal phrases, the analysis presented in the paper provides further support for Fox and Pesetsky's approach to linearization. As the primary empirical support for Cyclic Linearization in previous works has come from patterns in *clausal* syntax, involving sequencing patterns among constituents within clausal domains (verbs, objects, subjects, floating quantifiers), the present paper contributes novel arguments that elements within smaller *nominal* domains are also regulated by the interaction of Cyclic Linearization and Order Preservation, and hence Cyclic Linearization can be shown to have a very broad application across different kinds of syntactic domains, as might be expected and predicted.

Finally, the analysis of Korean has argued that nominal phrases may contain *two* Spell-out domains, DP as well as *n**P, rather than consist in just a single Spell-out domain (DP), and in this respect the syntactic architecture of nominal phrases demonstrates potentially interesting parallels with that of clauses, where two Spell-out domains are also assumed to be present (CP and VP or *v*P). While the notion of Spell-out domain in Cyclic Linearization is somewhat different to the assumption of phases in standard Minimalist approaches, the conclusion of the present paper that nominal projections may contain a secondary, internal Spell-out domain (*n**P) converges in an intriguing way with recent arguments that nominal phrases may contain secondary, 'mid-level' internal phases

(Simpson & Syed 2016, Syed & Simpson 2017). This convergence of views from two different theoretical perspectives and empirical paradigms suggests that nominal phrases are indeed divided into two major cycles relevant for Spell-out, and raises the broader question of whether any unification of the notions of Spell-out domain and phase can potentially be achieved. This will need to be the goal of future investigations.

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