Check for updates

Revisiting the structure of nominals in Japanese and Korean

Mixed headedness vs. pure head-finality

Andrew Simpson[1]

Abstract Models of nominal structure in Japanese and Korean (JK) are commonly built on the assumption that the nominal domain must be head-final because JK clauses show head-final ordering, rather than being directly supported by observable empirical head-final patterns. In order to produce the surface orders that are found in JK nominals, all head-final analyses require massive hidden movements from underlying structures which are never overtly realized in any surface sequencing. This paper suggests that a much more parsimonious analysis of JK nominal structure is available if JK are not taken to be uniformly head-final in their syntax but exhibit a degree of mixed-headedness, as found in German, Hindi, Hixkaryana, Amharic, Persian and other languages. The paper develops such an analysis, in which underlying head-initial structures do occur in surface syntax, and refines this further with support from the patterning of various numeral-classifier-noun relations in Japanese and Korean. The resulting analysis proposes that the functional structure of JK nominals is head-initial, while the lexical domain (nP, NP) is head-final. Such mixed-headedness is shown to accord with the Final Over Final Constraint/FOFC, and hence is not an unconstrained departure from the pure head-finality widely assumed for JK.

1 Introduction: The 'problem' of constituent ordering in Japanese and Korean nominals

In numeral classifier languages such as Chinese, Japanese, Korean, Vietnamese and Thai, the structural hierarchy commonly taken to relate demonstratives, classifiers, numerals and nouns, abstracting away from linear order is as shown in (1) (Tang

✉ A. Simpson
andrew.simpson@usc.edu

1   University of Southern California, Department of Linguistics, Los Angeles, CA, USA

✎ Springer

1990; Li 1998, 1999; Cheng and Sybesma 1999; Watanabe 2006; Park 2008; Saito et al. 2008; Choi 2011; An 2018; Simpson 2008):

(1)   D > Num/Q > Cl > NP

In Chinese, a language with robust head-initial patterns in the clausal domain, the hierarchical sequencing in (1) is clearly realized in the linear ordering of functional elements and noun, as illustrated in (2):

(2)   na   san ben shu
        Dem 3   CL book
        'those three books'

A range of evidence presented in Li (1998, 1999, 2014) and other works relating to ellipsis and tone sandhi patterns supports the view that demonstratives, numerals and classifiers in Chinese occur in head positions in the right-branching structure represented in (3) (see also Tang 1990):

(3)

In purely head-final languages, if the same elements occur as heads, one would expect to find the linearization and structure in (4) and (5):

(4)   NP Cl Num D

(5)

However, such an ordering is not found in head-final languages such as Japanese and Korean, and in fact may not be clearly attested in any language, according to Aikhenvald (2003:105). This is clearly a surprising observation—the mirror-image patterns of nominal structures found in head-initial languages do not seem to occur in head-final languages. Instead, a range of other orders may be observed, as noted for Japanese in Kitahara (1993), Kawashima (1998), Watanabe (2006), and for Korean in Park (2008), Choi (2011) and An (2018). The examples from Watanabe (2006:244) in (6) illustrate variability in the sequencing of nouns, numerals, classifiers and case-inflections in Japanese (parallel patterns are found in Korean: see An 2018:662):

(6)   a.   Taroo-wa   hon san-satsu-o katta   N Num CL Acc
              Taroo-TOP book 3-CL-ACC bought
              'Taroo bought three books.'

       b.   Taroo-wa   san-satsu-no hon-o   katta   Num CL Gen N Acc
              Taroo-TOP 3-CL-GEN   book-ACC bought
              'Taroo bought three books.'

       c.   Taroo-wa   hon-o   san-satsu katta   N Acc Num CL
              Taroo-TOP book-ACC 3-CL   bought
              'Taroo bought three books.'

       d.   Taroo-wa   san-satsu hon-o   katta   Num CL N Acc
              Taroo-TOP 3-CL   book-ACC bought
              'Taroo bought three books.'   Watanabe (2006:244)

Most approaches to Japanese and Korean assume that sequences such as (6a-d) should be related to a common base structure. As models of nominal structure in Japanese and Korean (henceforth JK) also regularly assume, without question, that the nominal domain must be uniformly head-final, in line with the head-finality of the clausal domain ((S)-O-V-X-Aux-C), it is necessary to posit the occurrence of massive, hidden movement operations within nominal projections to convert hypothesized head-final sequences of words into the surface forms actually attested in (6), none of which significantly corresponds to any head-final base ordering. Given the lack of independent, well-supported motivation for the multiple movements involved in such derivations, this paper will suggest that a different approach is desirable, and that a much more parsimonious analysis of JK nominal structure is available if JK are not taken to be uniformly head-final in their syntax but exhibit a degree of mixed-headedness, as has previously been well-motivated for German, Hindi, Bangla, Hixkaryana, Amharic, Persian and other languages (see, among others, Bayer 1999; Grewendorf 1988; Kalin 2014; Comrie 1989). The paper develops an analysis in which head-initial structures are projected by demonstratives, numerals and classifiers and are frequently manifested in surface linear order, and refines this modeling further with support from the patterning of various numeral-classifier-noun relations in Korean and Japanese. The resulting analysis proposes that the functional structure of JK nominals is head-initial, while the lexical domain (*n*P, NP) is head-final. This in turn raises questions about the degree to which languages may permit non-harmonic structures to occur and whether all combinations of head-initial and head-final projections should be assumed to be possible. The paper points out that its departure from a purely head-final analysis of Japanese/Korean nominals represents a pattern of mixed headedness which accords fully with the predictions of the Final Over Final Constraint (FOFC) that only one type of mixed-headed patterning should occur within any extended projection, with head-initial categories dominating head-final constituents (Sheehan et al. 2017). The analysis proposed in the paper is hence a structuring of nominal phrases that might indeed be anticipated to occur in certain languages, according to FOFC. Japanese and Korean are here suggested to be examples of languages which now fulfill FOFC's typological expectation of (a specific type of) mixed-headedness being available within nominal phrases.

2 Modeling word order variation in JK nominals: Issues with head-final analyses

As noted above in Sect. 1, none of the various orders of numerals, classifiers, and nouns/NPs illustrated in (6) corresponds to a simple head-final sequencing of the elements involved, which makes modeling such patterns in a convincing way a considerable challenge for any approach committed to an across-the-board head-final analysis of JK. This has been attempted in a number of works, such as Kitahara (1993), Kawashima (1998), Muromatsu (1998) and Watanabe (2006) for Japanese, and Park (2008), Choi (2011), and An (2018) for similar patterns in Korean. The prominent, well-referenced investigation in Watanabe (2006) will be used here as a representative example of how the variation in (6) can potentially be approached, and the kinds of analysis that appear to be required once a head-final base is assumed for JK nominal projections.[1] The current section first presents the derivations posited in Watanabe (2006) and then highlights a number of concerns that arise from head-final modelings of this type.

Watanabe (2006:252) proposes the structure in (7) as the base underlying all nominal phrases in Japanese, and An (2018) suggests a parallel structure and set of derivations for Korean. Classifiers are projected in the head of #P, nominative and accusative (but not genitive) case-particles are suggested to project a CaseP dominating #P, quantifiers occur in QP, and demonstratives higher still in DP:
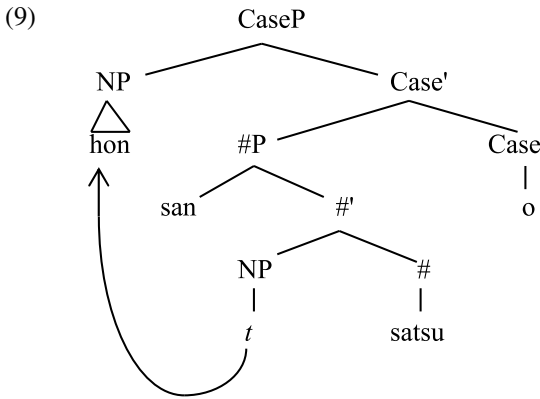
(7)
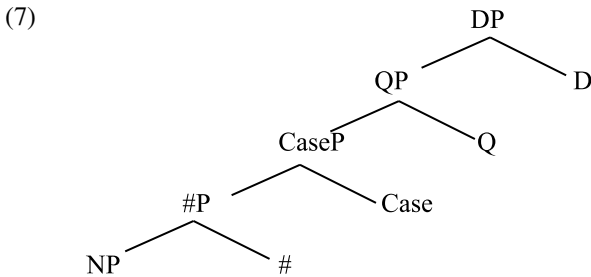
As numerals always precede classifiers, but are assumed to occur in structurally higher positions, Watanabe suggests that they are phrasal categories projected in the specifier of #P, as shown in (8):

---

[1]The other works on Japanese and Korean referenced here also posit multiple occurrences of movement to derive the surface patterns in JK nominals from the assumed, but unattested head-final base order, though with some variation in the details of this hidden movement. The paper focuses on Watanabe's (2006) proposal for Japanese, and its reapplication to Korean in An (2018), as these are the most commonly cited analyses of JK nominal structure.

(8)

```
          #P
    san          #'
    3
         NP          #
         /\          |
        hon        satsu
        book        CL
```
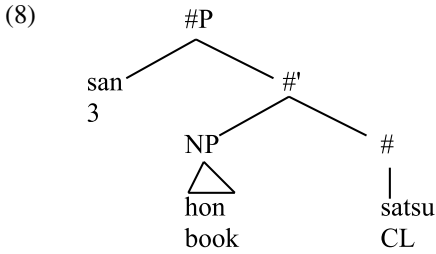
The base sequence hypothesized in (8) [numeral > NP > classifier] is never attested in Japanese, however, so it is proposed that NPs must always move to a higher position, which Watanabe identifies as SpecCaseP, producing the linear sequence in (9).

(9)

```
                CaseP
     NP                    Case'
     /\
    hon        #P              Case
                                |
          san         #'        o
                 NP        #
                 |         |
                 t       satsu
```

When another functional projection QP is projected above #P, optional remnant movement of #P is suggested to occur to SpecQP, as in (10):

(10)

```
                         QP
         #P                        Q'
        /  \
     san   satsu       CaseP              Q
                     hon        Case'
                              t        Case
                                        |
                                        o
```
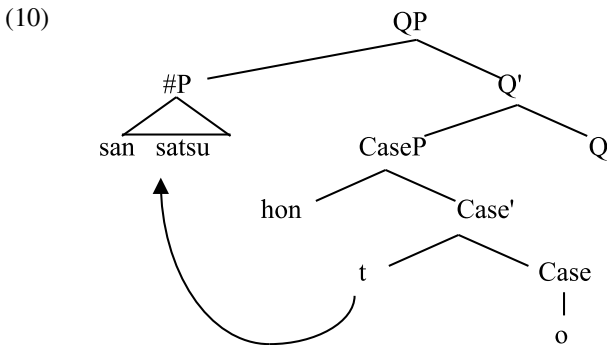
Following such remnant movement, at PF, there is attachment of the genitive case-morpheme *no* to #P, resulting in pattern (6b), reproduced in (11):

(11)   san satsu-no hon-o
         3   CL GEN book ACC

Pattern (6c) is suggested to result from further movement applying to the structure in (10). When D is merged, it is proposed that CaseP is optionally attracted to SpecDP, as in (12):

(12)
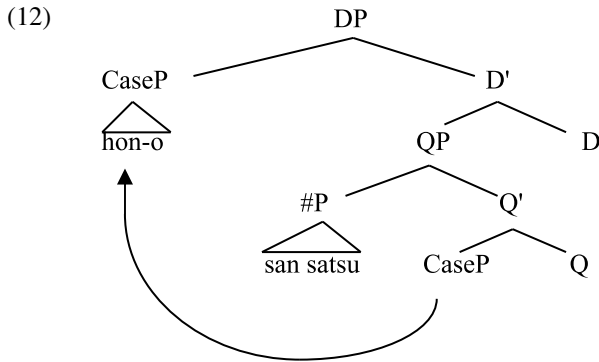
Finally, in pattern (6d), it is proposed that CaseP in structure (12) may first be moved out of DP, followed by DP remnant movement/scrambling to a position further forward, as schematized in (13):

(13) a. $[_{CaseP}$ hon-o$]_i$ $[_{DP}$ t_i san satsu t_i]
      b. $[_{DP}$ san satsu t_i $]_k$ $[_{CaseP}$ hon-o$]_i$ t_k

While the set of derivations proposed in Watanabe (2006) does provide a (very complex) way to model the four linear sequences of numerals, classifiers and nouns found in Japanese, by means of multiple remnant movements, there are two major causes for concern with such a head-final-base analysis of Japanese nominals.

First, although four surface patterns of numerals, classifiers and nouns/NPs are found in Japanese (and Korean), in no head-final analysis of Japanese (or Korean) are any of these sequences actually a manifestation of the hypothesized underlying base structure [Numeral NP Classifier], and all such patterns must be produced by multiple occurrences of movement. Elsewhere, when variant forms occur such as SOV and OSV orders in Japanese/Korean, or V2 vs. V-final clauses in German, illustrated below in (14) and (15), it is commonly assumed that one variant form is derived from another sequencing which does represent a neutral, base-generated order. However, in the case of the four linearizations of numerals/classifiers/nouns in Japanese, none of these arrangements can be assumed to be the head-final base order and source of the other sequences found. Such a sequencing surprisingly never occurs, raising questions about its hypothesized existence.

(14) a. Taro-ga   hon-o   katta.   *base SOV*
          Taro-NOM book-ACC bought
          'Taro bought the/a book.'
      b. hon-o$_k$ Taro-ga t_k katta   *derived OSV*
          book-ACC Taro-NOM bought
          'Taro bought the/a book.'

(15)   a.   Ich glaube dass sie gestern   angekommen ist.
             I   believe C   she yesterday arrived   is
             'I think she arrived yesterday.'
             base V-final embedded clause
       b.   Ich glaube sie ist_k gestern   angekommen t_k.
             I   believe she is   yesterday arrived
             'I think she arrived yesterday.'
             derived V2 embedded clause

Second, the non-occurrence of the posited base order of [Numeral NP Classifier] in surface forms goes well beyond Japanese as a potential problem for assuming such an underlying base. While it might perhaps be suggested that in Japanese the absence of such sequences could be seen as an accidental gap in the paradigm, caused by a particular distribution of EPP features on appropriate functional heads causing movement to occur, it is natural to expect that the hypothesized underlying base in Japanese would surface in other numeral classifier languages with a different distribution of EPP features. However, there are actually no languages found anywhere in the world which overtly manifest the base structure assumed for Japanese—a surface sequencing of numeral > NP > classifier. One of the most robust observations present in studies of numeral classifier languages is that numerals and classifiers always occur adjacent to each other, either preceding or following nouns, and such elements never surface on opposite sides of the NP they modify (see Aikhenvald 2003; Dryer 2018). It is hard to imagine what could possibly account for this fully cross-linguistic gap. One directly significant consequence of the complete absence of overt [numeral > NP > classifier] sequences across languages is that *all* head-final SOV languages with surface Num > CL orders and a [Num [[NP] CL]] base would need to be analyzed as having obligatory NP movement [NP_k [Num [t_k CL]], removing the NP from its underlying position between numerals and classifiers, and causing the latter to be string-adjacent in surface syntax. Here it is natural to ask what might explain such universally forced NP-movement in head-final classifier languages? Watanabe (2006) suggests that the movement in Japanese might perhaps be triggered by case-related reasons, but if this were to be so, I would expect to find some languages where the NP-raising would be overt, and others where it would not occur, if associated EPP features were not to be present on the case-related head, hence one would expect to find both [NP Num CL] sequences and [Num NP CL] linearizations. In all other paradigms of case-related movements—for example, the movement of subjects to SpecTP and objects to Spec*v*P/SpecAgrP—one finds some languages that exhibit this movement, and others that do not. Hence, not all languages have overt subject raising, and some languages display both subject raising and subject in situ patterns, as, for example, illustrated in the alternations between SVO and VSO orders in Arabic in (16):

(16)   a.   ra'a-a l-'awlaad-u   Zayd-an   VSO
             saw-3.S the-boys-NOM Zayd-ACC
             'The boys saw Zayd.'

b. l-'awlaad-u ra'a-w Zayd-an. SVO
the-boys-NOM saw-3PL Zayd-ACC
'The boys saw Zayd.' (Ouhalla 1994:338)

If DP-internal NP-movement is to be attributed to EPP features on an internal Case head, the cross-linguistic patterning of case-related movement creates the expectation that there should be languages where the NP movement will take place, and others where it will not, yet this is not what is found—no languages allow for the NP in situ option, and it has to be assumed that the Case head obligatorily carries an EPP feature in all relevant languages, unlike the variable distribution of EPP features on other case-related heads such as T and *v*/Agr. As far as is currently known, no equivalent forced movements have been found to occur across-the-board in all languages in any other syntactic domain, hence there are wh-movement and wh-in situ languages (English vs. Chinese), languages with V-to-T movement and languages where verbs do not raise overtly to T (French vs. English), languages with N-to-D movement and others where no N-raising takes place (Shona[2] vs. English). The NP-movement which it is necessary to assume from underlying [Num [[NP] CL]] structures stands out as being quite exceptional in nature in its fully automatic occurrence and might only seem to be motivated by the attempt to capture surface word order patterns from the assumption of a strictly head-final base.

Given the concerns which therefore emerge from a scrutiny of head-final analyses of JK nominals of the type exemplified here by Watanabe's (2006) study (arguably the most engaged investigation of its kind), when considered in a comparative cross-linguistic perspective, one might wonder if there are alternative modelings available which would avoid the issues highlighted above. The theoretical problems which arise for approaches such as that developed in Watanabe (2006) can all be ultimately attributed to the broadly-held assumption that JK nominals must be head-final in their structuring because clauses in these languages are head-final, although the strong empirical motivation for head-finality that is found with clauses is not manifested in nominal projections.[3] Section 3 challenges this important assumption about JK nominals to see what new possibilities this might open up, and argues that a head-initial analysis of the functional structure of JK nominals allows for a much simpler model free of the primary difficulties associated with head-final analyses.

3 Questioning a uniform head-final analysis of Japanese and Korean

As already emphasized in Sects. 1 and 2, models of nominal structure in Japanese and Korean have regularly been strongly influenced and driven by a commitment to the assumption that Japanese and Korean are head-final languages across all categories, despite the considerable complications this gives rise to in analyzing the surface linearization of numerals, classifiers and nouns. An alternative perspective may be to

---

[2]Carstens (2017).

[3]Perhaps with the exception of the linear positioning of case-particles, it will soon be shown that this support for head-finality in the nominal domain actually turns out to be an illusion once the broader, cross-linguistic patterning of case particles is taken into consideration.

entertain the idea that head-finality is a consistent property of the clausal domain, as suggested by the S-O-V-Aux-C patterns found in clauses, but not a consistent property of the nominal domain, where head-initial structures might potentially occur. Japanese and Korean, in such a view, would not be 'pure' head-final languages but exhibit a degree of mixed-headedness, varying according to domain.

Although it has been a traditional assumption of JK generative syntax that structures projected in both Japanese and Korean are uniformly head-final, as a result of the head (directionality) parameter (Travis 1989; Baker 2001, among others), patterns of mixed-headedness are well-attested and accepted as such in many other languages, some of which are otherwise dominantly head-final. For example, SOV German and Hindi show that not all categories pattern in the same way with regard to head-directionality. In German, VPs and TPs are head-final, but CPs, DPs and PPs are head-initial, as illustrated in (17) (Grewendorf 1988):

(17) Er glaubt, dass Johann das Haus verkaufen wird.
      he says   that Johann the house sell   will

              [$_{CP}$ C [$_{TP}$ [$_{VP}$ [$_{DP}$ D NP]   V]   T]]
      head-final: [$_{TP}$ VP T]   [$_{VP}$ Object V]
      head-initial: [$_{CP}$ C TP]   [$_{DP}$ D NP]   [$_{PP}$ P DP]

      'He says that Johann will sell the house.'

In Hindi, VPs, PPs and TPs are head-final, but CPs headed by *ki* 'that' are head-initial (Kachru 2006)

(18) Ram-ne   kahaa [$_{CP}$ ki Sita ghar-me^{n} hai^{n}]
      Ram-Erg said   C Sita home-at   is
      'Ram said that Sita is at home.'

Similar patterns of stable mixed headedness are found in other languages, e.g. Persian, Amharic, Bangla, and Hixkaryana (Kalin 2014; Bayer 1999; Comrie 1989). In some instances, they may arise as languages change their general direction of selection/head-complement sequencing from a head-final to a head-initial patterning, or from head-initiality to head-finality. In northeast China, for example, Xining Mandarin (Bell 2019) has undergone change from head-initial patterns to head-final patterns, under influence from local dominantly head-final Altaic languages. As examples (19-20) show, the Xining variety of Mandarin is now significantly different from standard Mandarin Chinese, and has the typical clausal word order of head-final SOV languages:

(19) Wang laoshi jia-ha   yi ben fu   gei-zhe   S > IO > OB V
      Wang teacher 3SG-Obj one CL book give-ASP
      'Teacher Wang gave him a book.'   (Bell 2019:144)

(20) gou-a che-tuo, [$_{CP}$ lang lai   li   fozho] han   lia ko
      dog-Prt bark-start,   wolf come will C   shout Prt Prt

                                          S > V > Aux > C
      'The dog started barking. (S/he) was shouting that a wolf is coming.'
                                                      (Bell 2019:144)

Interestingly, however, the nominal domain in Xining Mandarin retains the head-initial sequencing of standard Mandarin (compare (21) with (2)):

(21) a. [DP na [QP [CIP ge [NP gawa]]]]   Dem > Cl > NP
          Dem   Cl   N
          'that boy'   (Bell 2019:160)

      b. [QP yi [CIP ben [NP fu]]]]   Num > Cl > NP
          1   CL   book
          'a book'   (Bell 2019:160)

In South Asia, Bangla is an SOV numeral classifier language with dominant head-final patterns in the clausal domain, but has a neutral sequencing of functional elements in the nominal domain that parallels those in head-initial languages such as Chinese (compare (22) with (1) and (2)):

(22) o   tu To boi   D > Num > Cl > NP
      Dem 2 Cl book
      'those two books'

Both Xining Mandarin and Bangla are therefore SOV languages with dominant head-final structures in the clausal domain, but head-initial patterns in the nominal domain. Such mixed head-directionality in the clausal and nominal domains is now exactly what I would like to explore as an alternative hypothesis and analysis of nominal projections in Japanese and Korean, departing from the common assumption that such domains must be fully head-final.

4 A head-initial analysis of Japanese and Korean nominal projections

So, how might a potentially head-initial approach to the ordering of numerals, classifiers and nouns/NPs in JK nominals be able to capture the distribution of these elements? Perhaps a little surprisingly, a head-initial analysis actually turns out to be quite simple and straightforward to develop in its basics for Japanese and Korean nominals. This is first demonstrated in Sect. 4.1, followed by discussion of the attachment of case particles, in Sect. 4.2. Sections 4.3 and 4.4 show how the head-initial analysis allows for new insights into two further patterns involving numerals, classifiers and nouns in Korean and Japanese. Finally, Sects. 4.5 and 4.6 consider the lower lexical level of nominal projections, propose a structural analysis of both the functional and lexical domains in JK nominals, and address the issue of mixed-headedness in connection with the Final Over Final Constraint.

4.1 Modeling the basic alternations in Japanese and Korean

If one temporarily ignores the occurrence of case particles in nominal projections and how these are attached (returning to this shortly in Sect. 4.2), there are essentially two broad patterns to account for in the Japanese paradigm documented in (6). The first of these, 'Pattern A,' involves a sequencing of numeral > classifier > NP (=6b and 6d). The second, 'Pattern B,' linearizes the NP before the numeral and classifier: NP >

numeral > classifier (=6a and 6c), as schematized in (23). The original alternations noted in (6a-d) are repeated here for convenience.

(23)   a.   Num Cl NP **Pattern A**
        b.   NP Num Cl **Pattern B**

(6)   a.   **Pattern B**
            Taroo-wa hon san-satsu-o katta   NP Num CL Acc
            Taroo-TOP book 3-CL-ACC bought
            'Taroo bought three books.'   (Watanabe 2006:244)
        b.   **Pattern A**
            Taroo-wa san-satsu-no hon-o katta   Num CL Gen NP Acc
            Taroo-TOP 3-CL-GEN book-ACC bought
            'Taroo bought three books.'   (Watanabe 2006:244)
        c.   **Pattern B**
            Taroo-wa hon-o san-satsu katta   NP Acc Num CL
            Taroo-TOP book-ACC 3-CL bought
            'Taroo bought three books.'   (Watanabe 2006:244)
        d.   **Pattern A**
            Taroo-wa san-satsu hon-o katta   Num CL NP Acc
            Taroo-TOP 3-CL book-ACC bought
            'Taroo bought three books.'   (Watanabe 2006:244)

In a head-initial approach, the sequence found in Pattern A which may be preceded by a demonstrative [Dem > Num > CL > N] is open to an analysis as a fully base-generated sequence of heads of functional projections with no occurrence of any movement, entirely parallel to the structure and linearization of elements in head-initial Chinese—compare (24) with (2):

(24)   [$_{DP}$ Dem [$_{\#P}$ Num [$_{ClP}$ CL [$_{NP}$ NP]]]

Such an analysis has the immediate advantage that one of the basic surface patterns of Japanese nominals corresponds to the underlying, base structure of such constituents—Pattern A may simply be the realization of demonstrative, numeral, classifier and NP in their base-generated positions, with no instances of movement. This may be compared with the derivation of Pattern A in the head-final modeling proposed in Watanabe (2006) which may require five applications of phrasal movement to capture the surface sequencing of elements (see Sect. 2).

    Pattern B can be derived from the head-initial base structure in (24) by one application of optional movement, the leftwards displacement of the NP complement of the classifier, as represented in (25).

(25)   Num CL NP → NP$_k$ Num CL N̶P̶$_k$

It should be noted that this occurrence of movement is distinct from the NP-movement posited in Watanabe's head-final analysis in several important ways. First, it is optional movement vs. the obligatory occurrence of NP-movement necessary in the head-final approach to model the linear occurrence of numerals and classifiers relative to the NP. Second, the optional movement in (25) takes place from an

underlying structure which is realized in surface syntax in other instances – Pattern A. Third, it is possible to find independent empirical support and arguments for the kind of NP movement assumed to derive Pattern B from Pattern A. In Japanese (and Korean), one finds NP-movement regularly stranding numerals and classifiers in Q-float patterns such as (26). If nominal projections constitute phases and extraction from phasal constituents must proceed through the edge of a phase due the Phase Impenetrability Condition (Chomsky 2000), it can be assumed that the NP-fronting in (26) would first involve movement of the NP to the edge of the nominal, resulting in Pattern B, prior to extraction to a higher position.[4]

(26) $[hon-o]_k$ Taroo-ga $[t_k$ san satsu $t_k]$ katta.
        book-Acc Taroo-Nom 3 CL   bought
        'Taro bought three books.'

Similar nominal-internal NP-movement has also been well-motivated in other classifier languages, for example Thai, Burmese, and Bangla (Simpson 2008; Simpson and Syed 2016). The examples in (27) from Bangla show optional movement of an NP within a DP constituent. The pattern in (27a) is the neutral order of demonstrative, numeral, and classifier in Bangla, (27b) is a variant ordering:

(27)   a.   ei   du To lal boi →   b.   ei $[_{NP}$ lal boi $]_k$ du To $[_{NP}$ ~~lal boi~~ $]_k$

             Dem 2 CL red book   Dem red book 2 CL ~~red book~~
             'those two books'   'those two books'

There is consequently both cross-linguistic and language-internal support for the movement hypothesized in Pattern B, unlike the much less-motivated, obligatory movements posited in the head-final derivation in Watanabe (2006).[5]

Modeling the basic alternations found in Japanese nominal word order is consequently not complicated or difficult in a head-initial approach, and avoids the need to hypothesize the application of multiple occurrences of rather poorly-understood, hidden movement in each derivation.

4.2 The attachment of case particles

In examining the viability of a head-initial analysis of JK nominals in Sect. 4.1, I deliberately set aside the question of how case particles may come to be attached in Japanese and Korean, and this issue will now be addressed. In Watanabe (2006), it is suggested that nominative and accusative (but not genitive) case particles in Japanese

---

[4]The Q-float patterning in (26) shows a clear similarity to the phenomenon of split DPs in German, discussed in Fanselow and Cavar (2002), in which an NP constituent raises to a sentence-initial topic-like position (thanks to a reviewer for pointing this out). The interpretive effect of Q-float in Japanese and Korean may also correspond to DP-splitting in German, with the NP being interpreted as a topic and a focus occurring on the stranded numeral-classifier remnant constituent.

[5]I will not attempt to develop any argument for the specific landing-site of nominal-internal NP-movement in Japanese, Korean, or the other languages referenced here. As this movement is optional in Japanese and Korean, it could be analyzed as scrambling to higher, adjoined positions within the nominal projection or at its edge, in cases of further movement out of the nominal projection, as in (28).

are syntactic heads each projecting a CaseP in nominal structures, as represented earlier in (9) and (10).

In Pattern A, a genitive case particle may occur between the classifier and the noun:

(28)   Num CL-*no* NP

In Pattern B, nominative and accusative case particles may occur either following the entire sequence of NP Num Cl or between the NP and Num:

(29)   a.   NP Num Cl-*ga*/-*o*
         b.   NP-*ga*/-*o* Num Cl

How might these case particles/inflections be attached—as syntactic heads, as suggested in Watanabe (2006) for nominative and accusative case, or as purely morphological inflections, as proposed in various other works on Japanese? If some case particles are indeed the lexicalization of functional heads projected in syntax, the positioning of case particles might seem to constitute empirical evidence in favor of a head-final analysis of JK nominals—case particles follow the words/phrases to which they attach, and so would be open to an analysis as the instantiations of head-final projections.

While such an approach is indeed taken by Watanabe (2006) for nominative and accusative, but not for genitive case particles, elsewhere a broad range of works discussing case in Japanese argue for alternative morpho-phonological analyses of the attachment of case inflections. For example, in Nakamura (2012), Harada (2002), Fukui and Sakai (2003), evidence is presented from both sluicing and coordination structures in support of a PF insertion analysis of case-markers in Japanese.[6] In Miyagawa (2012), an investigation of quantifier float patterns leads to the conclusion that case particles do not project syntactically and are therefore non-syntactic affixes, and for Kitahara (1993) too case particles are affixes, attached to either nouns or classifiers and not inserted in any syntactic head position. Similar assumptions are held specifically for the genitive case-particle *no* in Kitagawa and Ross (1982), Saito et al. (2008), and also in Watanabe (2006)—genitive *no* is suggested to be attached in PF

---

[6]Fukui and Sakai (2003) show that the attachment of case particles can be made to sequences of words which do not comprise syntactic constituents, in contrast to the occurrence of postpositions, which are not possible in the same environments (see examples 19a/b in Nakamura 2012). To account for the sometimes odd syntactic placement of case particles in contrast to postpositions, Fukui and Sakai suggest that the latter are real syntactic heads, which can only be merged in appropriate positions projected by syntactic structure, whereas case particles are attached post-syntactically, and hence may appear in positions that do not correspond to syntactic heads. Nakamura (2012) shows that the movement of PPs in sluicing constructions may violate island constraints, as ellipsis is able to save such syntactic violations, but the movement of case-inflected NPs is not possible in the same environments. Nakamura argues that the movement violation in both cases must be assumed to be saved by ellipsis, and that the ill-formedness of the NPs in such examples can be attributed to a failure of case-transfer in a post-syntactic morphology component, affecting case-marked NPs but not PPs. Both such works follow a perspective on case-marking originating with Kuroda (1965, 1988) which argues that Japanese case-marking is fundamentally different from case-marking in languages such as English, because Japanese is a language without agreement, and agreement does not play a role in case-marking in Japanese (Agree in minimalist terms). The attachment of case-particles is instead argued to be determined in top-down linear way following the creation of syntactic structures (*Linear Case Marking*, Kuroda 1965), hence post-syntactically.

and not correspond to any syntactic position in nominal structure. There is consequently substantial support in the literature for the suggestion that case-particles in Japanese are morpho-phonologically affixed to other elements in nominal projections and do not project from syntactic head positions. As such a view seems plausible given the arguments presented in the works listed above, it will now also be adopted here.[7],[8]

Ignoring the attachment of case particles (as non-syntactic), this results in just two basic syntactic patterns to be modeled, rather than four, as already suggested: Patterns A and B. As shown above, capturing these patterns within a head-initial perspective is relatively straightforward and uncomplicated, and avoids the broader problems raised by head-final approaches and their highly complex, under-motivated movement analyses. A general, head-initial approach to the functional structure present in JK nominals also has further potential advantages, and allows for different, fresh insights into other patterns and phenomena associated with nominal syntax in Japanese and Korean. Here I will consider two additional nominal paradigms which are open to a new analysis with the head-initial modeling being explored in the paper, in Sects. 4.3 and 4.4.

4.3 Asymmetries in interpretation in Patterns A and B

The assumption that Pattern B in JK nominals is derived from Pattern A allows for an understanding of the differing availability of two types of quantity reading in Patterns A and B. I will illustrate this with data from Korean, reported in Hwang (2003), and parallel patterns in Japanese.[9] When demonstratives precede numeral-classifier + NP

---

[7]Specifically, I assume that nominative and accusative particles may be attached post-syntactically as suffixes to any NP node. In Pattern A, this results in the sequence [Num CL NP-ga/-o] as in (6b/d). In Pattern B, it can be assumed that nominative/accusative case particles may attach either to the raised position of an NP [NP_k-ga/-o Num Cl $\overline{NP}_k$] as in (6c), or to the copy of an NP in its base position [NP_k Num Cl $\overline{NP}_k$-ga/-o] as in (6a). For genitive case, I adopt the classic mod-insertion account in Kitagawa and Ross (1982), in which -no is inserted between a modifier and a noun:

(i)   Mod-Insertion: [$_{NP}$...XP N^α]$_\rightarrow$ [$_{NP...}$ XP Mod N^α], where Mod $=$ no (from Saito et al. 2008:249).

[8]There is also a general typological argument which can be given against the assumption that case particles in Japanese and other languages are syntactic heads and consequently provide information about the head-initiality/head-finality of nominal projections. In a broad cross-linguistic study of languages with overt case-marking elements, Dryer (2013) reports a striking asymmetry in the distribution of case particles relative to their nominal hosts, with pre-nominal case-marking being very rare in comparison to post-nominal case-marking, occurring at a ratio of only 1:10 (55 vs. 575 languages). Were the positioning of case particles relative to the NP to align with the head-directionality dominant in a language/nominal projection, one would expect to find case particles regularly preceding nominal constituents in head-initial languages, as heads of head-initial CasePs. However, large-scale studies such as Dryer (2013) and Blake (2001) show that this is very infrequently attested, and the overwhelming descriptive generalization is that case particles attach post-nominally as suffixes across languages. Such observations support the assumption that case-particles do not head Case-Phrases which can be taken to mirror the head-directionality elsewhere present in a language and that the syntactic organization of nominal projections as head-initial or head-final cannot reliably be deduced from the linear positioning of its case-marking elements.

[9]Many thanks to Tomoko Ishizuka, Hiroto Nakagome and Satoshi Shigeoka (personal communication) for the Japanese data and judgments.

combinations, Pattern B has been noticed by Hwang (2003) and others to allow for two distinct interpretations, as illustrated in (30). The first of these is a 'demonstrative high scope reading,' in which the definiteness added in to the nominal is interpreted as taking scope over the sequence of numeral, classifier and noun, resulting in the interpretation 'the two books.' The second interpretation possible in Pattern B in (32) is a 'pseudo-partitive reading,' in which the definiteness of the demonstrative is construed under the scope of the numeral and classifier, allowing for (30) to be interpreted as meaning 'two of the books.'

(30)　　Mary-ka　[ku　chayk twu kwen]-ul sassta.　　NP Num Cl = Pattern B
　　　　Mary-NOM DEM book two CL-ACC bought

　　　　'Mary bought the two books.'　　　　demonstrative high scope reading
　　　　'Mary bought two copies of the book.' pseudo-partitive reading

(Hwang 2003:15)

Pattern A, by way of contrast, only allows for one of these two interpretations—a demonstrative high scope reading 'the two books,' as shown in (31):

(31)　　Mary-ka　[ku　twu kwen uy　chayk]-ul sassta. Num Cl NP=Pattern A
　　　　Mary-NOM DEM two CL　GEN book-ACC bought
　　　　'Mary bought the two books.'　　　　demonstrative high scope reading
　　　　Not: 'Mary bought two copies of the book.' ~~pseudo-partitive reading~~
(Hwang 2003:15)

Parallel patterns occur in Japanese, as shown in (32) and (33) below:

(32)　　Mary-ga　[sono hon　ni-satu]-o　katta.
　　　　Mary-NOM DEM book two-CL-Acc bought

　　　　'Mary bought the two books.'　　　　demonstrative high scope reading
　　　　'Mary bought two copies of the book' pseudo-partitive reading

(33)　　Mary-ga　[sono ni-satu-no　hon]-o　katta.
　　　　Mary-NOM DEM two-CL-GEN book-Acc bought
　　　　'Mary bought the two books.'　　　　demonstrative high scope reading
　　　　Not: 'Mary bought two copies of the book.' ~~pseudo-partitive reading~~

How can this contrast between pairs such as (30/31) and (32/33) be interpreted? The difference between Patterns A and B can arguably be accommodated in a straightforward way by the analysis of these patterns offered here, and so adds further potential support for such an approach. Quite generally, the occurrence of movement creating a chain between two positions in a syntactic structure may often increase the interpretations available to an element, allowing in various instances for the interpretation of an element to be made either in the head of the chain/its raised position (high scope), or in the tail of the chain/base position (low scope, via reconstruction). The observation that Pattern B allows for two interpretations in sequences such as (30) and (32), whereas Pattern A in (31)/(33) only permits one of these interpretations can be suggested to indicate that Pattern B is derived by movement (from Pattern A), and

Pattern A is base-generated/not derived by any movement. This then clearly favors the analysis of these alternations given in (25), in which Pattern A is the head-initial base and Pattern B is derived from Pattern A by fronting of the NP constituent.[10] By way of contrast, the patterns found in (30-33) cannot be captured naturally in Watanabe's (2006) approach, as Pattern A is assumed to be derived by movement from Pattern B (as shown in (9) and (10)). If movement potentially increases the interpretational possibilities open to a constituent, it would be expected that the greater amount of movement associated with Pattern A would increase rather than restrict the interpretations open to it, and that Pattern A would have at least the same range of interpretations open to Pattern B, but this is not the case.

4.4 Classifier-less numeral noun patterns in Korean

A second paradigm that can be given a plausible new account in a head-initial approach to JK nominals involves a patterning of numerals and nouns in Korean which has not received much attention in the literature—the combination of a numeral and a noun *without a classifier*. Although classifiers are in most cases obligatory when a numeral occurs with a noun, in certain instances a bare 'numeral noun' pattern may be used as an alternative to sequences in which a classifier is present (Lee and Ramsey 2000; Choi 2011). This is illustrated in (34), from Choi (2011) and An (2014), which shows that a classifier-less version of the standard numeral-classifier-noun sequences in (34a/b) is possible in the sequences in (34c/d).

(34)   a.   sey myeng uy   haksayng
            3   Cl   Gen student
            'three students'   (Choi 2011:526)
       b.   ku   twu chae uy   kenmwul
            Dem 2   Cl   Gen building
            'these two buildings'   (An 2014: 384)
       c.   sey haksayng
            3   student
            'three students'   (Choi 2011:528)

---

[10]Concerning how NP-movement within nominals gives rise to a pseudo-partitive interpretation, I would like to tentatively suggest that the demonstrative present in (30-33) acts in a way like certain focus-sensitive operators such as the particle *shi* in Mandarin Chinese which impose a strict locality requirement on their associate—immediate linear adjacency (see Chiu 1993). In JK, a base sequencing of [Dem Num CL NP] can be hypothesized to result in demonstratives scoping only over the full, adjacent constituent [two classifier book]], causing a non-partitive interpretation, and it will not be possible for the demonstrative to associate just with the lower, embedded NP [$_{NP}$ book] (excluding the numeral and classifier from its modification-scope) to bring about a pseudo-partitive interpretation. For such an interpretation to arise, the NP associate needs to occur linearly adjacent to the demonstrative (building a structure with the interpretation [[$_{Dem}$ this [$_{NP}$ book]], two copies of it]), and this can be achieved by NP-movement: [Dem [[**NP**]$_k$ [Num CL t$_k$]]. Such a view of the alternations in (30-33) clearly needs to be fleshed out more but captures the basic intuition that raising in Pattern B allows for the NP either to be scoped over locally by the demonstrative, resulting in the pseudo-partitive reading, or to be interpreted in its base position, causing the demonstrative high scope reading, whereas the (hypothesized) lack of any movement in Pattern A restricts its interpretation, and the demonstrative is unable to scope locally over just the NP. For further discussion of pseudo-partitives in general, see Rutkowski (2007), Matushansky (2017), and Rothstein (2011).

    d.   ku   twu kenmwul
         Dem 2   building
         'these two buildings'   (An 2014:385)

The bare numeral noun pattern has two significant properties that need to be captured. The first of these is that only certain nouns may occur without a classifier when combined with a numeral. These include, but are not restricted to, the nouns listed in (30):

(35)   *haksyang* – student   *pyenhosa* – lawyer *ai* – child
        tanchey – organization *enni* – sister   *kica* – reporter
        kenmwul – building   *cip* – house

Second, only certain numerals occur in the bare numeral noun pattern. Specifically, only low native Korean numerals may be used when no classifier occurs in the bare numeral pattern, as illustrated in (38) and (39) from Lee and Ramsey (2000:99). Examples (36b/37b) involve high native Korean numerals, while (38c/39c) have Sino-Korean numerals. Use of these numerals is otherwise well-formed in the presence of a classifier.

(36)   a.   twu/sey/ney haksayng
           2/3/4   student
           '2/3/4 students'
      b. ??selhun haksayng
           20   student
      c. *o haksayng
           5 student

(37)   a.   twu/sey/ney thokki
           2/3/4   rabbit
           '2/3/4 rabbits'   Lee and Ramsey (2000:99)
      b. ?tases thokki
           5   rabbit
      c. *sam thokki
           3   rabbit

Here I will briefly sketch out an analysis of this patterning and how its restrictions can potentially be made sense of in a head-initial perspective of JK nominals in which the underlying base of such nominals is (38).

(38)   [$_{DP}$ Dem [$_{\#P}$ Num [$_{ClP}$ CL [$_{NP}$ NP]]]]

There are three primary ingredients to the analysis I would like to propose. First, I adopt Park's (2019) suggestion that the Korean nouns which participate in the bare numeral noun construction are lexically specified to combine either with a regular, overt classifier, or, alternatively, with a phonetically null classifier, which I label CL$_{-\emptyset}$.[11]

---

[11] Such an assumption avoids the conclusion that nouns in this set come in two different semantic types, a mass-noun type which needs a classifier in order to be partitioned in numeral quantification, and an

Second, I adopt the assumption, well-motivated in a number of works (Li 1998; Cheng and Sybesma 1999; and Zhang and Ning 2019 among others),[12] that restrictions on the distribution of phonetically null functional elements show that such elements must be licensed by an appropriate c-commanding head, akin to a relation of proper government (Longobardi 1994). I suggest that $CL_{-\varnothing}$ in Korean must similarly be licensed by an appropriate c-commanding head.

Third, I hypothesize that low, native Korean numerals occur in head positions c-commanding the position of classifiers and have the structural ability to head-govern and license the use of $CL_{-\varnothing}$. Here it can be noted that there is independent support for the hypothesis that mono-morphemic low Korean numerals occupy head rather than specifier/phrasal positions. Lee and Ramsey (2000:98) observe that special phonological conditioning of (only) low native Korean numerals occurs when certain classifiers such as *mal* (4.765 gal.), *toy* (0.4777 gal.) and *ca* (0.994 ft.) are present, causing *seys* '3' and *neys* '4' to be realized as *sek* and as *nek*. Special phonological conditioning of low native Korean numerals also occurs in the bare numeral construction, removing the final consonant of such numerals in pre-nominal position, as shown in (39), and when low Korean numerals precede an overt classifier, as in (40);

(39) twu-l/sey-s/ney-s haksayng → twu/sey/ney haksayng
      2/3/4   student

(40) twu-l/sey-s/ney-s myeng uy
      2/3/4   CL   GEN
      haksayng → twu/sey/ney myeng uy haksayng
      student

Morpho-phonological mutations of this type are most commonly characteristic of elements in adjacent head positions, for example clause-final verbal clusters in SOV languages (e.g. Japanese wasurete shimatta → wasure-chatta 'forget-Aux' 'ended up forgetting,' or clusters of sentence-final particles which amalgamate in varieties of Chinese such as Cantonese (Sybesma and Li 2007).[13] The occurrence of similar morpho-phonological adjustments in Korean nominals may therefore be suggested to result from a close structural relation obtaining between low Korean numerals and classifiers with both such elements being in adjacent head positions.

inherently individualized noun type which can be directly modified by numerals. See Simpson and Ngo (2018) for a similar suggestion with optional-classifier nouns in Vietnamese.

[12] These works present analyses of the licensing of null D elements and null numeral 'one' in Chinese.

[13] See also Bangla, where special morpho-phonological forms are found with classifiers only when combined with low numerals which otherwise pattern clearly as heads for syntactic processes (see Simpson and Syed 2016:758):

(i)   a.   tu Ta boi   → tu-Te boi
           2 CL book
           'two books'
      b.   tin Ta boi   → tin-Te boi
           3 CL book
           'three books'

Putting these three ideas together allows for a principled modeling of the otherwise unexplained restrictions which govern the special numeral noun pattern in Korean. The fact that only certain nouns permit this pattern can be attributed to their lexical specification for $CL_{-\emptyset}$ as an alternative to their regular classifier. The element $CL_{-\emptyset}$ must be licensed by a c-commanding head, like various other phonetically null functional elements, and low Korean numerals in head positions can satisfy this requirement, accounting for the second restriction on the set of numerals permitted in this construction. Such an analysis critically requires the assumption that low Korean numerals and classifiers occur in adjacent head positions, with the former c-commanding the latter, and can be directly implemented in a head-initial analysis of the type being explored here. It is not available in a head-final approach such as Watanabe (2006), in which all numerals must be analyzed as occurring in pre-nominal Specifier positions as represented in (8) and no numerals can be analyzed as heads merged in the main projection line and c-commanding classifiers (given the linear ordering of numerals before classifiers). For simple reasons of space I will not develop a fuller justification of a null classifier analysis further here. Our methodological point is to stress that the hypothesis of head-initial functional structures in JK nominals allows for new ways to look for explanations of morpho-syntactic phenomena occurring in the nominal domain, and opens up perspectives on numeral/classifier/noun relations that were previously assumed to be unavailable and may be worth exploring.[14]

4.5 Functional vs. lexical domains in JK nominals

The ongoing proposal of the current explorative remark is that the functional structure in Japanese and Korean nominal projections can very plausibly be assumed to be fully head-initial, not head-final, as represented in (42), which models Korean (41):

(41) ku   twu (myeng-uy) haksayng
      Dem 2   CL-Gen   student
      'those two students'

(42)

---
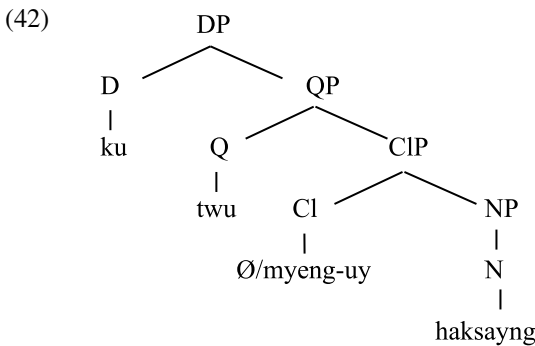
[14]As the Korean patterns described in this section do not occur in Japanese, it can be concluded that a zero classifier has not become part of the lexical specification of any noun in Japanese (like the majority of nouns in Korean, which do not permit a zero classifier). Alternatively, it might be assumed that the licensing condition on such a null head cannot be satisfied in Japanese, as numerals do not occur in head positions in this language—numerals in Japanese would therefore structurally be like higher native Korean numerals and Sino-Korean numerals in Korean.

If one assumes a head-final analysis of the clausal domain in JK to be correct and justified by the word order patterns present in clauses, a consequence of the analysis in (42) is that the direction of headedness found in clauses cannot be assumed to necessarily transfer to other domains such as nominal constituents. Japanese and Korean, in the current approach, are consequently languages which have mixed-headedness, like German, Bangla and other languages whose headedness significantly varies by domain.

In developing such a head-initial analysis of JK nominals, our attention has been firmly focused on the same paradigms which have pre-occupied other head-final analyses (e.g. Kitahara 1993; Muromatsu 1998; Watanabe 2006; Choi 2011; An 2018), namely the structural arrangement of numerals, classifiers, nouns, and demonstratives and the word order patterns involving these elements. Like these other works on JK nominals, I have not addressed the lexical domain of nominals and the way that arguments of the noun are projected. One possible assumption about the introduction of theme arguments would be to hypothesize that these are merged as rightward complements to nouns in a head-initial base and undergo obligatory leftwards raising over the noun to derive their surface ordering. However, here I will not make such an assumption, and I instead adopt the traditional view that the lower nP/NP portion of nominal phrases is indeed head-final. The principal reason for not hypothesizing head-initial structures at the nP/NP level is simply that there is no empirical evidence suggesting such an analysis (to the best of my knowledge). No elements follow nouns in JK nominal projections, neither arguments nor other modifiers such as relative clauses or PPs, and JK nominals do appear to being strongly N-final, as commonly described, and illustrated in (43) and (44)[15]:

(43) ku   twu saylowu-n Phikhaso-uy Sellesuthina   chosanghwa *Korean*
      DEM 2   new-PRT   Picasso-GEN Celestina-GEN portrait

(44) kono ni-satsu-no atarashii pikaso-no   seresutina-no syozoga *Japanese*
      DEM 2 CL GEN new   Picasso-GEN Celestina-GEN portrait
      'these two new portraits of Celestina by Picasso'

Because there are no surface patterns which might obviously motivate an N-initial analysis of the lexical domain in JK nominals, and the general approach here has been to question the hypothesis of hidden movement operations, I will not question the N-final characterization of JK nominal phrases, and suggest that JK nominals are projections which can best be analyzed as showing *internal* mixed-headedness like the mixed-headedness of clauses in German (see example 19). Specifically, I propose that the higher functional structure of JK nominals is head-initial, while its lower thematic area is head-final, as represented in (45) below (incorporating the analysis of An 2018 and Simpson and Park 2019 for the lower lexical level):

---

[15]The adjectives and agent and theme arguments in (43–44) must always precede the noun. They may sometimes scramble leftwards within nominal phrases, but may never appear after the noun.

(45)   Hypothesized uniform structure of nominals in Korean and Japanese
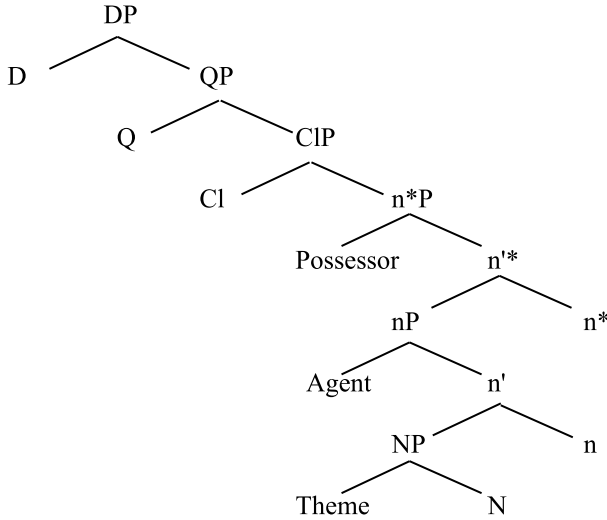
Such a structure is able to capture the variety of patterns considered in the paper, such as (43) and (44),[16] in a way which is both more parsimonious than head-final interpretations of JK nominal syntax and supported by additional evidence and argumentation. I therefore submit that it represents a more plausible analysis of the nominal domain in Japanese and Korean and so should be an analysis naturally entertained and adopted by learners in the acquisition of JK nominal syntax.

4.6 Anarchy in the DP? Mixed-headedness and FOFC

The final hypothesized structure in (45) raises general questions about the potential limits that mixed-headedness may have and whether there are any constraints on what can be assumed as mixed-headed structures. If languages allow departures from a fully uniform direction of head-complement relations, and headedness may vary across and also within individual domains, does this permit fully chaotic directionality and no restrictions on the ordering of heads and complements within a language?

The answer to this question, I believe, is 'no.' There is mounting evidence that languages may conform to a principle which makes reference to head-complement directionality but does not enforce fully harmonic structures—the Final Over Final Constraint (Sheehan et al. 2017:171):

(46)   *The Final-Over-Final-Constraint*
         A head-final phrase αP cannot dominate a head-initial phrase βP where α
         and β are heads in the same Extended Projection.

---

[16]Note that the examples (43) and (44) do not include overt Possessors, as the stacking of three arguments is often felt to be a little awkward. However a Possessor could be substituted for the Agent in these examples and has convincingly been argued in An (2018) to be base-generated low down in the lexical core of nominal projections.

The Final Over Final Constraint/FOFC permits harmonic head-final structures (47a), uniformly head-initial structures (47b), and one combination type in which both head-initial and head-final projections occur within a single domain, (47d). Structures such as (47c) in which a head-final projection dominates a head-initial phrase in the same domain are argued to be impossible and not found in any language. This also means that alternating headedness and multiple switches between head-initial and head-final projections should never occur, as one portion of the resulting structure will result in a FOFC-violation of type (47c). Consequently, the only type of mixed-headedness which is argued to be available and instantiated across languages is the pattern seen in (47d).

(47)   a.   Harmonic head-final

$$\checkmark \quad \beta'$$

```
           ✓        β'
                   /  \
               αP       β
              /  \
            γP     α
```

b.   Harmonic head-initial

```
           ✓        β'
                   /  \
                β       αP
                       /  \
                     α      γP
```

c.   FOFC-violation

```
           *        β'
                   /  \
               αP       β
              /  \
            α     γP
```

d.   Inverse FOFC (head-initial over head-final)

```
           ✓        β'
                   /  \
                β       αP
                       /  \
                     γP     α
```

Mixed-headed structures identified to date in German, Bangla, Hixkaryana[17] and other languages, and the nominal structures posited here for Japanese and Korean significantly all appear to conform with the Final Over Final Constraint and pattern (47d), which shows potentially promising signs of being a better predictor of word order patterns[18] than either a fully invariable interpretation of the head parameter, or

---

[17]See Kalin (2014) who presents evidence that the A′-domain of clauses in Hixkaryana is head-initial, and the lexical domain head-final. This division in clausal headedness between the functional and lexical domains is clearly very similar to the functional/lexical division proposed here for JK nominals.

[18]Although there have also been challenges to FOFC, see for example Liao (2017), Aboh (2020) and references within.

the assumption that head-initial/head-final structures may proliferate in a completely unconstrained way. The analysis of JK nominals being proposed in the current paper is therefore consistent with limits of variation in head-complement ordering which have recently been hypothesized to constrain movement away from harmonic structures, and the kind of mixed headed structure attested elsewhere in clausal domains in languages such as German and Bangla can be assumed to be instantiated in nominal phrases in Japanese and Korean as well, as might indeed be expected. I take this to be a generally positive result—although it can be added as a somewhat cautionary note that the analysis developed in the paper is actually not dependent on FOFC, and has ultimately resulted from quite general considerations of parsimony and the assumption that mixed-headedness is a patterning that may naturally occur in languages.

5 Summary and conclusions

The goal of this paper has been to explore a potential alternative to head-final analyses of nominal projections in Japanese and Korean. Head-final approaches to the modeling of JK nominals are driven by the assumption that Japanese and Korean are pure head-final languages and that the head-finality which is clearly observable in the clausal domain must necessarily transfer to and characterize the nominal domain as well, despite the lack of obvious head-final patterns occurring in the surface linearization of demonstratives, numerals, classifiers and nouns. Analyses assuming a uniform head-final base in JK nominals, such as the prominent account in Watanabe (2006), are forced to posit massive hidden movement operations within nominal projections in order to derive the attested surface forms which do not appear to be head-final. The paper set out to show that a viable head-initial analysis of functional elements in JK nominals is available and able to capture the basic alternations found with numerals, classifiers and nouns in a way that is significantly more parsimonious, cross-linguistically plausible, and potentially supported by additional evidence from within Japanese and Korean. Extending the analysis, it was suggested that the lower lexical domain of JK nominals contrasts with the functional structure and is head-final in orientation, resulting in mixed-headedness arising in nominal constituents, with a head-initial functional structure dominating a head-final lexical domain (nP/NP). In developing such a hybrid approach to JK nominal structure, the paper joins a growing body of work which suggests that the head-complement 'parameter' is too strong as a fully fixed ordering of elements in all domains in individual languages, and languages need not be purely head-initial or head-final across all categories or indeed within specific projections. Previous studies have shown that mixed headedness does indeed occur in the clausal domain, in languages such as German, Bangla and Hixkaryana. The present work now contributes to this re-examination of head-directionality with the claim that mixed-headedness also shows signs of manifesting itself in the nominal domain, in patterns exhibited in Japanese and Korean. Finally, it was noted that the mixed headed structures posited for JK nominals are consistent with the Final Over Final Constraint, and are structures that FOFC would predict to be found within nominal phrases in certain languages.

References

Aboh, Enoch. 2020. Apparent violations of the final-over-final constraint: the case of Gbe languages. In *Syntactic architecture and its consequences I: Syntax inside the grammar*, eds. András Bárány, Theresa Biberauer, Jamie Douglas, and Sten Vikner, 277–292. Berlin: Language Science Press.

Aikhenvald, Alexandra. 2003. *Classifiers: A typology of noun categorization devices*. Oxford: Oxford University Press.

An, Duk-ho. 2014. Genitive case in Korean and its implications for noun phrase structure. *Journal of East Asian Linguistics* 23: 361–392.

An, Duk-ho. 2018. On the word order of numeral quantifier constructions. *Studia Linguistica* 72(3): 662–686.

Baker, Mark. 2001. *The atoms of language: The mind's hidden rules of grammar*. New York: Basic Books.

Bayer, Josef. 1999. Final complementizers in hybrid languages. *Journal of Linguistics* 35: 233–271.

Bell, Daniel. 2019. Chinese possesses Japanese style scrambling: The case of Xining Mandarin. *Journal of East Asian Linguistics* 28: 143–178.

Blake, Barry. 2001. *Case*. Cambridge: Cambridge University Press.

Carstens, Vicki. 2017. Noun-to-determiner movement. In *The Wiley Blackwell companion to syntax*, eds. Martin Everaert and Henk van Riemsdijk. Vol. V, 2758–2783. Somerset: Wiley.

Cheng, L-S. Lisa, and Rint Sybesma. 1999. Bare and not-so-bare nouns and the structure of NP. *Linguistic Inquiry* 30: 509–542.

Chiu, Bonnie. 1993. The inflectional structure of Mandarin Chinese. PhD diss., UCLA

Choi, Kiyong. 2011. On the nature of the dependency between a numeral and a classifier. *Linguistic Research* 28(3): 517–542.

Chomsky, Noam. 2000. Minimalist inquiries. In *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, eds. Roger Martin, David Michaels, and Juan Uriagereka, 89–155. Cambridge: MIT Press.

Comrie, Bernard. 1989. *Language universals and linguistic typology*. Chicago: University of Chicago Press.

Dryer, Matthew. 2013. Position of case affixes. In *The world atlas of language structures online*, eds. Matthew S. Dryer and Martin Haspelmath. Leipzig: Max Planck Institute for Evolutionary Anthropology. Available online at http://wals.info/chapter/51, accessed on 2020-09-22.

Dryer, Matthew. 2018. On the order of demonstrative, numeral, adjective, and noun. *Language* 94(4): 798–833.

Fanselow, Gisbert, and Damir Cavar. 2002. Distributed deletion. In *Theoretical approaches to universals*, ed. Artemis Alexiadou. Vol. 49 of *Linguistik aktuell*, 65–107. Amsterdam: Benjamins.

Fukui, Naoki, and Hiromu Sakai. 2003. The visibility guideline for functional categories: Verb-raising in Japanese and related issues. *Lingua* 113: 321–375.

Grewendorf, Günther. 1988. *Aspekte der deutschen Syntax: Eine Rektions-Bindungs-Analyse*, Tübingen: Narr.

Harada, Naomi. 2002. Licensing PF-visible formal features: A linear algorithm and case-related phenomena in PF. PhD diss., University of California, Irvine.

Hwang, Heeju. 2003. The syntax and semantics of numeral classifiers in Korean. Ms., University of Southern California.

Kachru, Yamuna. 2006. *Hindi*. Amsterdam: Benjamins.

Kalin, Laura. 2014. The syntax of OVS word order in Hixkaryana. *Natural Language and Linguistic Theory* 32: 1089–1104.

Kawashima, Ruriko. 1998. The structure of extended nominal phrases: The scrambling of numerals, approximate numerals, and quantifiers in Japanese. *Journal of East Asian Linguistics* 7: 1–26.

Kitagawa, Chisato, and Claudia Ross. 1982. Prenominal modification in Chinese and Japanese. *Linguistic Analysis* 9: 19–53.

Kitahara, Hisatsugu. 1993. Numeral classifier phrase inside DP and the specificity effect. *Japanese/Korean Linguistics* 3: 171–186.

Kuroda, Sige-Yuki. 1965. Generative grammatical studies in the Japanese language. PhD diss., MIT.

Kuroda, Sige-Yuki. 1988. *Whether we agree or not: A comparative syntax of English and Japanese*. Amsterdam: Benjamins.

Lee, Iksop, and Robert Ramsey. 2000. *The Korean language*. Albany: State University of New York Press.

Liao, Wei-Wen Roger. 2017. Remarks on the final-over-final condition: A view from Chinese head-final structures. *Studies in Chinese Linguistics* 38(2): 98–113.

Li, Y.-H. Audrey. 1998. Argument determiner phrases and number phrases. *Linguistic Inquiry* 29(4): 693–702.

Li, Y.-H. Audrey. 1999. Plurality in a classifier language. *Journal of East Asian Linguistics* 8: 75–99.

Li, Y.-H. Audrey. 2014. Structure of noun phrases: Left or right? *Taiwan Journal of Linguistics* 12(2): 1–32.

Longobardi, Giuseppe. 1994. Reference and proper names. *Linguistic Inquiry* 25: 609–665.

Matushansky, Ora. 2017. On the structure and interpretation of pseudo-partitives. In *Seminar handout*, Paris. Available at http://www.trees-and-lambdas.info/matushansky/Downloads/Pseudo-partitive-syntax-EGR-JZ.pdf. Last accessed 22 February 2021.

Miyagawa, Shigeru. 2012. *Case, argument structure, and word order*. London: Routledge.

Muromatsu, Keiko. 1998. On the syntax of classifiers. PhD diss., University of Maryland.

Nakamura, Masanori. 2012. Case morphology and island repair. In *Sluicing: Cross-linguistic perspectives*, eds. Jason Merchant and Andrew Simpson, 104–122. Oxford: Oxford University Press.

Ouhalla, Jamal. 1994. *Introducing transformational grammar*. London: Arnold.

Park, So-Young. 2008. Functional categories: The syntax of DP and DegP. PhD diss., University of Southern California.

Park, So-Young. 2019. NP-ellipsis and numeral classifiers in Korean. Ms., Pusan National University.

Rothstein, Susan. 2011. Numbers: Counting, measuring and classifying. Paper presented at Sinn und Bedeutung 16, Utrecht University.

Rutkowski, Pawel. 2007. The syntactic structure of grammaticalized partitives (pseudo-partitives). In *University of Pennsylvania working papers in linguistics*, eds. Tatjana Scheffler, Joshua Tauberer, Aviad Eilam, and Laia Mayol. Vol. 3(1), 337–350.

Saito, Mamoru, T.-H. Jonah Lin, and Keiko Murasugi. 2008. N'-ellipsis and the structure of noun phrases in Chinese and Japanese. *Journal of East Asian Linguistics* 17: 247–271.

Sheehan, Michelle, Theresa Biberauer, Roberts Ian, and Anders Holmberg. 2017. *The final-over-final-constraint*. Cambridge: MIT Press.

Simpson, Andrew. 2008. Classifiers and DP structure in Southeast Asia. In *The Oxford handbook of comparative syntax*, eds. Guglielmo Cinque and Richard Kayne, 806–838. Oxford: Oxford University Press.

Simpson, Andrew, and Saurov Syed. 2016. Blocking effects of higher numerals in Bangla: A phase-based analysis. *Linguistic Inquiry* 47: 754–763.

Simpson, Andrew, and Binh Ngo. 2018. Classifier syntax in Vietnamese. *Journal of East Asian Linguistics* 27(3): 211–246.

Simpson, Andrew, and Soyoung Park. 2019. Strict vs. free word order patterns in Korean nominal phrases and cyclic linearization. *Studia Linguistica* 73(1): 139–174.

Sybesma, Rint, and Boya Li. 2007. The dissection and structural mapping of Cantonese sentence final particles. *Lingua* 117: 1739–1783.

Tang, Chih-chen Jane. 1990. *Chinese phrase structure and extended X'-theory*, Doctoral dissertation, Cornell University.

Travis, Lisa. 1989. Parameters of phrase structure. In *Alternative conceptions of phrase structure*, eds. Mark R. Baltin and Anthony S. Kroch, 263–279. Chicago: University of Chicago Press.

Watanabe, Akira. 2006. Functional projections of nominals in Japanese: Syntax of classifiers. *Natural Language and Linguistic Theory* 24: 241–306.

Zhang, Niina Ning. 2019. Complex indefinites and the projection of DP in Mandarin Chinese. *Journal of East Asian Linguistics* 28: 179–210.