Abstract

'Multiple nominative constructions' (MNCs) in Korean have two main subtypes: possessive and adjunct types. This paper shows that a grammar allowing the interaction of declarative constraints on types of signs – in particular, having constructions (phrases and clauses) – can provide a robust and efficient way of encoding generalizations for two different MNCs. The feasibility of the grammar developed here has been checked with its implementation into the LKB (Linguistic Knowledge Building) system

1 Recognizing the Two Types of Multiple Nominative Construction

The 'multiple' nominative constructions (henceforth MNCs) exemplified in (1) are some of the more puzzling phenomena in topic-prominent languages like Korean, Japanese, and Chinese (Yoon 2004).[1]

(1) a. John-i/-uy son-i khu-ta
John-NOM/GEN hand-NOM big-DECL
'John's hand is big.'

b. yelum-i/-ey/*-uy maykcwu-ka choyko-i-ta
summer-NOM/-LOC/-GEN beer-NOM best-COP-DECL
'Summer is the best time to have beer.'

In both examples, it is not the first but the second nominative (NOM) phrase that is the argument of the intransitive matrix predicate: it is the hand that is big, and it is the beer that tastes good in summer. *John* and *summer* are not direct arguments of the matrix predicate. Considering that a clause usually contains at most one subject, expressed as a NOM phrase, the function of the first NOM is then a puzzle.

In terms of pragmatic conditions, the first NOM phrase in both cases characterizes the remaining part (which is often called 'sentential predicate'). For example, in (1)a having a big hand is a characterizing property of John whereas in (1)b, tasty beer is a characteristic of summer. If there is no such relation, the first phrase cannot be NOM, though it can be a genitive modifier:

(2) a. John-uy/*-i [swuep-i ttapwunha-ta]
John-GEN/-NOM class-NOM boring-DECL
'John's class is boring.'

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[1]The abbreviations for the glosses and attributes used in this paper are ACC (accusative), ARG (argument), C-CONT (constructional content), DAT (dative), DECL (declarative), LBL (label), LOC (locative), LTOP (local top), NOM (nominative), PL (plural), PRE (predicate), PST (past), IND (index), RELS (relations), TOP (topic).

b. yelum-ey/*-i [John-i congcong mikwuk-ul ka-n-ta]
summer-LOC John-NOM often America-ACC go-PRES-DECL
'In summer, John often goes to America.'

However, the first NOM in these examples also behaves differently. In examples like (2)a (which we we call the possessive nominative construction (PNC)), the two consecutive NOM phrases are in a possessive relation, as shown by the alternation with the possessive marker on the first NOM. Meanwhile, in examples like (2)b (which we call the adjunct nominative construction (ANC)), there is no such a relation. The first phrase functions more like an adjunct, as indicated by the locative marker.

There are also other differences between the first NOM phrase in the PNC and the ANC. For example, only the former can function as a raised object:

(3) a. Mary-nun [John-ul] son-i khu-ta-lako mitessta
Mary-TOP John-ACC hand-NOM big-DECL-COMP believed
'Mary believed John's hand is big.'

b.??/*na-nun [ecey-lul] nalssi-ka acwu
I-TOP yesterday-ACC weather-NOM very

tewu-ess-ta-ko sayngkakha-n-ta
hot-PAST-DECL-COMP think-PRES-DECL
'I think yesterday the weather was really hot.'

The first NOM in the PNC can also serve as the antecedent of a floating quantifier, whereas this is not possible in the ANC:

(4) a. haksayng-tul-i khi-ka [sey myeng-i] khu-ta
students-NOM height-NOM three CL-NOM tall
'Three students are tall.'

b. *tosi-ka nalssi-ka [sey kos-i] cwup-ta
city-NOM weather-NOM three CL-NOM cold
'In three cities, the weather is cold.'

These differences indicate that the language has at least two different MNCs. However, this does not mean that the two do not share some properties. As noted earlier, the first NOM in both the PNC and ANC is in a characterizing relation with the remaining parts ('sentential predicate'). In addition, we can show that the first NOM in both constructions is the realization of information focus (cf. O'Grady 1991, Schüze 1996, Yang 1999). The evidence that the first NOM marks focus can be drawn from several phenomena. For example, the first nominative (unlike a genitive NP) receives an exhaustive reading, a canonical property of focus. The impossibility of having the exclamatory expression *ceki* 'here' in (5)a, which is generally not used for exhaustive listing, but rather for neutral description, could be attributed to the exhaustive list reading of *John-i*.

(5) a. *ceki John-i apeci-ka o-si-nta!
over.there John-NOM father-NOM come-HON-DECL

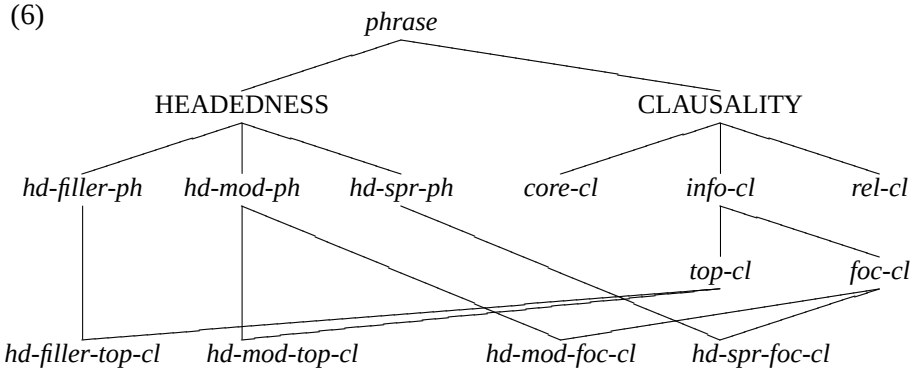
b. ceki John-uy apeci-ka o-si-nta!
over.there John-GEN father-NOM come-HON-DECL

Observing the similarities and differences between the two constructions we have shown so far, the questions that arise with respect to parsing such constructions are (a) how to license the first NOM phrase which is not an argument of the main predicate, (b) how to process its semantic and pragmatic contributions to the sentence as a whole, and (c) how to recognize and represent the different properties of these two constructions.

2 A Construction-Based Analysis

As a way of capturing generalizations about the shared properties of diverse construction types (including the MNCs here), our grammar adopts the notion of constructions from Ginzburg and Sag (2001) and classifies phrases in terms of HEADEDNESS and CLAUSALITY, as represented in (6):

(6)



As shown in the hierarchy here, each type of phrase is cross-classified, inheriting both from the CLAUSALITY type and from a HEADEDNESS type. The constraints on the subtypes of HEADEDNESS will license well-formed phrases in the language.[2]

(7) a. XP[*hd-spr-ph*] → 1, **H**[SPR ⟨1⟩]

b. XP[*hd-mod-ph*] → [MOD ⟨1⟩], 1**H**

[2]In addition to these well-formed phrases, the language has *hd-subj-ph*, *hd-comp-ph*, and *hd-lex-ex* for the combination of head with its subject, head with its complement, and head with another lexical element to form a complex predicate, respectively. See Kim (2004).

c. S[*hd-filler-ph*] → 1XP, S[GAP ⟨1⟩]

These constraints on well-formed phrases, similar to X′ rules, allow the combination of a head and its specifier, a head and its modifier, and a head and its filler, respectively. These constraints inherit to their subtypes like *hd-filler-top-cl* and *hd-mod-top-cl*, which also function as the subtypes of CLAUSALITY.

The subtypes of CLAUSALITY include *core-cl*, *rel(ative)-cl*, and *info-cl*. The *core-cl* type includes canonical types like declarative and imperative. The constraints on *info-cl* are the locus of our treatment of the PNC and ANC. The type *info-cl* has at least two subtypes: *top-cl* and *foc-cl*, which have either a positive TOP(IC) or FOC(US) value. Each has its own constraints that are inherited to its subtypes. For example, *top-cl* and *foc-cl* are declared to have the following constraints which will be inherited to their subtypes:

(8) a. *top-cl*:

$$\left[\text{C-CONT} \mid \text{RELS} \left\langle \begin{bmatrix}\text{PRED } \textit{about}\\ \text{ARG1 } \textit{h3}\\ \text{ARG2 } \textit{h4}\end{bmatrix} \right\rangle\right] \rightarrow \begin{bmatrix}\text{LBL } \textit{h3}\\ \text{TOP } +\end{bmatrix}, \mathbf{S}\begin{bmatrix}\text{MOOD } \textit{decl}\\ \text{LBL } \textit{h4}\\ \text{IC } +\\ \text{SUBJ } \langle\ \ \rangle\end{bmatrix}$$

b. *foc-cl*:

$$\begin{bmatrix}\text{SPR } \langle\ \ \rangle & \\ \text{C-CONT} \mid \text{RELS} \left\langle \begin{bmatrix}\text{PRED } \textit{characterizing}\\ \text{ARG1 } \textit{h3}\\ \text{ARG2 } \textit{h4}\end{bmatrix} \right\rangle & \end{bmatrix} \rightarrow$$

$$\boxed{1}\text{NP}\begin{bmatrix}\text{GCASE } \textit{nom}\\ \text{FOC } +\\ \text{LBL } \textit{h3}\end{bmatrix}, \quad \text{S}\begin{bmatrix}\text{SPR} \langle \boxed{1} \rangle\\ \text{LBL } \textit{h4}\end{bmatrix}$$

The topic clause (*top-cl*) has as its constructional content (C-CONT) an *about-relation*: the topic phrase tells us what the main clause is about. The value of LBL is a handle, which is a token to its elementary predicate (EP) in the MRS system. We can see that the ARG values of *about* are the value of the topic phrase's LBL (h3) and that of the head S (h4). Meanwhile, the focus phrase (*foc-cl*) also has a constructional constraint indicated by the relation *characterizing*. That is, in a *foc-cl*, the focused initial phrase (having a grammatical case (GCASE) such as nominative and also being marked as a FOC phrase) is characterized by the following S. Notice that the *top-cl* has two subtypes: *hd-filler-top-cl* and *hd-mod-top-cl*. The existence of two types of topic clause has been well attested in the literature:

(9) a. ku chayk-un [Edward-i _ ilk-ess-ta] (*hd-filler-top-cl*)
the book-TOP Edward-NOM read-PAST-DECL
'The book, Edward read _ .'

b. [ecey-nun [nalssi-ka chwu-ess-ta]] (*hd-mod-top-cl*)
yesterday-TOP weather-NOM cold-PAST-DECL
'As for yesterday, it was cold.'

In (9)a, the topic phrase *ku chayk-un* is an argument of the main predicate *ilk-ess-ta* and enters into a Filler-Head relation, whereas in (9)b, the topic *ecey-nun* is just an adjunct.

Similarly, the type *foc-cl* (focus clause construction) also has at least two subtypes, depending on the grammatical function of the first NOM phrase. As defined, the PNC is an instance of *hd-spr-foc-cl* whereas the ANC is an instance of *hd-mod-foc-cl*. This classification is motivated by the fact that in the PNC the first NOM functions as the specifier of the second NOM NP, whereas in the ANC it is just an adjunct. This kind of multiple inheritance system for clausal types allows us to capture the generalizations among constructions by appropriate type declarations. The constructional constraints on *foc-cl* are inherited to its subtypes, *hd-spr-foc-cl* and *hd-mod-foc-cl*. One thing to notice here is that in the *hd-mod-foc-cl* (ANC), the first NOM can be freely introduced if it has a positive MOD value. Meanwhile, in the *hd-mod-foc-cl* PNC, the first NOM phrase is introduced as a specifier in accordance with the following lexical rule:

(10) SPR Lexical Rule:

$$\textit{v-stative} \rightarrow \begin{bmatrix} \textit{v-spr} \\ \text{VAL} \begin{bmatrix} \text{SPR} \langle \boxed{2}_i \rangle \\ \text{SUBJ} \langle \begin{bmatrix} \text{SPR} \langle \boxed{2} \rangle \\ \text{LBL } \textit{h6} \end{bmatrix}_j \rangle \end{bmatrix} \\ \text{SEM} \mid \text{RELS} \left\langle \ldots, \begin{bmatrix} \text{PRED } \textit{subordinate} \\ \text{ARG1} \quad i \\ \text{ARG2} \quad j \end{bmatrix}, \ldots \right\rangle \end{bmatrix}$$

The effects of this lexical rule are as follows. It allows a stative verb taking one argument to be turned into a verb that selects an additional specifier which is in a *subordinate* relation to the subject.[3]

The two consecutive NOM phrases need to be in a certain semantic relation (e.g., the subordinate relation) in the PNC, as can be seen from the evidence in (11):

(11) a. pyeng-uy/-*i akhwak-ka i kyolkwa-lul cholayhayessta
illness-GEN/NOM worsening this result caused
'The worsening of the illness caused this condition.'

[3]The term *subordination* is borrowed from Na and Huck (1993). X is *thematically subordinate* to an entity Y iff Y's having the properties that it does entails that X has the properties that it does.

b. John-uy/*-i iphak-i wuli-lul nolla-key hayessta
John-GEN/NOM admission-NOM we-ACC surprise-COMP did
'John's admission surprised us.'

An intransitive predicate like 'big' will be turned into a *v-spr* word by the lexical rule above:

(12) a.
$$\begin{bmatrix} \text{PHON} & \langle \text{khu-} \rangle \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \textit{verb} \\ \text{VAL} \mid \text{SUBJ} & \langle \boxed{1} \text{NP}_i \rangle \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1} \rangle \\ \text{SEM} \mid \text{RELS} & \left\langle \begin{bmatrix} \text{PRED} & \textit{big} \\ \text{ARG0} & \textit{s1} \\ \text{ARG1} & \textit{i} \end{bmatrix} \right\rangle \end{bmatrix}$$

b.
$$\begin{bmatrix} \textit{v-spr} \\ \text{PHON} & \langle \text{khu} \rangle \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \textit{verb} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \boxed{3} \text{NP}_i \rangle \\ \text{SUBJ} & \langle \text{N}'_j [\text{SPR} \langle \boxed{3} \rangle] \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1} \rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & \textit{s1} \\ \text{RELS} & \left\langle \begin{bmatrix} \text{PRED} & \textit{big} \\ \text{ARG0} & \textit{s1} \\ \text{ARG1} & \textit{i} \end{bmatrix}, \begin{bmatrix} \text{PRED} & \textit{subordinate} \\ \text{ARG1} & \textit{i} \\ \text{ARG2} & \textit{j} \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix}$$

As sketched here, the generation of the PNC and the ANC is dependent upon interactions among different grammatical components, assigning the appropriate structures for the two different types of MNCs.

3 A Computational Implementation of the Analysis

The analysis we have presented so far has been incorporated into the typed-feature structure grammar HPSG for Korean (Korean Resource Grammar) aiming at working with real-world data (cf. Kim (2001, 2004)).To test the performance and feasibility of the analysis, we have implemented this into the LKB (Linguistic Knowledge Building) system.[4] The test results give the proper syntactic as well as semantic structures for the two different focus constructions. For example, the following is the parsing result of the sentence (1a):

We can see here that the MRS that the grammar generates provides enriched information of the phrase. The value of LTOP is the local top handle, the handle of

[4]The current Korean Resource Grammar has 394 type definitions, 36 grammar rules, 77 inflectional rules, 1100 lexical entries, and 2100 test-suite sentences, and aims to expand its coverage on real-life data.

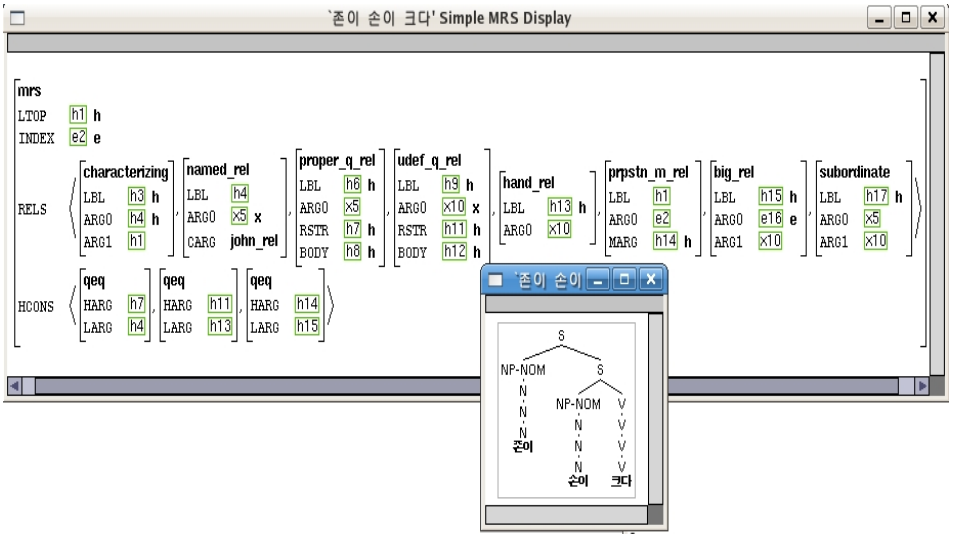


Figure 1: Parsed Tree and MRS for 'It is John whose hand is big.'

the relation with the widest scope within the constituent. The INDEX value here is identified with the ARG0 value of the *prpstn_m_rel* (propositional message). The attribute RELS is basically a bag of elementary predications (EP) each of whose values is a *relation*.Each of the types *relation* has at least three features LBL, PRED (represented here as a type), and ARG0. We can see that the LBL value of *named_rel* and that of the *prpstn_m_rel* are both the arguments of the PRED relation *characterizing*, capturing the pragmatic relations in the MNC. The two NOM phrases are also linked by the relation *subordinate* whose ARG0 and ARG1 values are x5 and x10, respectively.

4 Conclusion

'Multiple nominative' constructions present challenges to theoretical as well as computational linguists. In particular, the functions of the first NOM phrase in MNCs are not straightforward. The first NOM can be either a specifier or an adjunct, and it has a specific semantic relation with regard to the remaining sentence – it is 'characterized' by the rest of the sentence.

This paper shows that a grammar allowing interactions of declarative constraints on types of signs – in particular, constructions (phrases and clauses) – can provide an robust and efficient way of parsing these two different types of MNC.

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