University of Pennsylvania
ScholarlyCommons

IRCS Technical Reports Series | Institute for Research in Cognitive Science

5-1-2001

Bracketing Guidelines for Penn Korean TreeBank

Chung-hye Han
University of Pennsylvania

Na-Rae Han
University of Pennsylvania, nrh@ling.upenn.edu

Eon-Suk Ko
University of Pennsylvania, esko@alumni.upenn.edu

University of Pennsylvania Institute for Research in Cognitive Science Technical Report No. IRCS-01-10.

This paper is posted at ScholarlyCommons. http://repository.upenn.edu/ircs_reports/26
For more information, please contact repository@pobox.upenn.edu.

Bracketing Guidelines for Penn Korean TreeBank

Abstract
This document describes the syntactic bracketing guidelines for the Penn Korean Treebank, which is an online corpus of Korean texts annotated with morphological and syntactic information. The corpus consists of around 54,000 words and 5,000 sentences. The Treebank uses a phrase structure style of annotation, making head/phrasal node distinctions, argument/adjunct distinctions, and identifying empty arguments and traces for moved constituents. This document is organized as follows. In section 2, the basic syntactic ingredients of a clause structure are presented. Some notational conventions are introduced in section 3, including different types of syntactic tags, such as head level tags, phrase level tags and function tags used in the Treebank. In section 4, the bracketing guidelines for various types of clauses are discussed, including simple clauses, subordinate clauses, and clauses with coordination. Several types of subcategorizaion frames found in the Treebank are then presented in section 5, followed by bracketing guidelines for various linguistic phenomena in sections 6 to 21, including guidelines for annotating punctuation. The document ends with guidelines for handling some bracketing ambiguities and for handling some confusing examples.

Comments
University of Pennsylvania Institute for Research in Cognitive Science Technical Report No. IRCS-01-10.

This technical report is available at ScholarlyCommons: http://repository.upenn.edu/ircs_reports/26

Bracketing Guidelines for Penn Korean TreeBank

Chung-hye Han, Na-Rae Han, Eon-Suk Ko

May, 2001

Contents

1 Introduction **1**

2 An Overview of Basic Clause Structure **1**
2.1 Basic elements of S . . . 1
2.1.1 Predicate . . . 1
2.1.2 Arguments of the predicate . . . 1
2.2 Levels of attachment . . . 2
2.3 Complementation within syntactic categories . . . 2
2.4 Modification . . . 3

3 Notation **3**
3.1 Clause level tags . . . 3
3.2 Phrase level tags . . . 3
3.3 Head level tags . . . 4
3.4 Function tags . . . 4
3.5 Null elements . . . 5
3.6 Punctuation . . . 5

4 Clause type **5**
4.1 Simple clause . . . 5
4.2 Subordination . . . 6
4.2.1 Sentential complements . . . 6
4.2.2 Sentential adjuncts . . . 6
4.3 Coordination . . . 7

5 Subcategorization Frames **7**
5.1 Intransitive Verb . . . 9
5.2 Transitive Verb . . . 9
5.3 Intransitive Verb with a complement NP . . . 10
5.4 Transitive Verb with a complement NP . . . 11
5.5 Double Nominative Verb . . . 12
5.6 Predicative Nominal: Copula . . . 12
5.7 Adjective . . . 13
5.8 Adjective with a complement NP . . . 13
5.9 Double Nominative Adjective . . . 13

6 Noun Phrases **14**
6.1 Noun-noun compounds . . . 14
6.2 NP modifiers . . . 15
6.3 Relative clause constructions . . . 15
6.3.1 Argument relative clause constructions . . . 15
6.3.2 Relativization out of multiple nominative/accusative clauses . . . 16
6.3.3 Relativization out of a complex noun phrase construction . . . 16
6.3.4 Adjunct relative clause constructions . . . 16
6.3.5 Internally headed relative clause constructions . . . 17
6.3.6 Across-the-Board (ATB) relativization . . . 18

6.3.7 Relative clauses with Determiner . . . 19
6.4 Complex noun phrases . . . 19
6.4.1 When the head is a common noun . . . 19
6.4.2 When the head is a dependent noun . . . 19
6.5 Nominalized clauses: gerunds . . . 22
6.6 Equative NP . . . 22

7 Verb Phrases **23**
7.1 Verb complementation . . . 23
7.2 Auxiliary predicates . . . 23
7.2.1 Auxiliary verbs . . . 23
7.2.2 Sentences with more than one auxiliary verbs . . . 24
7.2.3 Auxiliary adjectives . . . 24
7.2.4 Auxiliary predicative nouns . . . 25
7.2.5 Complex auxiliary predicate . . . 26
7.3 Light verb . . . 26
7.4 Compound verb . . . 29
7.5 VP modification . . . 29
7.6 Derived verb . . . 30

8 Adjective Phrase **30**

9 Adverb Phrase **31**
9.1 Adjunction site of adverb phrase . . . 31
9.2 Derived adverbs . . . 32
9.3 Adverb with an NP complement . . . 33

10 Copular Sentences **34**

11 Multiple Nominative Constructions **35**
11.1 Complement NP with nominative case . . . 35
11.2 Statives . . . 36

12 Multiple Accusative Constructions **37**

13 Floating numerals **37**

14 Fronted elements **39**
14.1 Fronted arguments . . . 39
14.2 Across-the-Board fronting . . . 39
14.3 Fronted adjuncts . . . 40

15 Causatives **41**
15.1 Causee is the subject of the complement clause . . . 41
15.2 Causee is the object or complement of the main clause . . . 41

16 Object-to-Subject Raising **43**
16.1 Sentences with '만하다' . . . 43
16.2 Sentences with '되다' . . . 44

17 Coordination **45**
17.1 Level of coordination . . . 46
17.2 Coordination of unlike categories . . . 46
17.3 Coordination vs. modification . . . 47

18 Negative Sentences **48**

19 Minor Categories **49**
19.1 Parenthetical . . . 49
19.2 Lists . . . 50

20 Empty Categories **52**
20.1 Empty argument . . . 52
20.2 Trace . . . 52
20.3 Empty operator . . . 52
20.4 Predicate deletion . . . 53
20.4.1 Verb deletion . . . 53
20.4.2 VP deletion . . . 54
20.4.3 VX deletion . . . 54
20.4.4 Copula deletion . . . 54

21 Punctuation **55**
21.1 Mid-sentence punctuation . . . 55
21.1.1 Quotation . . . 55
21.1.2 Comma . . . 56
21.2 Sentence-final punctuation . . . 56

22 Ambiguity **57**
22.1 Adverb adjunction to S or VP . . . 57
22.2 Object scrambling or not . . . 58
22.3 Overt subject or *pro* . . . 59
22.4 Complement or not . . . 60
22.5 Trace of the scrambled object before or after an adverb . . . 60

23 Confusing Examples **61**
23.1 '필요로 하다' . . . 61
23.2 '-뿐만 아니라' . . . 61
23.3 '-밖에 안 되다', '-밖에 모른다' . . . 62
23.4 '되다' . . . 62
23.5 *pro* NP subjects with no referent . . . 62
23.6 'N-에서 N' . . . 63
23.7 'N-PAD+PCA' . . . 63
23.8 'N-PAD N-PAD' . . . 64
23.9 Fragments . . . 64

23.10 Coordination of a noun and a Sino-Korean verb with '하' 65
23.11 '-고 해서' 65
23.12 '-것만 하다' 65
23.13 '물론' 66
23.14 '자기 스스로' 66
23.15 '얼마나 되다' 66

A Summary of the Penn Korean Treebank Part-of-Speech Tagset 68
A.1 Content Tags 68
A.2 Function Tags 69
A.3 Symbols 69

1 Introduction

This document describes the syntactic bracketing guidelines for the Penn Korean Treebank, which is an online corpus of Korean texts annotated with morphological and syntactic information.[1] Each word in the corpus is annotated with part-of-speech (POS) tags and each sentence is bracketed to represent its structural analysis. A list of part-of-speech tags used in Penn Korean Treebank is presented in the appendix at the end of this document. For a detailed description of part-of-speech tags, see the IRCS technical report titled "Part of Speech Tagging Guidelines for Penn Korean Treebank" written by Chung-hye Han and Na-Rae Han. For structural analysis, the Treebank uses a phrase structure style of annotation, making head/phrasal node distinctions and argument/adjunct distinctions, and identifying empty arguments and traces for moved constituents.

This document is organized as follows. In §2, the basic syntactic ingredients of a clause structure are presented. Some notational conventions are introduced in §3, including different types of syntactic tags, such as head level tags, phrase level tags and function tags used in the Treebank. In §4, bracketing guidelines for various types of clauses are discussed, including simple clauses, subordinate clauses, and clauses with coordination. Several types of subcategorizaion frames found in the Treebank are then presented in §5, followed by bracketing guidelines for various linguistic phenomena in sections §6 to §21, including guidelines for annotating punctuation. The document ends with guidelines for handling some bracketing ambiguities in §22, and for handling some confusing examples in §23.

2 An Overview of Basic Clause Structure

2.1 Basic elements of S

2.1.1 Predicate

The predicate is either the lowest VP or ADJP.

2.1.2 Arguments of the predicate

- External:

  The surface subject is an NP marked with a nominative case, and is tagged as -SBJ. In some cases, i.e., multiple nominative constructions, there are more than one nominative marked NPs in a clause. See §11 on bracketing guidelines for multiple nominative constructions. The surface subject may be an S which can be marked with a nominative case. In this case, S has the function tag -SBJ.

- Internal:

  Object NP: marked with an accusative case and has the function tag -OBJ.

  Object S: (can be) marked with an accusative case and has the function tag -OBJ.

[1]We are extremely grateful to Martha Palmer for her continued support and encouragement. We also thank Aravind Joshi, Tony Kroch and Fei Xia for valuable discussions on many occasions. Special thanks are due to Owen Rambow, Nari Kim, and Juntae Yoon for discussions in the initial stage of the project. We also acknowledge Mark Dras for comments on the document. The work reported in this document was supported by contract DAAD 17-99-C-0008 awarded by the Army Research Lab to CoGenTex, Inc., with the University of Pennsylvania as a subcontractor, NSF Grant - VerbNet, IIS 98-00658, and DARPA Tides Grant N66001-00-1-8915.

Complement NP: marked with an adverbial postposition and has the function tag -COMP.

Complement S: marked with a complementizer and has the function tag -COMP.

2.2 Levels of attachment

- S-level:

  The following are attached at S-level: subject NP, highest VP, fronted constituents, initial and final punctuation, and adverbial modifiers that precede the subject NP, such as sentential adjunct clauses, NP adjuncts, and adverb phrases.

- VP-level:

  The following are attached at VP-level: object NP, complement NP, complement clause and almost all adverbial modifiers that follow the subject NP, such as sentential adjunct clauses, NP adjuncts, and adverb phrases.

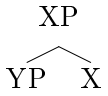
- ADJP-level:

  The following are attached at ADJP-level: complement NP, almost all adverbial modifiers that follow the subject NP, such as sentential adjunct clauses, NP adjuncts, and adverb phrases.

2.3 Complementation within syntactic categories

Complements are attached inside the VP, NP or ADJP. Structurewise, a complement and its head are in sister relation. In (1), X is the head, and YP is the complement of X.

(1)



- Complement of verbs:

  1. internal arguments are complements of verbs.

  2. auxiliary verbs and modal verbs take VPs or ADJPs as their complements.

- Complement of nouns:

  1. We do not make argument/adjunct distinctions for nouns. In general, we treat nouns associated with another noun as modifiers.

  2. For complex NPs, we treat the clause associated with the head noun as a modifier of that noun.

- Complement of adjectives:

  1. internal arguments are complements of adjectives.

- Complement of adverbs:

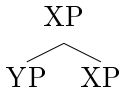
  1. There are some adverbs which take an argument.[2]

[2] Some examples are: '-와 같이', '-와 함께', '-는 물론', '-로 하여금', '없이'. See §9 for more on adverbs that take an argument.

2.4 Modification

S, ADVP, or NP can modify S, VP or ADJP. S and DANP can modify an NP. ADVP can modify another ADVP. Also, NPs can modify other NPs. Structurewise, a modifier adjoins onto the phrase it is associated with. In (2), YP modifies XP.

(2)



- Modifiers of a noun adjoin onto the NP they are associated with.
- Modifiers of a verb adjoin onto the lowest VP they are associated with.
- Modifiers of an adjective adjoin onto the ADJP they are associated with.
- Modifiers of an adverb adjoin on to the ADVP they are associated with.
- Modifiers of a sentence adjoin onto the S they are associated with.

3 Notation

3.1 Clause level tags

S: Simple sentential clause. Includes interrogatives, imperatives as well as declaratives.

3.2 Phrase level tags

ADJP: adjective phrase

VP: verb phrase

NP: noun phrase

ADVP: sentential and phrasal adverb phrase

ADCP: coordinate adverb phrase

DANP: adnominal phrase

INTJ: interjection

PRN: parenthetical

X: unknown, uncertain, or unbracketable

LST: list marker. includes surrounding punctuation. 1, 2, ㄱ, (ㄴ), a, b, c, (1.2.1), (2), (3), etc.

3.3 Head level tags

In general, the head level tag of a lexical item corresponds to the part-of-speech tag of its stem. Such lexical items are not labeled with a head level tag. Instead, they are directly assigned with a phrase level tag. But in some cases, the part-of-speech tag of the stem of a lexical item does not correspond to its head level tag. Such cases include verbs with a verbalization suffix, adjectives with an adjectivization suffix, light verbs, nominal auxiliary predicates, and adverbs with an adverbialization suffix '-게' or '-적으로'. Such lexical items are labeled with an appropriate head level tag, and then they are labeled with an appropriate phrase level tag.

VV: The stem of verbs with a verbalization suffix has the part-of-speech tag NNC. For syntactic annotation, these verbs are labeled with the head level tag VV.

VJ: The stem of adjectives with an adjectivization suffix has the part-of-speech tag NNC. For syntactic annotation, these adjectives are labeled with the head level tag VJ.

VX: The stem of nominal auxiliary predicates has the part-of-speech tag NNX. For syntactic annotation, these nominal auxiliary predicates are labeled with the head level tag VX.

LV: The stem of light verbs has the part-of-speech tag VV. For syntactic annotation, these light verbs are labeled with the head level tag LV.

ADV: The stem of adverbs with an adverbialization suffix '-게' or '-적으로' has the part-of-speech tag VJ. For syntactic annotation, these adverbs are labeled with the head level tag ADV.

CV: CV marks a compound verb. Note that there is no corresponding part-of-speech tag.

3.4 Function tags

Function tags mark the grammatical function of an NP (or an S) within a sentence. Usually, the subject has nominative case marker and the object has accusative case marker. But in some cases, even though an NP is marked with a nominative case marker, it may not be the subject of the sentence. Further, even though an NP is marked with accusative case marker, it may not be the object of the sentence. It is crucial that the function tags are markers of the grammatical function, and not case.

-SBJ: marks NP subject with nominative case marker.

-OBJ: marks NP complements with accusative case marker.

-COMP: marks NP complements that occur with adverbial postposition.

-ADV: marks NP when it is used adverbially.

-VOC: marks nouns of address.

-LV: used coupled with the LV tag on the light verb. This function tag marks the NP ('base noun') which associates with the light verb to form a predicate.

Note that S is marked with a function tag when it is used as the subject, object or the complement of a sentence. S does not have a function when it is used as an adjunct.

3.5 Null elements

T: trace of movement. used in object/complement preposing constructions and relative clauses.

(NP *pro*): for dropped subject or object. Generally, the dropped nominal constituent refers to some element within or outside the sentence in which it occurs, and can be recovered from the context. The sentence is still grammatical if the empty category is substituted by the appropriate constituent recovered from the context.

(WHNP *op*): used for the empty operator in relative constructions.

(VV *?*): used for verb deletion.

(VP *?*): used for VP ellipsis.

(XP *?*): used for other unknown empty categories.

3.6 Punctuation

commas: ,

parentheses( ): -LRB- (left round bracket), -RRB- (right round bracket)

braces{ }: -LCB- (left curly brace), -RCB- (right curly brace)

brackets[ ]: -LSB- (left square bracket), -RSB- (right square bracket)

quotation marks: “ ”

colons: :

final punctuations: . ? !

4 Clause type

4.1 Simple clause

Any simple sentences, including declaratives, interrogatives, imperatives, propositives, are S. The sentence final punctuation is attached to the highest S.

```
무전기가 고장났다.

(S (NP-SBJ 무전기/NNC+가/PCA)
   (VP 고장나/VV+았/EPF+다/EFN)
   ./SFN)

무전기가 고장났습니까?

(S (NP-SBJ 무전기/NNC+가/PCA)
   (VP 고장나/VV+았/EPF+습니까/EFN)
   ?/SFN)
```

4.2 Subordination

4.2.1 Sentential complements

A sentential complement is an argument of the verb. It is labeled as S with the function tag -COMP. In general, it is a sister of the verb it is associated with.

```
그는  무전기가  고장났다고  말했다.

(S (NP-SBJ 그/NPN+는/PAU)
   (VP (S-COMP (NP-SBJ 무전기/NNC+가/PCA)
               (VP 고장나/VV+았/EPF+다고/ECS))
       말하/VV+였/EPF+다/EFN)
   ./SFN)


그건  얼마나  많이  쓰는가에  달려  있지요.

(S (NP-SBJ 그것/NPN+은/PAU)
   (VP (VP (S-COMP (NP-SBJ *pro*)
                   (VP (NP-OBJ *pro*)
                       (VP (ADVP (ADVP 얼마나/ADV)
                                 (ADVP 많이/ADV))
                           (VP 쓰/VV+는가/EFN+에/PAD))))
            달리/VV+어/EAU)
        있/VX+지요/EFN)
     ./SFN)
```

4.2.2 Sentential adjuncts

Sentential adjuncts are adjoined to the S or VP that they are associated with.

```
날이  아주  더우면  차량  엔진이  과열된다.

(S (S (NP-SBJ 날/NNC+이/PCA)
      (ADJP (ADVP 아주/ADV)
            (ADJP 덥/VJ+면/ECS)))
   (S (NP-SBJ 차량/NNC
              엔진/NNC+이/PCA)
      (VP (VV 과열/NNC+되/XSV+ㄴ다/EFN)))
   ./SFN)

우리는  그  통신  기재에  대해  이야기했다.

(S (NP-SBJ 우리/NPN+는/PAU)
   (VP (S (NP-SBJ *pro*)
          (VP (NP-COMP 그/DAN
                       통신/NNC
```

```
                    기재/NNC+에/PAD)
              대하/VV+어/ECS))
      (VP (VV 이야기/NNC+하/VX+었/EPF+다/EFN)))
   ./SFN)
```

4.3 Coordination

Coordinated clauses are represented as sisters and they are attached to S. If a coordinating adverb is present, it is represented at the same level as the coordinated clauses.

```
박격포 중대는 정산 21이고 중기 중대는 정산 22이고 또한 비반충포 소대는
정산 23이지요.

(S (S (NP-SBJ 박격포/NNC
              중대/NNC+는/PAU)
      (VP (NP 정산/NPR
              21/NNU+이/CO+고/ECS)))
   (S (NP-SBJ 중기/NNC
              중대/NNC+는/PAU)
      (VP (NP 정산/NPR
              22/NNU이/CO+고/ECS)))
   (ADCP 또한/ADC)
   (S (NP-SBJ 비반/NNC
              충포/NNC
              소대/NNC+는/PAU)
      (VP (NP 정산/NPR
              23/NNU+이/CO+지요/EFN)))
   ./SFN)
```

5 Subcategorization Frames

This section describes various subcategorization frames in Korean. In our analysis, internal arguments of a predicate are subclassified into objects and complements. The difference between them is that the former category typically takes an accusative case marker, including a null one, whereas the latter typically takes an adverbial postposition.

Not only noun phrases, but sentential constituents can also be an argument and be treated either as a subject, object or a complement. When a sentential element is explicitly nominalized with the suffixation of '-음/-ㅁ' or '-기', it is bracketed as S and then is projected to an NP with an appropriate function tag, i.e., NP-SBJ, NP-OBJ, or NP-COMP. These nominalized clauses can be optionally followed by a case marker or a postposition.

```
화력 지원은 보통 철수를 엄호하기 위해서 혹은 후방으로의 대이동을
은폐하기 위해서 가능한 한 최대로 합니다.

(S (NP-SBJ *pro*)
   (VP (NP-OBJ 화력/NNC
               지원/NNC+은/PAU)
```

```
      (VP (ADVP 보통/ADV)
          (VP (S (S (NP-SBJ *pro*)
                    (VP (NP-OBJ (S (NP-SBJ *pro*)
                                   (VP (NP-OBJ 철수/NNC+를/PCA)
                                       (VV 엄호/NNC+하/XSV+기/ENM))))
                        위하/VV+어서/ECS))
                 (ADCP 혹은/ADC)
                 (S (NP-SBJ *pro*)
                    (VP (NP-OBJ (S (NP-SBJ *pro*)
                                   (VP (NP-OBJ (NP 후방/NNC+으로/PAD+의/PCA)
                                               (NP 때/XPF+이동/NNC+을/PCA))
                                       (VV 은폐/NNC+하/XSV+기/ENM))))
                        위하/VV+어서/ECS)))
             (VP (NP-ADV (S (NP-SBJ *pro*)
                            (ADJP (VJ 가능/NNC+하/XSJ+ㄴ/EAN)))
                         (NP 한/NNX))
                 (NP-ADV 최대/NNC+로/PAD)
                 (VP 하/VV+ㅂ니다/EFN)))))
   ./SFN)
```

Sentential elements taking suffixes such as '-지' and '-냐' can also be a sentential subject, sentential object or sentential complement. They are bracketed as S with appropriate function tags, i.e., S-SBJ, S-OBJ,or S-COMP. Note that they are not further projected to an NP. Although these sentential arguments can be optionally followed by a case marker or a postposition, they are distributionally restricted to be considered as a full-fledged NP.

그들의 군사 칭호가 뭔지는 제가 잘 모르겠습니다.

```
(S (S-OBJ-1 (NP-SBJ (NP 그/NPN+들/XSF+의/PCA)
                    (NP 군사/NNC
                        칭호/NNC+가/PCA))
            (VP (NP 무엇/NPN+이/CO+ㄴ지/EFN+는/PAU)))
   (S (NP-SBJ 제/NPN+가/PCA)
      (VP (S-OBJ *T*-1)
          (VP (ADVP 잘/ADV)
              (VP 모르/VV+겠/EPF+ㅂ니다/EFN))))
   ./SFN)
```

어떤 종류의 기준선이 사용되느냐에 따라 방위에는 세 가지 종류가 있소.

```
(S (S (NP-SBJ *pro*)
      (VP (S-COMP (NP-SBJ (NP 어떤/DAN
                              종류/NNC+의/PCA)
                          (NP 기준선/NNC+이/PCA))
                  (VP (VV 사용/NNC+되/XSV+느냐/EFN+에/PAD)))
          따르/VV+어/ECS))
   (S (NP-ADV 방위/NNC+에/PAD+는/PAU)
```

```
      (S (NP-SBJ 세/NNU
                 가지/NNX
                 종류/NNC+가/PCA)
         (ADJP 있/VJ+소/EFN)))
   ./SFN)
```

In all other cases where S is an argument, S itself is simply treated as a complement of a verb, i.e., S-COMP. This includes, but is not limited to, the cases where a sentence is followed by an inflectional ending (-ECS) such as '-다고' and '-라고' as well as '-도록', etc.

5.1 Intransitive Verb

Intransitive verbs do not take any internal arguments. They include verbs such as '자다, 전사하다', etc.

```
제가 이미 말씀드린 바와 같이 1 소대장은 오늘 아침에 전사했지요.

(S (ADVP (NP-COMP (S (NP-SBJ 제/NPN+가/PCA)
                     (VP (ADVP 이미/ADV)
                         (VP (NP-OBJ *pro*)
                             말씀드리/VV+ㄴ/EAN)))
                  (NP 바/NNX+와/PAD))
         같이/ADV)
   (S (NP-SBJ 1/NNU
              소대장/NNC+은/PAU)
      (VP (NP-ADV 오늘/NNC
                  아침/NNC+에/PAD)
          (VP (VV 전사/NNC+하/XSV+었/EPF+지요/EFN))))
   ./SFN)
```

5.2 Transitive Verb

Transitive verbs take an internal argument, which is optionally marked with an accusative case and has the function tag -OBJ.

```
어떤 과목에서 직일병의 근무 요령을 다루는가?

(S (NP-SBJ *pro*)
   (VP (NP-ADV 어떤/DAN
               과목/NNC+에서/PAD)
       (VP (NP-OBJ (NP 직일병/NNC+의/PCA)
                   (NP 근무/NNC
                       요령/NNC+을/PCA))
           다루/VV+는가/EFN))
   ?/SFN)
```

Some verbs such as '말하다' can take a sentence as an internal argument.

```
누가 그 지역 사령관인지 말해 보라.

(S (NP-SBJ *pro*)
   (VP (VP (S-OBJ (NP-SBJ 누구/NPN+가/PCA)
                  (VP (NP (NP 그/DAN 지역/NNC)
                          (NP 사령관/NNC+이/CO+ㄴ지/EFN))))
           말하/VV+어/EAU)
       보/VX+라/EFN)
   ./SFN)
```

5.3 Intransitive Verb with a complement NP

Some intransitive verbs take an NP complement which is marked with a postposition and the function tag -COMP. Such verbs include '대하다, 속하다, 가다' and so on.

```
이 사람도 조직에 속합니다.

(S (NP-SBJ 이/DAN 사람/NNC+도/PAU)
   (VP (NP-COMP 조직/NNC+에/PAD)
       속하/VV+ㅂ니다/EFN)
 ./SFN)

고등 학교 3학년 학생은 훈련소에 갑니다.

(S (NP-SBJ (NP 고등/NNC
               학교/NNC)
           (NP 3/NNU
               학년/NNX)
           (NP 학생/NNC+은/PAU))
   (VP (NP-COMP 훈련소/NNC+에/PAD)
       가/VV+ㅂ니다/EFN)
   ./SFN)

위수 규정, 보초와 감시병과 직일병의 근무 요령, 군대 예절, 군사 규율,
그리고 상벌 사항 등에 대해서 가르칩니다.

(S (NP-SBJ *pro*)
   (VP (S (NP-SBJ *pro*)
          (VP (NP-COMP (NP (NP 위수/NNC 규정/NNC)
                           ,/SCM
                           (NP (NP (NP 보초/NNC+와/PCJ)
                                   (NP 감시병/NNC+과/PCJ)
                                   (NP 직일병/NNC+의/PCA))
                               (NP 근무/NNC 요령/NNC))
                           ,/SCM
                           (NP 군대/NNC 예절/NNC)
                           ,/SCM
```

```
                            (NP 군사/NNC 규율/NNC)
                            ,/SCM
                            (ADCP 그리고/ADC)
                            (NP 상벌/NNC 사항/NNC))
                        (NP 등/NNX+에/PAD))
                 대하/VV+어서/ECS))
        (VP 가르치/VV+ㅂ니다/EFN))
   ./SFN)
```

5.4 Transitive Verb with a complement NP

Some transitive verbs take an NP complement in addition to an NP object.

```
공격 시에는 전투력을 한쪽에 집중해야 합니다.

(S (NP-SBJ *pro*)
   (VP (NP-ADV 공격/NNC
               시/NNX+에/PAD+는/PAU)
       (VP (VP (NP-OBJ 전투력/NNC+을/PCA)
               (NP-COMP 한쪽/NNC+에/PAD)
               (VV 집중/NNC+하/XSV+어야/ECS)))
           하/VX+ㅂ니다/EFN)
   ./SFN)
```

Ditransitive verbs such as '주다, 제공하다', etc. also belong to this category.

```
대대 예비 병력은 1개 탱크 소대인데 그 임무는 차량화 소총 부대한테 반전차
방어를 제공하는 겁니다.

(S (S (NP-SBJ 대대/NNC 예비/NNC 병력/NNC+은/PAU)
      (VP (NP 1/NNU 개/NNX
              탱크/NNC
              소대/NNC+이/CO+ㄴ데/ECS)))
   (S (NP-SBJ 그/DAN
              임무/NNC+는/PAU)
      (VP (NP (S (NP-SBJ *pro*)
                 (VP (NP-COMP 차량/NNC+화/XSF
                              소총/NNC
                              부대/NNC+한테/PAD)
                     (NP-OBJ 반/XPF+전차/NNC
                             방어/NNC+를/PCA)
                     (VV 제공/NNC+하/XSV+는/EAN)))
              (NP 것/NNX+이/CO+ㅂ니다/EFN))))
   ./SFN)
```

In addition, this subcategorization frame includes constructions that are similar to English small clauses. In these constructions, the two internal NP arguments cannot be deleted.

109 연대를 이따금 오성산 연대라고도 합니다.

```
(S (NP-SBJ *pro*)
   (VP (NP-OBJ 109/NNU
               연대/NNC+를/PCA)
       (VP (ADVP 이따금/ADV)
           (VP (NP-COMP 오성산/NPR
                        연대/NNC+라고/PAD+도/PAU)
               하/VV+ㅂ니다/EFN)))
   ./SFN)
```

5.5 Double Nominative Verb

Some verbs such as '되다' require two nominative arguments. The first nominative element is treated as the subject and the second nominative element is treated as the complement.

저희 포대가 또 사격 경연에서 승자가 됐습니다.

```
(S (NP-SBJ 저희/NPN
            포대/NNC+가/PCA)
   (VP (ADVP 또/ADV)
       (NP-ADV 사격/NNC
               경연/NNC+에서/PAD)
       (VP (NP-COMP 승자/NNC+가/PCA)
            되/VV+었/EPF+습니다/EFN))
   ./SFN)
```

Note that the above construction should be differentiated from the cases where both of the nominatives serve as subjects. See §11 for more on double nominative construction.

그 소대 사격수는 몹시 사기가 죽었다.

```
(S (NP-SBJ 그/DAN
           소대/NNC
           사격수/NNC+는/PAU)
   (S (ADVP 몹시/ADV)
      (S (NP-SBJ 사기/NNC+가/PCA)
         (VP 죽/VV+었/EPF+다/EFN)))
   ./SFN)
```

5.6 Predicative Nominal: Copula

In copular constructions, the predicative NP is directly projected to a VP.

그리고 탱크 소대의 표준 공격 정면은 약 150 미터입니다.

```
(S (ADCP 그리고/ADC)
   (S (NP-SBJ (NP 탱크/NNC 소대/NNC+의/PCA)
              (NP 표준/NNC 공격/NNC 정면/NNC+은/PAU))
      (VP (NP 약/DAN 150/NNU 미터/NNX+이/CO+ㅂ니다/EFN)))
   ./SFN)
```

5.7 Adjective

Intransitive adjectival predicates do not take any internal arguments.

```
육박전에서는 총검술이나 태권도가 제일 좋습니다.

(S (NP-ADV 육박전/NNC+에서/PAD+는/PAU)
   (S (NP-SBJ (NP 총검술/NNC+이나/PCJ)
              (NP 태권도/NNC+가/PCA))
      (ADJP (ADVP 제일/ADV)
            (ADJP 좋/VJ+습니다/EFN)))
   ./SFN)
```

5.8 Adjective with a complement NP

Some adjectival predicates such as '다르다, 같다' take an NP complement.

```
경보병 대대의 임무는 다음과 같다.

(S (NP-SBJ (NP 경보병/NNC
               대대/NNC+의/PCA)
           (NP 임무/NNC+는/PAU))
   (ADJP (NP-COMP 다음/NNC+과/PAD)
         같/VJ+다/EFN)
   ./SFN)
```

5.9 Double Nominative Adjective

Some adjectives such as '있다, 아니다, 좋다, 싫다, 필요하다', etc. take an NP with a nominative case marker as a complement. In such cases the NP complement is tagged with -COMP.

```
탱크 중대는 무기가 아주 많이 있습니다.

(S (NP-SBJ 탱크/NNC
           중대/NNC+는/PAU)
   (ADJP (NP-COMP 무기/NNC+가/PCA)
         (ADJP (ADVP (ADVP 아주/ADV)
                     (ADVP 많이/ADV))
               (ADJP 있/VJ+습니다/EFN)))
```

```
   ./SFN)
```

어떤 경우에는 제한된 시점에서도 철수가 필요합니다.

```
(S (NP-SBJ *pro*)
   (ADJP (NP-ADV 어떤/DAN
                 경우/NNC+에/PAD+는/PAU)
         (NP-ADV (S (WHNP-1 *op*)
                    (S (NP-SBJ *T*-1)
                       (VP (VV 제한/NNC+되/XSV+ㄴ/EAN))))
                 (NP 시점/NNC+에서/PAD+도/PAU))
         (ADJP (NP-COMP 철수/NNC+가/PCA)
               (VJ 필요/NNC+하/XSJ+ㅂ니다/EFN)))
   ./SFN)
```

한국 사람은 대체로 예절이 바릅니다.

```
(S (NP-SBJ 한국/NPR
           사람/NNC+은/PAU)
   (ADJP (ADVP 대체로/ADV)
         (ADJP (NP-COMP 예절/NNC+이/PCA)
               바르/VJ+ㅂ니다/EFN))
   ./SFN)
```

Note that these constructions should be differentiated from those where both of the nominatives are treated as subjects and tagged as -SBJ. For more discussion on double nominative constructions, see §11.

이 군수 공장은 상당히 규모가 크다.

```
(S (NP-SBJ 이/DAN
           군수/NNC
           공장/NNC+은/PAU)
   (S (ADVP 상당히/ADV)
      (S (NP-SBJ 규모/NNC+가/PCA)
         (ADJP 크/VJ+다/EFN)))
   ./SFN)
```

6 Noun Phrases

6.1 Noun-noun compounds

In general, compounds that are formed with nouns are left flat and is labeled as NP.

R-116 무전기가

```
(NP-SBJ R-116/NFW
       무전기/NNC+가/PCA)
```

6.2 NP modifiers

NP modifiers adjoin onto the noun they are associated with.

```
그 무전기의 송신기는

(NP-SBJ (NP 그/DAN
            무전기/NNC+의/PCA)
        (NP 송신기/NNC+는/PAU))
```

6.3 Relative clause constructions

6.3.1 Argument relative clause constructions

Argument relative clause constructions have a gap in an argument position of the relative clause which is semantically associated with the head noun. The head noun is labeled as NP, and the relative clause is labeled as S. The relative clause projects to S whose specifier contains an empty operator labeled as WHNP. This S adjoins onto the head noun NP. The gap in the relative clause is represented as a trace *T* and this trace is coindexed with the WHNP that contains the empty operator *op*.

```
고장난 수신기는

(NP (S (WHNP-1 *op*)
       (S (NP-SBJ *T*-1)
          (VP 고장나/VV+ㄴ/EAN)))
    (NP 수신기/NNC+는/PAU))

어제 저는 140 미리 방사포를 설치한 질-151 트럭 석 대를 보았습니다.

(S (NP-ADV 어제/NNC)
   (S (NP-SBJ 저/NPN+는/PAU)
      (VP (NP-OBJ (S (WHNP-1 *op*)
                     (S (NP-SBJ *pro*)
                        (VP (NP-OBJ 140/NNU
                                    미리/NNX
                                    방사포/NNC+를/PCA)
                            (NP-COMP *T*-1)
                            (VV 설치/NNC+하/XSV+ㄴ/EAN))))
                  (NP 트럭/NNC
                      석/NNU
                      대/NNX+를/PCA))
          보/VV+았/EPF+습니다/EFN))
   ./SFN)
```

6.3.2 Relativization out of multiple nominative/accusative clauses

The highest NP in a multiple nominative/accusative construction can undergo relativization. Be sure to properly coindex the gap position with the relative operator (see §11 for multiple nominative constructions and §12 for multiple accusative constructions).

눈이 큰 아이

```
(NP (S (WHNP-1 *op*)
       (S (NP-SBJ *T*-1)
          (S (NP-SBJ 눈/NNC+이/PCA)
             (ADJP 크/VJ+ㄴ/EAN))))
    (NP 아이))
```

6.3.3 Relativization out of a complex noun phrase construction

In '수 있-' constructions, sometimes an NP contained in the complement clause of '수' seems to have undergone relativization. Since 'clause + 수' is a complex NP, we would not expect such relativization to be possible given what we know about movement constraints, island effects and so on.

Although there may be something more complex going on in such constructions, for annotation purposes, simply put a trace in the complement clause (if the relativized NP is an argument of the clause) and coindex this trace with the empty relative operator.

제가 기억할 수 있는 건 빠짐없이 다 말씀드렸습니다.

```
(S (NP-SBJ *pro*)
   (VP (NP-OBJ (S (WHNP-1 *op*)
                  (S (NP-SBJ (S (NP-SBJ 제/NPN+가/PCA)
                                (VP (NP-OBJ *T*-1)
                                    (VV 기억/NNC+하/XSV+ㄹ/EAN)))
                             (NP 수/NNX))
                     (ADJP 있/VJ+는/EAN)))
               (NP 것/NNX+은/PAU))
       (VP (ADVP 빠짐없이/ADV)
           (ADVP 다/ADV)
           (VP 말씀드리/VV+었/EPF+습니다/EFN)))
   ./SFN)
```

6.3.4 Adjunct relative clause constructions

In adjunct relative clause constructions, an adjunct NP has been relativized. That is, the head noun is semantically associated with an empty adjunct in the relative clause. The bracketing guidelines for adjunct relative clause constructions are essentially the same as argument relative clause constructions, except in adjunct relative clause constructions, trace *T* is not represented.

그 무전기가 고장난 원인이 무엇인가?

```
(S (NP-SBJ (S (WHNP *op*)
              (S (NP-SBJ 그/DAN
                         무전기/NNC+가/PCA)
                 (VP 고장나/VV+ㄴ/EAN)))
           (NP 원인/NNC+이/PCA))
   (VP (NP 무엇/NPN+이/CO+ㄴ 가/EFN))
    ?/SFN)
```

6.3.5 Internally headed relative clause constructions

In internally headed relative clause constructions, the head of the relative clause is inside the relative clause (i.e., internal head of the relative clause), and it is semantically associated with the head noun of the relative clause which is instantiated as '것'. The bracketing guideline for such constructions is essentially the same as the argument relative clauses, except you should coindex the relative pronoun operator (WHNP) with the internal head of the relative clause.

제가 5 중대에 처음 왔을 때는 대대에 확기를 여분으로 둔 것이 없었습니다.

```
(S (NP-ADV (S (WHNP *op*)
              (S (NP-SBJ 제/NPN+가/PCA)
                 (VP (NP-COMP 5/NNU
                              중대/NNC+에/PAD)
                     (VP (NP-ADV 처음/NNC)
                         (VP 오/VV+었/EPF+을/EAN)))))
           (NP 때/NNC+는/PAU))
   (NP-COMP-2 대대/NNC+에/PAD)
   (S (NP-SBJ (S (WHNP-1 *op*)
                 (S (NP-SBJ *pro*)
                    (VP (NP-OBJ-1 확기/NNC+를/PCA)
                        (VP (NP-ADV 여분/NNC+으로/PAD)
                            (VP 두/VV+ㄴ/EAN)))))
              (NP 것/NNX+이/PCA))
      (ADJP (NP-COMP *T*-2)
            없/VJ+었/EPF+습니다/EFN))
   ./SFN)
```

금방 말씀드린 그 부대들 말고 다른 부대들에 대한 첩보는 가진 게 하나도 없습니다.

```
(S (S (NP-SBJ (S (WHNP-1 *op*)
                 (S (ADVP 금방/ADV)
                    (S (NP-SBJ *pro*)
                       (VP (NP-OBJ *T*-1)
                           말씀드리/VV+ㄴ/EAN))))
              (NP 그/DAN
                  부대/NNC+들/XSF))
      (VP 말/VV+고/ECS))
```

```
(S (NP-SBJ (S (WHNP-3 *op*)
              (S (NP-SBJ *pro*)
                 (VP (NP-OBJ-3 (S (WHNP-2 *op*)
                                  (S (NP-SBJ *T*-2)
                                     (VP (NP-COMP 다른/DAN
                                                  부대/NNC+들/XSF+에/PAD)
                                         대하/VV+ㄴ/EAN)))
                               (NP 첩보/NNC+는/PAU))
                     가지/VV+ㄴ/EAN)))
           (NP 것/NNX+이/PCA))
   (ADJP (NP-ADV 하나/NNU+도/PAU)
         (ADJP 없/VJ+습니다/EFN)))
./SFN)
```

6.3.6 Across-the-Board (ATB) relativization

Conjoined clauses can each have a gap that is semantically associated with a single head noun. In this case, the conjoined clauses project to S whose specifier contains an empty operator labeled as WHNP. Moreover, the gap in each conjunct is represented as a trace and it is coindexed with the empty operator.

개인화기란 개인이 휴대하여 혼자서 조작하는 모든 화기를 말한다.

```
(S (NP-SBJ 개인/NNC
           화기/NNC+란/PAU)
   (VP (NP-OBJ (S (WHNP-1 *op*)
                  (S (S (NP-SBJ 개인/NNC+이/PCA)
                        (VP (NP-OBJ *T*-1)
                            (VV 휴대/NNC+하/XSV+여/ECS)))
                     (S (NP-SBJ *pro*)
                        (VP (NP-ADV 혼자/NNC+서/PAD)
                            (VP (NP-OBJ *T*-1)
                                (VV 조작/NNC+하/XSV+는/EAN))))))
               (NP 모든/DAN
                   화기/NNC+를/PCA))
       말하/VV+ㄴ다/EFN)
   ./SFN)
```

모터사이클을 타고 순찰하는 사회 안전원도 있습니다.

```
(S (NP-SBJ (S (WHNP-1 *op*)
              (S (NP-SBJ *T*-1)
                 (VP (NP-OBJ 모터사이클/NNC+을/PCA)
                     타/VV+고/ECS))
              (S (NP-SBJ *T*-1)
                 (VP (VV 순찰/NNC+하/XSV+는/EAN))))
```

```
          (NP 사회/NNC
              안전원/NNC+도/PAU))
   (ADJP 있/VJ+습니다/EFN)
   ./SFN)
```

6.3.7 Relative clauses with Determiner

Determiners adjoin onto the NP containing the head noun and the relative clause.

```
이 빨간 선들이 도토지.

(S (NP-SBJ (DANP 이/DAN)
           (NP (S (WHNP-1 *op*)
                  (S (NP-SBJ *T*-1)
                     (ADJP 빨갛/VJ+ㄴ/EAN))))
               (NP 선/NNC+들/XSF+이/PCA))
   (VP (NP 도토/NNC+이/CO+지/EFN))
   ./SFN)
```

6.4 Complex noun phrases

A complex noun phrase is similar to a relative clause construction in that it is composed of a head noun and a clause that is associated with the head noun. But it differs from the relative clause construction in that it does not have a gap in the clause that is semantically associated with the head noun. Similarly to relative clause constructions, the head noun is labeled as NP, the clause is labeled as S, and this S adjoins onto the head noun NP. But unlike relative clause constructions, the clause in complex NPs does not project to an S whose specifier contains an empty operator.

6.4.1 When the head is a common noun

```
R-116 무전기가 5중대에 지급된다는 소식

(NP (S (NP-SBJ R-116/NFW
               무전기/NNC+가/PCA)
       (VP (NP-COMP 5/NNU
                    중대/NNC+에/PAD)
           (VV 지급/NNC+되/XSV+ㄴ다는/EAN))))
    (NP 소식/NNC+은/PAU))
```

Some common nouns that frequently occur as heads of a complex NP include '경우, 동안, 후, 다음, 정도', etc.

6.4.2 When the head is a dependent noun

- Clause + '것'

  When '것' is a head of a complex NP, it can denote a proposition.

그 사람들이 군복을 입고 있는 것이 눈에 띄었거든요.

```
(S (NP-SBJ (S (NP-SBJ 그/DAN 사람/NNC+들/XSF+이/PCA)
              (VP (VP (NP-OBJ 군복/NNC+을/PCA)
                      입/VV+고/EAU)
                  있/VX+는/EAN))
           (NP 것/NNX+이/PCA))
    (VP (NP-COMP 눈/NNC+에/PAD)
         띄/VV+었/EPF+거든요/EFN)
   ./SFN)
```

'것' can also be a head of a relative clause. In this case, '것' usually denotes 'thing'.

제가 본 것은 그것뿐입니다.

```
(S (NP-SBJ (S (WHNP-1 *op*)
              (S (NP-SBJ 제/NPN+가/PCA)
                 (VP (NP-OBJ *T*-1)
                     보/VV+ㄴ/EAN)))
           (NP 것/NNX+은/PAU))
   (VP (NP 그것/NPN 뿐/NNX+이/CO+ㅂ니다/EFN))
   ./SFN)
```

Note that '것이다' as a whole can be an auxiliary predicate, contributing future tense or irrealis modality. In this case, the verb preceding '것이다' is inflected with '-ㄹ/을'.

아마 우리 탱크가 공격 시에 그 도로를 사용하기로 되어 있었을 겁니다.

```
(S (ADVP 아마/ADV)
   (S (NP-SBJ 우리/NPN 탱크/NNC+가/PCA)
      (VP (VP (VP (VP (NP-ADV 공격/NNC 시/NNX+에/PAD)
                      (VP (NP-OBJ 그/DAN 도로/NNC+를/PCA)
                          (VV 사용/NNC+하/XSV+기로/ECS)))
                  되/VX+어/EAU)
              있/VX+었/EPF+을/EAN)
          (VX 것/NNX+이/CO+ㅂ니다/EFN)))
   ./SFN)
```

- Clause + '데', '일'

건전지를 보충받는 데는 지체되는 일이 없지요.

```
(S (NP-ADV (S (NP-SBJ *pro*)
              (VP (NP-OBJ 건전지/NNC+를/PCA)
                  (VV 보충/NNC+받/XSV+는/EAN)))
           (NP 데/NNX+는/PAU))
```

```
(S (NP-SBJ (S (NP-SBJ *pro*)
              (VP (VV 지체/NNC+되/XSV+는/EAN)))
           (NP 일/NNC+이/PCA))
   (ADJP 없/VJ+지요/EFN))
./SFN)
```

Note that '데' can also be a head of a relative clause. In this case, '데' usually denotes 'place'.

연대의 지휘부가 연대 지휘부가 있던 데로 이동해 온다고 들은 적은 있습니다.

```
(S (NP-SBJ (S (NP-SBJ *pro*)
              (VP (S-COMP (NP-SBJ (NP 그/DAN 연대/NNC+의/PCA)
                                  (NP 지휘부/NNC+가/PCA))
                          (VP (NP-COMP (S (WHNP-1 *op*)
                                          (S (NP-SBJ 연대/NNC 지휘부/NNC+가/PCA )
                                             (ADJP (NP-COMP *T*-1)
                                                   있/VJ+던/EAN)))
                                       (NP 데/NNX+로/PAD))
                              (CV (VV 이동/NNC+하/XSV+어/ECS)
                                  오/VV+ㄴ다고/ECS)))
                  듣/VV+은/EAN))
          (NP 적/NNX+은/PAU))
   (ADJP 있/VJ+습니다/EFN)
   ./SFN)
```

- Clause + '수'

  In general, the function tag for the NP headed by '수' is -SBJ.

  그들이 말을 너무나도 작게 해서 잘 알아들을 수가 없었습니다.

```
(S (S (NP-SBJ 그/NPN+들/XSF+이/PCA)
      (VP (NP-OBJ 말/NNC+을/PCA)
          (VP (ADVP (ADVP 너무나/ADV+도/PAU)
                    (ADVP (ADV 작/VJ+게/ECS)))
              (VP 하/VV+어서/ECS))))
   (S (NP-SBJ (S (NP-SBJ *pro*)
                 (VP (ADVP 잘/ADV)
                     (VP 알아듣/VV+을/EAN)))
              (NP 수/NNX+가/PCA))
      (ADJP 없/VJ+었/EPF+습니다/EFN))
   ./SFN)
```

- Clause + '적'

  In general, the function tag for the NP headed by '적' is -COMP. This is to capture the intuition that '적' implies the presence of an experiencer, which in turn implies the presence of an external argument, the subject of the clause.

```
왜냐하면 저희들은 포가 없었던 적이 한번도 없었기 때문이죠.

(S (ADCP 왜냐하면/ADC)
   (S (NP-SBJ *pro*)
      (VP (NP (NP (S (NP-SBJ 저희/NPN+들/XSF+은/PAU)
                     (ADJP (NP-COMP (S (NP-SBJ *pro*)
                                       (ADJP (NP-COMP 포/NNC+가/PCA)
                                             없/VJ+었/EPF+던/EAN))
                                    (NP 적/NNX+이/PCA))
                           (ADJP (NP-ADV 한번/NNC+도/PAU)
                                 (ADJP 없/VJ+었/EPF+기/ENM))))
              (NP 때문/NNX+이/CO+죠/EFN)))))
      ./SFN)
```

6.5 Nominalized clauses: gerunds

Gerunds are clauses headed by a nominalized verb or adjective (i.e., a verb or an adjective with a nominalizer ending such as '기' or '음'). They behave as an NP within the matrix clause in that they can be the subject or the object of the matrix clause. They are labeled as S and then projected to an NP with the relevant function tag.

```
보고서를 작성하기가 어렵다.

(S (NP-SBJ (S (NP-SBJ *pro*)
              (VP (NP-OBJ 보고서/NNC+를/PCA)
                  (VV 작성/NNC+하/XSV+기/ENM+가/PCA))))
   (ADJP 어렵/VJ+다/EFN)
   ./SFN)
```

6.6 Equative NP

When '즉' is equating two or more NPs, it should be part-of-speech tagged as ADC, and the NPs associated with '즉' should be conjoined.

```
2 명의 부중대장, 즉 정치 부중대장과 군사 부중대장이 있습니다.

(S (NP-SBJ (NP (NP 2/NNU
                   명/NNX+의/PCA)
               (NP 부중대장/NNC))
           ,/SCM
           (ADCP 즉/ADC)
           (NP (NP 정치/NNC
                   부중대장/NNC+과/PCJ)
               (NP 군사/NNC
                   부중대장/NNC+이/PCA)))
   (ADJP 있/VJ+습니다/EFN))
   ./SFN)
```

7 Verb Phrases

7.1 Verb complementation

Internal arguments are complements of verbs.

```
호출 대호를 받았습니다.

(S (NP-SBJ *pro*)
   (VP (NP-OBJ 호출/NNC
               대호/NNC+를/PCA)
       받/VV+았/EPF+습니다/EFN)
   ./SFN)

사령관에게 보고서를 보냈다.

(S (NP-SBJ *pro*)
   (VP (NP-COMP 사령관/NNC+에게/PAD)
       (NP-OBJ 보고서/NNC+를/PCA)
       보내/VV+었/EPF+다/EFN)
   ./SFN)
```

But when there is a verb modifier intervening between the internal argument and the verb, the verb is labeled as VP, and the modifier adjoins to this VP. And then the internal argument adjoins to the VP to which the modifier attaches.

```
호출 대호를 많이 받았습니다.

(S (NP-SBJ *pro*)
   (VP (NP-OBJ 호출/NNC
               대호/NNC+를/PCA)
       (VP (ADVP 많이)
           (VP 받/VV+았/EPF+습니다/EFN)))
   ./SFN)
```

7.2 Auxiliary predicates

7.2.1 Auxiliary verbs

Auxiliary verbs take the highest VP (or AP) in the clause as their complements, and auxiliary verbs and their complement VP (or AP) are labeled as VP.

```
그 무전기의 송신기는 뭐 뭣으로 구성되어 있지?

(S (NP-SBJ (NP 그/DAN
               무전기/NNC+의/PCA)
           (NP 송신기/NNC+는/PAU))
   (VP (VP (NP-COMP 무엇/NPN
                    무엇/NPN+으로/PAD)
```

```
          (VV 구성/NNC+되/XSV+어/EAU))
       있/VX+지/EFN)
    ?/SFN)
```

```
신문관 자격을 가진 사람들이 그렇게 많지 않다.
```

```
(S (NP-SBJ (S (WHNP-1 *op*)
              (S (NP-SBJ *T*-1)
                 (VP (NP-OBJ 신문관/NNC 자격/NNC+을/PCA)
                     가지/VV+ㄴ/EAN)))
          (NP 사람/NNC+들/XSF+이/PCA))
   (VP (ADJP (ADVP 그렇게/ADV)
             (ADJP 많/VJ+지/EAU))
       않/VX+다/EFN)
   ./SFN)
```

7.2.2 Sentences with more than one auxiliary verbs

The innermost auxiliary verb takes the VP as its complement, projecting to a VP. And then the outer auxiliary verb takes this VP as its complement, projecting to another VP, and so on.

```
왜 그 도로 상에서 지뢰를 탐지하기로 되어 있었지?
```

```
(S (NP-SBJ *pro*)
   (VP (VP (ADVP 왜/ADV)
           (NP-ADV 그/DAN 도로/NNC 상/NNC+에서/PAD)
           (VP (NP-OBJ 지뢰/NNC+를/PCA)
               (VV 탐지/NNC+하/XSV+기로/ECS))
           되/VX+어/EAU)
       있/VX+었/EPF+지/EFN)
   ?/SFN)
```

7.2.3 Auxiliary adjectives

Auxiliary adjectives such as '만하다, 듯하다, 법하다' take the highest VP (or AP) in the clause as their complements, and auxiliary adjectives and their complement VP (or AP) are labeled as VP.

```
그건 R-116 무전기로 통할 만하다.
```

```
(S (NP-SBJ 그것/NPN+은/PAU)
   (VP (VP (NP-ADV R-116/NFW
                   무전기/NNC+로/PAD)
           (VP 통하/VV+ㄹ/EAN)
   만하/VX+다/EFN))
   ./SFN)
```

7.2.4 Auxiliary predicative nouns

Auxiliary predicative nouns such as '것이다, 뿐이다, 터이다' contribute modal or aspectual interpretation. They are labeled as VX and take the highest VP (or AP) in the clause as their complements. Further, auxiliary predicative nouns and their complement VP (or AP) are labeled as VP.

```
6 중대에서는 언제 무전기를 교체할 건가?

(S (NP-ADV 6/NNU 중대/NNC+에서/PAD+는/PAU)
   (S (NP-SBJ *pro*)
      (VP (VP (NP-ADV 언제/NNC)
              (VP (NP-OBJ 무전기/NNC+를/PCA)
                  (VV 교체/NNC+하/XSV+ㄹ/EAN)))
          (VX 건/NNX+이/CO+ㄴ가/EFN)))
    ?/SFN)

이 선들은 인민군 지도에 있는 것보다 약 1.5도쯤 다를 뿐이다.

(S (NP-SBJ 이/DAN
           선/NNC+들/XSF+은/PAU)
   (VP (ADJP (NP-ADV (S (WHNP-1 *op*)
                        (S (NP-SBJ *T*-1)
                           (ADJP (NP-COMP 인민군/NNC
                                          지도/NNC+에/PAD)
                                 있/VJ+는/EAN)))
                     (NP 것/NNX+보다/PAD))
             (NP-ADV 약/DAN
                     1.5/NNU
                     도/NNX+쯤/XSF)
             (ADJP 다르/VJ+ㄹ/EAN))
       (VX 뿐/NNX+이/CO+다/EFN))
   ./SFN)

지도가 있으면 제가 그걸 찾아 낼 수 있을텐데요.

(S (S (NP-SBJ 지도/NNC+가/PCA)
      (ADJP 있/VJ+으면/ECS))
   (S (NP-SBJ (S (NP-SBJ 제/NPN+가/PCA)
                 (VP (VP (NP-OBJ 그걸/NPN+을/PCA)
                         찾/VV+어/EAU)
                     내/VX+ㄹ/EAN))
              (NP 수/NNX))
      (VP (ADJP 있/VJ+ㄹ/EAN)
          (VX 터/NNX+이/CO+ㄴ데요/EFN)))
   ./SFN)

약간 행군을 할 테니까 그 거리는 약 1 킬로미터쯤 될 겁니다.
```

```
(S (S (NP-SBJ *pro*)
      (VP (VP (NP-OBJ 야간/NNC 행군/NNC+을/PCA)
              하/VV+ㄹ/EAN)
          (VX 터/NNX+이/CO+ㄴ까/ECS)))
   (S (NP-SBJ 그/DAN 거리/NNC+는/PAU)
      (VP (VP (NP-COMP 약/DAN 1/NNU 킬로미터/NNX+쯤/XSF)
              되/VV+ㄹ/EAN)
          (VX 것/NNX+이/CO+ㅂ니다/EFN)))
   ./SFN)
```

7.2.5 Complex auxiliary predicate

Complex auxiliary predicates such as '것 같다' occur at the end of clauses and corresponds in meaning to English raising predicates such as 'seem' and 'be likely'. Label such predicates as VX and treat them as an auxiliary predicate.

```
중대에는 지금 임무를 수행하는 데 필요한 탄약이 없는 것 같습니다.

(S (NP-COMP-2 중대/NNC+에/PAD+는/PAU)
   (S (NP-SBJ (S (WHNP-1 *op*)
                 (S (NP-SBJ *T*-1)
                    (ADJP (NP-COMP (S (NP-SBJ *pro*)
                                      (VP (ADVP 지금/ADV)
                                          (VP (NP-OBJ 임무/NNC+를/PCA)
                                              (VV 수행/NNC+하/XSV+는/EAN))))
                                   (NP 데/NNX))
                          (VJ 필요/NNC+하/XSJ+ㄴ/EAN))))
              (NP 탄약/NNC+이/PCA))
      (VP (ADJP (NP-COMP *T*-2)
                없/VJ+는/EAN)
          (VX 것/NNX 같/VJ+습니다/EFN)))
   ./SFN)
```

7.3 Light verb

Light verbs occur with an activity-denoting noun. They are called 'light' because they do not seem to have much semantic content and do not seem to contribute subcategorization information. Rather, in sentences with light verbs, the subcategorization information come from the activity denoting noun. We refer to this activity denoting noun as the 'base noun' of the light verb.

The most common light verb is '하'. It follows a Sino Korean noun (Chinese origin nouns) which can be marked with accusative case marker.

```
수리를 하다
손질을 하다
보고를 하다
필요로 하다
```

Some other light verbs include '나다', '되다' and '받다'. '나다' occurs with a nominative marked NP, and '받다' occurs with an accusative marked NP.

```
배탈이 나다
기억이 나다
생각이 나다

할당을 받다
영향을 받다
```

A light verb is labeled as LV, and its base noun is labeled as NP with the appropriate function tags. If the base noun can have accusative case marker, the function tag is -OBJ, and if it can have nominative case marker, the function tag is -COMP. This base noun is further tagged with -LV.

```
그들은 무전기를 대대 통신 소대에서 수리를 합니다.

(S (NP-SBJ 그들은)
   (VP (NP-OBJ 무전기/NNC+를/PCA)
       (VP (NP-ADV 대대/NNC
                   통신/NNC
                   소대/NNC+에서/PAD)
           (VP (NP-OBJ-LV 수리/NNC+를/PCA)
               (LV 하/VV+ㅂ니다/EFN)))))
   ./SFN)

중대는 그 주파수 49.75를 언제 할당 받았는가?

(S (NP-SBJ 중대/NNC+는/PAU)
   (VP (NP-OBJ 그/DAN
               주파수/NNC
               49.75/NNU+를/PCA)
       (VP (NP-ADV 언제/NPN)
           (VP (NP-OBJ-LV 할당/NNC)
               (LV 받/VV+았/EPF+는가/EFN))))
   ?/SFN)

그 포로가 배탈이 난 원인을 말해 보시오.

(S (NP *pro*)
   (VP (VP (NP-OBJ (S (WHNP *op*)
                      (S (NP-SBJ 그/DAN
                                 포로/NNC+가/PCA)
                         (VP (NP-COMP-LV 배탈/NNC+이/PCA)
                             (LV 나/VV+ㄴ/EAN))))
                   (NP 원인/NNC+을/PCA))
           말하/VV+여/EAU)
```

```
        보/VX+시/EPF+오/EFN)
   ./SFN)
```

If the base noun is modified, -LV tag should be given to the highest projection of the base noun.

무전 통신은 자연의 영향을 많이 받지요.

```
(S (NP-SBJ 무전/NNC
           통신/NNC+은/PAU)
   (VP (NP-OBJ-LV (NP 자연/NNC+의/PCA)
                  (NP 영향/NNC+을/PCA))
       (VP (ADVP 많이/ADV)
           (VP (LV 받/VV+지요/EFN))))
   ./SFN)
```

또 제 친구가 122 미리 고사포 대대에서는 URAL-375 트럭을 쓴다고 말하던 기억이 납니다.

```
(S (ADVP 또/ADV)
   (S (NP-SBJ *pro*)
      (VP (NP-COMP-LV (S (NP-SBJ 제/NPN
                                 친구/NNC+가/PCA)
                         (VP (S-COMP (NP-ADV 122/NNU
                                             미리/NNX
                                             고사포/NNC
                                             대대/NNC+에서/PAD+는/PAU)
                                     (S (NP-SBJ *pro*)
                                        (VP (NP-OBJ URAL-375/NFW
                                                    트럭/NNC+을/PCA)
                                            쓰/VV+ㄴ다고/ECS)))
                                 말하/VV+던/EAN))
                      (NP 기억/NNC+이/PCA))
          (LV 나/VV+ㅂ니다/EFN)))
   ./SFN)
```

When an adverb intervenes between a light verb and its complement NP, bracket the light verb as VP and adjoin the adverb onto it.

우리는 그 친구들하고 늘 행동을 같이 했지요.

```
(S (NP-SBJ 우리/NPN+는/PAU)
   (VP (NP-COMP 그/DAN 친구/NNC+들/XSF+하고/PAD)
       (VP (ADVP 늘/ADV)
           (VP (NP-OBJ-LV 행동/NNC+을/PCA)
               (VP (ADVP 같이/ADV)
                   (VP (LV 하/VV+었/EPF+지요/EFN))))))
   ./SFN)
```

In many cases, determining whether a verb is a light verb is very difficult. When in doubt, treat the verb in question as a regular verb and do not label it as LV.

7.4 Compound verb

Compound verbs are labeled as CV. The first verb of compound verbs ends with '-어/-아' and it cannot have tense morphemes. The second verb belongs to a certain class of verbs that has a directional meaning, such as '가다, 오다, 나가다, 넣다, 다니다'.

```
그는 진공관을 갈아 넣었다.

(S (NP-SBJ 그는)
   (VP (NP-OBJ 진공관/NNC+을/PCA)
       (CV 갈/VV+아/ECS
           넣/VV+었/EPF+다/EFN))
   ./SFN)

아마 너를 감옥에 잡아 넣기까지 할지도 몰라.

(S (NP-SBJ *pro*)
   (VP (VP (ADVP 아마/ADV)
           (VP (NP-OBJ (S (NP-SBJ *pro*)
                          (VP (NP-OBJ 너/NPN+를/PCA)
                              (NP-COMP 감옥/NNC+에/PAD)
                              (CV 잡/VV+어/ECS
                                  넣/VV+기/ENM+까지/PAU))))
               하/VV+ㄹ지/ECS+도/PAU))
       모르/VX+어/EFN)
   ./SFN)
```

7.5 VP modification

Verb modifiers adjoin onto the lowest VP they are associated with.

```
우리는 무전기를 오랫동안 조작하지 못합니다.

(S (NP-SBJ 우리/NPN+는/PAU)
   (VP (VP (NP-OBJ 무전기/NNC+를/PCA)
           (VP (NP-ADV 오랫동안/NNC)
               (VP (VV 조작/NNC+하/XSV+지/EAU))))
       못하/VX+ㅂ니다/EFN)
   ./SFN)

포로를 잡으면 지체없이 보고해야 합니다.

(S (S (NP-SBJ *pro*)
      (VP (NP-OBJ 포로/NNC+를/PCA)
          잡/VV+으면/ECS))
   (S (NP-SBJ *pro*)
      (VP (VP (ADVP 지체없이/ADV)
              (VP (NP-OBJ *pro*)
```

```
                (VV 보고/NNC+하/XSV+어야/ECS)))
        하/VX+ㅂ니다/EFN))
   ./SFN)
```

When there are more than one verb modifiers, they attach to the same VP level.

```
부대 명칭은 통상 암호로 하달됩니다.

(S (NP-SBJ 부대/NNC
           명칭/NNC+은/PAD)
   (VP (ADVP 통상/ADV)
       (NP-ADV 암호/NNC+로/PAD)
       (VP (VV 하달/NNC+되/XSV+ㅂ니다/EFN)))
   ./SFN)
```

7.6 Derived verb

For derived verbs, the stem is part-of-speech tagged as NNC and the derivation suffix is part-of-speech tagged as XSV. The derived verbs are labeled as VV in syntactic bracketing.

```
보고하였다

(VV 보고/NNC+하/XSV+였/EPF+다/EFN)

보고되었다

(VV 보고/NNC+되/XSV+었/EPF+다/EFN)
```

In some cases, derived verbs have conjoined noun stems. Treat them as coordinated verbs.

```
지휘 통솔한다.

(VV (VV 지휘/NNC)
    (VV 통솔/NNC+하/XSV+ㄴ다/EFN))

습격 파괴한다.

(VV (VV 습격/NNC)
    (VV 파괴/NNC+하/XSV+ㄴ다/EFN))
```

8 Adjective Phrase

Adjectives project to AP. If an adjective has a complement, the adjective and the complement are labeled as AP. Adjective modifiers adjoin onto the AP.

```
날이 덥다.

(S (NP-SBJ 날/NNC+이/PCA)
```

```
   (ADJP 덥/VJ+다/EFN)
   ./SFN)
```

대대엔 탄약 재고가 많이 있는가 보지요.

```
(S (NP-COMP-1 대대/NNC+에/PAD+ㄴ/PAU)
   (S (NP-SBJ 탄약/NNC
              재고/NNC+가/PCA)
      (VP (ADJP (ADVP 많이/ADV)
                (ADJP (NP-COMP *T*-1)
                      있/VJ+는 가/EFN))
          보/VX+지요/EFN))
   ./SFN)
```

The stem of derived adjective is part-of-speech tagged as NNC and the derivation suffix is part-of-speech tagged as XSJ. The derived adjectives are labeled as VJ in syntactic bracketing.

유명하다

```
(VJ 유명/NNC+하/XSJ+다/EFN)
```

9 Adverb Phrase

Adverbs are part-of-speech tagged with ADV, and they are bracketed with the label ADVP.

빨리

```
(ADVP 빨리/ADV)
```

9.1 Adjunction site of adverb phrase

Adverb phrases (ADVPs) in general adjoin onto VP, ADJP or S.

대대 정치 군관의 권한은 대단히 크지요.

```
(S (NP-SBJ (NP 대대/NNC 정치/NNC 군관/NNC+의/PCA)
           (NP 권한/NNC+은/PAU))
   (ADJP (ADVP 대단히/ADV)
         (ADJP 크/VJ+지요/EFN))
   ./SFN)
```

전투시에는 통신망을 잘 운용해야 합니다.

```
(S (NP-ADV 전투/NNC
           시/NNX+에/PAD+는/PAU)
   (S (NP-SBJ *pro*)
      (VP (VP (NP-OBJ 통신망/NNC+을/PCA)
```

```
              (VP (ADVP 잘/ADV)
                  (VP (VV 운용/NNC+하/XSV+어야/ECS))))
          하/VX+ㅂ니다/EFN))
   ./SFN)
```

먼저 네 조출식 공중선의 높이를 조절하라.

```
(S (ADVP 먼저/ADV)
   (S (NP-SBJ *pro*)
      (VP (NP-OBJ (NP 네/NPN 조출식/NNC 공중선/NNC+의/PCA)
                  (NP 높이/NNC+를/PCA))
          (VV 조절/NNC+하/XSV+라/EFN)))
   ./SFN)
```

Sometimes an adverb modifies another adverb, especially adverbs of degree such as '너무, 아주, 매우, 더, 약간'. In the example below, '너무나도' does not modify the verb but rather the following adverb '작게'.

그 친구들이 말을 너무나도 작게 했다.

```
(S (NP-SBJ 그/DAN 친구/NNC+들/XSF+이/PCA)
   (VP (NP-OBJ 말/NNC+을/PCA)
       (VP (ADVP (ADVP 너무나/ADV+도/PAU)
                 (ADVP (ADV 작/VJ+게/ECS)))
           (VP 하/VV+였/EPF+다/EFN)))
   ./SFN)
```

Moreover, a few adverbs can adjoin to a limited number of noun phrases and limited number of adnominal phrases.

얼마나 오랫동안

```
(NP (ADVP 얼마나/ADV)
    (NP 오랫동안/NNC))
```

거의 모든

```
(DANP (ADVP 거의/ADV)
      (DANP 모든/DAN))
```

9.2 Derived adverbs

In general, adjectives suffixed with '-게' are derived adverbs (e.g., '작게') and are bracketed with the label ADV first and then bracketed with the label ADVP.

그 친구들이 말을 너무나도 작게 했다.

```
(S (NP-SBJ 그/DAN 친구/NNC+들/XSF+이/PCA)
```

```
(VP (NP-OBJ 말/NNC+을/PCA)
    (VP (ADVP (ADV 작/VJ+게/ECS))
        (VP 하/VV+였/EPF+다/EFN)))
./SFN)
```

Nouns suffixed with '-적으로' are also derived adverbs.

```
단계적으로

(ADVP (ADV 단계/NNC+적/XSF/+으로/PAD))
```

Note, however, that this does not entail that the nouns suffixed with '-적' is treated as an adjective. They are simply treated as a NP.

```
전면적 후방 이동을

(NP-OBJ (NP 전면/NNC+적/XSF)
        (NP 후방/NNC
            이동/NNC+을/PCA))
```

9.3 Adverb with an NP complement

Some adverbs such as '하여금, 달리, 같이, 함께, 물론' take an NP complement to form an adverb phrase.

```
포병 지원 부대로 하여금

(ADVP (NP-COMP 포병/NNC
               지원/NNC
               부대/NNC+로/PAD)
      하여금/ADV)

고등 학생과 대학생은 물론

(ADVP (NP-COMP (NP 고등/NNC
                   학생/NNC+과/PCJ)
               (NP 대학생/NNC+은/PAU))
      물론/ADV)

이와 같이

(ADVP (NP-COMP 이/NPN+와/PAD)
      같이/ADV)
```

In some cases, NPs functioning as adverbials also take an NP complement.

```
그 부대는 장갑차를 핵심으로 편성돼 있습니다.
```

```
(S (NP-SBJ 그/DAN
           부대/NNC+는/PAU)
   (VP (VP (NP-ADV (NP-OBJ 장갑차/NNC+를/PCA)
                   핵심/NNC+으로/PAD)
           (VP (VV 편성/NNC+되/XSV+어/EAU)))
       있/VX+습니다/EFN)
   ./SFN)
```

경연 대회는 통제 소대에 지휘 관측소를 점령하라는 심판관의 명령이 떨어짐과 동시에 시작됩니다.

```
(S (NP-SBJ 경연/NNC
           대회/NNC+는/PAU)
   (VP (NP-ADV (NP-COMP (S (NP-ADV 통제/NNC
                                   소대/NNC+에/PAD)
                            (S (NP-SBJ (S (NP-SBJ *pro*)
                                          (VP (NP-OBJ 지휘/NNC
                                                      관측소/NNC+를/PCA)
                                              (VV 점령/NNC+하/XSV+라는/EAN)))
                                       (NP 심판관/NNC+의/PCA
                                           명령/NNC+이/PCA))
                                (VP 떨어지/VV+ㅁ/ENM+과/PAD))))
                   동시/NNC+에/PAD)
       (VP (VV 시작/NNC+되/XSV+ㅂ니다/EFN)))
 ./SFN)
```

10 Copular Sentences

In copular sentences, a noun with a copula marker ('이') is the predicate. The predicative noun is labeled as NP, and this NP projects to VP. Auxiliary predicates take this VP as a complement.

R-106도 소련제입니다.

```
(S (NP-SBJ R-106/NFW+도/PAU)
   (VP (NP 소련제/NNC+이/CO+ㅂ니다/EFN))
   ./SFN)
```

R-106도 소련제이어야 한다.

```
(S (NP-SBJ R-106/NFW+도/PAU)
   (VP (VP (NP 소련제/NNC+이/CO+어야/ECS))
       하/VX+ㄴ다/EFN)
   ./SFN)
```

11 Multiple Nominative Constructions

11.1 Complement NP with nominative case

There are verbs and adjectives that take a nominative-case marked NP as their complement. Examples include 되다, 아니다, 필요하다, 좋다, 싫다,' '있다' (have, possess), '없다' (not have, not possess)

In sentences with such verbs and adjectives, the subject NP has function tag -SBJ, and the complement NP has function tag -COMP.

```
그것이 문제가 되었다.

(S (NP-SBJ 그것/NPN+이/PCA)
   (VP (NP-COMP 문제/NNC+가/PCA)
        되/VV+었/EPF+다/EFN)
   ./SFN)

그것이 문제가 아니다.

(S (NP-SBJ 그것/NPN+이/PCA)
   (ADJP (NP-COMP 문제/NNC+가/PCA)
         아니/VJ+다/EFN)
   ./SFN)

철수가 장갑이 있다.

(S (NP-SBJ 철수/NPR+가/PCA)
   (ADJP (NP-COMP 장갑/NNC+이/PCA)
         있/VJ+다/EFN)
   ./SFN)

철수가 장갑이 없다.

(S (NP-SBJ 철수/NPR+가/PCA)
   (ADJP (NP-COMP 장갑/NNC+이/PCA)
         없/VJ+다/EFN)
   ./SFN)

지금도 거기에 어떤 부대가 있는지는 의심스럽습니다.

(S (NP-SBJ *pro*)
   (VP (S-COMP (NP-ADV 지금/NNC+도/PAU)
               (NP-COMP-1 거기/NPN+에/PAD)
               (S (NP-SBJ 어떤/DAN
                          부대/NNC+가/PCA)
                  (ADJP (NP-COMP *T*-1)
                        있/VJ+는지/EFN+는/PAU)))
       (VJ 의심/NNC+스럽/XSJ+습니다/EFN))
```

```
   ./SFN)
```

전 그 무전기를 한번도 본 적이 없습니다.

```
(S (NP-SBJ 저/NPN+ㄴ/PAU)
   (ADJP (NP-COMP (S (NP-SBJ *pro*)
                     (VP (NP-OBJ 그/DAN 무전기/NNC+를/PCA)
                         (VP (NP-ADV 한번/NNC+도/PAU)
                             (VP 보/VV+ㄴ/EAN))))
                  (NP 적/NNX+이/PCA))
         없/VJ+습니다/EFN)
   ./SFN)
```

11.2 Statives

All adjectives and some stative verbs can have multiple nominative-case marked NPs. One of the NPs attaches to S, in general the one closest to the adjective, and other NPs adjoin onto S. All the nominative-marked NPs have -SBJ function tag. This treatment of multiple subjects in adjective constructions is to capture the intuition that an adjective forms a sentence with a nominative-marked NP and this sentence in turn forms a predicate and takes another nominative-marked NP as its own subject.

통신 기재가 상태가 좋습니다.

```
(S (NP-SBJ 통신/NNC
           기재/NNC+가/PCA)
   (S (NP-SBJ 상태/NNC+가/PCA)
      (ADJP 좋/VJ+습니다/EFN))))
   ./SFN)
```

Adjectives such as '어렵다, 쉽다' can take a clausal unit containing a nominalized verb as the second NP. Often the object of this clause is semantically coreferential with the subject of these adjectives.

보병 대대에서는 어떤 직책이 보충하기가 어려운가?

```
(S (NP-ADV 보병/NNC
           대대/NNC+에서/PAD+는/PAU)
   (S (NP-SBJ 어떤/DAN
              직책/NNC+이/PCA)
      (S (NP-SBJ (S (NP-SBJ *pro*)
                    (VP (NP-OBJ *pro*)
                        (VV 보충/NNC+하/XSV+기/ENM+가/PCA))))
         (ADJP 어렵/VJ+은가/EFN)))
   ?/SFN)
```

Compare the above example with the following one, where NP '어떤 직책' is marked with an accusative case. In this example, the noun phrase belongs to the nominalized clause, which is the subject of the entire sentence. The sentence is not a multiple nominative construction.

```
어떤 직책을 보충하기가 어려운가?

(S (NP-SBJ (S (NP-SBJ *pro*)
              (VP (NP-OBJ 어떤/DAN 직책/NNC+을/PCA)
                  (VV 보충/NNC+하/XSV+기/ENM+가/PCA))))
   (ADJP 어렵/VJ+은 가/EFN)
   ?/SFN)
```

12 Multiple Accusative Constructions

Some sentences can have more than one accusative-case marked NPs even though they do not contain a ditransitive verb. In this case, one of the accusative-marked NPs attaches to VP as a complement of the verb, in general the one closest to the verb, and other accusative-marked NPs adjoin to the VP. All the accusative-marked NPs have -OBJ function tag.

```
주기적으로 군관들이 정치 군관을 동향을 조사합니다.

(S (ADVP (ADV 주기/NNC+적/XSF+으로/PAD))
   (S (NP-SBJ 군관/NNC+들/XSF+이/PCA)
      (VP (NP-OBJ 정치/NNC 군관/NNC+을/PCA)
          (VP (NP-OBJ 동향/NNC+을/PCA)
              (VV 조사/NNC+하/XSV+ㅂ니다/EFN))))
   ./SFN)
```

When one of the accusative marked NPs occurs in the beginning of the sentence, this NP is treated as if it has undergone argument fronting (i.e., scrambling). That is, it is adjoined to the clause level S and it is coindexed with a *T* in the base position which is adjoined to VP. More on argument fronting is presented in §14.

```
정치 군관은 주기적으로 군관들이 동향을 조사합니다.

(S (NP-OBJ-1 정치 군관은)
   (ADVP (ADV 주기/NNC+적/XSF+으로/PAD))
   (S (NP-SBJ 군관/NNC+들/XSF+이/PCA)
      (VP (NP-OBJ *T*-1)
          (VP (NP-OBJ 동향/NNC+을/PCA)
              (VV 조사/NNC+하/XSV+ㅂ니다/EFN))))
   ./SFN)
```

13 Floating numerals

Numerals that semantically modify a subject NP can occur after the subject NP. These numerals can also take a nominative case marker, giving one the illusion that the sentence has multiple subjects. We treat such numerals as verb modifiers and mark them with -ADV function tag.

```
무전망이 두 개가 있읍니다.
```

```
(S (NP-SBJ 무전망/NNC+이/PCA)
   (ADJP (NP-ADV  두/NNU
                  개/NNX+가/PCA)
         (ADJP 있/VJ+습니다/EFN))
   ./SFN)
```

When the subject that does not have a case marker is immediately followed by a numeral, bracket the subject and the numeral as NP.

```
그런데 문산 공격 때 적의 포병 사격에 하전사 네 명이 손실됐습니다.

(S (ADCP 그런데/ADC)
   (NP-ADV 문산/NPR 공격/NNC 때/NNC)
   (NP-ADV 적/NNC+의/PCA 포병/NNC 사격/NNC+에/PAD)
   (S (NP-SBJ 하전사/NNC
              네/NNU 명/NNX+이/PCA)
      (VP (VV 손실/NNC+되/XSV+었/EPF+습니다/EFN)))
   ./SFN)
```

Numerals that are associated with an object NP can also occur after this object NP and they can also take accusative case marker, giving you the illusion that the sentence has double objects. We treat such numerals as verb modifiers and mark them with -ADV function tag.

```
3 대대는  감시망을 하나를 운용하고 있습니다.

(S (NP-SBJ 3/NNU
           대대/NNC+는/PAU)
   (VP (VP (NP-OBJ 감시망/NNC+을/PCA)
           (VP (NP-ADV 하나/NNU+를/PCA)
               (VP (VV 운용/NNC+하/XSV+고/EAU))))
       있/VX+습니다/EFN)
   ./SFN)
```

In cases where the subject or the object is absent, and only the numerals are present, in general, the empty subject and the object are represented as *pro*, and the numerals are adjoined to the predicate.

```
두 개 있지요.

(S (NP-SBJ *pro*)
   (ADJP (NP-ADV 두/NNU
                 개/NNX)
         (ADJP 있/VJ+지요/EFN))
   ./SFN)
```

However, depending on the context and the annotator's intuition, the numeral itself can be represented as the subject or the object of the predicate.

두 개 있지요.

```
(S (NP-SBJ 두/NNU
           개/NNX)
   (ADJP 있/VJ+지요/EFN))
   ./SFN)
```

Note that not all numerals have adverbial usage. In the following case, the numeral NP is an argument of the verb 되다.

원래 1개 포대에는 인원이 약 50명 됩니다.

```
(S (ADVP 원래/ADV)
   (NP-ADV 1/NNU 개/NNX 포대/NNC+에/PAD+는/PAU)
   (S (NP-SBJ 인원/NNC+이/PCA)
      (VP (NP-COMP 약/DAN 50/NNU 명/NNX)
          되/VV+ㅂ니다/EFN))
   ./SFN)
```

14 Fronted elements

Fronted elements are those that appear before the subject, but interpreted somewhere else in the clause. They are adjoined onto the top clause level S.

14.1 Fronted arguments

Fronted arguments are adjoined to the main clause level. They always leave a *T* and are coindexed with it.

권한을 누가 가지고 있지?

```
(S (NP-OBJ-1 권한/NNC+을/PCA)
   (S (NP-SBJ 누구/NPN+가/PCA)
      (VP (VP (NP-OBJ *T*-1)
              가지/VV+고/EAU)
          있/VX+지/EFN))
   ?/SFN )
```

14.2 Across-the-Board fronting

A fronted argument can originate from conjoined clauses. In this case, the conjoined clauses each have a trace that is syntactically associated with the fronted argument which is adjoined to the conjoined S.

거기엔 573 혼성 포병 연대와 다른 포병 연대 2개가 있고, 박격포 부대와 반항공 포병반 등도 있습니다.

```
(S (S (NP-COMP-2 거기/NPN+에/PAD+는/PAU)
```

```
      (S (S (NP-SBJ (NP 573/NNU 혼성/NNC 포병/NNC 연대/NNC+와/PCJ)
                    (NP 다른/DAN 포병/NNC 연대/NNC 2/NNU 개/NNX+가/PCA))
            (ADJP (NP-COMP *T*-2)
                  있/VJ+고/ECS))
         ,/SCM
         (S (NP-SBJ (NP (NP 박격포/NNC 부대/NNC+와/PCJ)
                        (NP 반항공/NNC 포병반/NNC))
                    (NP 등/NNX+도/PAU))
            (ADJP (NP-COMP *T*-2)
                  있/VJ+습니다/EFN))))
   ./SFN  )
```

14.3 Fronted adjuncts

Fronted adjuncts do not leave a *T*. They are adjoined to the top clause level S.

```
대대에서는 어떤 구분대들이 지휘망에 들어가지?

(S (NP-ADV 대대/NNC+에서/PAD+는/PAU)
   (S (NP-SBJ  어떤/DAN
               구분대/NNC+들/XSF+이/PCA)
      (VP (NP-COMP 지휘망/NNC+에/PAD)
          들어가/VV+지/EFN))
   ?/SFN )
```

When there are more than one adjuncts preceding a clause S, they attach to the same S level.

```
오늘 아침 사격을 받기 전에 너의 정찰대는 그 임무를 얼마나 수행했는가?

(S (NP-ADV 오늘/NNC 아침/NNC)
   (NP-ADV (NP (S (NP-SBJ *pro*)
                  (VP (NP-COMP *pro*)
                      (NP-OBJ-LV 사격/NNC+을/PCA)
                      (LV 받/VV+기/ENM))))
           (NP 전/NNC+에/PAD))
   (S (NP-SBJ 너/NPN+의/PCA 정찰대/NNC+는/PAU)
      (VP (NP-OBJ 그/DAN 임무/NNC+를/PCA)
          (VP (ADVP 얼마나/ADV)
              (VP (VV 수행/NNC+하/XSV+었/EPF+는가/EFN)))))
   ?/SFN  )
```

When both a fronted argument and an adjunct is preceding a clause S, they attach to the same S level.

```
집합지역에 그 외에 경보병이 또 몇 명이나 와 있었지?

(S (NP-COMP-1 집합/NNC 지역/NNC+에/PAD)
   (NP-ADV 그/DAN 외/NNC+에/PAD)
```

```
(S (NP-SBJ 경보병/NNC+이/PCA)
   (VP (VP (ADVP 또/ADV)
           (NP-ADV 몇/NNU 명/NNX+이나/PAU)
           (VP (NP-COMP *T*-1)
               오/VV+어/EAU))
       있/VX+었/EPF+지/EFN)))
?/SFN )
```

15 Causatives

Causatives are biclausal. The subject is the causer and the sentential complement denotes the situation the causer caused to bring about. There are two ways in which the causee can be represented syntactically: (i) as the subject of the complement clause, or (ii) as the object or the complement of the main clause.

15.1 Causee is the subject of the complement clause

In this case, the causative verb takes only an S-COMP argument, and the causee is represented as the subject of this S-COMP clause. The verbal ending of the S-COMP clause is usually '도록/ECS' or '게/ECS'.

중대 특무장은 중대 성원들이 전투에 필요한 무기와 탄약을 틀림없이 갖도록 합니다.

```
(S (NP-SBJ 중대/NNC 특무장/NNC+은/PAU)
   (VP (S-COMP (NP-SBJ 중대/NNC 성원/NNC+들/XSF+이/PCA)
               (VP (NP-OBJ (S (WHNP-1 *op*)
                              (S (NP-SBJ *T*-1)
                                 (ADJP (NP-COMP 전투/NNC+에/PAD)
                                       (VJ 필요/NNC+하/XSJ+ㄴ/EAN))))
                           (NP 무기/NNC+와/PCJ 탄약/NNC+을/PCA))
                   (VP (ADVP 틀림없이/ADV)
                       (VP 갖/VV+도록/ECS))))
       하/VV+ㅂ니다/EFN)
   ./SFN)
```

15.2 Causee is the object or complement of the main clause

In this case, the causative verb takes two arguments, an NP-OBJ and an S-COMP. The causee is represented as the NP-OBJ, and it is coreferential with the subject of the S-COMP argument, which is represented as a null pronoun. When the noun is followed by a postposition marker such as '한테/PAD' instead of '를/PCA', the causee argument is tagged as NP-COMP.

철수는 영희를 학교에 가게 했다.

```
(S (NP-SBJ 철수/NPR+는/PAU)
   (VP (NP-OBJ 영희/NPR+를/PCA)
       (S-COMP (NP-SBJ *pro*)
```

```
                (VP (NP-COMP 학교/NNC+에/PAD)
                    가/VV+게/ECS))
        하/VV+었/EPF+다/EFN)
    ./SFN)
```

정비, 경계 및 지원작전을 쉽게 하기 위해 연방 후방시설은 연대 후방 경계선 부근에 위치한다.

```
(S (S (NP-SBJ *pro*)
      (VP (NP-COMP (S (NP-SBJ *pro*)
                      (VP (NP-OBJ (NP 정비/NNC)
                                  ,/SCM
                                  (NP 경계/NNC)
                                  (ADCP 및/ADC)
                                  (NP (NP 지원/NNC)
                                      (NP 작전/NNC+을/PCA)))
                          (S-COMP (NP-SBJ *pro*)
                                  (ADJP 쉽/VJ+게/EAU))
                          하/VV+기/ENM)))
          위하/VV+여/ECS))
   (S (NP-SBJ 연방/NNC 후방/NNC 시설/NNC+은/PAU)
      (VP (NP-COMP 연대/NNC 후방/NNC 경계선/NNC 부근/NNC+에/PAD)
          (VV 위치/NNC+하/XSV+ㄴ다/EFN)))
   ./SFN)
```

관측자는 저희 무선 전화수한테 이 목표들에 대한 좌표를 저희 포반에 송신하도록 했습니다.

```
(S (NP-SBJ 관측/NNC+자/XSF+는/PAU)
   (VP (NP-COMP 저희/NPN
                무선/NNC
                전화수/NNC+한테/PAD)
       (S-COMP (NP-SBJ *pro*)
               (VP (NP-OBJ (S (WHNP-2 *op*)
                              (S (NP-SBJ *T*-2)
                                 (VP (NP-COMP 이/DAN
                                              목표/NNC+들/XSF+에/PAD)
                                     대하/VV+ㄴ/EAN)))
                           (NP 좌표/NNC+를/PCA))
                   (NP-COMP 저희/NPN
                            포반/NNC+에/PAD)
                   (VV 송신/NNC+하/XSV+도록/ECS)))
       하/VV+었/EPF+습니다/EFN)
   ./SFN)
```

16 Object-to-Subject Raising

16.1 Sentences with '만하다'

만하다 is an auxiliary predicate that occurs with a main verb inflected with '-ㄹ/-을'.

```
이 책상은 아이들이 쓸 만하다.
```

What is interesting about sentences with '-ㄹ/-을 만하다' is that the subject of the sentence seems to have originated from the object/complement position of the main verb. For instance, in the above example, the sentential subject '이 책상은' is also the object of the main verb '쓰'. Moreover, the subject of the main verb is not equivalent to the sentential subject. In the above example, the subject of the main verb '쓰' is not '이 책상은', but is '아이들 이'.

These syntactic properties of sentences with auxiliary predicate '만하다' is very similar to English tough-constructions.

```
John is tough for Mary to please.
```

In this example, *John* is the sentential subject, and yet it seems to have originated from the object position of *please*. Moreover, the subject of *please* is not *John*, but is *Mary*.

When annotating sentences with auxiliary predicate '만하다', assign the sentential subject and the subject of the main verb with -SBJ function. If the subject of the main verb is absent, insert an empty pronoun (*pro*). And then put a trace in the object/complement position of the main verb and coindex this trace with the sentential subject. Annotated examples are given below.

```
이 책상은 아이들이 쓸 만하다.

(S (NP-SBJ-1 이/DAN
             책상/NNC+는/PAU)
   (S (NP-SBJ 아이/NNC+들/XSF+이/PCA)
      (VP (VP (NP-OBJ *T*-1)
              쓰/VV+을/EAN)
          만하/VX+다/EFN))
   ./SFN)

이 영화가 청소년이 볼 만하다.

(S (NP-SBJ-1 이/DAN
             영화/NNC+가/PCA)
   (S (NP-SBJ 청소년/NNC+이/PCA)
      (VP (VP (NP-OBJ *T*-1)
              보/VV+을/EAN)
          만하/VX+다/EFN))
   ./SFN)

이 영화가 청소년에게 추천할 만하다.
```

```
(S (NP-SBJ-1 이/DAN
             영화/NNC+가/PCA)
   (S (NP-SBJ *pro*)
      (VP (VP (NP-OBJ *T*-1)
              (NP-COMP 청소년/NNC+에게/PAD)
              (VV 추천/NNC+하/XSV+을/EAN))
          만하/VX+다/EFN))
   ./SFN)
```

However, note that '만하다' can also be used as a regular auxiliary predicate, where the sentential subject is also the subject of the main verb. Annotate such sentences just as any other sentences with auxiliary predicates: i.e., '만하다' takes the highest VP as its complement.

```
청소년이 이 영화를 볼 만하다.

(S (NP-SBJ 청소년/NNC+이/PCA)
   (VP (VP (NP-OBJ 이/DAN
                   영화/NNC+를/PCA)
           보/VV+을/EAN)
       만하/VX+다/EFN)
   ./SFN)

이 영화를 청소년이 볼 만하다.

(S (NP-OBJ-1 이/DAN
            영화/NNC+를/PCA)
   (S (NP-SBJ 청소년/NNC+이/PCA)
      (VP (VP (NP-OBJ *T*-1)
              보/VV+을/EAN)
          만하/VX+다/EFN))
   ./SFN)
```

16.2 Sentences with '되다'

One dominant usage of verb '되다', when not used as a main verb, is an auxiliary verb as shown in the following example. In this example, the sentential subject and the subject of the main verb '가게' are the same, namely '철수가'.

```
철수가 가게 되었다.

(S (NP-SBJ 철수/NPR+가/PCA)
   (VP (VP 가/VV+게/EAU)
       되/VX+었/EPF+다/EFN)
   ./SFN)
```

However, in some other cases, the subject of the sentence seems to have originated from the object/complement position of the main verb. For instance, in the example below, the sentential

subject '이 기계는' is also the object of the main verb '쓰게'. The subject of the main verb is an empty pronoun that refers to unspecified people.

The annotation method for such sentences is the same as sentences with auxiliary predicate '만하다'. That is, assign the sentential subject and the subject of the main verb with -SBJ function. If the subject of the main verb is absent, insert an empty pronoun (*pro*). And then put a trace in the object/complement position of the main verb and coindex this trace with the sentential subject. Annotated examples are given below.

```
이 기계가 못쓰게 되었다.

(S (NP-SBJ-1 이 기계가)
   (S (NP-SBJ *pro*)
      (VP (VP (VP (NP-OBJ *T*-1)
              (VP (ADVP 못/ADV)
                  (VP 쓰/VV+게/EAU))))
          되/VX+었/EPF+다/EFN))
    ./SFN)

휴대 예비 양식은 대대장의 허가 없이는 쓰지 못하게 되어 있습니다.

(S (NP-SBJ-1 휴대/NNC
             예비/NNC
             양식/NNC+은/PAU)
   (S (NP-SBJ *pro*)
      (VP (VP (VP (VP (ADVP (NP-COMP (NP 대대장/NNC+의/PCA)
                                     (NP 허가/NNC))
                            없이/ADV+는/PAU)
                      (VP (NP-OBJ *T*-1)
                          쓰/VV+지/EAU))
                  못하/VX+게/EAU)
              되/VX+어/EAU)
          있/VX+습니다/EFN))
   ./SFN)
```

17 Coordination

The label of coordination has the same label as the coordinated phrases. For instance, in NP coordination, the coordinated NP phrases are attached to an NP. The coordinating adverb such as '그리고' or '또는' is represented at the same level as the coordinated phrases. See §4.3 for examples of clausal coordination.

```
우리는 송신기나 수신기를 가끔 손질한다.

(S (NP-SBJ 우리는)
   (VP  (NP-OBJ (NP 송신기/NNC+나/PCJ)
                (NP 수신기/NNC+를/PAU))
        (VP (ADVP 가끔/ADV)
```

```
            (VP (VV 손질/NNC+하/XSV+ㄴ다/EFN))))
    ./SFN)
```

송신기 그리고 수신기가 고장났다.

```
(S (NP-SBJ (NP 송신기/NNC)
           (ADCP 그리고/ADC)
           (NP 수신기/NNC+가/PCA))
   (VP 고장나/VV+았/EPF+다/EFN)
   ./SFN)
```

17.1 Level of coordination

Coordination is represented at the lowest level possible. For instance, where both VP coordination and S coordination analyses are possible, assign a VP coordination structure, unless the annotator has a strong intuition that S coordination is the right analysis.

우리는 R-106 무전기에는 HAK-24형 습전지를 쓰고 R-116 무전기에는 승리-80
건전지를 씁니다.

```
(S (NP-SBJ 우리는)
   (VP (VP (NP-ADV R-106/NFW
                   무전기/NNC+에/PAD+는/PAU)
           (VP (NP-OBJ HAK-24/NFW 형/NNC 습전지/NNC+를/PCA)
                쓰/VV+고/ECS))
       (VP (NP-ADV R-116/NFW 무전기/NNC+에/PAD+는/PAU)
           (VP (NP-OBJ 승리-80/NNC 건전지/NNC+를/PCA)
               쓰/VV+ㅂ니다/EFN))))
     ./SFN)
```

17.2 Coordination of unlike categories

When two different categories such as ADJP and VP seem to be coordinated, we exceptionally allow coordination at a higher level to avoid coordination of different categories.

총참모장은 바로 그 밑에서 군의 최고 사령관으로 있고 전군을 지휘 통솔한다.

```
(S (S (NP-SBJ 총참모장/NNC+은/PAU)
      (ADJP (NP-ADV 바로/DAN 그/DAN 밑/NNC+에서/PAD)
            (NP-ADV (NP 군/NNC+의/PCA)
                    (NP 최고/NNC 사령관/NNC+으로/PAD))
            (ADJP 있/VJ+고/ECS)))
   (S (NP-SBJ *pro*)
      (VP (NP-OBJ 전/DAN 군/NNC+을/PCA)
          (VV (VV 지휘/NNC)
              (VV 통솔/NNC+하/XSV+ㄴ다/EFN))))
   ./SFN)
```

Another example of coordination of unlike categories can be found when an NP is coordinated with a sentence. This is due to the unique characteristics of clauses in Korean which behave very often as if they are NPs. In our analysis, the coordinated S and NP are sisters and project to an NP.

```
조선 인민군 탱크 중대의 공격정면은 지형과 공격 전에 지원 확기로 적을 어느
정도로 제압했느냐에 따라서 달라집니다.

(S (NP-SBJ (NP 조선/NPR 인민군/NNC 탱크/NNC 중대/NNC+의/PCA)
           (NP 공격/NNC
               정면/NNC+은/PAU))
   (VP (VP (S (NP-SBJ *pro*)
              (VP (NP-COMP (NP 지형/NNC+과/PCJ)
                           (S (NP-SBJ *pro*)
                              (VP (NP-ADV 공격/NNC 전/NNC+에/PAD)
                                  (NP-ADV 지원/NNC 확기/NNC+로/PAD)
                                  (VP (NP-OBJ 적/NNC+을/PCA)
                                      (VP (NP-ADV 어느/DAN 정도/NNC+로/PAD)
                                          (VP (VV 제압/NNC+하/XSV+었/EPF+느냐/ECS+에/PAD))))))
                  따르/VV+아서/ECS))
             (VP (ADJP 다르/VJ+어/EAU)))
        지/VX+ㅂ니다/EFN)
   ./SFN)
```

17.3 Coordination vs. modification

In a VP or S level coordination, the predicate in the first conjunct of the coordinated structure is inflected with '-고' or '-거나'. A phrase containing a predicate inflected with all other endings such as '-서, - 면서, or '-아' projects to S and is adjoined to the following VP or S.

```
예를 들면, 탱크 소대들은 서로 엄호하면서 철수합니다.

(S (S (NP-SBJ *pro*)
      (VP (NP-OBJ 예/NNC+를/PCA)
          들/VV+면/ECS))
   ,/SCM
   (S (S (NP-SBJ 탱크/NNC
                 소대/NNC+들/XSF+은/PAU)0
         (VP (ADVP 서로/ADV)
             (VP (VV 엄호/NNC+하/XSV+면서/ECS))))
      (S (NP-SBJ *pro*)
         (VP (VV 철수/NNC+하/XSV+ㅂ니다/EFN))))
   ./SFN)
```

In a VV level coordination, however, the first verb can be inflected with '-서, - 면서, -아 as well as '-고' or '-거나'. Verbs can form a coordinated structure if they share exactly the same argument structure.

일단 적이 분산해서 철수하기 시작하면 우리는 적이 완전히 섬멸될 때까지 통상
적을 추격하게 됩니다.

```
(S  (S (ADVP 일단/ADV)
       (S (NP-SBJ 적/NNC+이/PCA)
          (VP (NP-OBJ (S (NP-SBJ *pro*)
                         (VP (VV (VV 분산/NNC+하/XSV+어서/ECS)
                                 (VV 철수/NNC+하/XSV+기/ENM)))))
              (VV 시작/NNC+하/XSV+면/ECS))))
   (S (NP-SBJ 우리/NPN+는/PAU)
      (VP (VP (NP-ADV (S (NP-SBJ 적/NNC+이/PCA)
                         (VP (ADVP 완전히/ADV)
                             (VP (VV 섬멸/NNC+되/XSV+ㄹ/EAN))))
                      (NP 때/NNC+까지/PAD))
              (ADVP 통상/ADV)
              (VP (NP-OBJ 적/NNC+을/PCA)
                  (VV 추격/NNC+하/XSV+게/EAU)))
          되/VX+ㅂ니다/EFN))
   ./SFN)
```

18 Negative Sentences

There are two major types of sentential negation in Korean: preverbal negation and postverbal negation. Preverbal negation is bracketed as an adverb phrase (ADVP) which adjoins onto a VP.

그렇지만 아무리 안 써도 일년 이상 가기는 힘듭니다.

```
(S (ADCP 그렇지만/ADC)
   (S (NP-SBJ *pro*)
      (VP (NP-OBJ *pro*)
          (VP (ADVP 아무리/ADV)
              (ADVP 안/ADV)
              (VP 쓰/VV+어도/ECS))))
   (S (NP-SBJ (S (NP-SBJ *pro*)
                 (VP (NP-COMP 일/NNU+년/NNX
                              이상/NNC)
                     가/VV+기/ENM+는/PAU)))
      (ADJP 힘들/VJ+ㅂ니다/EFN))
   ./SFN)
```

Postverbal negation is annotated as an auxiliary verb which takes a VP as a complement.

방어 시엔 예광탄을 자주 사용하지 않죠.

```
(S (NP-ADV 방어/NNC 시/NNX+에/PAD+ㄴ/PAU)
   (S (NP-SBJ *pro*)
      (VP (VP (NP-OBJ 예광탄/NNC+을/PCA)
```

```
            (VP (ADVP 자주/ADV)
                (VP (VV 사용/NNC+하/XSV+지/EAU))))
        않/VX+죠/EFN))
./SFN)
```

19 Minor Categories

19.1 Parenthetical

Parentheticals are usually surrounded by parentheses or commas. Bracket the entire parenthetical with the label PRN, including the punctuation marks that surround them. In most cases, they can be adjoined to VP or S, depending on the context. Annotate the content inside the parenthetical as much as you can, as you would for the content inside any other phrases.

```
자, (담배와 라이터를 테이블 위에 놓으면서) 이거 마음대로 피워요.

(S (INTJ 자/IJ)
   ,/SCM
   (PRN -LRB-/SLQ
        (S (NP-SBJ *pro*)
           (VP (NP-OBJ (NP 담배/NNC+와/PCJ)
                       (NP 라이터/NNC+를/PCA))
               (NP-COMP (NP 테이블/NNC)
                        (NP 위/NNC+에/PAD))
               놓/VV+으면서/ECS))
        -RRB-/SRQ)
   (S (NP-SBJ *pro*)
      (VP (NP-OBJ 이것/NPN)
          (VP (NP-ADV 마음/NNC+대로/PAD)
              (VP 피우/VV+어요/EFN))))
   ./SFN)


만약 대대에서 대대 무전망에 있는 무전소를, 예를 들어 두 세 군데나, 동시에
호출하려면 어떤 호출대호를 사용하는가?

(S (S (ADVP 만약/ADV)
      (NP-ADV 대대/NNC+에서/PAD)
      (S (NP-SBJ *pro*)
         (VP (NP-OBJ (S (WHNP-1 *op*)
                        (S (NP-SBJ *T*-1)
                           (ADJP (NP-COMP 대대/NNC
                                          무전망/NNC+에/PAD)
                                 있/VJ+는/EAN)))
                     (NP 무전소/NNC+를/PCA))
             (VP (PRN ,/SCM
                      (S (NP-SBJ *pro*)
```

```
                        (VP (NP-OBJ 예/NNC+를/PCA)
                            들/VV+어/ECS))
                    (NP 두/NNU
                        세/NNU
                        군데/NNX+나/PAU)
                    ,/SCM)
                (NP-ADV 동시/NNC+에/PAD)
                (VP (VV 호출/NNC+하/XSV+려면/ECS))))))
   (S (NP-SBJ *pro*)
      (VP (NP-OBJ 어떤/DAN
                  호출/NNC
                  대호/NNC+를/PCA)
          (VV 사용/NNC+하/XSV+는가/EFN)))
   ?/SFN)
```

When a parenthetical occurs with a noun, represent it as the sister of the noun it is associated with.

```
마지막으로 정치보위부에는 보위 지도원 (소좌) 1명이 있다.

(S  (NP-ADV 마지막/NNC+으로/PAD)
    (NP-COMP-1 정치/NNC
               보위부/NNC+에/PAD+는/PAU)
    (S (NP-SBJ 보위/NNC
               지도원/NNC
               (PRN -LRB-/SLQ
                    소좌/NNC
                    -RRB-/SRQ)
               1/NNU
               명/NNX+이/PCA)
       (ADJP (NP-COMP *T*-1)
             있/VJ+다/EFN))
    ./SFN)
```

19.2 Lists

Letters and numerals which identify items in a list, and their surrounding punctuation, are labeled as LST. The list marker is represented as the sister of the phrase it precedes. In particular, when the enumerated items are listed in one sentence, they are conjoined.

```
경보병 대대의 임무는 다음과 같다: (1) 전연의 후방지역에 침투하여 적의 지휘
및 통신망을 마비시킨다; (2) 군사 시설을 습격 파괴함으로써 적의 후방을
교란한다; (3) 그 후방지역에 제2 전선을 형성하여 적에게 전후방 양면전투를
강요한다.

(S (S (NP-SBJ (NP 경보병/NNC
                  대대/NNC+의/PCA)
              (NP 임무/NNC+는/PAU))
```

```
   (ADJP (NP-COMP 다음/NNC+과/PAD)
         같/VJ+다/EFN))
:/SSY
(S (LST -LRB-/SLQ 1 -RRB-/SRQ)
   (S (S (NP-SBJ *pro*)
         (VP (NP-COMP (NP 전연/NNC+의/PCA)
                      (NP 후방/NNC 지역/NNC+에/PAD))
             (VV 침투/NNC+하/XSV+어/ECS)))
      (S (NP-SBJ *pro*)
         (VP (NP-OBJ (NP 적/NNC+의/PCA
                         지휘/NNC)
                     (ADCP 및/ADC)
                     (NP 통신망/NNC+을/PCA))
             (VV 마비/NNC+시키/XSV+ㄴ다/EFN)))))
;/SSY
(S (LST -LRB-/SLQ 2 -RRB-/SRQ)
   (S (NP-ADV (S (NP-SBJ *pro*)
                 (VP (NP-OBJ 군사/NNC
                             시설/NNC+을/PCA)
                     (VV 습격/NNC
                         파괴/NNC+하/XSV+ㅁ/ENM+으로써/PAD))))
      (S (NP-SBJ *pro*)
         (VP (NP-OBJ (NP 적/NNC+의/PCA)
                     (NP 후방/NNC+을/PCA))
             (VV 교란/NNC+하/XSV+ㄴ다/EFN)))))
;/SSY
(S (LST -LRB-/SLQ 3 -RRB-/SRQ)
   (S (S (NP-SBJ *pro*)
         (VP (NP-ADV 그/DAN
                     후방/NNC
                     지역/NNC+에/PAD)
             (VP (NP-OBJ 제/XPF+2/NNU
                         전선/NNC+을/PCA)
                 (VV 형성/NNC+하/XSV+어/ECS))))
      (S (NP-SBJ *pro*)
         (VP (NP-ADV 적/NNC+에게/PAD)
             (VP (NP-OBJ 전후방/NNC
                         양면/NNC
                         전투/NNC+를/PCA)
                 (VV 강요/NNC+하/XSV+ㄴ다/EFN))))))
./SFN)
```

20 Empty Categories

20.1 Empty argument

Dropped arguments are represented as *pro* and labeled as NP with the appropriate function tag.

```
무전망을 몇 개나 운용하는가?

(S (NP-SBJ *pro*)
   (VP (NP-OBJ 무전망/NCC+을/PCA)
       (VP (NP-ADV 몇/NNU 개/NNX+나/PAU)
           (VP (VV 운용/NNC+하/XSV+는가/EFN)))))
    ?/SFN)

어젯밤 12시에 받았습니다.

(S (NP-SBJ *pro*)
   (VP (NP-ADV 어젯밤/NNC)
       (NP-ADV 12/NNU 시/NNX+에/PAD)
       (VP (NP-OBJ *pro*)
            받/VV+았/EPF+습니다/EFN))
   ./SFN)
```

20.2 Trace

When an argument constituent is fronted before the subject, it leaves a trace *T* which is labeled as NP (or S in some cases) with an appropriate function tag and this trace is coindexed with the fronted element.

```
수신기를 우리는 가끔 손질한다.

(S (NP-OBJ-1 수신기/NNC+를/PAU)
   (S (NP-SBJ 우리/NPN+는/PAU)
       (VP (NP-OBJ *T*-1)
           (VP (ADVP 가끔/ADV)
               (VP (VV 손질/NNC+하/XSV+ㄴ다/EFN)))))
   ./SFN)
```

Argument relative clauses also contain a trace *T* (see §20.3).

20.3 Empty operator

Relative clauses are indicated with an empty operator *op* which is labeled as WHNP. When an argument has been relativized, the empty operator is coindexed with the gap in the clause which is semantically associated with the head noun. The gap in the relative clause is represented as *T* and is labeled as NP with the appropriate function tag.

```
너희가 사용하고 있는 호출대호는 뭐 뭐지?

(S (NP-SBJ (S (WHNP-1 *op*)
              (S (NP-SBJ 너희가)
                 (VP (VP (NP-OBJ *T*-1)
                         (VV 사용/NCC+하/XSV+고/EAU))
                     있/VX+는/EAN)))
           (NP 호출/NNC
               대호/NNC+는/PAU))
   (VP (NP 무엇/NPN
           무엇/NPN+이/CO+지/EFN))
   ?/SFN)
```

When an adjunct has been relativized, there is no coindexation between the empty operator and the adjunct gap in the relative clause.

```
그 무전기가 고장난 원인이 무엇인가?

(S (NP-SBJ (S (WHNP *op*)
              (S (NP-SBJ 그/DAN 무전기/NNC+가/PCA)
                 (VP 고장나/VV+ㄴ/ECS)))
           (NP 원인/NNC+이/PCA))
   (VP (NP 무엇/NPN+이/CO+ㄴ가/EFN))
   ?/SFN)
```

20.4 Predicate deletion

Predicate deletion occurs in coordinated constructions. The deleted predicate is represented as *?* and is labeled with an appropriate head level or phrase level tag, e.g., VV, VJ, and VP.

20.4.1 Verb deletion

The deleted verb is annotated as (VV *?*).

```
크기는 가로가 42센티, 높이가 7센티, 세로가 42센티쯤 됩니다.

(S (NP-SBJ 크기/NNC+는/PAU)
   (S (S (NP-SBJ 가로/NNC+가/PCA)
         (VP (NP-COMP 42/NNU 센티/NNX)
             (VV *?*)))
      ,/SCM
      (S (NP-SBJ 높이/NNC+가/PCA)
         (VP (NP-COMP 7/NNU 센티/NNX)
             (VV *?*)))
      ,/SCM
      (S (NP-SBJ 세로/NNC+가/PCA)
         (VP (NP-COMP 42/NNU 센티/NNX+쯤/XSF)
             되/VV+ㅂ니다/EFN)))
   ./SFN)
```

20.4.2 VP deletion

The deleted VP is annotated as (VP *?*).

```
대대 지휘망은 기본 주파수 46.54 메가헬쯔에서, 사격 지휘망은 기본 주파수
47.36 메가헬쯔에서 운용되고 있읍니다.

(S (S (NP-SBJ 대대/NNC 지휘망/NNC+은/PAU)
      (VP (NP-ADV 기본/NNC 주파수/NNC
                  46.54/NNU 메가헬쯔/NNX+에서/PAD)
          (VP *?*)))
    ,/SCM
   (S (NP-SBJ 사격/NNC 지휘망/NNC+은/PAU)
      (VP (VP (NP-ADV 기본/NNC 주파수/NNC
                      47.36/NNU 메가헬쯔/NNX+에서/PAD)
              (VP (VV 운용/NNC+되/XSV+고/EAU)))
          있/VX+습니다/EFN))
   ./SFN)
```

20.4.3 VX deletion

When a sentence contains clauses that are coordinated and only the second clause has an auxiliary verb that takes scope over the entire coordinated clauses, annotate the sentence as S coordination and treat the first clause as having a VX deletion.

```
철수는 밥을 먹고 순이는 물을 마시고 있었다.

(S (S (NP-SBJ 철수/NPR+는/PAU)
      (VP (VP (NP-OBJ 밥/NNC+을/PCA)
              먹/VV+고/ECS)
          (VX *?*)))
   (S (NP-SBJ 순이/NPR+는/PAU)
      (VP (VP (NP-OBJ 물/NNC+을/PCA)
              마시/VV+고/ECS)
          있/VX+었/EPF+다/EFN))
   ./SFN)
```

20.4.4 Copula deletion

In coordinate copular sentences, the copula can be deleted. In such cases, put vacuous VP around the predicative noun to mark predication.

```
중기 중대는 "갑산 21," 박격포 중대는 "갑산 22," 그리고 비반충포 소대는
"갑산 23"입니다.

(S (S (NP-SBJ 중기/NNC 중대/NNC+는/PAU)
      (VP "/SLQ
          (NP 갑산/NPR 21/NNU)
```

```
        ,/SCM
        "/SRQ))
(S (NP-SBJ 박격포/NNC 중대/NNC+는/PAU)
   (VP "/SLQ
       (NP 갑산/NPR 22/NNU)
       ,/SCM
       "/SRQ))
(ADCP 그리고/ADC)
(S (NP-SBJ 비반/NNC 총포/NNC 소대/NNC+는/PAU)
   (VP "/SLQ
      (NP 갑산/NPR 23/NNU)
      "/SRQ
      이/CO+ㅂ니다/EFN))
./SFN)
```

21 Punctuation

Punctuation markers are not given a phrase level tag, and they attach to the highest level possible.

21.1 Mid-sentence punctuation

21.1.1 Quotation

Quotation markers are siblings of the constituent they surround. For instance, if an NP is surrounded by a quotation marker and it is a daughter of a VP, then the quotation markers are also daughters of the same VP.

```
왜 ''미록산 1이었다'' 고 하지?

(S (NP-SBJ *pro*)
   (VP (ADVP 왜/ADV)
       (VP (S-COMP (NP-SBJ *pro*)
                   (VP "/SLQ
                       (NP 미록산/NPR
                           1/NNU+이/CO+었/EPF+다/EFN)
                       "/SRQ
                       고/PAD))
           하/VV+지/EFN))
   ?/SFN)
```

Sometimes the content of the quotation makers form a constituent only by virtue of their presence. In this case, place a phrase level tag outside of the quotation markers, as in the following example:

```
''전체 들을 것, 여기는'' 이렇게 말하고

   (S (NP-SBJ *pro*)
      (VP (NP-ADV "/SLQ
```

```
                (NP (S (NP-SBJ 전체/NNC)
                       (VP (NP-OBJ *pro*)
                           듣/VV+ㄹ/EAN))
                    (NP 것/NNX))
                ,/SCM
                (NP 여기/NPN+는/PAU)
                "/SRQ)
        (ADVP 이렇게/ADV)
        (VP 말하/VV+고/ECS))
```

21.1.2 Comma

Commas are siblings of the constituent they follow. For example, if a comma follows an adverb adjoined to an S, it attaches to the same S.

```
그럼, 계속해 보지.

(S (ADCP 그럼/ADC)
   ,/SCM
   (S (NP-SBJ *pro*)
      (VP (VP (VV 계속/NNC+하/XSV+어/EAU))
          보/VX+지/EFN))
   ./SFN)
```

If a comma follows a noun that is adjoined to an NP, it attaches to the same NP.

```
송신기, 수신기, 안테나, 그런 정도지요.

(S (NP-SBJ *pro*)
   (VP (NP (NP (NP 송신기/NNC)
               ,/SCM
               (NP 수신기/NNC)
               ,/SCM
               (NP 안테나/NNC)
               ,/SCM)
           (NP 그런/DAN
               정도/NNC+이/CO+지요/EFN)))
    ./SFN)
```

21.2 Sentence-final punctuation

A sentence-final punctuation is a child of the highest level S label of the sentence.

```
축전지 재고도 충분히 있는가?

(S (NP-SBJ 축전지/NNC
           재고/NNC+도/PAU)
   (ADJP (ADVP 충분히/ADV)
```

```
        (ADJP 있/VJ+는 가/EFN))
   ?/SFN)
```

축 전 지 재 고 도 충 분 히 있 다.

```
(S (NP-SBJ 축전지/NNC
           재고/NNC+도/PAU)
   (ADJP (ADVP 충분히/ADV)
         (ADJP 있/VJ+다/EFN))
   ./SFN)
```

22 Ambiguity

22.1 Adverb adjunction to S or VP

If a sentence has an empty subject and an adverb preceding the VP, in principle, the adverb can adjoin to S, or to VP. In this case, the default rule is to adjoin the adverb to the VP, rather than to the S.

그 때 네 가 한 일 을 순 서 대 로 설 명 하 라.

```
(S (NP-SBJ *pro*)
   (VP (NP-ADV 그때/NNC)
       (VP (NP-OBJ (S (WHNP-1 *op*)
                      (S (NP-SBJ 네/NPN+가/PCA)
                         (VP (NP-OBJ *T*-1)
                             하/VV+ㄴ/EAN)))
                   (NP 일/NNC+을/PCA))
           (VP (NP-ADV 순서/NNC+대로/PAD)
               (VP (VV 설명/NNC+하/XSV+라/EFN)))))
   ./SFN)
```

However, when the annotator has a strong intuition that the adverb takes the S as its scope, adjoin it to S.

우 선 부 대 규 정 학 이 라 는 과 목 에 선 무 엇 을 가 르 치 는 가?

```
(S (ADVP 우선/ADV)
   (S (NP-SBJ *pro*)
      (VP (NP-ADV (S (WHNP-1 *op*)
                     (S (NP-SBJ *T*-1)
                        (VP (NP 부대/NNC
                                규정학/NNC+이/CO+라는/EAN))))
                  (NP 과목/NNC+에서/PAD+는/PAU))
          (VP (NP-OBJ 무엇/NPN+을/PCA)
              가르치/VV+는 가/EFN))))
   ?/SFN)
```

When a sentence has an empty subject with an adverb tagged as ADC, the adverb is adjoined to the S instead of the VP.

```
그러므로 거기에 학생이 전부 몇 명이나 있었는지 그것조차 모르겠습니다.

(S (ADCP 그러므로/ADC)
   (S (NP-SBJ *pro*)
      (VP (NP-OBJ (S (NP-COMP-1 거기/NPN+에/PAD)
                     (S (NP-SBJ 학생/NNC+이/PCA)
                        (ADJP (ADVP 전부/ADV)
                              (NP-ADV 몇/NNU 명/NNX+이나/PAU)
                              (ADJP (NP-COMP *T*-1)
                                    있/VJ+었/EPF+는지/ECS))))
                  (NP 그것/NPN+조차/PAU))
          모르/VV+겠/EPF+습니다/EFN))
   ./SFN)
```

22.2 Object scrambling or not

In a sentence with an empty subject, an object NP that appears in the beginning of a sentence with a topic marker '-는' is by default treated as in-situ, i.e., not treated as a moved element.

```
고폭 로케트 보조식 포탄은 어떤 목표에 사격할 때 사용하는가?

(S (NP-SBJ *pro*)
   (VP (NP-OBJ 고폭/NNC
               로케트/NNC
               보조/NNC+식/XSF
               포탄/NNC+은/PAU)
       (VP (NP-ADV (S (WHNP *op*)
                      (S (NP-SBJ *pro*)
                         (VP (NP-COMP 어떤/DAN
                                      목표/NNC+에/PAD)
                             (VV 사격/NNC+하/XSV+ㄹ/EAN))))
                   (NP 때/NNC))
           (VP (VV 사용/NNC+하/XSV+는가/EFN))))
   ?/SFN)
```

However, this is not a hard-cast rule. When the annotator has a clear intuition that the object NP should be treated as a moved element, annotate accordingly.

```
급조 지뢰원은 기록해서 보고할 필요가 없지요.

(S (NP-OBJ-1 급조/NNC
             지뢰원/NNC+은/PAU)
   (S (NP-SBJ  (S (NP-SBJ *pro*)
                  (VP (VP (NP-OBJ *T*-1)
                          (VV (VV 기록/NNC+하/XSV+어서/ECS)
```

```
                                (VV 보고/NNC+하/XSV+ㄹ/EAN)))))
                (NP 필요/NNC+가/PCA))
      (ADJP 없/VJ+지요/EFN))
   ./SFN)
```

22.3 Overt subject or *pro*

When an overt NP subject is followed by two VP's, and it is possible to assign a *pro* NP for either VP, we parse incrementally from left to right, assigning a *pro* NP subject for the second VP.

학생들은 중대 규모의 구분대로 편성해서 주로 야외에서 훈련을 실시합니다.

```
(S (S (NP-SBJ 학생/NNC+들/XSF+은/PAU)
      (VP (NP-ADV 중대/NNC
                  규모/NNC+의/PCA
                  구분대/NNC+로/PAD)
          (VP (VV 편성/NNC+하/XSV+어서/ECS))))
   (S (NP-SBJ *pro*)
      (VP (ADVP 주로/ADV)
          (NP-ADV 야외/NNC+에서/PAD)
          (VP (NP-OBJ 훈련/NNC+을/PCA)
              (VV 실시/NNC+하/XSV+ㅂ니다/EFN)))))
   ./SFN)
```

However, this is just a guideline to be followed when the annotator is in doubt. There are many cases where this incremental parsing principle does not apply, including when the first VP is part of a complex NP, a relative clause, or an adverbial clause.

내일 저희들은 생물학 전시의 포병 작전에 대한 훈련을 합니다.

```
(S (NP-ADV 내일/NNC)
   (S (NP-SBJ 저희/NPN+들/XSF+은/PAU)
      (VP (NP-OBJ (S (NP-SBJ *pro*)
                     (VP (NP-COMP (NP 생물학/NNC 전시/NNC+의/PCA)
                                  (NP 포병/NNC 작전/NNC+에/PAD))
                         대하/VV+ㄴ/EAN))
                  (NP 훈련/NNC+을/PCA))
          하/VV+ㅂ니다/EFN))
   ./SFN)
```

탱크 부대는 패주하는 적을 추격할 때는 어떤 대형을 사용하오?

```
(S (NP-SBJ 탱크/NNC
           부대/NNC+는/PAU)
   (VP (NP-ADV (S (NP-SBJ *pro*)
                  (VP (NP-OBJ (S (WHNP-1 *op*)
                                 (S (NP-SBJ *T*-1)
```

```
                                        (VP (VV 패주/NNC+하/XSV+는/EAN))))
                                  (NP 적/NNC+을/PCA))
                            (VV 추격/NNC+하/XSV+ㄹ/EAN)))
                    (NP 때/NNC+는/PAU))
        (VP (NP-OBJ 어떤/DAN
                    대형/NNC+을/PCA)
            (VV 사용/NNC+하/XSV+오/EFN)))
   ?/SFN)
```

22.4 Complement or not

For certain predicates such as '있다' that can be analyzed as either having a complement or not, go for an analysis with no complement, unless otherwise suggested by context.

For example, in the following sentence, the clause headed by '수 가' can in principle be treated either as a complement of the verb '있다' with an empty subject, or simply as a sentential subject. In such cases, go for the simpler analysis of analyzing it as a sentential subject.

```
우리가 가지고 있는 지도가 부정확해서 그 지점을 찾을 수 없었다.

(S (S (NP-SBJ (S (WHNP-1 *op*)
                 (S (NP-SBJ 우리/NPN+가/PCA)
                    (VP (VP (NP-OBJ *T*-1)
                            가지/VV+고/EAU)
                        있/VX+는/EAN)))
              (NP 지도/NNC+가/PCA))
      (ADJP (VJ 부정확/NNC+하/XSJ+어서/ECS)))
   (S (NP-SBJ (S (NP-SBJ *pro*)
                 (VP (NP-OBJ 그/DAN 지점/NNC+을/PCA)
                     찾/VV+을/EAN))
              (NP 수/NNX))
      (ADJP 없/VJ+었다/EFN))
   ./SFN)
```

22.5 Trace of the scrambled object before or after an adverb

When an object or a complement is scrambled out of a VP which is modified by an adverb, the trace can in principle be put before or after the adverb. In such cases, put the trace immediately preceding the verb, unless otherwise indicated by context.

```
1개 박격포 연대가 있다는 걸 저는 분명히 압니다.

(S (NP-OBJ-1 (S (NP-SBJ 1/NNU
                        개/NNX
                        박격포/NNC
                        연대/NNC+가/PCA)
                 (ADJP 있/VJ+다는/EAN))
             (NP 것/NNX+ㄹ/PCA))
   (S (NP-SBJ 저/NPN+는/PAU)
```

```
      (VP (ADVP 분명히/ADV)
          (VP (NP-OBJ *T*-1)
              알/VV+습니다/EFN)))
   ./SFN)
```

There is an exception to this guideline. Some adverbs normally come immediately before the verb. In such cases, the trace of the scrambled object is placed before the adverb.

```
그 사람은 내가 잘 알지.

(S (NP-OBJ-1 그/DAN
             사람/NNC+은/PAU)
   (S (NP-SBJ 내/NPN+가/PCA)
      (VP (NP-OBJ *T*-1)
          (VP (ADVP 잘/ADV)
              알/VV+지/EFN)))
   ./SFN)
```

23 Confusing Examples

This section lists a number of specific examples with the corresponding annotation as a reference guide.

23.1 '필요로 하다'

In this case, '하다' is treated as a light verb, and '필요로' is treated as the base noun of the light verb. Together, they form a predicate.

```
철수가 사람을 더 필요로 한다.

(S (NP-SBJ 철수/NNC+가/PCA)
   (VP (NP-OBJ 사람/NNC+을/PCA)
       (VP (ADVP 더/ADV)
           (VP (NP-COMP-LV 필요/NNC+로/PAD)
               (LV 하/VV+ㄴ다/EFN))))
   ./SFN)
```

23.2 '-뿐만 아니라'

'-뿐만' is treated as the subject of '아니라'. That is, '아니라' is intransitive adjective in this case.

```
박격포 중대는 적을 소멸할 뿐만 아니라 전투지역을 조명하기도 하지요.

(S (NP-SBJ 박격포/NNC 중대/NNC+는/PAU)
   (VP (VP (S (NP-SBJ (S (NP-SBJ *pro*)
                         (VP (NP-OBJ 적/NNC+을/PCA)
                             (VV 소멸/NNC+하/XSJ+ㄹ/EAN)))
```

```
                    (NP 뿐/NNX+만/PAU))
            (ADJP 아니/VJ+라/ECS))
        (VP (NP-OBJ 전투/NNC 지역/NNC+을/PCA)
            (VV 조명/NNC+하/XSV+기도/ECS)))
     하/VX+지요/EFN)
  ./SFN)
```

23.3 '-밖에 안 되다', '-밖에 모른다'

The NP with the postposition '-밖에' is treated as an adverbial element tagged with -ADV, and the presence of an empty NP complement is assumed.

김 특무장, 아까 사단 신병 교육 중대 훈련기간이 1개월밖에 안 된다고 그랬어.

```
(S (NP-VOC 김/NPR
           특무장/NNC)
   ,/SCM
   (S (NP-SBJ *pro*)
      (VP (ADVP 아까/ADV)
          (VP (S-COMP (NP-SBJ (NP 사단/NNC 신병/NNC 교육/NNC 중대/NNC)
                              (NP 훈련/NNC 기간/NNC+이/PCA))
                      (VP (NP-ADV 1/NNU 개월/NNX+밖에/PAU)
                          (VP (NP-COMP *pro*)
                              (VP (ADVP 안/ADV)
                                  (VP 되/VV+ㄴ다고/ECS)))))
        그러하/VV+었/EPF+어/EFN)))
    ./SFN)
```

23.4 '되다'

In general, this verb is analyzed as a double nominative verb that takes a subject and a complement NP as in '계절이 봄이 되다.' However, in some cases it is treated as an intransitive verb, having only a subject as in '밥이 다 되다.'

23.5 *pro* NP subjects with no referent

In many sentences, it is not clear what the *pro* NP subjects are supposed to refer to. This situation occurs particularly often in constructions involving copulas. These *pro* NPs should nevertheless be represented in an appropriate position.

언제 대대가 집합 지역에서 공격 출발 진지로 접적 행군을 개시할 예정인가?

```
(S (NP-SBJ *pro*)
   (VP (NP (S (NP-ADV 언제/NPN)
              (S (NP-SBJ 대대/NNC+가/PCA)
                 (VP (NP-ADV 집합/NNC 지역/NNC+에서/PAD)
                     (NP-ADV 공격/NNC 출발/NNC 진지/NNC+로/PAD)
                     (VP (NP-OBJ 접적/NNC 행군/NNC+을/PCA)
```

```
                        (VV 개시/NNC+하/XSV+ㄹ/EAN)))))
            (NP 예정/NNC+이/CO+ㄴ 가/EFN)))
   ?/SFN)
```

통신소는 언제 습격할 계획이었는가?

```
(S (NP-SBJ *pro*)
   (VP (NP (S (NP-SBJ *pro*)
              (VP (NP-OBJ 통신소/NNC+는/PAU)
                  (VP (NP-ADV 언제/NPN)
                      (VP (VV 습격/NNC+하/XSV+ㄹ/EAN)))))
            (NP 계획/NNC+이/CO+었/EPF+는 가/EFN)))
   ?/SFN)
```

23.6 'N-에서 N'

In general, 'N-에서' should project to an NP and attach to a VP. But there are cases in which it should be grouped together with another NP and attach to an NP.

6시에서 6시 30분 사이에, 즉 대대가 공격 준비 사격을 하는 동안이지요.

```
(S (NP-ADV (NP (NP 6/NNU 시/NNX+에서/PAD)
               (NP 6/NNU 시/NNX 30/NNU 분/NNX))
           (NP 사이/NNC+에/PAD))
   ,/SCM
   (ADCP 즉/ADC)
   (S (NP-SBJ *pro*)
      (VP (NP (S (NP-SBJ 대대/NNC+가/PCA)
                 (VP (NP-OBJ 공격/NNC 준비/NNC 사격/NNC+을/PCA)
                     하/VV+는/EAN))
              (NP 동안/NNX+이/CO+지요/EFN))))
   ./SFN)
```

23.7 'N-PAD+PCA'

Function tags for nouns that have an adverbial postposition in conjunction with a case postposition are determined by their grammatical functions within the sentence. For instance, in the example below, '여기에서부터가' has both adverbial postposition and a nominative case postposition, and it has the function tag -SBJ since it functions as the subject of the whole sentence.

여기에서부터가 문제이다.

```
(S (NP-SBJ 여기/NPN+에서부터/PAD+가/PCA)
   (VP (NP 문제/NNC+이/CO+다/EFN))
   ./SFN)
```

23.8 'N-PAD N-PAD'

A noun with an adverbial postposition can occur with another noun with an adverbial postposition to project an NP. In such cases, adverbial postpositions on the two nouns have cooccurrence restrictions and the second noun usually has a case postposition in addition to an adverbial postposition. For instance, a noun with the adverbial postposition '-에서부터' (from) can cooccur with another noun with an adverbial postposition and a nominative case postposition '-까지가' (to-Nom). In such examples, the first noun is bracketed as NP and adjoins onto the second noun bracketed as NP. The two NPs do not have a function tag, and only the NP to which the two NPs attach has an appropriate function tag.

```
학교에서부터 집까지가 문제이다.

(S (NP-SBJ (NP 학교/NNC+에서부터/PAD)
           (NP 집/NNC+까지/PAD+가/PCA))
   (VP (NP 문제/NNC+이/CO+다/EFN))
   ./SFN)
```

Some examples of adverbial postpositions that are subject to such cooccurrence restrictions include:

```
NP-에서 NP-로
NP-에서 NP-까지
NP-부터 NP-까지
NP-부터 NP-로
NP-에서 NP-에로의
NP-에서 NP-에의
```

Note that these pairs of nouns are grouped together as an NP only if such analysis is necessary: i.e., when the two nouns form a phrase to function as a subject or an object of a predicate, or the two nouns form a phrase and become a modifier of another NP. Otherwise, the two nouns each project an NP and they both adjoin to a VP.

```
철수가 학교에서부터 집까지 뛰었다.

(S (NP-SBJ 철수/NPR+가/PCA)
   (VP (NP-ADV 학교/NNC+에서부터/PAD)
       (NP-ADV 집/NNC+까지/PAD)
       (VP 뛰/VV+었/EPF+다/EFN))
   ./SFN)
```

23.9 Fragments

NP fragments do not have function tags.

```
"아마" 라니?

(S (NP "아마"/ADV+라니/PAD)
```

```
   ?/SFN)
```

잠시 후에.

```
(S (NP 잠시/NNC 후/NNC+에/PAD)
   ./SFN)
```

23.10 Coordination of a noun and a Sino-Korean verb with '하'

Treat examples such as '지휘 통솔한다' or '속격 피과한다' as VV-level coordination.

전군을 지휘 통솔한다.

```
(S (NP-SBJ *pro*)
   (VP (NP-OBJ 전/DAN
               군/NNC+을/PCA)
       (VV  (VV 지휘/NNC)
            (VV 통솔/NNC+하/XSV+ㄴ다/EFN)))
   ./SFN)
```

23.11 '-고 해서'

In this rather colloquial construction, '하-' is annotated as an auxiliary verb.

대대급에서는 기술도 시간도 없고 해서 대규모의 축산작업은 할 수가 없지요.

```
(S (NP-ADV 대대/NNC+급/NNX+에서/PAD+는/PAU)
   (S (NP-SBJ (NP 기술/NNC+도/PAU)
              (NP 시간/NNC+도/PAU))
      (VP (ADJP 없/VJ+고/ECS)
          하/VX+어서/ECS))
   (S  (NP-SBJ (S (NP-SBJ *pro*)
                  (VP (NP-OBJ-LV (NP 대규모/NNC+의/PCA)
                                 (NP 축산/NNC 작업/NNC+은/PAU))
                      (LV 하/VV+ㄹ/EAN)))
               (NP 수/NNX+가/PCA))
       (ADJP 없/VJ+지요/EFN))
   ./SFN)
```

23.12 '-것만 하다'

Treat the complex NP in '-것만 하다' as the object of '하다'.

너는 목숨이 살아 있다는 것만 해도 다행이다.

```
(S  (S (NP-SBJ 너/NPN+는/PAU)
       (VP (NP-OBJ (S (NP-SBJ *pro*)
                      (VP (NP-COMP 목숨/NNC+이/PCA)
```

```
                        살/VV+어/EAU)
                    있/VX+다는/EAN)
                (NP 것/NNX+만/PAU))
          하/VV+어도/ECS))
    (S (NP-SBJ *pro*)
       (VP (NP 다행/NNC+이/CO+다/EFN)))
    ./SFN)
```

23.13 '물론'

'물론' is tagged as an adverb (ADV) in most cases. But when it occurs with a copula, it is tagged as a common noun (NNC) and is bracketed accordingly.

```
예, 불구자는 물론이고 사회 안전원도 제외됩니다.

(S (INTJ 예/IJ)
   ,/SCM
   (S (S (NP-SBJ 불구자/NNC+는/PAU)
         (VP (NP 물론/NNC+이/CO+고/ECS)))
      (S (NP-SBJ 사회/NNC
                 안전원/NNC+도/PAU)
         (VP (VV 제외/NNC+되/XSV+ㅂ니다/EFN))))
   ./SFN)
```

23.14 '자기 스스로'

In '자기 스스로', '스스로' is an adverb taking '자기' as a complement NP.

```
경상자는 자기 스스로 치료하는 경우가 많지요.

(S (NP-SBJ (S (NP-SBJ 경상자/NNC+는/PAU)
              (VP (ADVP (NP-COMP 자기/NPN)
                        스스로/ADV)
                  (VP (NP-OBJ *pro*)
                      (VV 치료/NNC+하/XSV+는/EAN))))
           (NP 경우/NNC+가/PCA))
   (ADJP 많/VJ+지요/EFN)
   ./SFN)
```

23.15 '얼마나 되다'

'되다' in '얼마나 되다' is a verb requiring a degree argument. It is the same kind of verb as in '무전기의 주파수 범위는 3km가 된다.' In '얼마나 되다', there is no NP for degree argument, and instead the adverb '얼마나' seems to assume this role. In such sentences, simply adjoin '얼마나' to the verb, just like any other adverbs.

```
R-106 무전기의 주파수 범위는 얼마나 되는가?
```

```
(S (NP-SBJ (NP R-106/NFW
               무전기/NNC+의/PCA)
           (NP 주파수/NNC
               범위/NNC+는/PAU))
   (VP (ADVP 얼마나/ADV)
       (VP 되/VV+는가/EFN))
   ?/SFN)
```

대대 방어 지역의 종심은 보통 얼마나 되는가?

```
(S (NP-SBJ (NP 대대/NNC 방어/NNC 지역/NNC+의/PCA)
           (NP 종심/NNC+은/PAU))
   (VP (ADVP 보통/ADV)
       (ADVP 얼마나/ADV)
       (VP 되/VV+는가/EFN))
   ?/SFN)
```

A Summary of the Penn Korean Treebank Part-of-Speech Tagset

A.1 Content Tags

Category	Tag Description	Tag Label	Examples
noun	proper noun	NPR	한국 (Korea), 클린톤 (Clinton)
	common noun	NNC	학교 (school), 컴퓨터 (computer)
	dependent noun	NNX	것 (thing), 등 (etc), 년 (year), 달라 (dollar), 적 (situation)
	pronoun, demonstrative	NPN	그 (he), 이것 (this), 무엇 (what)
	ordinal, cardinal, numeral	NNU	하나 (one), 첫째 (first), 1, 세 (three)
	words written in foreign characters	NFW	Clinton, computer
predicate	verb	VV	가 (go), 먹 (eat)
	adjective	VJ	예쁘 (pretty), 다르 (different)
	auxiliary predicate	VX	있 (present progressive), 하 (must)
adverb	constituent adverb, clausal adverb	ADV	매우 (very), 조용히 (quietly), 제발 (please), 만일 (if)
	conjunctive adverb	ADC	그리고 (and), 그러나 (but, however), 및 (and), 혹은 (or)
adnominal	configurative, demonstrative	DAN	새 (new), 헌 (old), 그 (that)
interjection	exclamation	IJ	아 (ah)
list	list marker	LST	a, (b), 1, 2.3.1, 가, 나.

A.2 Function Tags

Category	Tag Description	Tag Label	Examples
postposition	case	PCA	가/이 (nominative), 을/를 (accusative), 의 (possessive), 야 (vocative)
	adverbial	PAD	에서 (from), 로 (to)
	conjunctive	PCJ	와/과, 하고 (and)
	auxiliary	PAU	만 (only), 도 (also), 는 (topic), 마저 (even)
copula		CO	이 (be)
ending	final	EFN	는다/ㄴ다 (declarative), 니, 는가, 는지 (interrogative), 어라/라 (imperative), 자 (propositive), 구나 (exclamatory)
	coordinate, subordinate, adverbial, complementizer	ECS	고 (and), 므로 (because), 게 (attaches to adjectives to derive adverbs), 다고 (that), 라고 (that)
	auxiliary	EAU	아, 게, 지, 고 (on verbs or adjectives that immediately precede auxiliary predicates)
	adnominal	EAN	는/ㄴ (on main verbs or adjectives in relative clauses or complement clauses of a complex NP)
	nominal	ENM	기, 음 (on nominalized verb)
	pre-final ending (tense, honorific)	EPF	었 (past), 시 (honorific), 겠 (future)
affix	suffix	XSF	님, 들, 적
	prefix	XPF	제, 각, 매
	verbalization suffix	XSV	하, 되, 시키
	adjectivization suffix	XSJ	스럽, 답, 하

A.3 Symbols

Category	Tag Description	Tag Label	Examples
comma		SCM	,
termination	sentence ending markers	SFN	. ? !
left quotation mark		SLQ	‘ “ left bracktets
right quotation mark		SRQ	’ ” right brackets
symbols	others	SSY	... ; : -