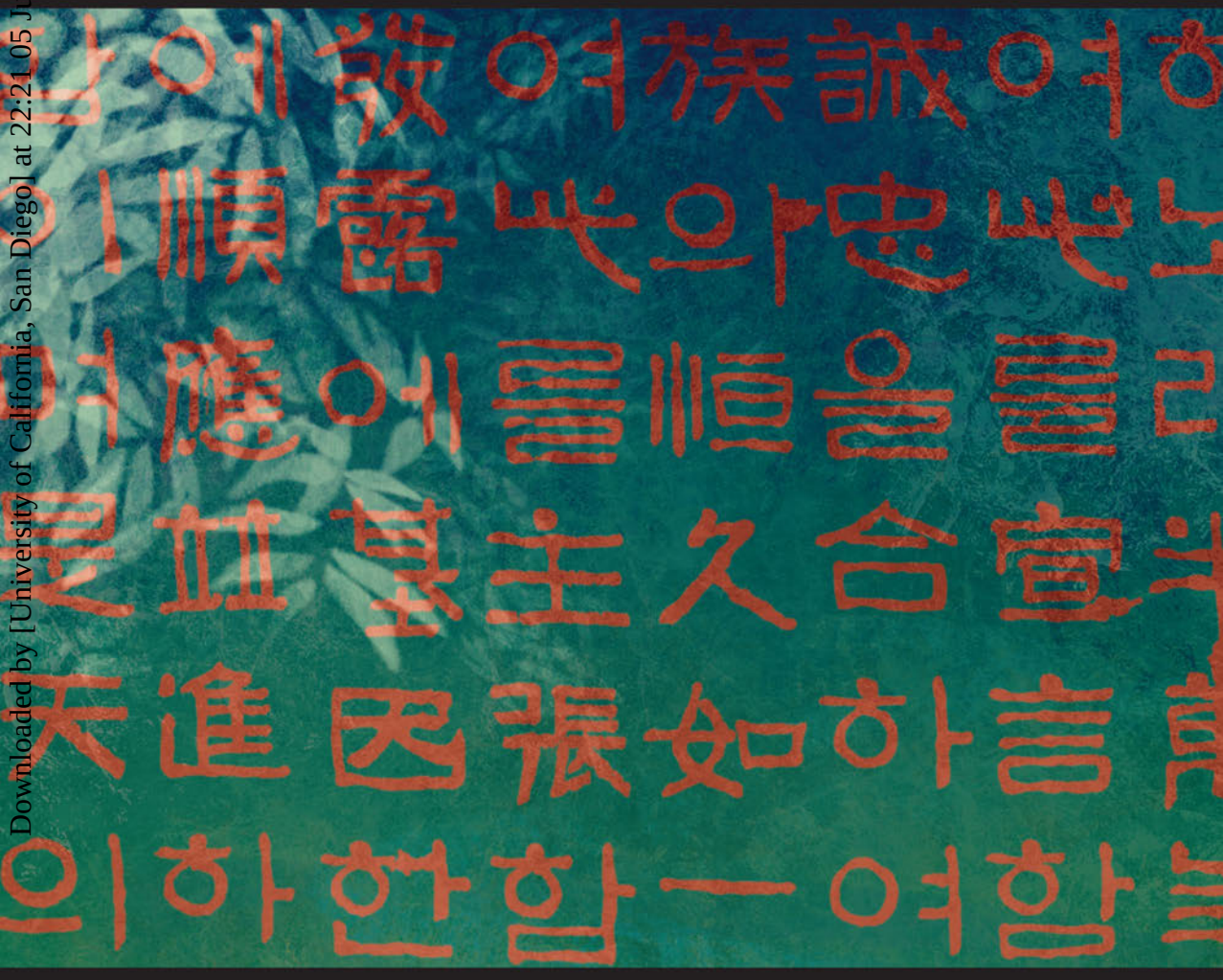
# An Introduction to Korean Linguistics



EunHee Lee, Sean Madigan and Mee-Jeong Park

ROUTLEDGE

# An Introduction to Korean Linguistics



*An Introduction to Korean Linguistics* is a valuable and comprehensive text for anyone with an interest in Korean linguistics.

This book provides an in-depth introduction to the basics of Korean linguistics and modern linguistic theory in an accessible style. It features a step-by-step approach designed to lead the reader through the linguistic make-up of the language, from the basics of its sound system and sentence structure to the semantics of modern spoken Korean.

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- Detailed chapters covering the core areas in the field of linguistics, including phonetics, phonology, morphology, syntax, and semantics
- Clear and accessible explanations which effectively demonstrate the intricacies and subtleties of the Korean language
- Exercises designed to complement the factual and analytical issues covered in each chapter
- A comprehensive glossary of central terms.

Korean is an invaluable language for the study of theoretical and comparative linguistics, as it provides important examples and counter-examples to key issues, making *An Introduction to Korean Linguistics* an essential text for students and professional linguists alike.

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# Glossary

**accentual phrase** – a smaller phrasal tone than an intonational phrase (IP) and larger than a word, usually composed of a lexical item plus a case marker or postposition.

**accusative** – case of the direct object of a sentence.

**active** – a canonical sentence structure in which the subject is the agent and the object is the patient.

**adjunct** – a class of constituents that modify the head in a phrase but are not required by the head. For example, adjectives and adverbs are adjuncts because they are optional, in contrast to complements, which are required by the head.

**adjunction** – the syntactic process of adding an adjunct.

**affix** – a morpheme that is attached to a word stem to form a new word. Affixes usually cannot stand alone as a word, e.g., *re-* and *-al* in *re-viv-al*.

**affricate** – a consonant sound that consists of a stop and a fricative, e.g., [ch] in 'chair'.

**agglutinating** – a morphological process in which a series of affixes are loosely put together, with clear morpheme boundaries.

**allophone** – variation in speech sounds conditioned by the phonetic environment, e.g., the aspirated 'k' in 'kit' and the unaspirated 'k' in 'skit', which are allophones of the phoneme /k/.

**alveo-dental** – consonants that are produced with the tongue against the alveolar ridge and upper teeth.

**alveolar ridge** – the roof of the mouth between the upper teeth and the hard palate.

**analytic** – a morphological process in which words are made up of a sequence of free morphemes without the use of any affixes.

**anaphora** – an expression whose interpretation depends on another expression in context, e.g., pronouns.

**antecedent** – a noun phrase that precedes and is co-referential with another NP whose form is more attenuated, e.g., 'John' is the antecedent for the anaphora 'he' in 'John said he loves Mary'.

**argument** – an expression that completes the meaning of a predicate, e.g., in 'John runs', 'John' is the argument of the predicate 'run'.

**articulation** – production of speech sounds by moving the speech organs such as tongue, lips, and lower jaw.

**aspect** – the internal temporal constituency of an event, such as beginning, middle, and end.

**aspiration** – a strong burst of airflow that accompanies the release when making an obstruent consonant.

**assimilation** – a phonological process by which one sound becomes more like a neighboring sound.

**assimilation, partial** – the assimilated sound retains some of its original phonetic features.

**assimilation, progressive** – assimilation in which a preceding sound triggers a change in the following one.

**assimilation, regressive** – assimilation in which a following sound triggers a change in the preceding one.

**back vowel** – a vowel that is produced with the tongue positioned far back in the mouth.

**base-generated** – elements that are generated in their original position.

**bilabial** – a consonant articulated using both lips.

**binding** – interpretive dependency between an antecedent and an anaphor, which typically requires syntactic relations such as c-command.

**Bindung** – epenthetic /t/ (/s/ in spelling) that appears between morphemes in a word or compound, generally a modifier + a head. The sound is assimilated to the following sound.

**blade of tongue** – the part right behind the tip of the tongue.

**blending** – combination of the first part of one word with the second part of another to form a new word, e.g., 'brunch'.

**bound morpheme** – a morpheme that cannot function as a word by itself.

**bound variable** – a variable whose interpretation is determined by an operator.

**branch** – lines in a tree diagram, which represent syntactic phrasal and sentential structure.

**bright/light and dark vowels** – bright vowels are produced with the tongue moved forward and raised, and dark vowels are produced with a relaxed tongue.

**case** – a certain form that a noun or pronoun takes when it is in various argument positions relative to the verb, e.g., nominative, accusative, dative.

**c-command** – the structural relation between two syntactic nodes such that node 1 and node 2 do not dominate each other, and the lowest branching node that dominates node 1 also dominates node 2.

**central vowel** – a vowel that is produced with the tongue halfway between the front and the back of the mouth.

**checking mechanisms** – mechanisms in which an element is licensed by another element in the syntax, e.g., the case of an argument is checked by the verb.

**circumstantial (root) modality** – modality that arises from the current conditions such as the general circumstances of the situation or a permission or obligation that is imposed.
**classifiers** – bound morphemes indicating units of counting and measurement.
**clitic** – a morpheme that has the function of a word but depends on another word phonologically.
**coda** – a consonant sound that follows the nucleus, which is a vowel, in a syllable.
**coindexation** – putting the same number subscript on an antecedent and an anaphor to indicate that they refer to the same entity.
**collective reading** – a reading of a predicate in which the subject as a group performs the described action together.
**common ground** – the set of propositions that are assumed to be true by both speaker and hearer.
**complement** – those units that are required by the head and provide some sort of information with respect to the meaning of the head, such as location or a description.
**compounding** – a word formation process in which two free morphemes are put together to form a new word, e.g., 'girlfriend'.
**constituents** – combinations of words that form a meaningful unit and behave as a unit in syntactic operations.
**content morpheme** – a morpheme that carries semantic content. e.g., nouns, verbs, etc.
**copula** – 'be' verb, which indicates an equation relation between two arguments.
**coronal** – a consonant that is produced with the flexible front part of the tongue.
**counterfactual** – a hypothetical situation that is not true in the actual world.
**dative** – case assigned to a recipient.
**declarative** – the speech act category of statement.
**decoronization** – a phonological change where a coronal consonant becomes a non-coronal consonant.
**deep structure** – a base or kernel structure, where the basic configuration of the sentence is established.
**delimiter** – an inflectional morpheme that provides a special discourse meaning with little or no syntactic function.
**denotational semantics** – study of meaning that views meaning as a relation between linguistic expression and what it refers to.
**deontic modality** – modality expressing rules and regulations.
**derivational rule** – a morphological rule that derives a new word by adding affixes to a word stem.
**determiner** – an element that precedes a noun to define its meaning, e.g., definite and indefinite articles.
**diphthong** – a sound formed by the combination of two vowels.
**disjunct** – a proposition that is connected to another with 'or'.

**distributive reading** – a reading of a predicate in which each individual performs the described action separately.
**dominance** – a syntactic relationship in a tree diagram where a node is higher than another.
**dorsum of tongue** – the mid-body of the tongue.
**entailment** – a relationship between two propositions such that if one is true, then the other is true as well.
**epenthesis** – the insertion of a sound or letter within a word.
**epistemic modality** – modality expressing knowledge of the speaker.
**event semantics** – semantic framework that treats verbs as having an extra argument position for an event.
**exclusive disjunction** – disjunction that is true only when either one of the disjuncts is true but not both.
**exhortative** – the speech act category of suggestion.
**existential quantifier** – quantifier that quantifies over something in the domain.
**feature spreading** – a phonetic feature of a segment spreading to another segment.
**free morpheme** – morphemes that can occur as words by themselves.
**free variable** – variable whose denotation depends on the speech context.
**fricative** – a consonant that is produced when air flows through a narrow passage.
**front vowel** – a vowel that is produced with the tongue positioned in the front of the mouth.
**function morpheme** – a morpheme that serves only to provide information about grammatical function. e.g., postposition, honorific suffix, conjunctions.
**fusion** – a type of synthetic language in which the morphemes are fused and their boundaries are not easy to detect.
**geminate** – a consonant that consists of two identical consonants.
**genitive** – the case assigned to the possessor.
**glide** – a sound that is between a vowel and a consonant (called semi-vowels/consonants).
**glottis** – the space between the vocal folds.
**grammatical aspect** – expression of internal temporal constituency of events that is marked by aspectual morphemes or constructions such as progressives and perfectives, which are operators that change the aspectual property of the lexical predicate.
**head** – the main word of the phrase, the one that defines what category it belongs to. Heads can be from any of the word categories: nouns, verbs, adjectives, etc.
**honorific** – grammatical form marking deference to the subject or the addressee.
**illocutionary force** – force that is conventionally associated with the locutionary act.
**imperative** – the speech act category for command.
**implicature** – messages that are not explicitly said but only contextually implied and derive from rules of conversation.

**inclusive disjunction** – a disjunction that is true when both disjuncts are true.
**indexical** – an expression whose interpretation depends on the speech context, e.g., 'now', 'here'.
**indicative** – same as declarative, i.e., the speech act category of making a statement.
**inflection** – the process of creating different grammatical forms of words.
**input** – an argument that is fed to a function to be mapped to a value.
**intensionality** – an expression whose interpretation requires more than how things are currently in the actual world.
**intersective** – adjectives that intersect the denotation of common nouns and adjectives.
**intersonorant voicing** – a phonological process in which a voiceless segment becomes voiced between two sonorant sounds.
**intonation phrase** – the highest prosodic phrase level.
**irrealis** – states of affairs that have not been realized in the actual world.
**labial** – consonants which are articulated using one or both lips.
**lambda notation** – logical representation of function that forms a property when applied to a sentence by abstracting over individuals or predicates.
**lateral** – a consonant in which the airflow escapes along both sides of the tongue.
**lateralization** – a phonological process where a non-lateral sound becomes lateral.
**lexical aspect** – internal temporal constituency of events expressed by the lexical meaning of a predicate.
**lexical item** – a broad term for part(s) of a word, or word(s)
**lexical morpheme** – free morpheme, i.e., a morpheme that can stand alone as a word.
**licensing** – an element is checked or justified by another element in the syntax.
**liquid** – a sound that is made by a partial obstruction of the airstream without any friction.
**liquidization** – a phonological process where a non-liquid segment becomes a liquid.
**local and long-distance reflexives** – reflexives are the pronominal elements that must obligatorily take their reference from some sentence-internal nominal. Local reflexives must find their antecedent in the same clause, whereas long distance reflexives can have an antecedent that is outside its local domain.
**locutionary force** – what is said (the denotational meaning of a sentence).
**matrix subject** – the subject in the matrix sentence when a sentence is embedded in a sentence. For example, in 'John said that he loved Mary', 'John' is the matrix subject.
**matrix verb** – the verb in the matrix sentence when a sentence is embedded in a sentence. For example, in 'John said that he loved Mary', 'said' is the matrix verb.

**meta-linguistic negation** – a negation of linguistic expressions themselves, rather than negation of the state of affairs.
**model theory** – interpretation of linguistic expressions as true or false relative to a model, a simulated or made-up specification of what the world is like.
**modifier** – a constituent that adds more information or meaning to the head, e.g., an adjective.
**monophthong** – a simple vowel whose articulation is constant at both beginning and end.
**mood** – markers that have an associated illocutionary force such as making a statement, asking a question, etc., encoding the speaker's intention when he/she utters the sentence.
**morpheme** – minimal, irreducible linguistic units with a lexical or a grammatical meaning.
**morphology** – a sub-discipline of linguistics that deals with systematic patterns of word formation rules and the internal constituent structure of words.
**nasal** – a sound that is produced by allowing airflow through the nose by lowering the velum.
**nasalization** – a phonological process where a non-nasal sound turns into a nasal one.
**natural class** – a set of sounds that share certain phonetic features.
**negative polarity item** – words that must occur inside the scope of some kind of negative operator, e.g., 'any'.
**node** – any point on the tree where a branch, represented by lines, terminates.
**nominalizer** – a grammatical morpheme that turns a verb into a noun.
**nominative** – the case that is assigned to the subject of the sentence.
**non-intersective** – adjectives that do not allow intersection or subset relations between the adjective denotation and the noun denotation.
**object** – an internal argument of a verb phrase that is usually a patient or a theme.
**obstruent** – a sound that is produced with complete or partial constriction of the airflow, e.g., stop, fricative, or affricate.
**one-place predicates** – predicates that require one argument, i.e., intransitive verbs.
**onset** – a consonant that precedes the nucleus vowel in a syllable.
**output** – a value of a function that comes out as a result of operating on the argument.
**palatal** – a consonant that is produced with the body of the tongue raised towards the hard palate.
**palatalization** – a phonological process where a non-palatal segment becomes a palatal sound.
**palato-alveolar** – a post-alveolar consonant that is weakly palatalized.
**paradigm** – list of words put in the format of columns and rows, where each column and each row has some common linguistic material.

**paralinguistic features** – the aspects of spoken language that do not involve words but instead involve bodily gestures, facial expressions, tone and pitch of voice, which are employed to add emphasis or shades of meaning.
**particle** – a bound morpheme with a grammatical function, such as case markers and postpositions.
**passive** – a construction where the theme is the subject of the sentence rather than the agent.
**performative** – an utterance or sentence that performs a certain kind of action rather than describing a state of affairs, e.g., 'I promise'.
**perlocutionary force** – what we accomplish by saying, e.g., convincing, persuading, threatening, requesting, etc.
**phoneme** – the smallest contrastive unit in the sound system of a language.
**phone** – the smallest unit in a stream of speech.
**phonetics** – the study of speech sounds and their production, transmission, and reception, and their analysis, classification, and transcription.
**phonology** – the study of the distribution and patterning of speech sounds in a language and of the tacit rules governing pronunciation.
**phonotactic constraints** – constraints in which phonemes can be arranged to form syllables.
**pitch** – the relative highness or lowness of a tone, which depends on the number of vibrations per second produced by the vocal cords.
**postposition** – a case particle or delimiter that follows the host noun phrase.
**pragmatics** – the study of how people use language.
**prefix** – an affix that precedes the stem.
**presupposition** – a sentence that is assumed to be already part of the background knowledge or taken for granted by speaker and hearer.
**projection** – a process in which a head combines with another constituent to form a phrase.
**promissive** – the speech act category of promising.
**quantification** – expressing generalizations about what quantity of the individuals in the domain have the given property.
**realis** – a state of affairs that has already realized.
**referent** – the object or a situation that is referred to.
**reflexive** – a pronominal element that must obligatorily take its reference from some sentence-internal nominal.
**root** – the core of a word, typically a free morpheme with rich meaning such as an entity, a situation, or a property.
**rounded vowel** – a vowel that is produced by rounding the lips.
**scalar implicature** – implicature that is based on the Gricean maxim of cooperation, operating on linguistic scales in which an item lower on the scale implicates the negation of the item higher on the scale.
**scope ambiguity** – two different interpretations of a sentence depending on the relative order of two quantifiers.

**scope relations** – relations between two quantified noun phrases in terms of interpretation orders.
**scrambling** – relatively free changing of the word order in a sentence.
**segmentals** – discrete elements of speech, such as consonants and vowels.
**semantics** – the study of meaning.
**sonorant** – a voiced speech sound, produced by the relatively free passage of air through the vocal tract, e.g., vowel, semivowel, liquid, and nasal.
**sonority** – the degree to which a speech sound is like a vowel.
**specifier** – a constituent that serves to make the meaning of the head more specific, e.g., the adjective 'pretty' in 'pretty flower' is a specifier to the head noun 'flower'.
**spell-out** – an instruction to map morphology and syntax to phonetic form.
**stem** – complex root, i.e., root with an affix.
**stop** – consonants that are formed by completely stopping the airflow in the vocal tract.
**stress** – the emphasis that is placed on certain syllables in a word or on certain words in a phrase or sentence.
**subject** – the external argument of a predicate and its most prominent argument, which precedes the predicate in English and many other languages and is usually the agent or the theme.
**subsective** – adjectives that are subsets of noun denotation, e.g., 'small' in 'small elephant' is a subsective adjective because it selects a set of small elephant, which is a subset of the set of elephants.
**suffix** – an affix that follows the stem.
**suppletion** – allomorphic variations that are lexically or syntactically conditioned and have no phonological basis for the variation. An example is *mek-ta* 'eat' and *tusi-ta* 'eat' (honorific).
**suprasegmentals** – some phonetic features of speech that operate on syllables, words, or sentences, e.g., length, intonation, and stress.
**surface structure** – a final or output structure that is produced by the application of any transformations to the base or kernel structure, which is the basic configuration of the sentence.
**syllable nucleus** – a vowel or syllabic consonant which is obligatory in a syllable.
**syntax** – the discovery and examination of the rules and principles that govern phrasal and sentential structure.
**synthetic** – languages that attach affixes or bound morphemes to other morphemes, making up words consisting of several meaningful units.
**telicity** – property describing whether a predicate has a natural end-point. For example, 'build' in 'build a house' is a telic verb because the event is over when the house is built.
**tense logic** – the logical representation of temporal information.
**tensification** – the phenomenon in which Korean plain consonants /p, t, k, c, s/ are changed into tense consonants [p', t', k', c', s'] after an obstruent (post obstruent tensing), a nasal, or a lateral.

**theme** – an entity that undergoes a change of state or has some property, e.g., in 'John fell' or 'John is smart', 'John' is a theme.

**theta (or thematic)-role** – the semantic relations that the entities denoted by the noun phrases bear towards the action or state denoted by the verb.

**tonal contour** – a shift from one pitch to another over the course of a syllable or word.

**tone** – a contrastive pitch in language to distinguish lexical or grammatical meaning.

**topic** – an entity which the rest of the sentence is about.

**trace** – an empty category that remains after a constituent moves in syntactic structure.

**transformation** – a process where a constituent moves from its original position to a different position.

**truth value** – the denotation of a sentence, which is either true or false.

**two-place predicates** – predicates that require two arguments, i.e., transitive verbs.

**universal quantifier** – quantifier that quantifies over everything in the domain.

**unrounded vowel** – a vowel that does not involve rounding the lips.

**velar** – a consonant that is pronounced with the back part of the tongue towards the soft palate.

**velum** – another term for soft palate, which is the back part of the roof of the mouth.

**voice** – the relationship between the event described by the verb and the participants identified by its arguments.

**X-bar theory** – a theory that generalizes over different phrases by postulating a common structure consisting of X standing for any lexical category (noun, verb, adjective) and other constituents such as complements and specifiers that help the lexical category head to form a phrase.

# Abbreviations

| | |
|---|---|
| A | adjective |
| ACC | accusative |
| Adv | adverb |
| AP | accentual phrase |
| CAU | causative |
| CG | common ground |
| COMP | complementizer |
| CONJ | conjunction |
| COP | copula |
| CL | classifier |
| D | domain of individuals or universe |
| DAT | dative |
| DEC | declarative |
| DET | determiner |
| DP | determiner phrase |
| D.PST | double past |
| EPP | Extended Projection Principle |
| EXH | exhortative |
| F | interpretation function |
| FUT | future tense |
| GEN | genitive |
| HON | honorific |
| I | inflection |
| iff | if and only if |
| IP | intonation phrase |
| INFL | inflection |
| IMP | imperative |
| IP | inflection phrase |
| KP | case phrase |
| M | model |
| MOD | modality |
| NP | noun phrase |

| | |
|---|---|
| N | noun |
| NOM | nominative |
| NUM | numeral |
| Op | operator |
| P | postposition |
| PASS | passive |
| PL | plural |
| PRM | promissive |
| PRS | present tense |
| PST | past tense |
| QUE | question |
| RC | relative clause |
| Spec | specifier |
| t | trace (syntax) |
| t | truth value (semantics) |
| T | tense |
| TDL | To Do List |
| TOP | topic |
| TP | tense phrase |
| V | verb |
| VOC | vocative |
| VP | verb phrase |

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CHAPTER 1

# Introduction



Korean is spoken by more than 77 million people, 48 million of whom live in South Korea (Sohn 2001). Among the other countries where Korean is spoken are: China, Japan, North Korea and the Russian Federation (http://www.ethnologue.com/language/kor 2015). It is safe to say that if there is a country where Koreans are living, you will find the Korean language in use. In this book, we will explore many facets of the Korean language, from its sound system to its sentence structure and beyond. Korean is a fascinating language and when you begin to look deeper into its workings, it will surprise you at every turn. The closer you examine the language, the more you begin to realize the intricacies and elegant subtleties in the grammar and its usage. In addition to being a fascinating subject of study for the individual, Korean has proven to be an invaluable language to theoretical linguists by providing rich examples and many counterexamples to central issues. It seems at any linguistics conference when someone makes the claim that indeed all languages behave in a certain way regarding some phenomenon, invariably there will be someone who raises their hand and says, '. . . it's not that way in Korean'. This only adds to the excitement and intrigue of studying the language in depth. Hopefully this book will convey to you our own sense of wonder about this language.

In this book we present what could best be called an intermediate introduction to Korean linguistics. This book is intended as a vehicle by which undergraduate and graduate students, and professional linguists alike can not only get a feel for the language as a whole, but also find an intermediate introduction to current thinking in the field. We hope this book will prove useful in this respect. In what follows in this chapter, we provide a cursory discussion of linguistics, language and how to conduct linguistic research. Some more advanced readers may want to skip these sections. We also provide a basic overview of Korean in order to set the stage for the more detailed analyses of the language we will be discussing later on.

## 1.1 LANGUAGE AND LINGUISTICS

Perhaps the first question that needs to be addressed before we get into any details about Korean is: what is language? Following this, we will certainly need to also ask: what is linguistics? Sticking to our first question for a while, we will

approach the question of what language is by looking at some characteristics that language seems to exhibit.

Open any book on introductory linguistics and you will find a section somewhere in the first chapter that espouses all of the fascinating wonders of language. At first this may seem trite and banal, especially after you have read a few of these books. The fact is, however, that the reason these sections are included in so many texts is that language viewed from a linguistic perspective can be truly thought-provoking and profound. For example, consider the following seemingly trivial English phrase which makes use of the plural marker.

(1) cat**s** and dog**s**

If we were to ask native English speakers what the plural marker is in this example, the answer would resoundingly be: 's' and indeed they would be correct. If we ask these same speakers whether the two usages of the plural marker in (1) are the same sounds, the vast majority of people would also promptly reply, 'yes'. This time, however, they would be incorrect. If one examines the sounds more closely, we find that the sound of the plural marker on 'cat' is in fact an 's' sound. However, the plural marker attached to 'dog' actually has a 'z' sound. The difference between these two sounds is what is known as **voicing**. For the 's' sounds, the vocal flaps (or vocal cords as they are more commonly known) are open and not vibrating. We therefore say that this is a **voiceless** sound. The 'z' sound, on the other hand, does have voicing in that the vocal flaps are vibrating producing an audible noise. For the reader that is still in disbelief, hold your hand to your larynx (voice box) while saying the phrase in (1). You can feel that your voice is not vibrating when you say the 's' sound in 'cats', but it most certainly is when you say the final plural marker in 'dogs'. The reason for this is that the consonant preceding 's' in 'cats' is also voiceless, while the consonant preceding 'dogs' is voiced. It is therefore a rule of the English sound system (or phonology), that one should voice the plural marker when following a voiced consonant.

While the fact presented above is certainly compelling in and of itself, what is even more remarkable is that the average native speaker of English has no idea that this is what they actually say when they utter a seemingly simple phrase as in (1). You will see as we progress in our study of language that speakers are often completely unaware of the true rules of their own language. In this way, we seem to have no conscious access to many of the rules of our own language. This is astounding given the fact that humans have such an intimate connection with the languages they speak. In a very real sense, our language is an extension of who we are, so to not have complete conscious knowledge of our own language systems is truly striking.

So far, we have learned that whatever language is, the knowledge of its rules and structure are largely unconscious. Moving forward then, consider the analysis given for the sound change phenomenon in (1). Implicit in the explanation

above of the sound patterning of the English plural is the existence of a rule. We could state this rule as follows:

(2) English Plural Sound Patterning Rule – If plural -s is preceded by a voiced consonant pronounce as /-z/, if preceded by a voiceless consonant, pronounce as /-s/.[1]

[1] The actual rule for this morpheme is somewhat more complex; however, given our lack of an understanding of phonology at this point, this simplified rule will suffice.



When we say that this is a rule of English, we are really saying that this is an algorithm of English that the native speaker has **internalized**. It is part of his or her unconscious **knowledge** of language. As will be seen in this book, all parts of language comprise various rules that the speaker learned in childhood and applies effortlessly. In this way, we say that language is a **rule-governed** phenomenon.

Another property of language pertains to the application of these rules, in particular to the recursive nature of rule application and the infinite creativity this leads to. For this example, consider the following rule of English sentence structure.

(3) Nouns can be modified by prepositional phrases containing other nouns.

Given this rule above, we should be able to produce phrases such as those in (4).

(4) a. The man with the stick
b. The man with the stick from the tree
c. The man with the stick from the tree on the hill

Our rule in (3) is recursive in that it implies that when one noun has a prepositional phrase with a second noun in it modifying the first noun, one can have yet another prepositional phrase with a third noun in it modifying the second noun, and so on. In this way, we can generate the sentences in (4a–c). Indeed we could in theory generate a phrase of infinite length using the recursive rule in (3). Along the way in our study of Korean we will see many examples of recursion; it is yet another property of language that makes it so unique. It is through the processes of rule application and recursion, as well the existence of a varied and productive vocabulary, that we can produce sentences such as the following, which has most likely never been produced before.

(5) The big flamboyant door with huge ears listened for the slightest sound of seagulls pecking at its peculiar pink hinges, which were worn from years of perfunctory opening and closing and shutting and slamming and general all-around dolphin-like mistreatment.

While the sentence above may strike one as silly, its mere existence is really quite profound. The fact one can take a finite number of rules and apply them in an infinite number of ways leads to the type of unbridled creativity we are talking about. It is because of these properties that language presents itself as a system of truly elegant design.

We now know that language is creative, recursive, rule-governed unconscious knowledge. So, what are linguists concerned with? In a nutshell, linguistics is the **scientific study of language**. We employ scientific methodology to uncover what someone knows when they know a language. Linguistics can be subdivided into a number of areas of study, as well as methodologies. At a gross level of classification, linguistics can be divided into theoretical linguistics, applied linguistics and biological linguistics. Theoretical linguistics is what we will be doing in this book as we attempt to understand what it is that a Korean speaker knows when they know the language. Applied linguistics is concerned with those areas of study that make use of what we know about language through linguistics and applies these things to real world situations. These situations could be anything from second language teaching to speech therapy. Finally, biological linguistics, loosely defined here, are those branches of linguistics that look at how we process language in the mind and how this is done by the brain – termed psycholinguistics and neurolinguistics respectively.

In theoretical linguistics we are interested in the rules and knowledge a speaker has when they know a language. What exactly are we looking at then? Consider the example in (6) as a starting point.

(6) The physicist smashed the particles.

What must a speaker know in order to produce and/or understand the sentence in (6)? Perhaps the most obvious thing one would need to know is the sounds of the language. For example, one would need to know that the word 'particles' starts with a 'p' sound. In knowing this sound, our speaker would need to know how to put his or her lips in the proper position and how to properly control the air from the lungs in order to produce this sound. He would also need to know how to distinguish this sound from other sounds in order not to get confused when he hears words such as 'pin' versus 'bin'. These are just a few of the things that the study of **phonetics**, the study of sounds, looks at.

Depending on which region our speaker comes from he would also have to know something about the **phonology** of the language in order to produce or understand (6). This area of linguistics deals with the sound system of the language. Previously we saw how the pronunciation of the English plural varied depending upon the phonetic context it found itself in. In (6), our speaker would have to know that in American English there is what is known as a **flapping** rule that states that when the sounds 't' or 'd' occur between two vowels, they are changed to what is called a flap. Flaps are produced by tapping the tip of the tongue rather quickly against the ridge on the roof of the mouth, located

just behind the teeth (i.e. the **alveolar ridge**). In (6), this is true with the 't' sound in 'particle', which is pronounced as a flap in fluent speech.

Moving on from the sounds of the language and towards the word level, the speaker must know the words in (6). In addition, he must know how to use the various markers, or **morphemes**, that can attach words. This is the **morphology** of a language. In (6), one must know the rule for forming the past tense, namely the addition of *-ed* to the main verb for regular verbs. One must also know the rule for pluralizing.

Even though this may seem like a lot for a speaker to know, we are only about half way there regarding what he would need to know to produce and understand this sentence. For example, the speaker would need to know the rules of **syntax** in order to begin to put the sentence together. He would need to know that sentences comprise verbs and nouns and how to put them together properly. In addition, he would have to know the rules in such a way that he would not accidently produce incorrect syntactic structures. For example, it must be part of the speaker's knowledge of language that one cannot have two determiners modifying one noun, as shown in (7).

(7) *the the physicists[2]

[2] The *indicates that the phrase or sentence is not acceptable to a native speaker.

He also must know various rules about word order, as any native speaker would know that any of the following are simply incorrect.

(8) a. *Physicists the particles smashed the.
b. *Physicists the smashed the particles.
c. *Smashed the particles the physicists.
d. *The smashed the particles physicists.

And these are just a few of the things about syntax he would need to know. It is at this point that one really begins to appreciate the scope of linguistics as an object of study, as what it takes to know a language can be quite complicated and the number of rules necessary quite numerous. Even so, we are still not done, as our theory of language still has no way for the speaker to make any sense of the meaning of a sentence. In other words, within our linguistic study of language, we must make room for the **semantics**. Semantics is the study of meaning in language. Not only do we need to understand how it is that a speaker knows the meaning of the words in (6), we need to also understand what these words mean in combination with each other. Things become even more complicated when we begin to try and understand what it is a speaker knows when they are interpreting sentences in the context of other sentences.

While we have just scratched the surface of what theoretical linguistics covers, we have begun to see that there are basic modules of grammar that

we are interested in explaining the workings of. In this book, we will follow this approach and illustrate how these modules, or domains, of grammar play out in Korean.

## 1.2 INTRODUCING THE KOREAN LANGUAGE

Now that we have laid the foundation for our methodological considerations, we can begin to look at our primary subject of study, the Korean language. In this section, we will discuss some of the more salient characteristics of Korean. This will serve as the basic foundation on which to build our study of the language.

In this section we will discuss the basics of the Korean language. As is often the case throughout this book, we will employ the use of an example as a springboard to discuss the relevant issues at hand. First we will discuss some of the basic ways in which we present examples.

(9) 인호가 딸기를 먹었다. ← Line 1 - Hangul
Inho-ka ttalki-lul mek-ess-ta. ← Line 2 - Romanization
Inho-NOM strawberry-ACC eat-PST-DEC ← Line 3 - Gloss
'Inho ate the strawberry.' ← Line 4 - Translation

**Figure 1.1** Presentation of examples

The first things that should be discussed before moving on to any specifics of the language are the Korean script, romanization, and glossing. The first line in the example above is written in the Korean script known as Hangul. Hangul was invented in 1443 under the reign of King Sejong and with his active involvement. Previously, Chinese characters were used in all writing, making it difficult for the average Korean to learn to read and write. They have since fallen out of heavy usage and are generally only found in some newspapers, scholarly articles and legal documents. Hangul symbols are similar to English in that one symbol stands for one sound. In Korean, however, there is much less variation than in English, as Hangul is almost perfectly phonemic. This will be elaborated on in Chapter 2. Unlike English, however, each syllable in Hangul is represented by a cluster of symbols into what we will call a syllable block. We can think of the syllable block as having at least three slots. The first has a consonant or a place holder symbol if there is no syllable initial consonant. The second slot contains a vowel. The third slot contains a consonant if the syllable in question requires one. These are arranged from left-to-right and from top-to-bottom.[3]

[3] There are other rules that go into the creation of properly formed syllable blocks. We refer the reader to Grant (1982).

Moving on to the second line in (9), this is the romanization of the Hangul. This allows those who are not familiar with the Korean script to follow the discussion. Here we employ the Yale Romanization system, because it is the established standard among linguists. The basic Hangul symbols and corresponding **Romanization** are given in Table 1.1 below.

The third line in the example in (9) is what is called a gloss. What this does is to provide the reader with a word-by-word translation of Korean into English. In addition, it provides the names of the markers used. A '-' indicates a bound morpheme boundary (see Chapter 4 for more information on this). The morpheme glosses used in this book are given below.

Finally, in line 4 we have an English translation, which may or may not follow the grammar of the original sentence. This is given to provide the reader with a sense of what the sentence might mean, or how it may function. Now that we have the technicalities out of the way, we can move on to a discussion of the fundamentals of Korean. Let's look at our example in (9), listed again here for convenience.

**Table 1.1** Yale Romanization of Hangul

| *Vowels and Diphthongs* | *Yale Romanization* | *Consonants* | *Yale Romanization* |
|---|---|---|---|
| ㅏ | a | ㄱ | k |
| ㅐ | ay | ㄲ | kk |
| ㅑ | ya | ㄴ | n |
| ㅒ | yay | ㄷ | t |
| ㅓ | e | ㄸ | tt |
| ㅔ | ey | ㄹ | l |
| ㅕ | ye | ㅁ | m |
| ㅖ | yey | ㅂ | p |
| ㅗ | o | ㅃ | pp |
| ㅘ | wa | ㅅ | s |
| ㅙ | way | ㅆ | ss |
| ㅚ | oy | ㅇ | ng |
| ㅛ | yo | ㅈ | c |
| ㅜ | wu | ㅉ | cc |
| ㅝ | we | ㅊ | ch |
| ㅞ | wey | ㅋ | kh |
| ㅟ | wi | ㅌ | th |
| ㅠ | yu | ㅍ | ph |
| ㅡ | u | ㅎ | h |
| ㅢ | uy | | |
| ㅣ | i | | |

**Table 1.2** Morpheme glosses

| *Gloss* | *Morpheme Type* |
|---|---|
| NOM | Nominative |
| ACC | Accusative |
| DAT | Dative |
| TOP | Topic |
| GEN | Genitive |
| VOC | Vocative |
| CL | Classifier |
| CONJ | Conjunction |
| PST | Past Tense |
| D.PST | Double Past Tense |
| FUT | Future Tense |
| PRS | Present Tense |
| MOD | Modality |
| COP | Copula |
| DEC | Declarative |
| QUE | Question |
| COMP | Complementizer |
| PRM | Promissive |
| IMP | Imperative |
| EXH | Exhortative |
| PL | Plural |
| HON | Honorific |
| RC | Relative Clause |
| PASS | Passive |
| CAU | Causative |

(10) 인호가 딸기를 먹었다.
Inho-ka ttalki-lul mek-ess-ta.
Inho-NOM strawberry-ACC eat-PST-DEC
'Inho ate the strawberry.'

If unfamiliar with Korean, perhaps the first thing one notices is that there are a number of markers, or morphemes, that seem to be bound to their stems. In (10) these are: the *-ka* nominative marker on the subject Inho, the *-lul* accusative marker on the object and the past tense *-ess* and the declarative marker *-ta* on the verb. The exact functions of these markers will be discussed in detail later on. For the time being, however, it will serve us well to simply notice the way the language puts its words together. We can see that each marker – in these cases we can call them **affixes** – has one meaning and it is joined to the 'chunk' of word, or **base**, that precedes it. Furthermore, we can have more than

one affix joined to a base, as evidenced by the verb. These kinds of languages are called **agglutinating** languages.

Another salient characteristic of the sentence in (10) is its word order, which is subject–object–verb. Like English, the subject begins the sentence. Unlike English, the object precedes the verb.

(11)

| **Subject** | **Object** | **Verb** |
|---|---|---|
| Inho-ka | ttalki-lul | mek-ess-ta. |

**Figure 1.2** Korean word order

We will see later in Chapter 5 that word order in Korean is relatively free, a phenomenon known as **scrambling**. SOV is, however, the basic underlying word order in the language.

In addition to different morphology and word order, Korean has many more features that are very different from more extensively studied European languages. Subject-prominence vs. discourse/topic-prominence is a commonly assumed typological distinction between languages (Li and Thompson 1976). Whereas subject-prominent languages such as English and many European languages require main grammatical arguments to be present for a well-formed sentence, discourse-prominent languages like Korean (as well as Japanese and Chinese) allow frequent omission of subjects and objects when they are contextually recoverable, which is called **zero anaphora**. (12a–b) below are perfectly grammatical sentences given the contexts.

(12) a. (Who ate the strawberry?)
인호가 먹었다.
Inho-ka mek-ess-ta.
Inho-NOM eat-PST-DEC
'Inho ate it.'

b. (What did Inho do?)
딸기를 먹었다.
Ttalki-lul mek-ess-ta.
strawberry-ACC eat-PST-DEC
'He ate the strawberry.'

Yet another characteristic of Korean that stands out to most newcomers to the language is its extensive use of **honorifics**. Honorifics are a system of morphological modifications that pertain to the relation between the speaker of the sentence and the addressee, or the person about whom one is talking. For example, consider the sentence (9) where the agent is a person of honorific (superior) status, such as a teacher, as shown in (13).

(13) 선생님께서 딸기를 드셨다.
Sensayngnim-kkeyse ttalki-lul tu-si-ess-ta.
teacher-NOM strawberry-ACC eat-HON-PST-DEC
'The teacher ate the strawberry.'

Two things are immediately noticeable in the example above. First, the nominative case marker is different from the example in (9). *-Kkeyse* is the nominative marker a speaker uses to talk about someone of honorific status. In addition, we notice the verb for 'eat' is a completely different verb, specifically used when the agent or addressee of the sentence is of a higher status than the speaker. Finally, the verb also takes a specialized honorific morpheme, *-si*. This system is extremely rich and the rules for its usage can be quite complex depending on various social situations. These will be detailed more in Chapters 4 through 6.

## 1.3 CONDUCTING LINGUISTIC RESEARCH

As students begin to progress in linguistics and transition into doing their own linguistic research, it is often never fully explained to them how to go about doing actual research. The result is confusion about how exactly to conduct linguistic research and/or even understand in detail the research they are reading about. This is especially true in a language which is not one's native tongue. In the following section, we hope to alleviate some of these issues in order to better help students transition into doing their own research on Korean as soon as possible.

Note that what we are talking about in this book is largely **theoretical** linguistics, as discussed in detail above. This is much less true in Chapter 2, which discusses such things as the acoustics of various sounds and the physiology of the human vocal tract. However, from Chapter 3 on, we are really attempting to create a model of what a Korean speaker knows about Korean. What this means is that we are trying to build a theoretical model of what it is a person knows when they know a language. In the simplest sense, what we are looking to do is to uncover the rules that comprise this system of knowledge. We do this through a variety of means, such as one's own judgments about data, native speakers' judgments about created data, corpus data and psychometric experiments. Since linguistics is the scientific study of language, any established scientific methodological protocol is worth looking at to get at uncovering this system of knowledge.

The primary aim of this book is to bring you to a point where you understand how the Korean language is built, as well as to introduce you to a variety of issues and topics relevant to current linguistics. A secondary aim is to illustrate how to conduct linguistic research. While we cannot hope to impart all the knowledge necessary to constructing a cogent and convincing argument, we do hope that we can at least point you in the right direction. While we will provide you with at least this much, nothing can replace studying original works

by prominent scholars, many of which are listed in the reference section of this book. When reading these articles and books, the student should pay attention not only to the linguistics, but also to how the author crafts his or her arguments.[4]

[4] Beginning students often find it difficult transitioning from introductory texts to current, more advanced, research. We recommend that when reading a current linguistics article, you should endeavor not to give up and quit reading when confusion sets in; and it will at first. When reading these articles it is important to first try and discover the overall point(s) the author(s) is/are trying to make. To do this, simply keep reading as things are often summed up later on in the work. Once armed with this knowledge, you can go back through the article and attempt to understand those things which confused you on the first pass through.

Throughout the chapters ahead, we will make many references to argumentation. For the time being, however, let's go over some of the more basic types of argument structure that theoretical linguists use to conduct research and write an article. This is by no means an exhaustive list, and should not be considered one, as each type can have numerous variants. The purpose here is to give student readers a head start in beginning their own research, by providing them with some research program templates to work from.

Consider the four types of basic argumentation structure listed below:

(14) Four Types of Basic Argumentation Structure
1. Describe a new phenomenon
2. Hypothesis A vs. Hypothesis B
3. My data supports your theory
4. My data says your theory does not work (so here is my theory, which is better)

These four argumentation structures can be used as a research program to conduct and write up theoretical linguistic research. This is not a list of all possible ways to construct an argument, but it will serve us well to get started. The first is probably the most desirable and potentially exciting option. To describe a new phenomenon that no linguist has ever heard of is certainly something most linguists dream of. Realistically, however, this is a very difficult task and often only comes from years of dedicated study. Care must be taken here by the new student of linguistics so as to not get discouraged. Most seasoned scholars, when just starting out, spent an enormous amount of time trying to find something new. Through each scholarly internet and/or article database search they found that what they thought they had discovered had already been written about. Often this leads to an 'I am not cut out for linguistics' attitude, which is unfortunate and certainly unnecessary. Fortunately, there are other ways to break into a topic in linguistics that are much more doable and can provide you with a foothold on your way to your major discovery.

Most of the time, what counts as new in linguistic research is a new way of looking at an already known empirical phenomenon. The new data we find in various languages can often provide us with valuable insight regarding the theories we are considering. Often it is only by viewing theories through the lens of other languages that we see the shortcomings of these theories. This can lead to revisions of the theory so that it more correctly predicts the data that is out there. One way to do this sort of research is to use an argumentation structure such as number 2 above. With argumentation structure 2, Hypothesis A versus Hypothesis B, we can begin to start looking at real world data as it applies to various theories. The actual structure of this style of argumentation will look something like the following outline:

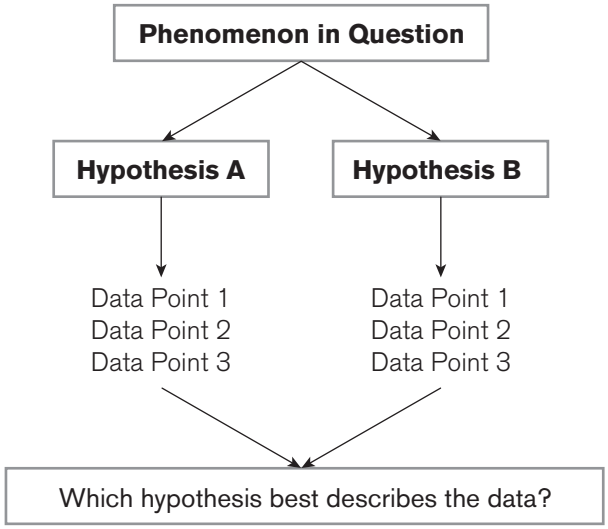



Figure 1.3 Argumentation structure 2

If one looks closely at the above outline, what becomes apparent is that we are employing the **scientific method** in order to conduct our research and ultimately create our arguments. In the scientific method, we do the following:

- create a research question
- do background research
- construct a hypothesis (or hypotheses)
- test the hypothesis (or hypotheses) by doing an experiment
- analyze the data and draw a conclusion
- communicate the results

As there is an almost limitless number of resources that delve very deeply into the scientific method, we will not cover it here in any detail. We will, however, note that our basic approach to linguistic research is most often some variant

of this method. In short, we come up with a question, or questions, to research, we make educated guesses about these questions (i.e. hypotheses) and we conduct experiments of some sort to figure out which guess is the most likely to be correct.

Getting back to argumentation structure 2, in order to illustrate this, we will employ a very over-simplified example. First, the outline above shows us that we should first choose some interesting linguistic phenomenon. One way of easing into finding such a thing is to begin with a phenomenon you find interesting and begin looking at other languages. Often you will find that other languages do not necessarily behave like the ones that were studied to create the current theory of the phenomenon. For example, let's say we are interested in **reflexives**. Reflexives are words that must have some obligatory reference within the sentence in which they occur. An example in English is given below.

(15) $Jim_1$ saw **himself**$_{1/*2}$ in the mirror.

In (15), 'himself' is the reflexive in question. The subscripts indicate who 'himself' can and cannot refer to. In this case, 'himself' can refer to the subject 'Jim', but cannot refer to anyone outside the sentence. One question about this phenomenon might be something such as: what determines which noun can be a referent for a reflexive? Referring back to the section on the scientific method, this would be our research question.

Now we need some hypotheses to test regarding our research question. These can be obtained from current theories in the literature, or they can be created by you the researcher as a 'best guess'. For now, let's consider two reasonable guesses that may explain the above data. There are two possibilities given the sentence in (15). One could be that any noun in the sentence could be a referent for the reflexive. However, since there is only one noun, it could also be that only the closest noun to the reflexive could be a referent. This gives us two hypotheses.

(16) Hypothesis A – A referent of a reflexive must be the closest noun in the sentence.
Hypothesis B – A referent of a reflexive may be any noun in the sentence.

Now that we have our hypotheses, we can begin to go looking for data that would have something to say about them. We can look to hypothesis B for a clue as to what a testable piece of data should look like. Since, hypothesis B states that any noun in a sentence could be a referent for a reflexive, perhaps we should attempt to construct a sentence with more than one noun in it order to test these hypotheses. Just such an example is given in (17) below.

(17) $Jim_1$ thinks $Bill_2$ saw **himself**$_{*1/2/*3}$ in the mirror.

(17) shows that 'himself' can refer to the noun 'Bill', but not the noun 'Jim', nor anyone outside the sentence. Obviously, there are some restrictions on which noun can be the reference for 'himself'. The next step is to plug this data into our hypotheses and see which one best predicts the sentence.

Hypothesis A predicts that the noun closest to the reflexive will be a possible referent. This prediction is borne out in that only the closest noun, 'Bill', is a possible referent. Hypothesis B, however, makes an incorrect predication as it predicts that 'Jim' should be a possible referent, which it is not. Given the analysis above, we can therefore reject hypothesis B and accept hypothesis A. Admittedly, this is an extremely over-simplified example. In reality, you will often need many data points to properly decide between various hypotheses. This format, however, should suffice the beginning linguist in at least attempting to begin research of their own.

Moving on to argument type 3, it is often the case that when studying languages we stumble on a piece of data that supports a current theory we are familiar with. This is a perfect way to get one's foot in the research door, so to speak. This sort of thing is well worth looking at, and may lead to further refinements of the theory and a better understanding of its implications. Therefore, whenever data is encountered that seems to support a contested theory, one should certainly follow that line of inquiry.

Finally, argument type 4 makes itself available when one finds data that a current theory predicts should not exist. One can even go looking for such data by constructing examples that should not be possible under the theory and asking native speakers if these examples, or any like them, are in fact correct. When you do find data that suggests a theory is incorrect, it then becomes your burden to present a theory that accounts not only for your data, but also for the original data that previous researchers used to construct their incorrect theory.

Hopefully in this section we have given the beginning linguist a head start in doing independent research. In the rest of this section, we will make note of some of the finer points of argumentation that students often miss. First, when constructing an argument make sure that you use examples to prove your point. Again, linguistics is the **scientific** study of language and we use data to prove our points, just as any other science would.

Secondly, never list examples without explanation. For example, one should never say something such as:

> The following example proves that my hypothesis is correct.
> (1) (example which illustrates your point)
> Moving on to our second question . . .

While it may be clear to you what the implications of your example are, it may not be so clear to the reader. One should spell out in as much detail as necessary exactly what the example has to say about the hypothesis in question.

Just as important as example usage is how you present the individual pieces of your argument. It is extremely important that one thought leads to the next. When writing up your analysis, always ask yourself, is what I just wrote relevant? Does it relate to what I just wrote in the last sentence? Does my current point logically follow from the last point I made?

Finally, when presenting your solution to a problem, make sure that it will be considered by the reader as a logical necessity. You must construct your argument in such a way that the reader has no choice but to say, 'Yes, there could not possibly be any other solution. Logically, this is the only possible one'. In order to do this, you must argue in such a way as to exclude all other possible explanations and lead the reader to the conclusion that yours must be this way, out of logical necessity. This is perhaps the hardest thing to do and often the only way to truly master this style of argumentation is to read the work of other linguists who are successful at doing so.

## 1.4 ROAD MAP

In the chapters that follow, we will take an extensive journey through the Korean language. In Chapter 2 we will start with phonetics, which examines the basic building blocks of the language, sounds. Chapter 3 will focus on phonology and explore how sounds pattern and change in Korean. How words are put together, the study of morphology is the subject of Chapter 4. Chapter 5 discusses syntax, making many direct comparisons to English as well as other languages. It is in this chapter that we really see how different the structure of Korean is from western languages. Finally, Chapter 6 focuses on Korean semantics.

CHAPTER 2

# Phonetics



## 2.1 INTRODUCTION

While the majority of this book deals with theoretical linguistics, as noted in Chapter 1, this chapter focuses more on some of the physical and perceptual processes associated with language, namely phonetics. In a broad sense, phonetics is the study of the different aspects of speech sounds in a language. These aspects include speech production (**articulatory phonetics**), speech acoustics (**acoustic phonetics**), and speech perception (**auditory phonetics**). In this book, however, we will mostly be dealing with speech production, as this is the most accessible area of phonetics to begin with.

Let's first begin briefly thinking about perception and try to imagine what is going on when you hear an utterance. What you are hearing is a sequence of speech sounds, which includes both consonants and vowels. We can refer to the individual sounds as segments or **segmentals**. Along with the segments of the utterance, you also hear a tonal contour. As phenomena such as tonal contours often occur independently of the segments, and, as will be seen, are often subject to their own sets of rules, we call these sorts of things **suprasegmentals**. In other languages, it is in this domain that we find things such as stress and tone. This chapter deals with the inventory of Korean segments and suprasegmentals, in terms of their characteristics and categories based on their physical aspects as well as their production mechanism using human speech organs.

It is very common for adult learners of a foreign language to rely on orthography (i.e. a language's writing system) when learning the sound system of a language. Indeed, it is common for many beginning linguistic students to do the same. Some languages such as Spanish, Polish, and Indonesian are considered to have phonetic writing systems. That is, once you learn the sound representation for each of the letters in the alphabet, it is quite predictable how to read most of the words found in a dictionary even if you have never heard them before. In this context, **phonetic** refers to a (near) one-to-one correspondence between the actual speech sound and an orthography's representing symbol. English in many ways has a phonetic writing system, but as any elementary school student can attest to, there are many words that are not phonetic. In this way, we can say that English is relatively less phonetic than Spanish and Polish.

In fact the discrepancy between the spelling and the actual pronunciation of a sound can be relatively severe so that many foreign learners of English have difficulty reading words that are new to them. Moreover, one single sound can be represented by multiple sets of letters. For example, all of the following words contain the same vowel sound in General American or RP accents: b**e**, ach**ie**ve, s**ee**, k**ey**, p**ea**, slow**ly**. Numerous other examples abound. In Korean, on the other hand, the sound–spelling correspondence is much more consistent than in English. However, foreign learners of Korean soon realize that the spelling does not necessarily reflect the exact pronunciation in all instances. For example, *hankwuke* 'Korean' is read as [haŋgugʌ]. The nomenclature in this example makes use of the **International Phonetic Alphabet (IPA)**, which will be discussed in detail below. For the time being, however, note that each symbol simply represents a sound as it is actually pronounced. So, if we look at the way the spelling of the word dictates things should be pronounced, we get [han.kuk.ʌ]. In actual usage, however, the pronunciation is [haŋgugʌ]. Note, that there are some discrepancies in these two representations. If Korean was a purely phonetic language we would expect them to be identical. Korean is, therefore, known as a **morpho-phonemic** language, which will be discussed in more detail in Chapter 3.

Obviously, attempting to use the Korean spelling system to represent this sort of discrepancy will fall short. In point of fact, as we proceed in the next two chapters, it will become very clear that languages often group many sounds under one orthographic symbol. Given these issues, it is necessary for linguists to have a way to discuss these things. The International Phonetic Alphabet (IPA) can be used to show these subtle differences. The IPA does not reflect the writing system of a particular language, but instead, is a standardized notation system, which includes sound symbols that can cover the sound sequences of all known human languages. One major benefit of this is that linguists can discuss the sounds of a language unfamiliar to some or all of them. Although the IPA contains unfamiliar symbols, it is necessary to become familiar with it in order to accurately represent Korean speech sounds. Below are the IPA symbols for consonants and vowels in Korean, which will be used instead of the Yale Romanizations in this and the next chapter. In what follows, we will discuss in detail what kinds of sounds each symbol represents.

In the following sections, the inventory of the Korean sound system will be divided into two major classes: consonants and vowels. In order to understand the notions of consonants and vowels, and their respective categories, we need to know how these sounds are produced physiologically. The following figure illustrates the main parts of the human **vocal tract** that are responsible for producing different sounds in any human language. Different sounds can be produced depending on what parts of the vocal tract are being used and how they are used with the airflow that comes from the lungs.

Speech sounds are considered to be different from the mere human voice or any other sound in terms of their production. Speech sounds are produced

**Table 2.1** IPA for Korean consonants and vowels

| *Hangul alphabet* | *Yale Romanization* | *IPA* | *Hangul alphabet* | *Yale Romanization* | *IPA* |
|---|---|---|---|---|---|
| ㄱ | k | k | ㅓ | e | ʌ |
| ㄲ | kk | k’ | ㅏ | a | ɑ |
| ㄴ | n | n | ㅔ | ey | e |
| ㄷ | t | t | ㅐ | ay | ɛ |
| ㄸ | tt | t’ | ㅑ | ya | jɑ |
| ㄹ | l | l | ㅖ | yey | je |
| ㅁ | m | m | ㅒ | yay | jɛ |
| ㅂ | p | p | ㅕ | ye | jʌ |
| ㅃ | pp | p’ | ㅗ | o | o |
| ㅅ | s | s | ㅘ | wa | wɑ |
| ㅆ | ss | s’ | ㅚ | oy | ø |
| ㅇ | ng | ŋ | ㅞ | wey | we |
| ㅈ | c | tɕ | ㅙ | way | wɛ |
| ㅉ | cc | tɕ’ | ㅛ | yo | jo |
| ㅊ | ch | tɕ$^{h}$ | ㅜ | wu | u |
| ㅋ | kh | k$^{h}$ | ㅝ | we | wʌ |
| ㅌ | th | t$^{h}$ | ㅟ | wi | y |
| ㅍ | ph | p$^{h}$ | ㅠ | yu | ju |
| ㅎ | h | h | ㅡ | u | ɯ |
| | | | ㅢ | uy | ɯi |

by the human vocal organ known as the vocal tract. For a better understanding of the production of speech sounds, let us consider the analogy of a stringed instrument such as the violin. One can play a violin by plucking one of its strings, and the body of the violin will amplify the sound by resonating its body. One can produce different notes or tunes by putting one’s fingers on the strings near the handle so that the length of the strings can be adjusted to produce higher or lower pitches. So, a violin can produce beautiful tunes and notes only when there is a bowing or plucking of the strings, a resonating body, and string adjustment to produce different notes. Similarly, the human body can also produce speech sounds by forcing out the airstream from the lungs, and resonating it through the **vocal tract**, which includes the **larynx**, the **oral cavity**, and the **nasal cavity**. The **vocal folds** play a fundamental part in the production of speech sounds. By opening them to let the air flow freely, partially opening them, or closing them so that the air will just pass through, the folds vibrate, creating a buzzing sound that resonates through the rest of the vocal tract. Different positioning of the tongue in relation to different parts of the oral cavity can also modify the speech sound. When the vocal folds are closed to vibrate and

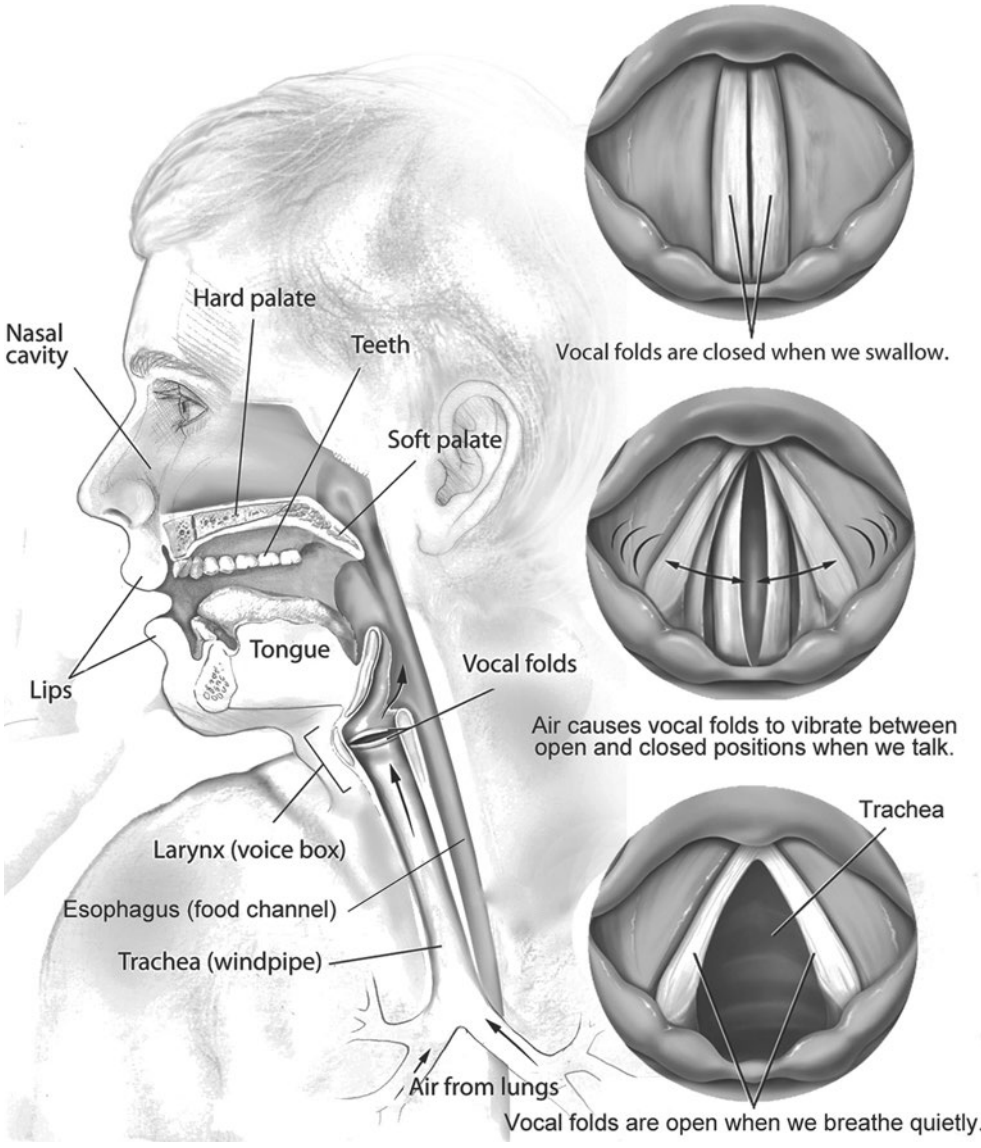



**Figure 2.1** Structures involved in speech production and states of the glottis (Source: U.S. Department of Health & Human Services, National Institutes of Health, National Institute on Deafness and Other Communication Disorders.)

resonate the outgoing airflow without any further intervention within the vocal tract, **vowels** such as [i], [o], and [ɑ] can be produced. When the outgoing airflow passes the vocal tract with further intervention or no intervention but vocal folds open, **consonants** such as [p], [t], and [k] are produced. In Korean, no consonant can stand alone without a vowel to produce an intelligible word.

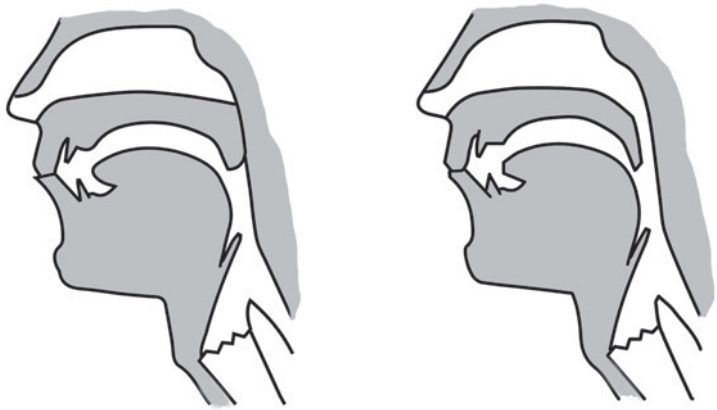
**Glides** are known as **semi-vowels** that are a combination of a vowel with an initial [w] sound or [j] sound.

All consonants and vowels can be categorized either as **sonorants** or **obstruents**. Sonorants are sounds that are made with the flow of air with no obstacle in its way such as all vowels, nasal sounds [m], [n], [ŋ] and liquid [l]. On the other hand, in obstruent sounds, the airstream is released after being fully blocked as in [p], [t], [k], or partially blocked as in [s] and [tɕ]. The following are some examples of (a) sonorants and (b) obstruents:

(1) (a) Sonorants
만사 [***m****ansa*] 'all things'
난 [***n****an*] 'orchid'
라디오 [***l****adio*] 'radio'
암 [***a****m*] 'cancer'

(b) Obstruents
감사 [***k****amsa*] 'thanks'
산 [***s****an*] 'mountain'
자몽 [***tɕ****amoŋ*] 'grapefruit'
밤 [***p****am*] 'night, chestnut'

Consonants and vowels can also be categorized as **oral** or **nasal** depending on the opening or closing of the nasal passage via the **velum**. As shown in Figure 2.2 (a) below, the velum closes the nasal passage when producing most consonants and vowels, so that the airstream can flow through the oral cavity. However, when producing nasal consonants and vowels, the velum lowers to open the nasal passage to let the airstream flow through it as in Figure 2.2 (b).



(a) oral (b) nasal

**Figure 2.2** Oral versus nasal sounds

The following are some examples of oral and nasal speech sounds:

(2) (a) Oral
봄 [***p****om*] 'spring'
달 [***t****al*] 'moon'
팔 [***p****al*] 'foot'

(b) Nasal
몸 [***m****om*] 'body'
날 [***n****al*] 'day'
방 [***p****aŋ*] 'room'

In Korean, there are only three nasal sounds, all being consonants, but in some languages such as French, there are nasal versions of some regular vowels as well.

## 2.2 SEGMENTAL FEATURES IN KOREAN: CONSONANTS

Consonants are produced as air from the lungs is pushed through the **glottis**, the opening between the vocal folds, and out of the mouth. They can be classified according to the state of the glottis, and by the place and manner of their articulation. In this section, we will detail what this means.

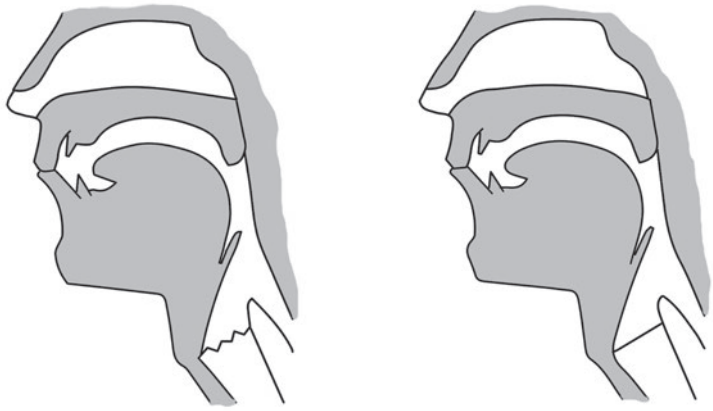
### 2.2.1 States of Vocal Folds

**Voicing** of a consonant is determined by the states of the glottis, which determines whether the vocal folds vibrate or not. The sound /s/ is called **voiceless** because the vocal folds are open and the airstream can freely pass through it, and as a result, there is no vibration of the vocal folds. On the other hand, the sound /z/ is called **voiced** because the vocal folds close and the airstream causes the folds to vibrate as it passes through them. One can actually feel on one's throat whether there is vibration. Figure 2.3 below shows different states of the vocal folds, which will result in the production of different sound types.

In English, two similar consonants can be differentiated just by their voicing, as in the following examples:

| (3) | (a) Voiced | (b) Voiceless |
|---|---|---|
| | **b**ay [b] | **p**ay [p] |
| | **d**oll [d] | **t**oll [t] |
| | **g**old [g] | **c**old [k] |

The example words in (a) and (b) are phonetically identical in the General American accent (their pronunciation is identical) except for the first consonants that differ only by their voicing where the states of the glottis play an important role. These types of pairs of words are known as **minimal pairs** where only one feature of a consonant differs from the other word in the pair. In the English example word '<u>b</u>ay', the consonant [b] is considered voiced because it is produced by the vibration of the vocal folds as the airstream passes through the closed folds, as in Figure 2.3 (a) below. In the example word '<u>p</u>ay', on the other hand, the consonant [p] is produced by the airstream that passes the open vocal folds without any vibration, as in Figure 2.3 (b) below, and therefore, it is voiceless. Therefore, voicing can be used as a **distinctive feature** in a minimal pair in English, the only feature that makes the two words different from each other.



(a) voiced (b) voiceless

**Figure 2.3** Voiced versus voiceless sounds

In Korean, the voicing is not a crucial feature in categorizing consonants. Various studies claim that the Korean plain obstruent consonants [p], [t], [tɕ], and [k] and aspirated obstruents [pʰ], [tʰ], [tɕʰ], and [kʰ] do not show distinctive VOT[1] values, which can cause confusion to many language learners (M.R. Kim 1994, Choi 2002, Silva 2006a, Wright 2007).[2] The plain consonants [p], [t], [tɕ], and [k] are not fully voiced in word initial positions. Therefore, Korean consonants cannot be categorized in just two groups in terms of their voicing, as in English. Since the plain obstruents are voiceless in word-initial positions, a third group [±voice] should be included to the [+voice] and [–voice] distinction as in the following table.

[1] The Voice Onset Time (VOT) refers to the time between the start of the consonant and the start of vibration in the vocal tract. For /ba/ the voicing starts when the speech sound starts; for /pa/ the voicing is delayed. This acoustic feature correlates with the phonological feature of aspiration.

[2] Plain and aspirated obstruents were clearly distinguished in terms of VOT in older generations (Cho and Keating 2001, Cho et al. 2002) but such a distinction is being lost in younger generations in the Seoul dialect (especially among females).

**Table 2.2** Voiced versus voiceless consonants in Korean

| *+voice* | *±voice* | *–voice* |
|---|---|---|
| m, n, ŋ | p | pʰ, p’ |
| l | t | tʰ, t’ |
| | | s, s’ |
| | tɕ | h |
| | k | tɕʰ, tɕ’ |
| | | kʰ, k’ |

As the shapes of the Korean alphabet letters show, the three-way obstruent is the most popular and well-known classification of Korean obstruent consonants: (a) plain, such as [p], [t], [tɕ], [k]; (b) aspirated, such as [pʰ], [tʰ], [tɕʰ], [kʰ]; and (c) tense, such as [p'], [t'], [tɕ'], [k'].

An obstruent consonant can be **aspirated** when it is produced by an additional and explosive airflow. In English some obstruent consonants have aspiration: the sounds [pʰ] as in 'p̲ot', [tʰ] as in 't̲op', [kʰ] as in 'c̲op'. An extra puff of air is pushed out when these sounds begin a word or stressed syllable in English. Hold a piece of paper close to your mouth when producing the [p] consonants in 'p̲in' and 'sp̲in'. You should notice extra air when you say 'p̲in'. As you can see, the English obstruent consonants such as [p] and [t] are aspirated only if they are word initial or in a stressed syllable initial position.

In Korean, on the other hand, there are some obstruent consonants that are always aspirated, some that are always unaspirated, and some that are slightly aspirated in word-initial positions as in the table below. Speakers of English without prior knowledge of Korean might think that Korean consonant [p] as in *pata* [pɑdɑ] 'sea' is equivalent to English [b] as in 'boy' or [p] as in 'pea'. However, none of these two English consonants are the exact counterpart of the Korean consonant [p]. English [b] as in 'boy' is a voiced stop and [p] as in 'pea' is a voiceless aspirated stop, while Korean [p] as in *pata* 'sea' is a voiceless lax stop. For this reason, consonants and vowels are often described according to their features or with IPA.

**Table 2.3** Aspirated consonants in Korean

| *aspirated* | *slightly aspirated* | *unaspirated* |
|---|---|---|
| pʰ | p | p' |
| tʰ | t | t' |
| tɕʰ | tɕ | tɕ' |
| kʰ | k | k' |

The consonants in the middle column, also known as plain consonants, are slightly aspirated in word initial positions. These four consonants [p], [t], [tɕ], and [k] were introduced earlier as the [±voiced] group. The tense obstruents in the last column are always unaspirated.

Korean obstruents can also be **tense** when the vocal folds are tensioned and do not completely open, as in cases when voiceless obstruents are produced (Kim and Duanmu 2004). However, because the folds are not placed together so closely as in the case of voiced sounds, the tense consonants are voiceless like the aspirated ones. Korean tense obstruents are similar to Spanish and French obstruents [p], [t], [k].

So far, we have looked at different ways of categorizing Korean consonants based on the states of the vocal folds. In the next section, two additional categories will be introduced in terms of place of articulation and manner of articulation.

Table 2.4 Tense consonants in Korean

| *+tense* | *−tense* |
|---|---|
| p’ | p, $p^h$ |
| t’ | t, $t^h$ |
| s’ | s |
| tɕ’ | tɕ, $tɕ^h$ |
| k’ | k, $k^h$ |

## 2.2.2 Place of Articulation

Korean consonants, like consonants in all languages, can be categorized in terms of the **place of articulation**. When different consonants are produced within the vocal tract, different parts of the oral cavity, such as the tongue, lips, teeth, alveolar ridge, soft palate and hard palate, velum, and glottis (see Figure 2.1 above) intervene in the outgoing airstream and produce different types of consonants. In Korean, consonants can be subcategorized into the following five types depending on five different places of articulation.

**Bilabial** consonants are made by touching the upper and lower lips together. There are four bilabial consonants in Korean: [m] as in ***mom*** ‘body’, [p] as in ***pal*** ‘foot’, [$p^h$] as in ***$p^h$al*** ‘arm’, and [p’] as in ***p’aŋ*** ‘bread’.

**Alveo-dental** consonants are made by touching the area between the back of the upper teeth and the alveolar ridge with the tongue tip. There are six alveo-dental consonants in Korean: [t] as in ***tal*** ‘moon’, [$t^h$] as in ***$t^h$al*** ‘mask’, [t’] as in ***t’al*** ‘daughter’, [n] as in ***nal*** ‘day’, [s] as in ***sal*** ‘flesh’, and [s’] as in ***s’al*** ‘rice’.

**Palato-alveolar** consonants are made by touching the area in between the alveolar ridge and the hard palate on the roof of mouth with the tongue body. There are three alveo-palatal consonants in Korean: [tɕ] as in ***tɕam*** ‘sleep’, [$tɕ^h$] as in ***$tɕ^h$a*** ‘car’, and [tɕ’] as in ***tɕ’ak*** ‘pair’.

**Velar** consonants are made at the soft part of the roof of the mouth behind the hard palate, the velum. There are three velar consonants in Korean: [k] as in ***kam*** ‘persimmon’, [$k^h$] as in ***$k^h$al*** ‘knife’, and [k’] as in ***k’um*** ‘dream’.

**Glottal** consonants are produced at the larynx, between the vocal folds. There are two glottal consonants in Korean: [h] as in ***hana*** ‘one’ and [ŋ] as in ***paŋ*** ‘room’.

Classification of Korean consonants based on the five places of articulation can be summarized as in the following table.

Some Korean consonants differ from those of English in terms of their place of articulation. For instance, English has one additional place of articulation known as labio-dental where the upper teeth and the lower lip are used to produced consonants such as [f] and [v]. Because Korean lacks such consonants, these two consonants are replaced by Korean [$p^h$] and [p] respectively when adopting English loanwords as in [$p^h$oɛbʌ] for the English word ‘forever’. For the English palatal consonants [tʃ] for ‘church’ and [dʒ] for ‘juice’, the Korean

Table 2.5 Korean consonants with respect to place of articulation

| *bilabial* | *alveo-dental* | *alveo-palatal* | *velar* | *glottal* |
|---|---|---|---|---|
| p, $p^h$, p’<br>m | t, $t^h$, t’<br>s, s’<br>n, l | tɕ, $tɕ^h$, tɕ’ | k, $k^h$, k’ | h, ŋ |



counterparts [tɕ], [$tɕ^h$], and [tɕ’] are produced slightly more toward the front of the oral cavity, and therefore, they are classified as palato-alveolar instead of palatal.

## 2.2.3 Manner of Articulation

Consonants of all languages can also be classified in terms of how the airstream is modified within the vocal tract. Korean has the following five **manners of articulation**.

**Stops** are made by obstructing the airstream completely in the oral cavity. This can be achieved by using the different places of articulation introduced in the previous section. For instance, [p] and [m] are produced by stopping the airstream by putting the upper and lower lips together.

**Fricatives** are made by partial obstruction of the airstream with the friction of relevant places of articulation. For instance, [s] and [h] are made by stopping the air partially so that a hissing noise is produced while the air escapes through a small opening in the oral cavity.

**Affricates** are made by briefly stopping the airstream and then releasing the air slightly so that a sound that is similar to a fricative is produced. For instance, [tɕ], [$tɕ^h$], and [tɕ’] are produced as a quick sequence of stop followed by fricative. Korean affricates have been subjects of debate among many researchers in terms of their place of articulation. Traditionally, the three Korean affricates were considered to be palatal /c, c’, $c^h$/, just like English affricates. In later works, they were claimed to be alveolo-palatals /tɕ, tɕ’, $tɕ^h$/ (Hume 1990, Shin et al. 2013), palato-alveolar /tʃ, tʃ’, $tʃ^h$/ (Ahn 1985, Cho 1990a, H.B. Lee 1993), or even just alveolar /ts, ts’, $ts^h$/ (H. Kim 1999, 2001). The differences among these four places of articulation can be accounted for by their phonological features. Many authors of Korean linguistics choose different classifications for different reasons. This book will place the affricates under post-alveolar so that they are not alveolar but anterior to palatal as shown in Table 2.6 below.

**Nasals** are made by closing the velum so that the airstream does not go through the oral cavity, but through the nasal cavity instead. For instance, [m], [n], and [ŋ] are produced by stopping the airflow that is exhaled through the nasal cavity.

Table 2.6 Korean consonants

| | | *Bilabial* | *Alveolar* | *Post-alveolar* | *Palatal* | *Velar* | *Glottal* |
|---|---|---|---|---|---|---|---|
| Stop | lax | p | t | | | k | |
| | tense | P’ | t’ | | | k’ | |
| | aspirated | $p^h$ | $t^h$ | | | $k^h$ | |
| Affricate | lax | | | tɕ | | | |
| | tense | | | tɕ’ | | | |
| | aspirated | | | $tɕ^h$ | | | |
| Fricative | lax | | s | | | | h |
| | tense | | s’ | | | | |
| Nasal | | m | n | | | ŋ | |
| Liquid | | | l | | | | |
| Glides | | w | | | j | | |

**Liquids** are made by a partial obstruction of the airstream without any friction. While the tongue tip touches the alveo-dental area, the air escapes the oral cavity at the sides of the tongue. For instance, when [l] is produced, one can feel the air escaping within the oral cavity on the two sides of the tongue body.

**Glides** are produced with little or no obstruction of the airstream in the mouth. When occurring in a word, they must always be either preceded or followed directly by a vowel. The Korean glides always precede a vowel, never follow one. Glides are transitional sounds, being partly like consonants and partly like vowels, and they are sometimes called **semivowels**. In producing the palatal glide [y], the blade of the tongue is raised toward the hard palate. The bilabial glide [w] is produced by both raising the back of the tongue toward the velum and simultaneously rounding the lips.

Now that we have all three ways of classifying Korean consonants, we can summarize all these features into a single table above: states of the glottis, place of articulation, and manner of articulation. Voicing is not included in this chart because it is not a clear criterion in classifying Korean obstruents, as mentioned earlier. A similar problem arises with aspiration, since all plain stop consonants are slightly aspirated in word-initial positions. However, we will keep these categories in the summary table to simplify the classification.

## 2.3 ARTICULATION: KOREAN VOWELS

Vowels are produced as air from the lungs is pushed through the glottis, while the vocal folds are closed to vibrate and resonate the outgoing airflow without any further intervention within the vocal tract. Vowels are sounds in which no extreme constriction is made; the air flows out of the mouth relatively freely and the sound is relatively loud and strong. They can be classified according to the presence or absence of glides into two categories: simple vowels (**monophthongs**) and complex vowels (**diphthongs**).

## 2.3.1 Simple Vowels

Simple vowels are independent vowels that can stand alone in a syllable, being the minimal unit carrying a meaning such as *i* 'two' and *o* 'five'. In Korean, there are ten simple vowels; their types are defined based on the position of the tongue within the oral cavity when producing the corresponding vowels, and their positions are determined based on the height and position of the tongue within the oral cavity.



### *2.3.1.1 Tongue Height and Tongue Position*

To produce different types of vowels, the height of the tongue can stay high, mid, or low within the oral cavity. This is also determined by the opening of the mouth. For the **high vowels**, the mouth is slightly open so that the body of the tongue is close to the ceiling of the oral cavity. In case of **mid vowels**, the mouth is halfway open and therefore, the body of the tongue is positioned neither too close nor too far from the ceiling. For the **low vowels**, the lower jaw is dropped down and the mouth is wide open, and therefore, the body of the tongue is distant from the ceiling. The Korean high vowels are [i], [y], [ɯ] and [u], the mid vowels are [e], [ø], [ʌ], and [o], and the low vowels are [ɛ] and [ɑ].

In addition to determining the types of vowels in terms of the height of the tongue, the vowels can also be classified by how close to the front the tongue is within the oral cavity. Vowels can be front when the air pressure is concentrated in the front part of the tongue while producing vowels. Likewise, they can be back if the air pressure is concentrated in the back of the tongue. Based on the frontness of the tongue, vowels can be front, central, or back. The Korean vowels [i], [e], [ɛ], [y] and [ø] are **front vowels**, and [u], [ʌ], [ɯ], [ɑ] and [o] are **back vowels**.

The exact point of height and frontness of vowels are not the same in all languages. For example, in some languages the vowel [ɑ] can go slightly toward the front, whereas in others slightly toward back. Personal variation, although minor, can also be observed within a group of people who speak the same language. Some Korean speakers pronounce [ʌ] and [ɯ] as **central vowels**, [ə] and [ɨ], respectively. Also, the distinction between [e] and [ɛ] is disappearing among younger generations. The front rounded vowels [y] and [ø] are turning into diphthongs [wi] and [we], respectively, in younger generations.

### *2.3.1.2 Lip Rounding*

The next category that determines the type of vowels is the roundness of the lips. Some vowels require the lips to form a round shape to produce them, as in the back vowels [u] and [o]. Depending on the inventory of different languages, some back vowels may not be necessarily round. Some front vowels can be rounded as well.

Based on the three categories to determine the types of vowels, height, frontness, and roundedness, the ten simple Korean vowels can be organized as in the following table. The front high and mid vowels include not only [i] and [ɛ] but also the **rounded vowels** [y] and [ø] as shown in the chart.

Table 2.7 Korean vowels

| | *Front unrounded* | *Front rounded* | *Back unrounded* | *Back rounded* |
|---|---|---|---|---|
| High/Close | i | y | ɯ | u |
| Mid | e | ø | ʌ | o |
| Low/Open | ɛ | | ɑ | |

## 2.3.2 Diphthongs

Simple vowels are sometimes preceded by glides that can be considered as **semi-consonants** or **semi-vowels** [w] and [j] sounds to form vowels such as those in English 'boy' [bɔɪ], *lie* [lɑɪ], 'bow' [bɑʊ], where two vowels appear in sequence as in [ɔɪ], [ɑɪ], and [ɑʊ], among others. In Korean, diphthongs are formed when simple vowels appear right after a glide, either [w] or [j]. Examples of [w] and [j] glides and simple vowels are as follows:

(4) [wɑ] as in 화 [*hwɑ*] 'anger', 과 [*kwɑ*] 'lesson'
[we] as in 왜 [*we*] 'why'
[wɛ] as in 웨이터 [*wɛit$^h$ʌ*] 'waiter'
[wʌ] as in 뭐 [*mwʌ*] 'what'

[jɑ] as in 야구 [*jɑku*] 'baseball'
[jʌ] as in 여자 [*jʌca*] 'woman', 겨울 [*kjʌul*] 'winter'
[jo] as in 묘 [*mjo*] 'tomb', 학교 [*hɑk'jo*] 'school'
[ju] as in 우유 [*uju*] 'milk'

There is an **off-glide diphthong** which is a combination of [ɯ] and [i]. The high back unrounded vowel [ɯ] becomes the velar approximant [ɰ].

(5) [ɰi] as in 의사 [*ɰisɑ*] 'doctor'

Now, going back to the two rounded front high and mid vowels [y] and [ø], these two vowels differ from the listed diphthongs in the following aspects. All diphthongs differ from monophthongs or simple vowels in terms of their length and the shape of the lips. Diphthongs are longer in timing when compared to simple vowels because there are two different sounds combined together. In addition, the position of the tongue at the beginning of the production is different from that at the end of production. In other words, the two components of the

diphthongs require the vocal tract to use two different ways of producing them. For example, in the vowel [wɑ], the beginning of the vowel is produced by rounding the lips, but the ending of the vowel requires the mouth to open wide to produce the low back vowel [ɑ]. However, the two simple vowels [y] and [ø] have shorter production times when compared to regular diphthongs. However, as we have mentioned, they are becoming more like diphthongs in the speech of younger generations.

## 2.4 SUPRASEGMENTALS IN KOREAN

Imagine you are creating an automated voice message using a voice synthesis computer program. The first thing you would need to do is to create consonants and vowels and combine them in an intelligible sequence as listed in the example sentence below.

(6) 다음 주말에 친구 만나기로 했어?
Taum cwumal-ey chinkwu manna-kilo hay-ss-e?
next weekend-LOC friend meet-decide-PST-DEC
'Have you decided to meet your friend next weekend?'

Once that is finished, what would you add to this string of consonants and vowels to make it more like human utterance? You would probably add a short juncture between *taum cwumal-ey* 'next week' and *chinkwu manna-kilo haysse* 'have you decided to meet a friend', and a rising tone at the end of the sentence to make it sound like a yes–no question. When you play back what you have just created, you will notice that the sentence is too flat and that it needs some tonal contours applied to the entire sentence, in addition to the ending tone. You would then need to figure out which part of the sentence will have prominence such as longer duration and higher tone placed on certain vowels. In phonetics, the longer duration applied to certain speech sounds within a sentence or phrase is expressed in terms of **length**, and the tonal contour in terms of **intonation**.

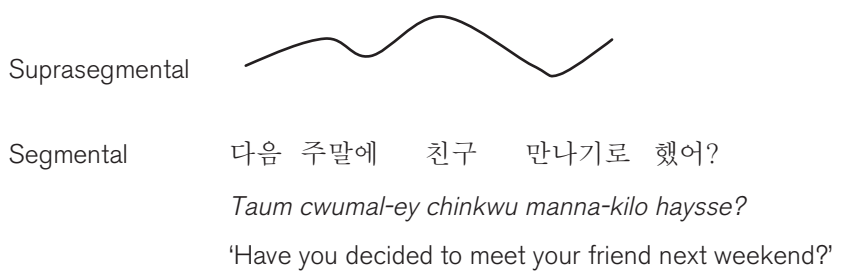



Figure 2.4 Segmental and suprasegmental

In any given language, segments are the ones that express the actual meaning. Other linguistic properties, such as length, stress, pitch, and loudness, are applied to one or more segments to make them more noticeable than others. Combination of some of these features creates a melody type of contour generally known as **intonation**, and each of these properties applied to the segments are called **suprasegmentals**.

All languages have segments and suprasegmentals, but their inventories vary across languages. For instance, the number and types of consonants and vowels vary among languages. In a similar way, types of suprasegmental properties also vary across languages. Let us have a closer look at the most common properties included in this category, and see what salient features are included in Korean.

## 2.4.1 Length, Pitch, Tone, and Stress

### *2.4.1.1 Length*

**Length** refers to the extended duration of a speech sound compared to other sounds. There are distinctively long vowels as well as long consonants. In some languages, the length of a segment has an effect on meaning. That is, substituting a long segment for an identical short segment can result in a different word, as in the following examples:

| | | | | |
|---|---|---|---|---|
| (7) | a. | Short | 말 [mal] | 'horse' |
| | | | 눈 [nun] | 'eye' |
| | | | 밤 [pam] | 'night' |
| | | | 이 [i] | 'tooth' |
| | b. | Long | 말: [ma:l] | 'language' |
| | | | 눈: [nu:n] | 'snow' |
| | | | 밤: [pa:m] | 'chestnut' |
| | | | 이: [i:] | 'two' |

In this case, two of the same words are different only in terms of their vowel length, as in *mal* 'horse' versus *ma:l* 'language'. The lengthening of the second noun *ma:l* is lexically inherent, in which case the lengthening is called **phonemic** or **contrastive**. Traditionally, this vowel lengthening is regarded as a sequence of two short vowels. However, there is a general consensus that this vowel length distinction is disappearing in Standard Korean and only survives in certain dialects.[3] In fact, many of these example words are still included in major Korean dictionaries and are reinforced by the media.

[3] Gyungsang, Chung-Cheong, and Jeonla dialects are known to maintain this vowel lengthening. However, some research suggests that there is variation among speakers (Park 1994).

A vowel is also lengthened when its environment changes, as in English stressed syllables, in which case the lengthening is called **allophonic**. It is generally known that high vowels have a shorter duration than low vowels, and vowels before a voiceless coda consonant have a shorter duration.

In many languages, a long vowel is regarded as a sequence of two short vowels, which is also the case for consonants, also known as **geminates**. In long consonants, substituting a long segment for an identical short segment can result in a different word. For instance, the Japanese word *kitta* 'came' has a lexically inherent long consonant [tt] when compared to *kita* 'cut'. In case of Korean consonant geminates, they are mostly morphological, where two of the same consonants are in the **coda** (final consonant in a syllable) and **onset** (initial consonant of a syllable) of two adjacent syllables, as in **compounding** constructions where two words are combined together as one. Many scholars also claim that Korean tense consonants must be seen as geminates (Silva 1992, Ahn and Iverson 2004), as in the following examples:

**Table 2.8** Long and short consonants

| (8) | *Short* | *Long* |
|---|---|---|
| | 몸 [m] 'body' | 잇-몸 [m-m] 'gum (of teeth)' |
| | 거미 [k] 'spider' | 독-거미 [k-k] 'poison spider' |

In addition to the lengthening cases described above, an utterance final syllable is also lengthened. When spoken, the example sentence below will have the utterance-final syllable *ka:* 'go' lengthened, but lengthening does not occur with the same verb stem *ka* 'go' at the non-final position.

(9) 가고 싶으면 가:
**ka**-ko siph-umyen **ka**:
go-want-if go
'Go if you want to (go).'

### *2.4.1.2 Pitch, Tone, and Stress*

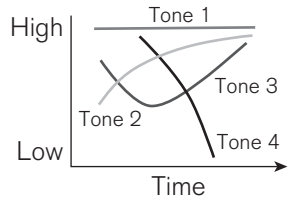
As mentioned earlier, all speech forms have a tonal contour that can be perceived as a sequence of high and low frequency known as **pitch**. For instance, the yes–no question (6) above is perceived and understood as a yes–no question because of the final rising tone. That is, the final syllable *-e* carries a relatively higher pitch than its neighboring syllables. Speakers use pitch to convey emphasis, contrast, or even emotion. Given this, what determines which syllable will take a high pitch or low pitch within an utterance? In point of fact, this varies across languages or types of languages.

Some languages are called tonal or **tone languages**, while others are called **intonation languages** depending on the mechanism that triggers the high pitch

within an utterance. In tone languages, such as Mandarin Chinese, **tone** functions as the key element in creating a given contour in an utterance. Tone is a contrastive pitch in language to distinguish lexical or grammatical meaning. In Mandarin Chinese, for instance, many words are differentiated by the use of four tones and a neutral tone, and they are used to determine the meanings of some homophones. The Mandarin word *ma* can have four different meanings depending on the tone used with them.

**Table 2.9** Tones in Mandarin Chinese

| *Tone* | *Mark* | *Description* | *Meaning* |
|---|---|---|---|
| Tone 1 | mā | high and level | 'mother' |
| Tone 2 | má | medium then rising | 'numb' |
| Tone 3 | mǎ | low then rising | 'horse' |
| Tone 4 | mà | high then falling | 'scold' |
| neutral | ma | flat, no emphasis | question particle |




Some languages are considered tone languages because of their distinctive tonal features – Mandarin Chinese, Vietnamese, Thai, and some African languages. Although Korean is considered an intonation language, the Southern dialect Gyungsang is known to have lexical tones in a way similar to Mandarin as described above (Jun et al. 2005). In the case of Gyungsang dialect, however, there are only three tone types, high, mid, and low, as shown in the following table.

**Table 2.10** Tones in Gyungsang dialect

| *Tone* | *Mark* | *Meaning* |
|---|---|---|
| high | són / kí | 'guest' / 'flag' |
| mid | sōn / kî | 'hand' / 'ear' |
| low | sòn / kì | 'grandchild' / 'crab' |

What then determines which syllable will take a high pitch or low pitch in intonation languages such as standard Korean and English? Let us consider English first since Korean has a rather unique system.

In the case of English, as in many other intonation languages such as Spanish, Italian, and Swedish, the relative prominence is placed on a certain syllable within a word and is manifested through higher pitch, loudness, and lengthening known as **stress**. In this way, the domain of stress is the syllable and different words carry stress in ultimate, penultimate, or antepenultimate syllables, as in 'result', **'**republic', and 'democracy'. In some languages, more than one syllable within a word may be stressed as in nation**al**ity and confi**den**tial, where the bold is the primary stress and the underlined is the secondary stress.

In English, stress may be used as the only clue in differentiating two words spelled the same but with different meaning, such as noun versus verb, as in the following examples:

**Table 2.11** Stress in English: noun versus verb

(10)

| *noun* | *verb* |
|---|---|
| **re**port | re**port** |
| **ob**ject | ob**ject** |
| **pre**sent | pre**sent** |
| **ex**port | ex**port** |

In addition, the placement of stress changes when the word category changes as a result of added derivational suffixes.

**Table 2.12** Stress placement change with derivational suffixes in English

(11)

| *noun* | *adjective* |
|---|---|
| de**mo**cracy | demo**cra**tic |
| **po**litics | po**li**tical |
| **u**niverse | uni**ver**sal |

Stress is manifested in different ways in different languages, such as Cambodian, in which either all syllables within a word are stressed or all unstressed. In Finnish and Hungarian, the initial syllables are stressed. In Polish, the penultimate syllables are stressed, but in French, the final syllables. It is generally understood that Korean does not have lexical stress, but rather phrasal prominence. This will be explained in detail in the following section.

## 2.4.2 Intonation

We have said that the domain of stress is the syllable. However, when a different range of high and low pitches is applied over a phrase or sentence in an utterance, the contiguous pitches together form an melody type of contour known as **intonation**. Intonation is a variation of pitch used to convey meaning that cannot be expressed with words alone. Speakers use intonation to signal sentence types, discourse structure, emotion and attitude toward the utterance as well as the hearer. Intonation is found in every language including tone languages, but its structure and function differ from language to language. For instance, in English, yes–no questions have a rising intonation whereas declarative statements and wh-questions have a falling intonation. Intonation can also be used in shaping discourse structure to signal the beginning and the end of a speech turn, emphasis, contrast, and various other phenomena at this level.

In English, lexical stress plays an important role in the way the tonal contour is shaped over a phrase or sentence. That is, some of the stressed syllables within a phrase or sentence will lead into either a high or low pitch when shaping a tonal contour, which is called **pitch accent**. English pitch accents are not lexically inherent whereas stresses are. Now, let us see how Korean speakers determine where to place a high and low pitch over a phrase or sentence(s). In Korean, intonation contour is determined mainly at the phrasal level, since there is no lexical stress that could result in prominence at the sentence level.

Standard Korean has two intonation units, the **Intonation Phrase (IP)** and the **Accentual Phrase (AP)**. An IP can have one or more APs and is marked by a **boundary tone** and final lengthening. The final syllable of all utterances is marked with a boundary tone, which will be labeled with either a high (H) pitch or a low (L) pitch followed by (%) which means the end of the IP. The smaller unit AP can contain one or more words and is marked by phrase-initial LH or HH tones, the choice between which is determined by the initial segment type, and phrase final LH tones, but without lengthening (Jun 1998, 2000). More details on AP and IP will be provided in the next section.

### *2.4.2.1 Accentual Phrase*

Unlike English, the peak of the intonation contour in Korean is not determined by stressed syllables, but by some inventories of predictable phrasal tone shapes determined at the AP level. A default AP can contain one or more words and is marked by a phrase initial H tone if the phrase initial segment is aspirated or a tense consonant. In all other situations an L tone is applied. Therefore, in standard Korean, the AP initial aspirated and tense consonants such as [pʰ], [tʰ], [tɕʰ], [kʰ], [s], [h] and their tense counterparts trigger a high initial tone H. All other consonants trigger a low initial tone L. These two initial tones are followed by a high tone H, which could be omitted if there are not enough syllables within the AP. The default AP final tone is also high H, but could be overridden by an IP tone if the AP and IP final boundaries overlap. Again, a default AP will have either HHLH or LHLH if the phrase contains at least three syllables. Otherwise, the medial H can be omitted resulting in HLH, LLH, LHH, LH, among others. Consider the following examples of AP contours.

(12) **L** H L H **L** L H AP tonal contour
[미영이는]$_{AP}$ [민수를]$_{AP}$ [좋아해요.]$_{AP}$
Miyengi-nun minswu-lul coahhay-yo
Miyoung-TOP Minsu-ACC like-DEC
'Miyoung likes Minsu.'

In the example above, both the first and second AP have an initial L tone because of the AP initial consonant [m]; however, the first AP has a LHLH tonal pattern because it has four syllables, whereas the second AP has a LLH tonal

pattern because it has only three syllables. The sentence (12) has three APs but all of them together form a single tonal contour IP.

### 2.4.2.2 Intonational Phrase

A default IP has one or more APs and is marked with a final **boundary tone**, labeled with a tone type followed by %, which leads into a bigger juncture due to the lengthening of the IP final syllable. The final H tone of an IP-final AP is overridden by an IP boundary tone but IP-medial AP will mostly have an H final or LH final tone. For instance, a short sentence such as *annyengha-se-yo?* 'How are you?' or even a short phrase such as *way?* 'Why?' can have an IP if it ends in a boundary tone. Longer sentences with more words can have one or more IP.

Consider the following example sentences with an IP containing only one AP. The initial segment of the example (13) is a lax stop [p] in *paliyeyo* 'it is a foot' and therefore, the AP initial tone is L. At the IP level, the AP final H assigned to the final syllable *yo* is overridden by the IP final boundary tone L% which is commonly used in declarative statements.

(13) L H L **L%** IP level tonal contour
L H L ~~H~~ AP level tonal contour
[발 이 에 요.]$_{IP}$
pal -iey -yo
'It is a foot.'

In example (14), in contrast, the AP initial tone is H because its initial segment is an aspirated stop [p$^h$] in *phaiyeyo* 'it is an arm'. The AP final H is also overridden by IP final L%.

(14) H H L **L%** IP level tonal contour
H H L ~~H~~ AP level tonal contour
[팔 이 에 요.]$_{IP}$
phal -iey -yo
'It is an arm.'

Below are pitch tracks illustrating the IP contours of sentences (13) and (14).

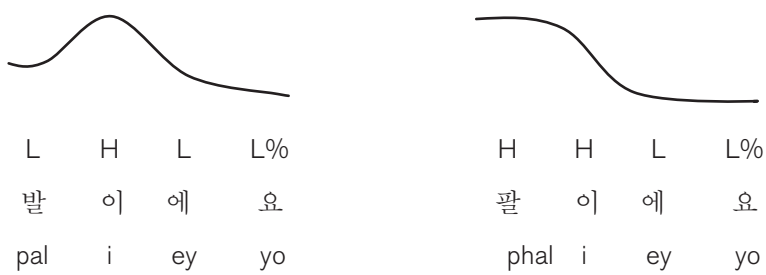



Figure 2.5 Pitch tracks of (13) and (14)

In example (15) below, the IP boundary tone is H%, since the sentence is a question. H% is the typical tone used in Korean yes–no questions.

(15) L H L **H%** IP level tonal contour
L H L H AP level tonal contour
[안녕하세요?]$_{IP}$
Annyengha-se-yo?
Are you well? / How are you?'

In other circumstances, speakers may use a different IP boundary tone for the same greeting *Annyengha-se-yo?* as in (16) below, where the IP boundary tone is HL% instead of H%. In such a case, the greeting does not sound like a yes–no question, but like a formulaic greeting expression.

(16) L H L **HL%** IP level tonal contour
L H L H AP level tonal contour
[안녕하세요?]$_{IP}$
Annyengha-se-yo?
'Are you well? / How are you?'

In Korean, there are several combinations of H and L used as a boundary tone. The most commonly used tones are H%, L%, HL%, LH%, LHL%, and HLHL%. However, other combinations are also used, such as LHLH%, LHLHL%, or an even larger combination of tones. A typical boundary tone is applied on the last syllable of an IP regardless of the number of tones it contains. Different types of boundary tones are illustrated in the following diagram. The vertical line indicates the syllable boundary between the final and penultimate syllables within an IP (Jun 2000).

Boundary tones are known to convey different types of information about the sentence type as well as the speaker's emotion and attitude. The boundary

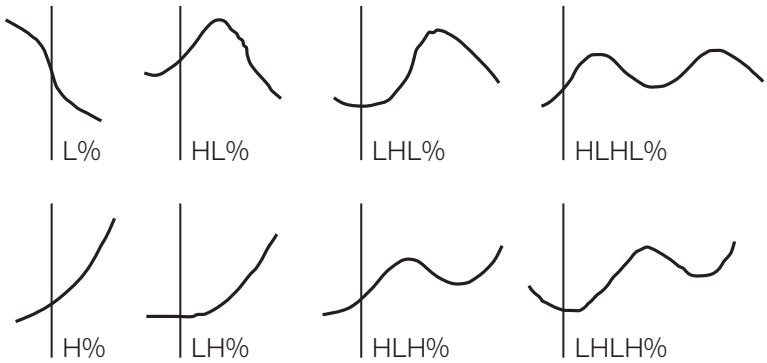



**Figure 2.6** Korean intonation phrase boundary tones (Reprinted from Jun 2000)

tone is realized on the final syllable of the IP, and depending on sentence type, its pragmatic meaning, or the shape of the tonal contour, it may carry a L initial boundary tone such as L%, LH%, LHL%, LHLH%, LHLHL%, or a H initial boundary tone such as H%, HL%, HLH%, HLHL%. These tones can be grouped in monotonals (H% and L%) as in (15), bitonals (HL% and LH%) as in (16), and multitonals with three or more tonal elements as in (17) and (18). In fact, regardless of the number of tonal elements within a boundary tone, the final one is more closely related to the meaning of the sentence, whereas the initial one is related to the overall contour shape (e.g., the number of syllables, the tone assigned to the penultimate syllable).

(17) **LHL%** IP level tonal contour
L H ~~L~~H AP level tonal contour
[아 니 야.]$_{IP}$
ani -ya
'It is not.'

(18) **HLHL%** IP level tonal contour
L ~~L~~H AP level tonal contour
[몰 라.]$_{IP}$
mol -la
'I don't know.'

In naturally occurring conversations, a greater variety of boundary tones can be found. For instance, the use of a boundary tone with ten tonal units was discovered from a television program: HLHLHLHLHL%. This boundary tone was applied to the last syllable of the addressee's first name. Here, a boundary tone with ten tonal elements was used within the vocative particle, a single syllable. Of course, this type of boundary tone is not used often in everyday conversations, although it might occasionally be heard in children's utterances and often described as whiny intonation.

### *2.4.2.3 Phrasing*

When an IP has more than one AP, it can have a variety of tonal contours depending on the meaning of the sentence or the intention/attitude of the speaker. Consider the following two types of questions in (19) and (20) which are the same sentences except for their tonal contours as well as phrasing strategies.

(19) L H L **LH%** IP level tonal contour
L H L H AP level tonal contour
[[어디 가요?]$_{AP}$]$_{IP}$
Eti ka-yo?
'Where are you going?'

Example (19) is a typical case of a wh-question where the wh-word *eti* 'where' and the verb *kayo* 'go' are within the same AP. At its IP level, the LH% tone is usually used for this type of wh-question. Example (20), on the other hand, is a typical case of a yes–no question where the same word *eti* 'where' is now used as an indefinite pronoun 'somewhere' instead of 'where'. This sentence has one IP, but also two APs. Notice that each of the two words *eti* 'where' and *kayo* 'go' forms an AP on its own.

(20) L H L **H%** IP level tonal contour
L H L H AP level tonal contour
[[어디]$_{AP}$ [가요?]$_{AP}$] $_{IP}$
Eti ka-yo?
'Are you going somewhere?'

Native speakers distinguish the meaning between these two questions, (19) and (20), in terms of their phrasing and tonal shape, especially the type of boundary tone. All other wh-words and indefinite pronouns such as *nwukwu* 'who', *mye* 'what', *encey* 'when' are differentiated with the same prosodic strategy. In this way, phrasing provides important information in processing sentence meaning and discourse structure.

Phrasing is also used in organizing sentence constituents, so that sentence elements are grouped accordingly in expressing intended meaning. In the following examples (21)–(23), depending on the way the two APs within each sentence are parsed, all three can have different meanings.

(21) [[미나]$_{AP}$ [언니 집에 가요?]$_{AP}$]$_{IP}$
Mina enni cip-ey ka-yo?
'Is Mina going to her sister's home?'

(22) [[미나 언니]$_{AP}$ [집에 가요?]$_{AP}$]$_{IP}$
Mina enni cip-ey ka-yo?
'Is Mina's sister going home?'

(23) [[미나 언니 집에]$_{AP}$ [가요?]$_{AP}$]$_{IP}$
Mina enni cip-ey ka-yo?
'Are you going to Mina's sister's home?'

Phrasing is also related to the notion of topic, as in example (24), and focus, as in example (25). In this case, the topical and focused phrase usually forms its own IP and therefore has a boundary tone with a bigger juncture.

*topic*
(24) [[민수]$_{AP}$]$_{IP}$ [[여행 못 간대.]$_{AP}$]$_{IP}$
Minswu yehayng mos ka-n-tay
'As for Minsu, he cannot make the trip.'

*focus*

(25) [[미나가]$_{AP}$]$_{IP}$ [[반에서]$_{AP}$ [제일 예뻐.]$_{AP}$]$_{IP}$
Mina-ka pan-eyse ceyil yeyppu-e.
'MINA is the prettiest in class.'

## 2.5 EXERCISES

1. Fill in the consonant and vowel charts using the phonetic symbols in the boxes.

**Table 2.13** Exercise 1 consonant list

| t, s, h, m, l, $p^h$, $k^h$, k, p, tɕ, tɕ', $t^h$, p', $tɕ^h$, ŋ, s', n, k', t', w, j |
|---|

**Table 2.14** Exercise 1 consonant chart

| | | *Bilabial* | *Alveolar* | *Post-alveolar* | *Palatal* | *Velar* | *Glottal* |
|---|---|---|---|---|---|---|---|
| Stop | lax | | | | | | |
| | tense | | | | | | |
| | aspirated | | | | | | |
| Affricate | lax | | | | | | |
| | tense | | | | | | |
| | aspirated | | | | | | |
| Fricative | lax | | | | | | |
| | tense | | | | | | |
| Nasal | | | | | | | |
| Liquid | | | | | | | |
| Glides | | | | | | | |

**Table 2.15** Exercise 1 vowel list

| i, y, ɑ, u, o, e, ɛ, ʌ, ɯ, ø |
|---|

**Table 2.16** Exercise 1 vowel chart

| | *Front Unrounded* | *Front Rounded* | *Back Unrounded* | *Back Rounded* |
|---|---|---|---|---|
| High/Close | | | | |
| Mid | | | | |
| Low/Open | | | | |

2. Have a native speaker read the following words and transcribe what you hear using IPA. Don't forget to put the transcription in brackets.

(a) 할머니 *halmeni* 'grandmother' _____

(b) 도둑 *totwuk* 'thief' _____

(c) 아가씨 *akassi* 'young lady' _____

(d) 귀하다 *kwihata* 'be precious' _____

(e) 잠자리 *camcali* 'dragonfly' _____

3. Write out the following words transcribed in IPA using Hangul and Yale Romanization.
   (1) [pul] 'fire'
   (2) [pʰul] 'grass'
   (3) [p'ul] 'horn'
   (4) [tʌlda] 'reduce'
   (5) [tʰʌlda] 'shake'
   (6) [t'ʌlda] 'tremble'
   (7) [tɕada] 'sleep'
   (8) [tɕʰada] 'kick'
   (9) [tɕ'ada] 'salty'
   (10) [kɯn] 'pound'
   (11) [kʰɯn] 'big'
   (12) [k'ɯn] 'string'
   (13) [sal] 'flesh'
   (14) [s'al] 'rice'

4. Read the following sentence or have a native speaker read it, then find all the consonants and vowel sounds and write them down.
   민수가 살던 곳에는 좋은 식당이 아주 많다.
   [민수가 살던 고세는 조은 식땅이 아주 만타]

   Minswu-ka sal-ten kos-ey-nun coh-un siktang-i acwu manh-ta.
   Minswu-NOM live-RC place-LOC-TOP good restaurant-NOM very many-DEC
   'There are many good restaurants where Minswu used to live.'
   [minsuka saltʌn kosenɯn tɕoɯn sikt'aŋi atɕu mantʰa]

   Consonants: _____

   Vowels: _____

5. Practice saying the sounds of the Korean alphabet to see if you can identify the places and manner of articulation in the mouth.

6. From the sentence in 1, *Minswu-ka sal-ten*, list three consonants and three vowels, and provide distinctive features as in the example in (a). You should provide all relevant features that make each of the following consonants different from others.

(a) [ m ] nasal, bilabial
(b) [ ]
(c) [ ]
(d) [ ]
(e) [ ]
(f) [ ]
(g) [ ]

7. Now, given the distinctive features as in the example (a), provide the consonants representing the features.
(a) [ p' ] stop, bilabial, tense
(b) [ ] fricative, alveo-dental
(c) [ ] nasal, alveo-dental
(d) [ ] fricative, glottal
(e) [ ] affricative, palate-alveolar, aspirated
(f) [ ] stop, velar, plain
(g) [ ] liquid, alveo-dental

8. Given the distinctive features as in the example (a), provide the vowels representing the features.
(a) [ i ] high front unrounded
(b) [ ] high front rounded
(c) [ ] high back unrounded
(d) [ ] high back rounded
(e) [ ] mid front unrounded
(f) [ ] mid back rounded
(g) [ ] low back unrounded

9. Write down the Korean sounds and describe how these sounds are produced.
(a) Bilabial consonants:
(b) Palatal stops:
(c) Nasals:
(d) Glides:
(e) Back vowels:
(f) Rounded vowels:

10. Label each of the following words with the AP initial tone.
수세미 *swuseymi* [susemi] 'scouring pad'
해바라기 *haypalaki* [hɛparagi] 'sunflower'
금요일 *kumyoil* [kɯmjoil] 'Friday'
까마귀 *kkamakwi* [k'amagy] 'crow'
우렁이 *wulengi* [ulʌŋi] 'snail'
피라미 *philami* [pʰiɾami] 'minnow'

토요일 *thoyoil* [tʰojoil] 'Saturday'
대한민국 *tayhanminkwuk* [tɛhanminguk] 'Republic of Korea'
무지개 *mwucikay* [mutɕigɛ] 'rainbow'
라디오 *latio* [ladio] 'radio'

11. Using the brackets, label the AP and IP of the following sentences.
    (a) 무슨 노래예요?
    Mwusun nolay-yey-yo?
    what song-be-Q
    'What song is that?'
    (b) 무슨 소리예요?
    Mwusun soli-yey-yo?
    what sound-be-Q
    'Was it some sort of noise?'
    (c) 뭐 먹었어요?
    Mwe mek-ess-eyo?
    what eat-PST-Q
    'Did you eat something?'
    (d) 누가 간대요?
    Nwuka ka-n-tayyo?
    who go-PRES-Q
    'Who's going?'

CHAPTER 3

# Phonology



## 3.1 BASIC NOTIONS IN PHONOLOGY

In the previous chapter, we talked about different types of speech sounds in Korean, how they are produced and classified. In this chapter on phonology, we will talk about how these speech sounds are combined together to create words and phrases, and how each of these sounds affects its neighboring sounds in creating larger units. We will talk about some characteristics of Korean consonants and vowels, in terms of how they affect each other when combined together. We will also deal with different types of rules controlling sound combinations and explain what makes these combinations identifiable as a sound sequence in the Korean language.

In any language, there are some sound changes that take place over time. For instance, Old English words such as 'honor' used to have the initial consonant [h] pronounced, but it became silent over time. Phonology does not deal with this type of change. Instead, it deals with sound alternations where a consonant or vowel deviates from its original sound under certain circumstances.

### 3.1.1 Phonemes and Allophones

If you consider English words such as 'top' and 'stop', the /t/ in 'top' is fully aspirated and is represented as [$t^h$], while the /t/ in 'stop' is not so aspirated and is represented as [t]. English [t] is fully aspirated at the word initial position or between vowels, but not so aspirated after a consonant as in 'stop', 'steam', and 'stool'. In this case, we say that the English phoneme /t/ has two phonetic realization [$t^h$] and [t] depending on its environment.[1] In this context, **phoneme** refers to a particular set of sounds produced in a particular language that is distinguished by its native speakers from other sets of sounds in that language. The two phonetic realizations of the phoneme /t/ are known as **allophones**, and therefore, the English phoneme /t/ has two allophones [$t^h$] and [t]. These allophones are **non-contrastive** because they do not contribute to a change in meaning.

[1] Phonemes are put between / / and allophones are between [ ].

**Table 3.1** Allophones of the phoneme /t/

(1)

| | *phoneme* | *allophone* |
|---|---|---|
| Korean | [t] | |
| | [tʰ] | |
| English | [t] | [tʰ] |

In English, the phoneme /t/ has two allophones. [tʰ] and [t], depending on its environment, but whether you pronounce the word 'top' with [tʰ] or [t], its meaning does not change – that is, the two sounds are **non-contrastive**. However, the /tʰ/ and /t/ in Korean are two different phonemes, and by replacing the phoneme /tʰ/ with /t/, the word can have a different meaning. Therefore, these two sounds are **contrastive**. For instance, for the Korean word [tʰal] 'mask', if the initial consonant [tʰ] changes into [tal] it becomes a totally different word, 'moon'. In this case, the two words [tʰal] and [tal] are considered **minimal pairs**, where the two words are exactly the same in terms of their pronunciation except for the contrastive sounds that are two different phonemes in that particular language.

**Table 3.2** Plain stops and aspirated stops

(2)

| *Plain stops* | | *Aspirated stops* | |
|---|---|---|---|
| 발 [pal] | 'foot' | 팔 [pʰal] | 'arm' |
| 달 [tal] | 'moon' | 탈 [tʰal] | 'mask' |
| 공 [koŋ] | 'ball' | 콩 [kʰoŋ] | 'bean' |

On the other hand, in the case of Korean examples *tal* 'moon' and *tal-i* 'moon-subj', the [l] in the two examples is realized in two allophones [l] and [ɾ][2] respectively, and they occur in different environments: syllable final versus syllable initial. That is, where [l] occurs, [ɾ] will not occur, and vice versa. The two Korean allophones [l] and [ɾ] are in **complementary distribution**.

[2] [ɾ] is the IPA symbol for alveolar tap (or flap).

**Table 3.3** Complementary distribution of Korean allophones [l] and [ɾ]

(3)

| *syllable final* [ㄹ] | | *syllable initial* [ㄹ] | |
|---|---|---|---|
| 길 [kil] | 'road' | 길이 [ki-ɾi] | 'road-subj' |
| 말 [mal] | 'horse' | 말이 [ma-ɾi] | 'horse-subj' |
| 달 [tal] | 'moon' | 달이 [ta-ɾi] | 'moon-subj' |

Now, one might ask questions such as why in Korean words such as *han* 'one' and *kwuk* 'nation', all phonemes are realized as predicted as in [han] and [kuk] respectively, but in the case of the word *hankwuke* 'Korean', it does not follow its prediction. Instead, it is pronounced as [hɑŋgugʌ], and most people learning Korean at the beginning level have difficulty trying to grasp this discrepancy. The Korean writing system is known to be phonemic in that each and every letter has its own contrastive sound being represented. However, this is true only within a morpheme boundary. Therefore, Korean is called a morpho-phonemic language in that the connection of the sound and letters is fully realized only within a morpheme boundary. For instance, the phoneme [n] in *han* is pronounced as [ŋ] because the next morpheme begins with a [k]. This change of sound is known as **phonological rules** or **sound alternation rules** because the change is not permanent and it occurs only under certain conditions. There are many predictable and non-predictable sound alternations in words, and phonological rules will be able to explain why and when to apply them.

## 3.1.2 Natural Class and Distinctive Features

When describing these phonological rules, things will be much easier if a generalization can be made instead of creating a rule for each of many phonological rules, such as 'change of [n] before [k]', 'change of [n] before [p]', and so on. To be able to make generalizations across different rules and consonants and vowels involved in the alternations, the following notions might be helpful. If you consider the following consonants, you can draw a generalization about them in terms of their articulatory descriptions:

(4) /m/ voiced labial nasal
/n/ voiced alveo-dental nasal
/ŋ/ voiced velar nasal

These three consonants share some common features such as 'voiced' and 'nasal'. Since these are the only nasal consonants in Korean, you can remove the properties about their place of articulations and name this group as 'Korean nasals' since all nasals are voiced. When you use the term 'Korean nasals' you are referring to these three consonants, which are produced by letting the airflow out through the nasal cavity instead of the oral cavity. Therefore, the consonants [m, n, ŋ] form the **natural class** of Korean nasals, which is a set of sounds in a language that share one or two features, and there should be no other sounds in the language that have the same features. All the members of a natural class are affected in the same way in the same environment. Similarly, all members of a natural class have the same effect on other sounds that occur in their environment. Therefore, when applying a phonological rule, it affects the entire natural class instead of just one single sound when they are found in the same environment.

Table 3.4 Voiceless and voiced English plural marking suffix -s

(5)

| *Voiceless* | | *Voiced* | |
|---|---|---|---|
| *singular* | *plural* | *singular* | *plural* |
| cap | cap[s] | cab | cab[z] |
| bat | bat[s] | pad | pad[z] |
| pack | pack[s] | mug | mug[z] |

In the English examples above, the plural marking suffix -s is pronounced either as voiceless fricative [s] or voiced fricative [z] depending on the voice feature of the word final consonants, which are all oral stops in this case. Therefore, this rule is applied to all word final oral stop (or plosive) consonants and depending on their voice features, the plural -s is realized in the same voice feature. In this case, the phonological rule applies to the entire natural class of plosives.

If you consider the consonant chart provided in the Phonetics chapter, all consonants can be categorized based on another property used to describe natural class and which divides all consonants into two groups: **obstruents** and **sonorants**. Obstruents are speech sounds produced with an obstruction of the airflow, such as stops, fricatives, and affricates. Sonorants, on the other hand, are speech sounds produced with a relatively open passage to the airflow such as nasals, liquids, glides, and vowels.

As you can see from the examples above, phonological rules act upon phonetic features instead of on the consonants or vowels themselves. That is, phonological rules alter some phonetic features of the target segment and all other segments that are members of the same natural class are all subject to the same alternation. This implies that all segments are composed of various phonetic features and they can be categorized according to either one of the features they share in common, known as **distinctive features**. Many of these features are represented in pairs, such as [+voice], which is the opposite of [–voice], [+nasal] being the opposite of [–nasal], where the [+] sign means the presence of such a feature and [–] its absence. As you can see, these features are based on the phonetic descriptions of consonants and vowels mentioned in the previous chapter. The most commonly used distinctive features are as follows:

(6) **(a) Major class features** represent the major classes of sounds.
**[± syllabic]**: syllabic sounds refer to vowels and syllabic consonants.
**[± consonantal]**: consonantal sounds include all consonants except for glides.
**[± sonorant]**: sonorants are produced with open passage to the airflow. Sonorants include vowels and glides.
**(b) Laryngeal features** describe the glottal states of sounds.
**[± voice]**: voiced sounds are produced with the vibration of the vocal cords.

**[± spread glottis]**: represents the vocal folds being spread apart for frication to occur. Examples of [+spr.glot]: [h], [$p^h$], [$t^h$], [$k^h$].

**[± constricted glottis]**: represents the vocal folds being held closely together to block the airflow momentarily. Examples of [+const.glot]: [p'], [t'], [k'].

**(c) Manner features** represent the manner of articulation.

**[± continuant]**: continuant feature describes the passage of the airflow through the vocal tract.

**[± nasal]**: nasal sounds are produced by lowering the velum to let the airflow go through the nasal tract.

**[± lateral]**: lateral sounds are produced by letting the airflow pass along the sides of the tongue.

**[± delayed release]**: describes the delayed release of the airflow that distinguishes stops from affricates.

**(d) Place features** describe the place of articulation.

**[± labial]**: labial sounds involve constriction at the lips.

**[± round]**: sound produced with lip rounding.

**[± coronal]**: coronal sounds are articulated with the tip or blade of the tongue.

**[± anterior]**: anterior sounds are produced by placing the tip or blade of the tongue at the alveolar ridge.

**[± high]**: sounds produced by raising the dorsum of the tongue close to the palate.

**[± low]**: sounds produced with the dorsum to a low position in the mouth.

**[± back]**: sounds produced with the dorsum retracted slightly to the back of the mouth.

This sound alternation can be described using the above distinctive features as follows.

(7)

(a) description

[p] becomes [m] when there is [m] or [n] following it

[t] becomes [n] when there is [m] or [n] following it

[k] becomes [ŋ] when there is [m] or [n] following it

(b) rule

[+stop] become [+nasal] before [+nasal]

**Figure 3.1** Sound alternation in nasalization

As shown in the above example, distinctive features [+stop] include all plain, aspirated, and tense stop consonants in Korean, and not all tense stop consonants occur at the syllable final position. Therefore, [+stop] will be enough to describe [p, t, k, $p^h$, $t^h$, $k^h$] from the description above. Korean [+nasal] are also [+voiced] and include only the three nasal consonants [m], [n], and [ŋ]. Therefore, the description in (a) can be summarized using distinctive features as in (b).

Features for vowels are often described with [+high] for high vowels such as [i], [ɯ], or [u]. [+low] is used for low vowels such as [ɑ]. Mid vowels such as [e] and [o] are described with [–high][–low], which means neither high nor low, mid vowel. The two high vowels [i] and [u] can be differentiated by adding [+round] to the vowel [u], so [i] is [+high][–round] whereas vowel [u] is [+high] [+round].

In Section 3.3, some of the major rules will be provided according to their types.

## 3.2 SYLLABLE STRUCTURE

**Syllables** are the smallest units forming words that can be pronounced by any native speaker. A letter 't', for instance, has a name [tee] but cannot be read when it stands alone. However, when a vowel 'o' is added to it, it forms a syllable 'to; and is read as [tu]. 't' is an alphabet letter but 'to' is a syllable. Syllables are abstract psychological entities and their structures vary across languages. A syllable is composed of a **nucleus**, an **onset**, and a **coda**. Among these three parts, a nucleus is obligatory and without it, there is no syllable. In most languages, nuclei are normally vowels. An onset is a consonant that precedes the nucleus and a coda is a consonant that follows the nucleus. In Korean, a syllable requires at least a vowel, which is the nucleus, and an onset and a coda, which are optional.

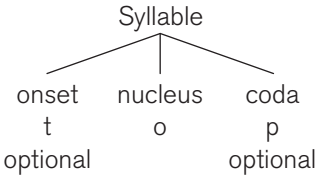



Figure 3.2 Syllable structure

Different languages have different rules in terms of combining phonemes to build syllables. **Phonotactic constraints** are sets of rules that tell you what is a possible combination or not, how many consecutive consonants are allowed within an onset and/or coda position in a given language, among other things. In languages such as English, certain sequences, for example, 'bla' and 'stri' are possible but sequences such as 'bna' or 'stmi' are not. In addition, in English, an

onset can have up to three consecutive consonants before the nucleus, as in *strike* [str]. A coda can contain up to four consecutive consonants right after the nucleus as in *texts* [ksts]. In Korean, on the other hand, some consonants cannot appear at the beginning of a word (e.g., [l] except for loanwords), and only one consonant is allowed in the onset and coda positions. Therefore, in some words that contain two spelled consonants in a coda position as in *salm* 'life', only one consonant is pronounced, as [sam].

In general, Korean is known to have four types of syllables V, CV, VC, and CVC as in:

(8) a. V 이 [i] 'two'
오 [o] 'five'
b. CV 피 [pʰi] 'green onion'
마 [ma] 'yam'
네 [ne] 'yes'
c. VC 일 [il] 'work'
앞 [ap] 'front'
옷 [ot] 'clothing'
d. CVC 길 [kil] 'road'
산 [san] 'mountain'
밥 [pap] 'meal, rice'

In addition to these four types of syllables, more are found when glides (G) are added before the nucleus, as in:

(9) a. GV 왜 [we] 'why'
요 [jo] 'Korean mattress'
b. CGV 뭐 [mwʌ] 'what'
귀 [kwi] 'ear'
겨 [kjʌ] 'husks'
c. GVC 원 [won] 'Korean currency'
왕 [waŋ] 'king'
열 [jʌl] 'ten, fever'
d. CGVC 관 [kwan] 'coffin'
꿩 [k'wʌŋ] 'pheasant'
면 [mjʌn] 'cotton'

Although there is variation between dictionary entries and spoken forms, among these eight syllable types, the CVC type is known to be the most frequent, followed by the CV type. The GV and CGVC types are the least frequent among all Korean words.

## 3.3 SOUND ALTERNATIONS

### 3.3.1 Phonological Rules

The phonemes have allophones that are frequently observed due to the environment they are found in (e.g., neighboring sounds). For instance, stop consonants /p, t, k/ at the beginning of a word are pronounced as lax stops [p, t, k] but intervocalically, [b, d, g] as in /pata/ → [padɑ] 'sea'. Likewise, the liquid /l/ is realized as lateral [l] at a coda position but as a flap [ɾ] at an onset position as in /mal/ 'horse' → [mɑ-ɾi] 'horse-NOM'. Many of these consonants as well as vowels are realized as different types of allophones and these changes will be shown by the IPA transcription used within the [ ]. These changes are not easily audible and are different from sound changes introduced in the following section known as **sound alternations** or **phonological rules**.

Having discussed phonemic and phonetic representation in the earlier section, let us now consider how the **phonemic forms** or **underlying forms**, abstract and mental representations, get their **phonetic forms** or **surface forms**, the actual sounds produced. In this section, we will talk about phonological or sound alternation rules that are responsible for the phonetic forms resulting through the **derivation** process from different types of phonemic forms. The processes through which these two levels of sound representations, underlying and surface, are connected are known as **phonological rules** (Goldsmith 1995).

(10)

| | | |
|---|---|---|
| phonemic form | /한국/ | /n/ |
| ↓ | ↓ | ↓ |
| phonological rules | phonological rules | |
| ↓ | ↓ | ↓ |
| phonetic form | [항국] | [ŋ] |

Phonological rules as generalizations about the different ways a sound can be pronounced in different environments, and they are language specific, unconscious and intuitive processes (Hayes 2009). There are three parts related to phonological rules: (a) the sound combination that undergoes changes, (b) the environment where the affected sound is found, and (c) the output that results from phonological rules. From the above example, the nasal alveo-dental [n] is pronounced as [n] is *han* 'one'. However, in *hankwuk* 'Korea' the same [n] of *han* is pronounced as velar consonant [ŋ] because of the following velar consonant [k] from *kwuk* 'nation'. In this case, the nasality of [n] is still preserved in [ŋ] but the place of articulation is changed according to the place of the following consonant. This sound alternation is derived through a rule known as **assimilation**, where two adjacent sounds become similar to each other. A summary of this process can be written as follows:

(11) a. [n] becomes [ŋ] when it is followed by a velar consonant as in 한국 *hankwuk* [haŋguk] 'Korea'
b. [n] becomes [m] when it is followed by a bilabial consonant as in 한미 *hanmi* [hammi] 'Korea and America'

These changes can be described using the distinctive features in formal notation form as follows:

(12) X → Y / A__B

In this notation, the sound X becomes Y when the sound is found in an environment where A precedes it and B follows it. Following this format, the sound changes provided above can be represented using the distinctive features as follows:

(13) [+nasal] → [+nasal] / _____
[–coronal] [+coronal] [–coronal]

In this case, the feature [+coronal] includes consonants that are either alveolar or palatal, and [–coronal] implies consonants that are non-coronal, bilabial or velar in Korean. Therefore, [n] becomes [m] if the following consonant is bilabial, and [n] becomes [ŋ] if the following consonant is velar.

Different phonological rules will be provided in the next section according to their types.

## 3.3.2 Classification of Phonological Rules in Korean

Phonological rules can occur within a syllable as well as across syllables within a word and/or across word or phrase boundaries. These rules can be classified in several groups based on the different types of processes involved in the sound alternation. Some of the most common classifications of Korean phonological rules are as follows:

(1) **Common categories-based** (e.g., Choi 2008, Kang 2011, Bae 2013, Baek et al. 2013) classification includes general types of commonly occurring rules in most languages in the world, e.g. assimilation, insertion, deletion.
(2) **Automaticity-based** (e.g., Sohn 2001) classification includes two types of rules: automatic and non-automatic. **Automatic rules** are applied within a syllable or across syllable boundaries regardless of the nature of the grammatical information contained within these syllables (known as morphemes, which will be covered in Chapter 4). The **non-automatic rules**, on the other hand, are applied across syllable boundaries based on the grammatical information contained within the corresponding syllables.

(3) **Unit-based**, such as morpheme and syllable (e.g., Shin et al. 2013), classification is based on the boundary types, whether they are across morpheme or syllable boundaries.

In this section, Korean sound alternation rules will be presented according to the common-category-based classification. Six major types of phonological rules will be discussed accompanied by some Korean examples. When consonants and vowels are combined to form syllables, words, and sentences, the original quality of the consonants and vowels can be altered for many reasons, such as easier articulation and reduction due to faster speech rate. The most common types of sound alternation include the following:

(14)

| | | | |
|---|---|---|---|
| a. | Assimilation | Progressive | AB → AA |
| | | Regressive | AB → BB |
| b. | Dissimilation | AA → AB | or AA → BA |
| c. | Insertion | AC → ABC | or AB → ABC |
| d. | Deletion | ABC → AB | or ABC → AB |
| e. | Fusion | ABCE → ABŒ | |
| f. | Reduction | AB → Ab / AB → aB | or AB → A / AB → B |

### 3.3.2.1 Assimilation

Being one of the most representative automatic rules, **assimilation** affects one of two adjacent sounds so that one of them becomes more similar to its adjacent sound in terms of its phonetic properties, so that overall articulation becomes smoother and easier. This rule is one of the most common phonological rules in any language, although detailed rules may vary from language to language. Assimilation can be **progressive** (e.g., AB → AA) or **regressive** (e.g., AB → BB) depending on the direction in which a sound affects its adjacent sound. When the two sounds involved in the process become identical sounds, it is called **total assimilation**, as in liquidization. When the two are not identical, it is called **partial assimilation**, as in decoronization, palatalization, and many others. Assimilation can result in a different phoneme, as in most cases provided below, or in an allophone of the original sound, as in intersonorant voicing.

Assimilation can occur between (i) two consonants, as in nasalization, liquidization, and decoronization; (ii) a consonant and a vowel, as in palatalization; or (iii) two vowels, as in umlaut and vowel harmony.

The easiest way to explain assimilation is **feature spreading** (Iverson and Sohn 1994). Assuming that sonorants are more marked than obstruents among consonants (Clements 1990), feature spreading from more marked sites to less marked ones provides a simple explanation for a wide variety of assimilation processes in Korean. For example, the feature [+nasal] spreads to obstruents in nasalization, and [+liquid] speads to [+nasal] in liquidization.

**(a) Nasalization**: Korean stop consonants at the end of a syllable are replaced by the corresponding nasal. In syllable-final position, all obstruent consonants are neutralized into three stop consonants: [p], [t], and [k]. When these three types of stops are followed by nasal [m] or [n] they are replaced by one of these nasals, preserving only its place of articulation. Therefore, [p] is replaced by the corresponding nasal [m], [t] by [n], and [k] by [ŋ] when followed by [m] or [n]. The velar nasal [ŋ] never occurs at the beginning of a syllable, and therefore, only [m] and [n] trigger nasalization in Korean. This sound alternation is observed at an affixal boundary (e.g., verb stem + suffix), as in examples (15a), a morpheme boundary (e.g., Sino-Korean root + Sino-Korean root), a compound boundary (e.g., Noun-Noun) as in examples (15b), as well as a word/phrase boundary (e.g., NP + VP) as in examples (15c). Because of the variety of environments in which this rule applies, there has been debate about the domain of this rule (Cho 1987, Kang 1990, Jun 1992, 1996). In this sound alternation process, only the manner is assimilated, preserving the original place of articulation.

(15) (a)

| | | | | |
|---|---|---|---|---|
| 있는데 | /it.nɯn/ | → 인는 | [innɯn] | 'exist-but' |
| 봅니다 | /pop.nita/ | → 봄니다 | [pomnida] | 'see-deferential' |
| 닦니? | /tak.ni/ | → 당니 | [taŋni] | 'clean-interrogative' |

(b)

| | | | | |
|---|---|---|---|---|
| 십년 | /sip.njʌn/ | → 심년 | [simnjʌn] | 'ten years' |
| 앞문 | /ap$^{h}$.mun/ | → 암문 | [ammun] | 'front door' |
| 잇몸 | /it.mom/ | → 인몸 | [inmom] | 'gum (of teeth)' |
| 덧니 | /tʌt.ni/ | → 던니 | [tʌnni] | 'snaggletooth' |
| 각막 | /kak.mak/ | → 강막 | [kaŋmak] | 'retina' |
| 막내 | /mak.nɛ/ | → 망내 | [maŋnɛ] | 'the youngest (of the family)' |

(c)

| | | | | |
|---|---|---|---|---|
| 저녁 먹었어? | /cɛnjʌk mʌk/ | → 저녕 먹 | [cenjʌŋmʌk] | 'Did you eat dinner?' |
| 꽃 너무 이뻐. | /k'ot nʌmu/ | → 꼰 너무 | [k'onnʌmu] | 'The flower is so pretty.' |

(16) Rule summary: [plain stops] → [+nasal] / ___ [+nasal]

**(b) Liquidization**: This rule is also known as **lateralization**. When there is a sequence of an alveo-dental nasal [n] either preceded or followed by lateral [l], [n] is assimilated to [l]. This process can occur in a progressive way as in examples (17a), where [n] is preceded by [l], and therefore, [n] is assimilated to [l]. In examples (17b), on the other hand, [n] is followed by [l] and is assimilated to the [l] in a regressive way.

(17) (a) progressive

| | | | | | |
|---|---|---|---|---|---|
| 틀니 | /tʰɯl.ni/ | → | 틀리 | [tʰɯlli] | 'denture' |
| 설날 | /sʌl.nal/ | → | 설랄 | [sʌllal] | 'New Year's Day' |
| 실내 | /sil.nɛ/ | → | 실래 | [sillɛ] | 'indoor' |
| 달나라 | /tal.naɾa] | → | 달라라 | [tallaɾa] | 'moon' |

(b) regressive

| | | | | | |
|---|---|---|---|---|---|
| 신라 | /sin.la/ | → | 실라 | [silla] | 'Silla dynasty' |
| 진리 | /tɕin.li/ | → | 질리 | [tɕilli] | 'truth' |
| 난로 | /nan.lo/ | → | 날로 | [nallo] | 'stove' |
| 만리 | /man.li/ | → | 말리 | [malli] | '10,000 miles' |

In some cases, however, the sequence of [n]-[l] does not result in [l]-[l] as expected, but [n]-[n] instead. When Sino-Korean suffixes are attached to some nouns, as in examples (18), the liquidization process does not occur. Instead, [l] is assimilated to the preceding [n]. In either case, this process is a Total Assimilation, where the two consonants involved become identical.

(18) 결단-력 /kjʌldan.ljʌk/ → 결단-녁 [kjʌltannjʌk] 'determination'
임진-란 /imtɕin.lan/ → 임진-난 [imtɕinnan] 'the Year of the Dragon War'
생산-량 /sɛŋsan.ljaŋ/ → 생산-냥 [sɛŋsannjaŋ] 'production output'
신문-로 /sinmun.lo/ → 신문-노 [sinmunno] 'Simunno (a street name)'

(19) Rule summary: [+nas, +cor] → [+lat] / ____[+lat] or [+lat]____

This discrepancy of /n-l/ → [n-n] instead of /n-l/ → [l-l] was first observed in the seventeenth century in written Middle Korean texts, and it seems to have been increasing since then in terms of frequency among young native speakers.

**(c) Decoronization**: Coronal feature refers to consonants that are articulated with the tongue tip and/or blade, and therefore, include consonants that fall into the range of dental, alveolar, and palatal. In casual speech, [+coronal] consonants, which include all alveo-dental and alveo-palatal consonants at the syllable-final position, become [–coronal] when followed by [–coronal] consonant (Kim-Renaud 1991, J. Jun 1996, Ahn 2009, Kochetov and Pouplier 2008). When a labial consonant follows the [+coronal] consonant, this becomes labial, as in examples (20a). When a velar consonant follows the [+coronal] consonant, this becomes velar, as in examples (20b). In this sound alternation process, only the place of articulation is assimilated.

(20) (a)

| | | | | | |
|---|---|---|---|---|---|
| 신문 | /sin.mun/ | → | 심문 | [simmun] | 'newspaper' |
| 덧문 | /tʌt.mun/ | → | 덤문 | [tʌmmun] | 'outer door' |
| 돗보기 | /tot.pogi/ | → | 돕보기 | [toppogi] | 'magnifying glass' |

(b)

| | | | | |
|---|---|---|---|---|
| 곳간 | /kot.kan/ | → | 곡간 [kokkan] | 'warehouse' |
| 전구 | /tɕʌn.ku/ | → | 정구 [tɕʌŋgu] | 'light bulb |
| 벚꽃 | /pʌt.k'ot/ | → | 벅꽃 [pʌkk'ot] | 'cherry blossom' |

(21) Rule summary: [+coronal] → [–coronal] / ____ [–coronal]

**(d) Palatalization**: In this alternation process, some consonants that are followed by vowel [i] or glide [j] go through a palatalization process. Since both [i] and [j] are palatal, having the hard palate as a passive articulator, consonants preceded by [i] or [j] gain a palatal property for easier articulation (Hume 1990, Kiparsky 1993, Hong 1997, H. Kim 2012).

When consonants /n/, /l/, and /s/ are affected, they are replaced by their respective allophones palatal nasal [ɲ], palatal lateral approximant [ʎ], and post alveolar fricative [ʃ], as in examples (22a), (22b), and (22c). If you carefully pronounce the plain version and palatalized version of the consonants, you will notice that when palatalized, the relevant consonants are articulated around the hard palate area whereas the plain consonants are all articulated in the alveo-dental area. In these palatalization processes, the glide [j] is not fully pronounced but is fused within the palatalized consonants.

(22) (a) /n/ palatalization

| | | | | |
|---|---|---|---|---|
| 남녀 | /nam-njʌ/ | → | [nam-ɲjʌ] | 'man and woman, men and women' |
| 님 | /nim/ | → | [ɲim] | 'one's beloved' |
| 가냐 | /ka-nja/ | → | [ka-ɲja] | Are you going?' |

(b) /l/ palatalization

| | | | | |
|---|---|---|---|---|
| 빨리 | /p'alli/ | → | [p'aʎʎi] | 'quickly' |
| 발령 | /palljʌŋ/ | → | [paʎʎjʌŋ] | 'appointment' |
| 한류 | /hallju/ | → | [haʎʎju] | 'Korean wave (popularity of South Korean culture elsewhere in Asia)' |

(c) /s/ palatalization

| | | | | |
|---|---|---|---|---|
| 시간 | /sikan/ | → | [ʃigan] | 'time' |
| 모시 | /mosi/ | → | [moʃi] | 'ramie fabric' |
| 씨 | /s'i/ | → | [ʃ'i] | 'seed' |
| 쉰 | /swin/ | → | [ʃwin] | 'fifty' |

The next case is the palatalization of /t/ and /$t^h$/. When followed by suffixes that begin with [i], [j], or [hj], the consonants are replaced by other phonemes /tɕ/ and /$tɕ^h$/, respectively, due to their palatal feature. Different from the previous three cases of palatalization, this non-automatic alternation occurs only if there is an intervening affixal boundary, as in examples (23). This rule does not occur across the word/compound boundary.

(23) /t, $t^h$/ palatalization

| | | | | | |
|---|---|---|---|---|---|
| 맏-이 | /mat.i/ | → | 마지 | [matɕi] | 'the eldest (child)' |
| 해돋-이 | /hɛdot.i/ | → | 해도지 | [hɛdotɕi] | 'sunrise' |
| 닫-히다 | /tat.hida/ | → | 다치다 | [tatɕ$^h$ida] | 'be closed' |
| 걷-혀요 | /kʌt.hjʌjo/ | → | 거쳐요 | [kʌtɕ$^h$jʌjo] | 'something is cleared off.' |
| 같-이 | /kat$^h$.i/ | → | 가치 | [katɕ$^h$i] | 'together' |
| 붙-이다 | /put$^h$-ida/ | → | 부치다 | [putɕ$^h$ida] | 'to paste' |

In some Southern dialects, /k, $k^h$, k'/ palatalization is also observed, as in examples (24). This alternation occurs only within a word boundary of Korean native vocabulary. In this case, /k, $k^h$, k'/ are replaced by other homorganic phonemes [tɕ, tɕ$^h$, tɕ'] that share the palatal feature.

(24) /k, $k^h$, k'/ palatalization

| | | | | | |
|---|---|---|---|---|---|
| 기름 | /kirɯm/ | → | 지름 | [tɕirɯm] | 'oil' |
| 길 | /kil/ | → | 질 | [tɕil] | 'road' |
| 끼다 | /k'ita/ | → | 찌다 | [tɕ'ida] | 'be tight' |
| 가리키다 | /karikhita/ | → | 가리치다 | [karitɕ$^h$ida] | 'to point' |

**(e) Obstruent voicing**: Plain obstruents /p, t, k/ become voiced /b, d, g/ between voiced segments. As we see in examples in (25), this rule applies not only within a phonological word, as in (29a), but also between phrasal boundaries, as in (25b–d) (Cho 1990b).

(25)

| | | | | | |
|---|---|---|---|---|---|
| a. | 아버지 | /apʌtɕi/ | → | [abʌdʑi] | 'father' |
| b. | 예쁜 그림 | /jɛp'ɯn kɯrim/ | → | [jɛp'ɯn gɯrim] | 'pretty picture' |
| c. | 먹은 밥 | /mʌɯn pap/ | → | [mʌɯn bap] | 'eaten rice' |
| d. | 그림을 보다 | /kɯrimɯl pota/ | → | [kɯrimɯl boda] | 'look at the picture' |

(26) Rule summary: [–continuant] → [+voice] / [+voice] _____ [+voice]
[–laryngeal]

**(f) Vowel harmony**: Vowel harmony is a non-automatic assimilatory phenomenon in which one vowel becomes harmonious with another one in the neighboring syllable. Korean simple vowels are divided in two groups on which the harmony is based: bright vowels and dark vowels (see 3.5). Bright vowels comprise [a], [o], [we], and dark vowels comprise [i], [ɛ], [ʌ], [u], [wi], and [ɯ].

All Korean words contain either bright or dark vowels, but there are some words that historically shared some semantic similarities and developed into bright–dark pairs toward more specific meanings.

**Table 3.5** Bright vowels and dark vowels

(27)

| *Bright vowels* | | | *Dark vowels* | | |
|---|---|---|---|---|---|
| 밝다 | [pɑkt'ɑ] | 'to be bright' | 어둡다 | [ʌdupt'ɑ] | 'to be dark' |
| 곧다 | [kot'ɑ] | 'to be straight' | 굳다 | [kut'ɑ] | 'to harden' |
| 작다 | [tɕɑkt'ɑ] | 'to be small (in size)' | 적다 | [tɕʌkt'ɑ] | 'to be small (in amount)' |
| 깎다 | [k'ɑkt'ɑ] | 'to cut' | 꺽다 | [k'ʌkt'ɑ] | 'to snap' |
| 다 | [tɑ] | 'all' | 더 | [tʌ] | 'more' |

The vowel harmony pattern in Korean applies to morphologically restricted ideophones and the value of the harmonic feature determines the meaning of the ideophone itself. Previous analyses have acknowledged the morphological nature of vowel harmony in Korean ideophones (Ahn and Kim 1985, Cho 1994, Chung 2000, Kim-Renaud 1976).

(ii) Vowel harmony in verb/adjective stem + suffix

One of the most commonly used Korean speech style ending is the Polite style *-eyo/ayo*. This is a single suffix with an option of two initial vowels depending on the vowel found in the verb or adjective stem, to which the suffix is attached for conjugation. When a verb or adjective stem contains a bright vowel [ɑ] or [o], *-ayo* is attached to the stem. When the stem contains a dark vowel, *-eyo* is used. The same rule applies to similar suffixes that begin with a vowel [ɑ] or [ʌ] such as *-ese/ase* 'because', *-eto/ato* 'even if'.

(28) a. Bright vowels

| | | | | | |
|---|---|---|---|---|---|
| 많다 | [mɑnt$^{h}$ɑ] | 'be many' | 많-아요 | [mɑnɑjo] | 많-아서 [mɑnɑsʌ] |
| 앉다 | [ɑnt'ɑ] | 'to sit' | 앉-아요 | [ɑntɕɑjo] | 앉-아서 [ɑntɕɑsʌ] |
| 높다 | [nopt'ɑ] | 'be high' | 높-아요 | [nop$^{h}$ɑjo] | |
| 놓다 | [not$^{h}$ɑ] | 'to put' | 놓-아요 | [noɑjo] | |

b. Dark vowels

| | | | | | |
|---|---|---|---|---|---|
| 멀다 | [mʌldɑ] | 'be far' | 멀-어요 | [mʌlʌjo] | 멀-어서 [mʌlʌsʌ] |
| 벗다 | [pʌt'ɑ] | 'to undress' | 벗-어요 | [pʌsʌjo] | 벗-어서 [pʌsʌsʌ] |
| 읽다 | [ikt'ɑ] | 'to read' | 읽-어요 | [ilgʌjo] | |
| 굶다 | [kumt'ɑ] | 'to starve' | 굶-어요 | [kulmʌjo] | |

**(g) Umlaut:** In this vowel alternation, central vowels are fronted when followed by a syllable containing a high front vowel [i]. In this case, the central vowels are moved toward the front preserving their height. For instance, [ɑ] goes to [ɛ], as in examples (29a), and [ʌ] goes to [e], as in examples (29b). Although younger generation Korean speakers no longer distinguish the front mid [e] from front low [ɛ], older generation speakers still do.

(29) (a)

| | | | | | |
|---|---|---|---|---|---|
| 아기 | → [애기] | [agi] | → | [ɛgi] | 'baby' |
| 남비 | → [냄비] | [nambi] | → | [nɛmbi] | 'kettle' |
| 학교 | → [핵교] | [hak'jo] | → | [hɛk'jo] | 'school' |
| 다리미 | → [대리미] | [tarimi] | → | [tɛrimi] | 'iron (for pressing clothes)' |
| 방망이 | → [방맹이] | [paŋmaŋi] | → | [paŋmɛŋi] | 'bat' |

(b)

| | | | | | |
|---|---|---|---|---|---|
| 어미 | → [에미] | [ʌmi] | → | [emi] | 'mother (animal)' |
| 먹이다 | → [멕이다] | [mʌgida] | → | [megida] | 'to feed' |
| 버리다 | → [베리다] | [pʌrida] | → | [perida] | 'spoil, ruin' |

There are some exceptions where umlaut is not observed. The change does not occur between a root and a suffix, as in [karaŋbi] 'light shower', and when the intervening consonant is coronal, as in [maʃit'a] 'delicious'. Umlaut is widely used in Southern dialects.

### *3.3.2.2 Dissimilation*

The opposite to the assimilation process, dissimilation involves changes in two adjacent sounds to become less alike with respect to some phonetic properties. Some dissimilation examples exist in Korean, which are more historical changes rather than sound alternations. Tensification is the only phonological rule that can be considered as dissimilation process.

**(a) Tensification:** Also known as **post obstruent tensing**, tensification was traditionally considered as feature-changing dissimilatory process converting a sequence of two lax obstruents into a lax and a tense sequence (Cho and Inkelas 1994). Obstruents [p, t, s, tɕ, k] change to their respective tensed counterparts [p', t', s', tɕ', k'], when they appear after [p, t, k] including those stops that have resulted from syllable-final consonant neutralization. This rule occurs at the word level (e.g., compound nouns, verb stem + suffix), as in examples (30a–c), but depending on the pause and/or speech rate, it may occur across word boundaries. as in examples (30d), as long as the relevant consonants belong to the same Accentual Phrase, introduced in the Phonetics chapter.

(30) (a)

| | | | | |
|---|---|---|---|---|
| 국수 | /kuk.su/ | → 국쑤 | [kuk.s'u] | 'noodle' |
| 각도 | /kak.to/ | → 각또 | [kak.t'o] | 'angle' |
| 잡지 | /cap.ci/ | → 잡찌 | [tɕap.tɕ'i] | 'magazine' |
| 업보 | /ʌp.po/ | → 업뽀 | [ʌp.p'o] | 'karma' |

(b)

| | | | | | |
|---|---|---|---|---|---|
| 닭-고기 | /tak-kogi/ | → | 닥꼬기 | [tak.k'ogi] | 'chicken (meat)' |
| 덮-밥 | /tʌp.pap/ | → | 덥빱 | [tʌp.p'ap] | 'rice topped with toppings' |
| 낮-잠 | /nat.cam/ | → | 낟짬 | [nat.tɕ'am] | 'nap' |
| 목-살 | /mok.sal/ | → | 목쌀 | [mok.s'al] | 'neck (of animal)' |

(c)

| | | | | | |
|---|---|---|---|---|---|
| 덥-지만 | /tʌp.ciman/ | → | 덥찌만 | [tʌp.tɕ'iman] | 'hot-but' |
| 죽-도록 | /cuk.torok/ | → | 죽또록 | [cuk.t'orok] | 'to death' |
| 먹-습니다 | /mʌk.sumnida/ | → | 먹씀니다 | [mʌk.s'umnida] | 'eat-deferential' |

(d)

영국 가봤니? / jʌŋ.kuk ka/ → 영국 까봔니 [jʌŋ.kuk k'a] 'Have you been to England?'

집 샀어. /tɕip sas'ʌ/ → 집 싸써 [tɕip s'as'ʌ] '(I) bought a house.'

각 잡아봐. /kak tɕababwa/ → 각 짜바봐 [kak tɕ'ababwa] 'Get the angle.'

(31) Rule summary: [p, t, k].[p, t, s, tɕ, k] → [p', t', s', tɕ', k']

This kind of dissimilation process is not phonetically motivated and unprecedented. Recently, there have been attempts to analyze this rule as an assimilation, rather than dissimilation, rule (Ahn and Iverson 2004). Many scholars treat Korean tense obstruents as geminates (Silva 1992, Ahn and Iverson 2004) and claim that tensification is the result of the first obstruent forming a geminate with the second one, creating a tense obstruent.

### 3.3.2.3 Epenthesis or Insertion

As the name indicates, in this type of rules, a new segment that is not present at an underlying or phonemic level appears at the surface or phonetic level. Epenthesis can involve insertion of a consonant or a vowel. Epenthesis means an insertion of a consonant or vowel in non-initial, non-final position in a word. The two main epentheses involve /n/ and /t/, and their insertion is morphologically driven. On the other hand, the glide insertion and vowel insertion are motivated by the need to maintain the typical Korean syllable structure.

**(a) /n/ insertion**: In this rule, an epenthetic /n/ is prefixed to a word or stem that begins with [i] or [j], if the word or stem is preceded by another word or stem that ends in a consonant other than [l]. If you consider the examples in (a), they are all compounds composed of a combination of two words. If the second word of this combination begins with [i] or [j] as in example [han-jʌrum], and the first noun ends in a consonant other than [l], /n/ is inserted before [i] or [j] as in [han-ɲjʌrum].

(32) 솜-이불 /som-ibul/ → 솜-니불 [som-ɲibul] 'cotton comforter/blanket'
한-여름 /han-jʌɾɯm/ → 한-녀름 [han-ɲjʌɾum] 'midsummer'
콩-엿 /kʰoŋ-jʌt/ → 콩-녓 [kʰoŋ-ɲjʌt] 'beans candy'

If the consonant preceding the [i] or [j] is [l], an additional rule needs to be applied to obtain the final output: the liquidization or lateralization rule, as in examples (33). For instance, in ***mul-jak***, /n/ is inserted between [l] in [mul] and [j] in [jak] resulting in [mul-njak]. Following the liquidization rule, [mul-njak] becomes [mul-ljak].

(33) 물-약 /mul-jak/ → 물-략 [mul-ljak] 'liquid medicine'
들-일 /tɯl-il/ → 들-릴 [tɯl-lil] 'field work'
휘발-유 /hwibal-ju/ → 휘발-류 [hwibal-lju] 'gasoline'

In fact, /n/ epenthesis might trigger another rule by inserting /n/ in a word. The appearance of [n] will bring the possibility of nasalization as long as the preceded consonant is a stop, as in examples (34).

(34) 깻-잎 /k'ɛt-ip/ → 깬-닙 [k'ɛn-ɲip] 'sesame leaf'
나뭇-잎 /namut-ip/ → 나문-닙 [namun-ɲip] 'tree leaf'
홑-이불 /hot-ibul/ → 혼-니불 [hon-ɲibul] 'bed sheet'

**(b) [t] insertion:** in epenthesis, one of the most typical types of non-automatic rule, /t/ appears between the morphemes that compose a word or compound, generally a modifier + a head. In this case, the two words must be native Korean words, or a combination of a native word and a Sino-Korean word. The /t/ tensifies the following lax consonant and it also becomes a nasal before a nasal consonant. The [t] insertion rule can be applied in two different ways: (35a) [t] insertion in spelling and (35b) insertion in sound only. In spelling, the letter 's' is inserted between word boundaries, and therefore, this rule is also called 'middle s' in Korean. When both words are Sino-Korean words, [t] insertion takes place without the spelling change, as in examples (35c).

(35) (a) [t] insertion in spelling
촛-불 /tɕʰot-pul/ → 촛-뿔 [tɕʰot-p'ul] 'candle light'
귓-밥 /kwit-pap/ → 귓-빱 [kwit-p'ap] 'earlobe'
잇-몸 /it-mom/ → 인몸 [in-mom] 'teethridge'
깻-잎 /k'ɛt-ip/ → 깬닙 [k'ɛn-ɲip] 'sesame leaf'

(b) [t] insertion in sound only
들-길 /tɯl-kil/ → 들-낄 [tɯl-k'il] 'a field path'
강-가 /kaŋ-ka/ → 강-까 [kaŋ-k'a] 'a riverside'
(c) [t] insertion in sound only for Sino-Korean compounds
초-점 /tɕʰo-tɕʌm/ → 초-쩜 [tɕʰot-tɕ'ʌm] 'focus'
대-가 /tɛ-ka/ → 대-까 [tɛt-k'a] 'a cost'

**(c) Glide insertion:** Very often, a glide is inserted between two vowels for smoother articulation. One of the most typical uses is the [j] insertion between a noun that ends in a vowel and the vocative *-a*. This suffix is attached to a person's first name when calling out the person's attention in a non-polite way (i.e. intimate form), as in examples (36a). [j] insertion is also common between a vowel such as [ɛ, o, u, i] and a vowel initial suffix such as particle *-ey*, and verb suffixes *-ese* as in examples (36b). In addition to the glide [j], [w] may also be inserted between a syllable final [u] and a suffix [ʌ], as in examples (36c).

(36) (a)
미순-아 [misun-a] 'Misun'
순미-야 [sunmi-ja] 'Soonmi'
영민-아 [jʌŋmin-a] 'Youngmin'
철수-야 [tɕʰʌlsu-ja] 'Cheolsu'
(b)
저기-에 /cʌgi-ɛ/ → 저기예 [tɕʌgi-jɛ] 'there-at'
뒤-에서 /ty-ɛsʌ/ → 뒤예서 [ty-jɛsʌ] 'behind-from'
내-어 /nɛ-ʌ/ → 내여 [nɛ-jʌ] 'put out-and then'
되-어서 /tø-ʌsʌ/ → 되여서 [tø-jʌsʌ] 'become-and then'
(c)
나누-어 /nanu-ʌ/ → 나누워 [nanu-wʌ] 'divide-and then'
가두-어 /kadu-ʌ/ → 가두워 [kadu-wʌ] 'lock up-and then'

**(d) vowel insertion:** The high vowel [ɯ] or [i] is inserted in the loanwords to break consonant clusters, or in the word-final position, to avoid unwanted sound alternation rules applying (Kim and Kochetov 2011). All non-syllabic consonants, except the post-alveolar [tɕ] and [tɕʰ], trigger insertion of [ɯ] to form an independent syllable, as in examples (37). The English word 'desk' has three consonants, but there is only one vowel [ɛ]. This means that neither [s] nor [k] are followed by a vowel. These stranded consonants cannot be pronounced in Korean. Therefore, [ɯ] vowel is inserted to create a syllable on its own. The English word 'desk' becomes [tɛsɯkʰɯ] with two additional vowels [ɯ] inserted at surface level in Korean.

(37) [ɯ] insertion

| | | | | |
|---|---|---|---|---|
| 데스크 | → | 데스크 | [tɛsɯkʰɯ] | 'desk' |
| 스트레스 | → | 스트레스 | [sɯtʰɯrɛsɯ] | 'stress' |

When the stranded consonant is either [tɕ] or [tɕʰ], [i] vowel is inserted instead, as in examples (38).

(38) [i] insertion

| | | | | |
|---|---|---|---|---|
| 벤치 | → | 벤치 | [pɛntɕʰi] | 'bench' |
| 캐치 | → | 캐치 | [kʰɛcʰi] | 'catch' |
| 오렌지 | → | 오렌지 | [orɛntɕi] | 'orange' |

### 3.3.2.4 Deletion

In addition to assimilation, dissimilation, and insertion, this section deals with deletion of a segment for smoother, easier, and economic articulation. There are several types of deletion but only three most commonly used cases will be introduced in this section. Consonant types: [l] deletion and [h] deletion, and vowel type: [ɯ] deletion.

**(a) [l] deletion:** In compound words, the word final consonant [l] of the first word is deleted when the following word begins with its homorganic consonants [n], [s], [t], or [tɕ], as in examples (39a). Some verb stem finals [l] also undergo deletion when the verb suffixes begin with [n], [s], [p], [m], [l], or [o], as in examples (39b).

(39) (a)

| | | | | |
|---|---|---|---|---|
| 솔+나무 | → | 소나무 | [sonamu] | 'pine tree' |
| 바늘+질 | → | 바느질 | [panɯcil] | 'sewing' |
| 활+살 | → | 화살 | [hwasal] | 'arrow' |
| 아들+님 | → | 아드님 | [adɯnim] | 'son-honorific' |
| 불+동산 | → | 부동산 | [pudoŋsan] | 'real estate' |

(b)

| | | | | |
|---|---|---|---|---|
| 만들+는 | → | 만드는 | [mandɯnɯn] | 'make-suffix' |
| 살+시는 | → | 사시는 | [sasinɯn] | 'live-suffix' |
| 놀+세요 | → | 노세요 | [nosɛjo] | 'play-suffix' |
| 멀+ㄴ | → | 먼 | [mʌn] | 'be far-suffix' |
| 살+ㅂ시다 | → | 삽시다 | [sapsida] | 'live-suffix' |

**(b) [h] deletion**: a verb stem final [h] is deleted when a vowel initial suffix is used, as in examples (40a). When [h] is in syllable initial position but not at a word initial position, it may be deleted depending on the formality of the speech situation, as in examples (40b).

(40) (a)

| | | | |
|---|---|---|---|
| 좋-아요 | [조아요] | [tɕoɑjo] | 'be good-suffix' |
| 많-이 | [마니] | [mɑni] | 'a lot-suffix' |
| 잃-은 | [이른] | [irɯn] | 'to lose-suffix' |
| 놓-여 | [노여] | [nojʌ] | 'to place-suffix' |
| 넣-어서 | [너어서] | [nʌʌsʌ] | 'to put-suffix' |

(b)

| | | | |
|---|---|---|---|
| 미혼 | [미혼/미온] | [mihon/mion] | 'unmarried' |
| 영화 | [영화/영와] | [jʌŋhwɑ/jʌŋwɑ] | 'movie' |
| 전화 | [전화/저놔] | [tɕʌnhwɑ/tɕʌnwɑ] | 'telephone' |

**(c) [ɯ] deletion**: when [ɯ], the least sonorant among all Korean vowels, is followed by a vowel-initial suffix, it gets deleted, as in examples (41a). Likewise, when a suffix with [ɯ] at the initial position is preceded by a word-final vowel, it gets omitted too, as in examples (41b).

(41) (a)

쓰-어요 → 써요 ssu-eyo [s'ɯ.ʌjo] → sseyo [s'ʌjo] 'to write-suffix'
크-어요 → 커요 khu-eyo [kʰɯ.ʌjo] → kheyo [kʰʌjo] 'be big-suffix'
바쁘-어서 → 바빠서 pappu-ese [pɑp'ɯ.ʌsʌ] → pappese [pɑp'ɑsʌ] 'be busy-suffix'
잠그-아서 → 잠가서 camku-ase [tɕɑmkɯ.ɑsʌ] → camkase [tɕɑmgɑsʌ] 'to lock-suffix'

(b)

차+으로 → 차-로 cha-ulo [tɕʰ.ɯro] → chalo [tɕʰaro] 'car-suffix'
자+으면 → 자-면 ca-umyen [tɕɑ.ɯmjʌn] → camyen [tɕɑmjʌn] 'sleep-suffix'
오+을 것 → 올 것 o-ul-kes [o.ɯlk'ʌt] → olkes [olk'ʌt] 'come-suffix'
가+으시고 → 가-시고 ka-usiko [kɑ.ɯʃigo] → kasiko [kaʃigo] 'go-suffix'

### 3.3.2.5 Fusion

This is the type of sound alternation in which two sounds are fused or contracted to make a simpler and economic articulation. By combining two elements, a vowel or a consonant will be eliminated, and therefore, a whole or partial syllable will disappear from a word. Two phonological rules will be introduced in this section: Aspiration and Vowel Contraction.

**(a) Aspiration**: When the initial or final lax stop of a morpheme and the initial or final [h] of another morpheme become contiguous, they merge into an aspirated stop. This is a mirror image rule as it applies whether the lax stop precedes or follows [h]. Phonologically speaking, the prominent feature of [h], [+spread glottis] is being added to the main features of lax stops [–son, -cont], resulting in the features representing aspirated stops as in

[–son, –cont, +spr.glot]. This way, the two consonants [h] and [p, t, tɕ, k] are merged into a single consonant [$p^h$, $t^h$, $tɕ^h$, or $k^h$].

(42) (a)

| | | | | |
|---|---|---|---|---|
| 입학 | /ip.hak/ | → 이팍 | [ip$^h$ak] | 'matriculation' |
| 녹화 | /nok.hwa/ | → 노콰 | [nok$^h$wa] | 'recording' |
| 막히다 | /mak.hita/ | → 마키다 | [mak$^h$ida] | 'be blocked' |
| 걷히다 | /kʌt.hita/ | → 거치다 | [kʌtɕ$^h$ida] | 'be cleared off' |

(b)

| | | | | |
|---|---|---|---|---|
| 좋-고 | /coh-ko/ | → 조코 | [tɕok$^h$o] | 'be good-and' |
| 넣-고 | /nʌh-ko/ | → 너코 | [nʌk$^h$o] | 'to insert-and' |
| 옳다 | /olh.ta/ | → 올타 | [olt$^h$a] | 'be correct, right' |
| 싫-지만 | /silh. tɕiman/ | → 실치만 | [siltɕ$^h$iman] | 'do not like-but' |

(43) Rule summary: [p, t, tɕ, k] → [$p^h$, $t^h$, $tɕ^h$, $k^h$] / _____[h] or [h]_____

**(b) Vowel Contraction**: This can also be seen as a glide formation, where two consecutive vowels are contracted to undergo glide formation. This rule is different from glide insertion in which the number of syllables is not affected. In vowel contraction, on the other hand, the total number of syllables within the word is reduced by one, as a result of the contraction. There are two different types of glide formations:

(i) when a verb stem ending in [i, o, u] is followed by a suffix that begins with -e/a, the two vowels are contracted to undergo glide formation, as in examples (44a). When the first vowel is [i], the glide [j] is formed, but for the back vowels [o, u], the glide [w] is formed.

(ii) a sequence of vowels such as [a, o, u, ɛ] + [i] may also undergo glide formation preserving the height of the first vowel as in examples (44b).

(44) (a)

| | | | | |
|---|---|---|---|---|
| 보아요 | /po- ajo/ | → 봐요 | [pwajo] | 'see-(polite)' |
| 놓아요 | /noh- ajo/ | → 놔요 | [nwajo] | 'to place something somewhere' |
| 주어요 | /tɕu-ʌjo/ | → 줘요 | [tɕwʌjo] | 'to give something to someone' |
| 마시어요 | /masi-ʌjo/ | → 마셔요 | [masjʌjo] | 'to drink-polite' |
| 기다리어요 | /kitali-ʌjo/ | → 기다려요 | [kidarjʌjo] | 'to wait-polite' |
| 먹이어요 | /mʌk-i-ʌjo/ | → 먹여요 | [mʌkjʌjo] | 'to feed-polite' |

(b)

| | | | | |
|---|---|---|---|---|
| 아이 | /a.i/ | → 애 | [ɛ] | 'child' |
| 오누이 | /onu.i/ | → 오뉘 | [ony] | 'brother and sister' |
| 어이고 | /ʌ.iko/ | → 에고 | [ɛgo] | 'oh my' |
| 사나이 | /sana.i/ | → 사내 | [sanɛ] | 'man' |
| 조이다 | /tɕo-ita/ | → 죄다 | [tɕøda] | 'to tighten' |

(45) Rule summary: [V1] + [V2] → [GV]

### 3.3.2.6 Reduction

In this rule, some phonological distinctions or number of consonants are reduced in a particular environment, syllable final position in case of Korean.

**(a) Coda Neutralization:** In Korean, aspirated and tense stops, affricates, and fricatives in coda position are all reduced to lax stops. These consonants at the end of a syllable are not released completely, but replaced with unreleased consonants that share similar places of articulation. Labial stops in coda position (46a) become unreleased [p̚], marked with the diacritic [˺] in IPA, which symbolizes unreleased consonant. Alveolar and post-alveolar stops, affricates, and fricatives in coda position (46b) are all neutralized into [t̚], which is the closest lax stop to these three types of consonants. Finally, all velar stops become unreleased lax velar stops [k̚] as in (46c). All sonorant consonants (i.e., nasals and lateral) are free from this phonological rule. Therefore, in surface forms, only seven consonants can occupy the coda position in Korean: /m, n, ŋ, l, p̚, t̚, k̚/.

(46) (a)

| | | | | |
|---|---|---|---|---|
| 입 | ip | → | [ip̚] | 'mouth' |
| 잎 | ip$^h$ | → | [ip̚] | 'leaf' |
| (b) | | | | |
| 곧 | kot | → | [kot̚] | 'immediately' |
| 곳 | kos | → | [kot̚] | 'a place' |
| 있다 | iss | → | [it̚] | 'to be, have' |
| 빚 | pitɕ | → | [pit̚] | 'debt' |
| 빛 | pitɕ$^h$ | → | [pit̚] | 'light' (N) |
| 밭 | pɑt$^h$ | → | [pɑt̚] | 'a field' |
| 히읗 | hiɯt$^h$ | → | [hiɯt̚] | 'consonant ㅎ' |
| (c) | | | | |
| 박 | pɑk | → | [pɑk̚] | 'gourd' |
| 밖 | pɑk' | → | [pɑk̚] | 'outside' |
| 부엌 | puʌk$^h$ | → | [puʌk̚] | 'gourd' |

(47) Rule summary: /C, C', C$^h$/ → [C˺] / → __# (# = syllable boundary)

It appears that laryngeal (tense and aspirated) and continuant (as opposed to stop, i.e., fricatives and affricates) sounds cannot occur in the coda position, which is summarized as the Korean coda condition in (11). * means 'not permitted' and σ marks the syllable boundary.

(48) Korean coda condition (Y. Kim 2002)
a. *[laryngeal ] ]$_σ$
b. *[continuant ] ]$_σ$

**(b) Consonant cluster simplication:** In the first type in (44), the second consonants are not permitted sounds in the coda position in Korean, and thus get deleted.

**(c) Consonant cluster reduction:** In Korean, the coda position in a syllable can carry only one consonant in surface forms, and therefore, some phonemic consonant clusters are reduced to a single consonant. In most cases, the first consonant is produced between the two syllable final consonants as in (49b). Note that, in this case, the second consonant is usually not an admissible sound in a coda. However, there are cases where the second one is kept instead in surface forms, as in (49a). In this case, both consonants are admissible in a coda. When there is a vowel in the next syllable, the first consonant remains as a coda of the corresponding syllable and the second consonant is carried over to the next syllable in the onset position, as in (49c).

(49) (a) C2=/k, m, $p^h$/ are kept

| | | | | |
|---|---|---|---|---|
| 닭 | /talk/ | → | [tak] | 'chicken' |
| 삶 | /salm/ | → | [sam] | 'life' |
| 읊다 | /ɯlp$^h$/ | → | [ɯp] | 'to recite' |

(b) C1=/k, n, l, p/ are kept

| | | | | |
|---|---|---|---|---|
| 삯 | /saks/ | → | [sak] | 'wages' |
| 앉다 | /antɕ/ | → | [an] | 'to sit' |
| 여덟 | /jʌtʌlp/ | → | [jʌdʌl] | 'eight' |
| 외곬 | /kols/ | → | [kol] | 'single-minded' |
| 핥다 | /halt$^h$/ | → | [hal] | 'to lick' |
| 값 | /kaps/ | → | [kap] | 'price' |
| 많다 | /manh/ | → | [man] | 'be many' |
| 싫다 | /silh/ | → | [sil] | 'to dislike' |

(c)

| | | | | |
|---|---|---|---|---|
| 앉+아요 | /antɕ+ajo/ | → | [antɕajo] | '(I, you, he/she, we, they) sit' |
| 읽+어서 | /ilk+ʌsʌ/ | → | [ilkʌsʌ] | 'because (I, you, he/she, we, they) read' |
| 값+이 | /kaps+i/ | → | [kapsi] | 'price-SUBJ' |

(50) Rule summary: /$C^1C^2$#/ → [C2] / C1=/l/, C2=/k, m, $p^h$/
[C1] / elsewhere

Noting that the second sounds in (49b) are exactly those that are subject to neutralization, as we have seen in (46) above (Whitman 1985), some attempts have been made to relate consonant cluster simplification to other coda processes such as neutralization and assimilation, rather than giving separate rules for consonant cluster simplification and coda neutralization (Cho 1990a, Oh 1994, Y. Kim 2002).

For the type in (49a), the fact that the second consonant survives seems arbitrary at first because both sounds are permitted in a coda in Korean. Moreover, there is a dialectal variation: in Gyungsang dialect, it is the first segment that survives. To explain this, two additional rules are needed, namely align R and coda sonority, given in (51). **Align R** has been proposed by many researchers as a constraint on syllable structure (McCarthy and Prince 1993, Ito and Mester 1994, Lombardi 1995, Prince and Smolensky 2004, among others). **Coda conority** is motivated by cross-linguistic preference for sonorant sounds at the end of a syllable (Clements 1990, Iverson and Lee 1994, Prince and Smolensky 2004).

(51) a. Align R: Align the right edge of a stem with the right edge of a syllable.
b. Coda sonority: In syllable codas, parse sonorant segments.

In (49) above, we see that [p, t, m] survive at the expense of [l]. This means that align R is observed rather than coda sonority in Seoul dialect (Y. Kim 2002). In Gyungsang dialect, by contrast, coda sonority takes precedence over align R, resulting in [hɯl] 'soil'.

There are some exception cases for consonant combinations such as /lp/ and /lk/, as in (52). These example verbs and adjectives are the most frequently used ones that show irregularity in terms of dropping the consonant in the reduction process. For nouns such as *talk* 'chicken' and *hulk* 'soil', the first consonant /l/ is dropped. However, some verbs and adjectives such as *ilk* 'to read' and *palp* 'to step on' are subject to confusion, since the cluster reduction is not regular compared to other examples. According to the Regulation of Standard Korean Pronunciation (2012), this process is quite regular except for the examples in (52a).

(52) (a)

| | | | | |
|---|---|---|---|---|
| 밟다 | /palp/ | → | [pal/pap] | 'to step on' |
| 넓다 | /nʌlp/ | → | [nʌl/nʌp] | 'be wide' |
| 읽다 | /ilk/ | → | [il/ik] | 'to read' |
| 맑다 | /malk/ | → | [mal/mak] | 'be clear' |

(b)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 밟다 | /palp/ | → | [pal/pap] | 밟-고 | /palp/ | → | [pap-ko] |
| | | | | 밟-지 | /palp/ | → | [pap-tɕi] |
| 넓다 | /nʌlp/ | → | [nʌl/nʌp] | 넓-죽 | /nəlp/ | → | [nəp-tɕuk] |
| | | | | 넓-둥글 | /nəlp/ | → | [nəp-tuŋkɯl] |
| 읽다 | /ilk/ | → | [il/ik] | 읽-게 | /ilk/ | → | [il-ke] |
| 맑다 | /malk/ | → | [mal/mak] | 맑-고 | /malk/ | → | [mal-ko] |

For instance, for verb [palp-tɑ] 'to step on', the second consonant /p/ is kept when the verb stem is followed by suffixes with initial consonants such as

/t, tɕ, k, s, n/; for verb [nʌlp-tɑ] 'be wide' the second consonant /p/ is kept when followed by suffixes *tɕuk-* and [tuŋ-] as in (52b). Similar irregularity is shown in /lk/ cluster, as in [ilk-tɑ] 'to read' and [mɑlk-tɑ] 'be clear'. When these stems are followed by a suffix with initial /k/, the first consonant /l/ is kept instead of the second one, as in (52a).

However, native speakers of Korean tend to go against this rule by showing a high rate of discrepancy in dropping either the first or second consonant in /lk/ and /lp/ consonant cluster verbs such as [ilk-tɑ] 'read', [mɑlk-tɑ] 'clear', [nʌlp-tɑ] 'wide', and [pɑlp-tɑ] 'step on'. Several studies have attempted to provide a rationale for this rather confusing rule by incorporating some key features such as [±continuant], [±sonority], and [±coronal] (Kim-Renaud 1991, H.S. Lee 1980, Y. Kim 2002, Shin et al. 2013) involved in this complex phonological processes, but more clarification is needed. There is a claim that Korean Southern dialect speakers as well as younger generation Seoul speakers tend to keep the first consonant /l/ even when it is followed by suffixes [–ko] and [–tɕi], going against the rule because of the generalization made from the high rate of environments where /l/ is preferred (Nam and Oh 2009).

## 3.4 EXERCISES

1. Based on the phonetic features provided below, write down in ( ) what Korean sound(s) they represent.

| (a) ( ) | (b) ( ) | (c) ( ) | (d) ( ) |
|---|---|---|---|
| [+consonant] | [–sonorant] | [–sonorant] | [–consonant] |
| [+nasal] | [–continuant] | [+continuant] | [+high] |
| [+coronal] | [–anterior] | [+coronal] | [–back] |

2. Provide all the applicable phonetic features to the following consonants and vowels.

(a) ( u ) (b) ( $p^h$ )
(c) ( l ) (d) ( e )

3. Provide a minimal pair to show that the allophones [p] and [$p^h$] are not allophones in Korean. Be sure to use a phonetic transcription of the two words you choose.

4. From the following two word lists, find out in what environments the Korean consonants [s] and [ʃ] are used. In general, phonemes occur under more than one condition or environment, whereas allophones of a phoneme occur in one environment of the relevant phoneme that is in complementary distribution. Based on that, which of these two are the phoneme and its allophone? Why?

(a) [s]

| | | |
|---|---|---|
| 새해 | [sɛhɛ] | 'New Year' |
| 소리 | [sori] | 'noise' |
| 이사 | [isɑ] | 'moving' |
| 마술 | [mɑsul] | 'magic' |
| 서울 | [sʌul] | 'Seoul' |

(b) [ʃ]

| | | |
|---|---|---|
| 시험 | [ʃihʌm] | 'exam' |
| 시작 | [ʃitɕɑk] | 'start' |
| 네시 | [neʃi] | 'four o'clock' |
| 미신 | [miʃin] | 'superstition' |
| 실 | [ʃil] | 'thread' |

5. In the following Korean words, consider the distribution of [tɕ] and [tɕʰ]

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 잠 | [tɕɑm] | 'sleep' | 잠자리 | [tɕɑmɟɑri] | 'dragonfly' | 참 | [tɕʰɑm] 'truth' |
| 기차 | [kitɕʰɑ] | 'train' | 기자 | [kitɕɑ] | 'reporter' | 차다 | [tɕʰɑdɑ] 'to kick' |
| 자다 | [tɕɑdɑ] | 'to sleep' | 춤 | [tɕʰum] | 'dance' | 종 | [tɕoŋ] 'bell' |

Determine whether the sounds [tɕ] and [tɕʰ] are allophones of the same phoneme or separate phonemes.

6. In the following Korean words, consider the distribution of [p] and [b].

불 [pul] 'fire' 부부 [pubu] 'married couple' 이불 [ibul] 'blanket'
바지 [pɑdʑi] 'pants/trousers' 발 [pɑl] 'foot' 이발 [ibɑl] 'haircut (for a man)'

(a) List the distribution of the two allophones (be careful not to miss some cases because some words contain both allophones).
(b) Classify the distribution of the two allophones (complementary or contrastive).
(c) Are [p] and [b] allophones of the same phoneme? If yes, provide the phonological rule that captures their realization.
(d) Which is basic and which is derived?

7. Provide the syllable structure of the Korean words below. Use the initials O(nset), N(ucleus), and C(oda).

(a) 한강 'Han river' [hɑn.kɑŋ] (b) 음식 'food' [ɯm.sik]
(c) 우유 'milk' [u.ju] (d) 경주 'race' (N) [kjʌŋ.tɕu]

8. Provide Korean words that contain the following syllable structures, as in example (a).

(a) CV
차 'tea' [tɕʰɑ]

(b) GVC

(c) CVC

(d)

(e) (f)
CGVC

(g) (h)

9. Fill in the [ ] with the actual pronunciation of the following words, as in example (a) below. Then, fill in the blanks with the phonological rule(s) that are responsible for such pronunciation output.

(a) 박자 'rhythm' /pɑk.tɕɑ/ [ ]

_____

(b) 북미 'North America' /puk.mi/ [ ]

_____

(c) 같이 'together' /kɑtʰ.i/ [ ]

_____

(d) 입후보 'candidate' /ip.hu.bo/ [ ]

_____

(e) 빛 'light' /pitɕʰ/ [ ]

_____

(f) 윤리 'ethics' /jun.li/ [ ]

_____

10. Read the sentence below and find examples of the phonological rules specified in (a) – (d):

나는 작년부터 독학으로 한국어를 공부했다.
[나는 장년부터 도카그로 항구거를 공부해따]

na-nun caknyen-puthe tok.hak-ulo hankuk.e-lul kongpu-hayssta.
I-TOP last year-from self-study-by Korean-ACC study-past
'I started studying Korean by myself since last year.'

/nɑ-nɯn tɕɑk.njʌn-putʰʌ tok.hak-ɯlo han.kuk. ʌ-lɯl koŋpuhɛt'ɑ/ →
[nɑnɯn tɕɑŋnjʌnbutʰʌ dok'agɯro haŋgugʌrɯl goŋbuɛt'ɑ]

(a) an example of an assimilation:
(b) an example of a deletion:
(c) an example of an insertion:
(d) an example of a fusion:

11. Consider the following words and their pronunciation outputs in [ ]. Provide all the relevant phonological rules applied in the right order to get the desired output. Do so as in example (a).

| | | | | |
|---|---|---|---|---|
| (a) | 빗-물 [빈물] | /pit-mul/ | → | [pinmul] |
| | 빋-물 | pit-mul | 1. | [t] insertion |
| | 빈-물 | pin-mul | 2. | nasalization |
| (b) | 한국말 [항궁말] | /han.kuk-mal/ | → | [haŋ.guŋ.mal] |
| (c) | 나뭇-잎 [나문닙] | /na.mus-ip$^{h}$/ | → | [na.mun.nip] |

CHAPTER 4

# Morphology



## 4.1 BASIC NOTIONS OF MORPHOLOGY

In the previous chapters, we talked about how different types of speech sounds in Korean are combined together to create words and phrases, and how each of these sounds affects its neighboring sounds in creating larger units. We focused on each segment, such as vowels and consonants, although we also dealt with suprasegmentals that affect larger units than segments. In this chapter, we expand our object of inquiry from individual speech segments to a bigger linguistic unit called the **morpheme**. Morphemes, the morphological building blocks of words, are defined as 'minimal, irreducible linguistic units with a lexical or a grammatical meaning' (Booij 2007, 9). Notice that 'meaning' is a keyword here. A single speech sound, such as [k], does not have any meaning on its own, but it is employed to make up certain words, for example, 'cat' [kæt], in which case the whole word carries a meaning (feline). In this particular case, the word 'cat' consists of only one morpheme, as one can see from the fact that it cannot be broken down into smaller units containing meaning. But words can also be constructed by putting together more than one morpheme, as in the case of 'cats'. In this instance, '-s' carries the meaning of 'plural', which is a grammatical, rather than lexical, meaning. Notice also that the method of making a plural form, i.e., adding '-s' after a (countable) noun, is systematic and therefore rule-like. **Morphology** is a sub-discipline of linguistics that deals with systematic patterns of word formation rules and the internal constituent structure of words.

### 4.1.1 Structure of Words

#### *4.1.1.1 Paradigms and Morphological Rules*

More often than not, words are built up by combining more than one morpheme. In such cases, we need to ask the following questions in order to discover the word structure: what morphemes does this word have? What does each of them mean? How are they combined? In order to answer these questions, we need to examine the relevant data closely. A **paradigm**, which is a list of words put in the format of columns and rows, where each column and row has some

common linguistic material, helps to discern such a morpheme boundary and the form–meaning mapping. For example, consider the following English plurals:

(1)

| Singular | Plural |
|---|---|
| cat | cats |
| dog | dogs |
| cow | cows |

(1) shows a paradigm where the morpheme '-s', which consistently adds the meaning of plurality to the word to which it is attached, appears repeatedly in the given list of words, and everything before it is different. This allows us to place a morpheme boundary before this morpheme.

Now that we have identified two separate morphemes and identified the meanings associated with each, we can proceed to write rules specifying how words such as 'cats' and 'dogs' are formed. (2a) below states that a noun may consist of a noun and a plural morpheme. This is a **word structure rule**. This rule has to be accompanied by a supplementary **lexical entry rule** such as (2b), which specifies the actual shape of the plural morpheme in English.[1]

[1] In the phonology chapter, we have seen the phonological rule that alternates [s] and [z] depending on the voice feature of the coda of the base noun. In morphology, we are not concerned with this type of sound alternation but treat -s as a single morpheme. Note however that this sound change is conditioned by morpheme boundaries and thus constitutes a non-automatic phonological rule.

(2) a. N → N - PLURAL
b. PLURAL → '-s'

The rules that form the word 'cats' out of 'cat' are systematic in nature, since a similar pattern occurs for nouns in general in English. Morphological patterns that can be systematically extended are called **productive**. The plural formation rule is productive because almost any (countable) noun can be turned into its plural counterpart by putting a plural morpheme after it. Due to this productivity and predictability, there is no separate entry for cats in an English dictionary. The singular and plural forms are considered to be instantiations of the same word. In this case, the different forms of words are constructed by applying rules that are termed **inflectional**. Inflection contributes grammatical, rather than lexical, meaning, such as the plural. Dictionary makers assume that such inflectional rules are part of language users' knowledge and therefore need not be listed individually.

Now let us look at Korean examples to see if the same principles apply. In the paradigm below, what we need to identify, along the different columns and rows, is the same string of sounds that contribute a common meaning. In the second column, [tul] appears continuously, adding the meaning of plural. In each

row, a different noun is listed. Given this data set, we can conclude that the Korean morpheme *-tul* is a plural morpheme. A rule of inflection (4), similar to the one in (2a) above, is applied here to generate a plural counterpart of a singular noun.

(3) 고양이 *koyangi* 'cat' 고양이들 *koyangitul* 'cats'
개 *kay* 'dog' 개들 *kaytul* 'dogs'
책상 *chayksang* 'desk' 책상들 *chayksangtul* 'desks'
집 *cip* 'house' 집들 *ciptul* 'houses'

(4) a. N → N - PLURAL
b. PLURAL → *-tul*

Let us now consider a somewhat different type of morphological process. In (5), men- can be attached to different nouns to form new nouns. An obvious thing to notice is that this morpheme precedes, rather than follows, the different nouns, unlike *-tul*. This is called a **prefix**. More importantly, it adds some substantial meaning, rather than just changing the grammatical category (e.g., singular to plural) of the same word, therefore creating different, though related, words.

(5) 맨밥 *men-pap* 'cooked rice without any side dishes'
맨살 *men-sal* 'bare skin'
맨발 *men-pal* 'bare foot'
맨주먹 *men-cwukmek* 'bare fist'
맨정신 *men-cengsin* 'sober mind'

The set of word forms *koyangi* and *koyangi-tul* should be distinguished from the set of related words *pal* 'foot' and *men-pal* 'bare foot'. These words are not forms of the same word, but different words that each have their own entry in the dictionary. Such word formation rules are called **derivational**. In this case, it takes *pal* 'foot' and forms a new word *men-pal* 'bare foot' by adding *men-* 'bare' at the beginning. To capture this, rules such as the following can be written:

(6) a. N → PREFIX - N
b. PREFIX → 맨 *men* 'bare'
c. N → 밥 *pap* 'cooked rice', 발 *pal* 'foot', 손 *son* 'hand', 주먹 *cwukmek* 'fist', 정신 *cengsin* 'mind', 살 *sal* 'skin'

To understand (6), we need some terminology. The morphemes *pap* 'boiled rice' and *pal* 'foot' are called **free** or **lexical morphemes**, because they can occur as words by themselves. By contrast, *men-* 'bare' is an **affix** and a **bound morpheme**, which cannot function as a word on its own. The lexical morpheme *pap* to which a bound morpheme *men-* is attached is called the **root** of the

Table 4.1 Different types of morphological rules

| *creation of different forms of the same word* | *word formation: creation of different words* | |
|---|---|---|
| | *combination of a word and affix(s)* | *combination of words* |
| Inflection | Derivation | Compounding |

word. The root is the core of the word, typically a free morpheme with rich meaning (such as an entity, a situation, or a property). If an affix appears before the root, it is a **prefix**; if it appears after the root, it is a **suffix**. So *men-* is a prefix, whereas *-tul* is a suffix.

Note that the rules in (4) and (6) are quite different in terms of productivity. While (4) can be applied to any (countable) noun, most nouns cannot be preceded by *men-*, e.g., **men-cip* '(intended) bare house'. Unlike inflectional affixes, derivational affixes are not completely productive. For this reason, the set of nouns to which the particular derivational affix can be attached must be listed separately, as in (6c). In addition to derivation, word formation processes include **compounding**. In compounding, the constituents of a word are themselves words, whereas in derivation this is not the case. For example, *men-* is not a word, and hence *men-pap* is a case of derivation. By contrast, *pap-sang* 'dining table' is an example of compounding, because *pap* 'cooked rice' and *sang* 'table' can occur as words by themselves. Table 4.1 shows different types of morphological rules.

### 4.1.1.2 Hierarchical Structure of Words

The examples we have seen so far represent a rather simple case, because only two morphemes appear in a word and all we need to be concerned with is the order of the two. However, things can get more complicated. Let us look at a more complex example in which more than two morphemes are combined. Consider the Korean word *che-mek-ki* 'devouring', for example. This word consists of the prefix *che-* meaning 'recklessly, overly', the verb root *mek-* 'eat', and the nominalizing suffix *-ki*. The following paradigm helps us identify these morphemes and their associated meanings and functions.

(7)

| | | |
|---|---|---|
| 먹다 | 처먹다 | 먹기 |
| mekta 'eat' | che\|mekta 'devour' | mek\|ki 'eating' |
| 넣다 | 처넣다 | 넣기 |
| nehta 'put in' | che\|nehta 'shove in' | neh\|ki 'putting in' |
| 들어가다 | 처들어가다 | 들어가기 |
| tulekata 'enter' | che\|tulekata 'invade' | tuleka\|ki 'entering' |
| 부수다 | 처부수다 | 부수기 |
| pwuswuta 'break' | che\|pwuswuta 'destroy' | pwuswu\|ki 'breaking' |

We need the following rules to represent the derivational processes.

(8) a. V → PREFIX - V
b. PREFIX → 처 *che-* 'recklessly, randomly, overly' (derogatory intensifier)
c. V → 먹다 *mekta*, 들어가다 *tulekata*, 부수다 *pwuswuta*, 넣다 *nehta* (e.g., 처먹다 *che-mek-ta* 'devour')

(9) a. N → V - NOMINALIZER
b. NOMINALIZER → 기 *-ki*
c. V → 먹다 *mekta* 'eat', 자다 *cata* 'sleep', 달리다 *talita* 'run' (e.g., 먹기 *mek-ki* 'eating')

A very important thing to decide is the order of application of the two rules in (8) and (9) to form complex words such as *chemekki* 'devouring'. If (9) applies first, the result is a noun. Then (8) cannot apply because it requires a verb to be its input. Therefore, we know that *che-* is attached to *mek-* first to form another (intensified) verb and then *-ki* is attached to the resulting verb *che-mek* to change it into a noun. This suggests that words must have a hierarchical structure, as in (10), reflecting such a derivational history, rather than a flat structure, as in (11).

(10)

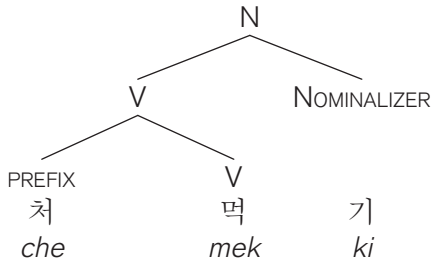



**Figure 4.1** Hierarchical structure of words

(11)

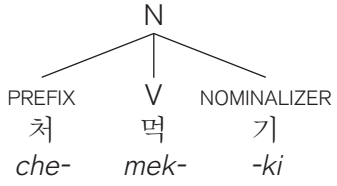



**Figure 4.2** Flat structure of words

In *che-mek-ta*, *mek-* is the verb root to which the prefix *che-* is attached. The root is also called a **stem** when it is complex. That is, roots may be turned into stems by adding more morphemes. For example, *che-mek-*, which is complex, is the stem to which *-ta* is attached.

### *4.1.1.3 Word Categories*

In determining word structure, **part of speech** plays an important role. Derivational processes such as the one we have just observed impose constraints on the kind of base words they take as their inputs. The stems to which an affix is attached (its **input**) usually belong to the same part of speech class. For example, the English suffix *-able* attaches freely to verbs, but not to adjectives or nouns, e.g., *breakable*, **happiable*, **angerable* (Bergmann et al. 2007, 168). The words that are formed after an affix attaches to a stem (its output) also belong to the same category. For example, the words resulting from the addition of *-able* to a verb are always adjectives. As we have observed, from these two facts follow some important consequences for determining the way in which words with multiple derivational affixes are built. For example, 'reusable' consists of three morphemes 're' + 'use' + 'able'. The prefix 're-', meaning 'do again', attaches to a verb and creates a new verb. The suffix '-able' also attaches to a verb, but it forms adjectives. Hence, 're-' cannot attach to *usable* because it is an adjective; rather, it attaches to the verb 'use' and then '-able' attaches to the resulting verb 'reuse' to give 'reusable.' We have observed that the same principle applies in Korean. The derogatory intensifier derivational suffix *che-* attaches only to verbs but not to nouns, and the word resulting from the addition of *che-* is again a verb, for example. Therefore, knowledge about part of speech categories constitutes an important part of the linguistic knowledge of native speakers. Basic part of speech classes include nouns, verbs, adjectives, and adverbs. These words belong to **open classes** because they can be extended by means of word formation. Function words such as postpositions, conjunctions, pronouns, on the other hand, form **closed classes** of words that cannot be extended by word formation rules. Therefore, the base words that form inputs to word formation are normally words of open classes. Open classes are also **content morphemes**, which carry semantic content. e.g. nouns, verbs, etc. Closed classes are usually **function morphemes**, which serve only to provide information about grammatical function, e.g., postposition, honorific suffix, conjunctions.

Open class words belong to different categories, such as noun, verb, adjective and adverb, and the derived words may or may not belong to the same category as their bases.

(12a) contains an example where the derived word is of the same category as the base word. The example in (12b), on the other hand, illustrates a categorical shift.

(12) a. 맏아들 *mat-atul* first-son 'the eldest son'
derivational prefix + noun root (Noun → Noun)
b. 보기 *po-ki* see-nominalizer 'example'
verb root + derivational suffix (Verb → Noun)

Table 4.2 shows that the distinctions between free vs. bound and content vs. function morphemes interact in the morpheme categorization. As we see in the

Table 4.2 Possible kinds of morphemes

| | *Content morphemes* | *Function morphemes* |
|---|---|---|
| Free morphemes | - Nouns<br>(인호 *Inho* 'Inho'; 사과 *sakwa* 'apple')<br>- Adverbs<br>(빨리 *ppali* 'quickly') | - Pronouns<br>(나 *na* 'I'; 이 *i* 'this')<br>- Numerals<br>(하나 *hana* 'one'; 삼 *sam* 'three')<br>- Conjunctions<br>(그리고 *kuliko* 'and') |
| Bound morphemes | - Bound roots<br>(소 *so* 'small')<br>- Verb/Adjective stems<br>(달리 *tali-* 'to run'; 건강하 *kenkangha-* 'to be healthy')<br>- Derivational affixes<br>(처 *che-* 'recklessly') | - Postpositions<br>(이/가 *i/ka*; 을/를 *ul/lul*; 한테 hanthey)<br>- Inflectional affixes<br>(시 si; 었 ess; 고 ko; 다 ta) |

table, Korean verbs, unlike English verbs, are not free morphemes so they must be followed by the declarative sentence ender *-ta* to be used as a citation form (the form found in dictionaries). Affixes are bound morphemes, but not all bound morphemes are affixes. There are many roots from Classical Chinese that are used in so-called Sino-Korean compounds but do not occur as words by themselves. They are called **bound roots**. For example, *so-nye* 'girl' consists of bound roots *so* 'small, young' and *nye* 'female', but *so* and *nye* do not occur by themselves and therefore are not words.

## 4.1.2 Morphemes and Allomorphs

Parallel to the notions of phonemes and allophones in phonology, morphology distinguishes morphemes and **allomorphs**. In phonology, phonemes refer to a particular set of sounds produced in a particular language that are distinguished by its native speakers from other sets of sounds in that language. On the other hand, the different phonetic realizations of the same phoneme are allophones. For example, the English phoneme /t/ has two allophones [$t^h$] and [t] ('top' vs. 'stop'). These allophones are non-contrastive because they do not contribute to a change in meaning. Similarly, allomorphs are different realizations (shapes) of the same morpheme that do not result in a change in meaning. Some allomorphic variations are phonologically conditioned. We have seen examples in the previous chapter, e.g., vowel harmony. The Polite style *-eyo/ayo* suffix has one of two initial vowels depending on the vowel found in the verb or adjective stem to which the suffix is attached for conjugation. When a verb or adjective stem contains a bright vowel [a] or [o], *-ayo* is attached to the stem. When the stem contains a dark vowel, *-eyo* is used. The same rule applies to similar suffixes that begin with a vowel *a/e* such as *-ese/ase* 'because', *-eto/ato* 'even if'.

Phonological allomorphy is a property of the sound pattern of a language and is not limited to one morpheme.

Other allomorphic variations are lexically or syntactically conditioned and have no phonological basis for the variation. Therefore, these rules, which are called **suppletion**, are felt to be even more arbitrary and irregular. This is so because it is usually a property of one morpheme rather than that of the general sound pattern and therefore needs to be specified separately in the lexicon. For example, let us reconsider the English plural morpheme, which has variations such as these:

(13)

| Singular | Plural |
|---|---|
| cat | cats |
| sheep | sheep |
| ox | oxen |

In light of this, we need to revise our lexical entry rule in (2b) above to (14):

(14)

| | |
|---|---|
| PLURAL → -(r)en with class A | Nouns: |
| Ø with class B | Class A – ox, child, etc. |
| -s elsewhere | Class B – sheep, deer, etc. |

The plural morpheme in English has allomorphs *-s*, zero, and *-en*, each of which applies to specific class of nouns. This type of allomorphy is determined by word classes and must be memorized separately.

In the introduction chapter, we discussed that Korean is an honorific language. Korean exhibits suppletive morphology in honorifics, as shown in (15).

(15)

| Non-honorific | Honorific |
|---|---|
| 먹다 *mek-ta* 'eat' | 드시다 *tusi-ta* 'eat' |
| 자다 *ca-ta* 'sleep' | 주무시다 *cwumwusi-ta* 'sleep' |

As we can see in (15), the non-honorific and honorific forms of the same verb have totally different forms.

## 4.1.3 Morphological Typology

Although it might appear so far that Korean and English are not very different in their morphological systems, there are in fact fundamental differences between the two languages. To appreciate this, consider (16).

(16) 김선생님이 오셨겠어요.
Kim sensayngnim-i o-si-ess-keyss-eyo.
Kim teacher-NOM come-HON-PST-MOD-DEC
'Mr. Kim must have come.'

In the English translation of the Korean example in (16), we notice separate words *must*, *have*, and *come*. In the Korean sentence, on the other hand, these separate (auxiliary) verbs correspond to verbal suffixes *-ess*, and *-keyss*. (17) presents another somewhat extreme example. The noun phrase consists of various suffixes (honorific, dative, plural, topic, conjunction) in Korean, which are realized as separate words (*only*, *to*, *the*, *and*) in English.

(17) 선생님들께하고 미나한테만은 말했다.
sensayng-nim-tul-kkey-hako Mina-hanthey-man-un malhay-ss-ta.
teacher-HON-PL-DAT(HON)-CONJ Mina-DAT-FOC-TOP say-PST-DEC
'I said only to the teachers and to Mina.'

Languages are different in terms of how much morphology they utilize. **Analytic languages** are made up of a sequence of free morphemes, that is, each word is a single morpheme which is used by itself with a consistent meaning. English is an analytic language. Purely analytic languages, also called **isolating languages**, such as Mandarin Chinese and Vietnamese, do not use prefixes or suffixes at all to create words.

On the other hand, **synthetic languages** attach affixes or bound morphemes to other morphemes, making up words consisting of several meaningful units. e.g. Hungarian, Turkish, Korean. Synthetic languages are further divided into three sub-types. In **agglutinating languages**, such as Korean, it is usually easy to determine the morpheme boundaries. In **fusion languages**, the affixes may not be easy to separate from the stem, e.g. Spanish. In **polysynthetic languages**, such as Greenlandic and Sora (an Indian language), highly complex words are formed by combining several stems and affixes, incorporating nouns (subjects, objects, etc.) into part of the verb forms.

In Korean, an agglutinating language, each bound morpheme carries only one meaning and is concatenated serially. As shown in (18), it is easy to separate the root *cip* 'house' and the suffixes with various grammatical meanings.

(18) a. 집이 *cip-i* 'house-nominative'
b. 집을 *cip-ul* 'house-accusative'
c. 집에 *cip-ey* 'house-locative'
d. 집으로 *cip-ulo* 'house-direction'
e. 집은 *cip-un* 'house-topic'

## 4.2 WORD FORMATION RULES IN KOREAN

### 4.2.1 Derivations in Korean

We have defined derivation as the process of creating words out of other words by adding affixes. For example, *al-mom* 'naked body' is built by attaching the

**Table 4.3** Derivations in Korean

| | | | |
|---|---|---|---|
| | | *Derivation of nouns* | |
| V → N | suffixation | 죽다 *cwuk-ta* 'die' | 죽음 *cwuk-um* 'death' |
| | | 벌다 *pel-ta* 'make money' | 벌이 *pel-i* 'money making, job' |
| | | 크다 *khu-ta* 'be big' | 크기 *khu-ki* 'size' |
| N → N | suffixation | 점 *cem* 'fortune-telling' | 점쟁이 *cem-cayngi* 'fortune-teller' (NK) |
| | | 과학 *kwahak* 'science' | 과학자 *kwahak-ca* 'scientist' (SK) |
| | prefixation | 비 *pi* 'rain' | 가랑비 *kalang-pi* 'drizzle' (NK) |
| | | 가능 *kanung* 'possibility' | 불가능 *pwul-kanung* 'impossibility' (SK) |
| | | *Derivation of verbs* | |
| N → V | suffixation | 자유 *cayu* 'freedom' | 자유롭다 *cayu-lopta* 'be free' |
| V → V | suffixation | 먹다 *mek-ta* 'eat' | 먹이다 *mek-i-ta* 'feed' |
| | prefixation | 밟다 *palp-ta* 'step on' | 짓밟다 *cis-palp-ta* 'overrun' |
| | | *Derivation of adverbs* | |
| V → A | suffixation | 재미있다 *caymiiss-ta* 'be fun' | 재미있게 *caymiiss-key* 'with fun' |

prefix *al-* 'naked' to the root *mom* 'body'. *Mom-tungi* 'body' is an example of suffixation, where the diminutive/pejorative derivational suffix *-tungi* is attached to the root mom.

Table 4.3 exhibits possible derivations in Korean and some representative examples. As we can see, Korean prefixes do not change the word category, i.e., they are only used to form either nouns from nouns or verbs from verbs. Korean suffixes, on the other hand, are category determining, i.e, they may change the category of their base words. In Table 4.3, NK means **Native Korean**, and SK stands for **Sino-Korean**. Derivational prefixes and suffixes are from both the NK and SK stock. SK affixes are only used to derive nouns. Korean is a suffix-heavy language and there are a relatively small number of prefixes (Sohn 2001). For example, all inflectional affixes are suffixes in Korean, as we will see in Section 4.4, whereas derivational affixes are either prefixes or suffixes.

### *4.2.1.1 Noun Derivation*

**(a)** **Category-changing suffixes**: The derivational rule in (19) states that verbs can be turned into nouns by putting a nominalizing suffix after them. One

such suffix is *-(u)m*. Since only a limited set of verbs can combine with this suffix, they are listed in the lexical insertion rule in (19c).

(19) a. N → V – NOMINALIZER
b. NOMINALIZER → 음-*(u)m*
c. V → 죽다 *cwuk-ta* 'to die', 울다 *uwl-ta* 'to cry', 자다 *ca-ta* 'to sleep' . . .

(20) contains a list of representative Korean suffixes that turn verbs into nouns and some example words.[2] They are all from NK.

[2] For more extensive lists of derivational affixes, see Sohn (2001) and Lee and Ramsey (2000).

(20) a. 음 *-(u)m* 'fact, thing' in 죽음 *cwuk-um* (die-) 'death' and 잠 *ca-m* (sleep-) 'sleep'
b. 이 *-i* 'act, thing' in 벌이 *pel-i* (make money-) 'money making, earning' and 먹이 *mek-i* (eat-) '(animal) food'
c. 기 *-ki* 'quality, -ing' in 크기 *khu-ki* 'size' and 보기 *po-ki* 'example'
d. 보 *-po* 'thing, person' in 울보 *wul-po* 'cry-baby' and 먹보 *mek-po* 'glutton'
e. 개/게 *-kay/key* 'er' in 집게 *cip-key* (pick up-) 'tweezer', 날개 *nal-kay* (fly-) 'wing'

**(b) Category-preserving suffixes**: The derivational rule in (21) describes that a noun can consist of a noun and a person (practitioner)-denoting suffix such as *cayngi*. The list of nouns to which this suffix can be attached is given in the lexical entry rule in (21c).

(21) a. N → N - SUFFIX
b. SUFFIX → 쟁이 *cayngi* 'someone who practices N or who is full of N (practitioner, overindulger)'
c. N → 점 *cem* 'fortune', 심술 *simswul* 'tantrum', 욕심 *yoksim* 'greed', 멋 *mes* 'fashion', 거짓말 *kecismal* 'lie'

(22) and (23) present lists of typical Korean suffixes that derive nouns, also from Sohn (2001) and Lee and Ramsey (2000). Most Native Korean (NK) noun-deriving suffixes are attached to a noun denoting an activity or a property and change it into a person who does the activity or has the property, as shown in (22). Sino-Korean (SK) suffixes are more varied in meaning and often add more abstract concepts, as in (23). Korean derivational processes are subject to **stratal constraints**. A **stratum** is a layer of the lexicon of a particular historical origin (Booij 2007, 65). In general, a native affix occurs with a native root or stem. There are some exceptions: *am-saca* (native 'female' + SK 'lion') 'lioness', *sayk-kkal* (SK 'color' + native intensifier) 'color', and *seuwul-sik* (native 'Seoul' + SK 'style') 'Seoul style'.

(22) Native Korean (NK):
  a. 아지 *-aci* (diminutive) in 강아지 *kang-aci* (dog-) 'puppy' and 목아지 *mok-aci* (neck-) 'neck (derogatory)'
  b. 꾸러기 *-kkwuleki* 'overindulger' in 잠꾸러기 *cam-kkwuleki* (sleep-) 'late riser' and 장난꾸러기 *cangnan-kkwuleki* (mischief-) 'trouble maker'
  c. 꾼 *-kkwun* 'doer' in 일꾼 *il-kkwun* (work-) 'worker' and 장사꾼 *cangsa-kkwun* (trade-) 'merchant'
  d. 보 *-po* 'thing, person' in 털보 *thel-po* (hair-) 'hairy person' and 잠보 *cam-po* (sleep-) 'sleepy-head'

(23) Sino-Korean (SK):
  a. 자 *-ca* 'person' in 기술자 *kiswul-ca* (skill-) 'technician' and 과학자 *kwahak-ca* (science-) 'scientist'
  b. 장 *-cang* 'chief' or 'place' in 위원장 *wiwen-cang* (committee-) 'committee chair' and 운동장 *wuntong-cang* (exercise-) 'athletics field, playground'
  c. 적 *-cek* '-ic' in 과학적 *kwahak-cek* (science-) 'scientific' and 체계적 *cheky-cek* (system-) 'systematic'
  d. 학 *-hak* 'study' in 언어학 *ene-hak* (language-) 'linguistics' and 회계학 hoykyey-hak (account-) 'accounting'
  e. 식 *-sik* 'style' in 한국식 *hankwuk-sik* (Korea-) 'Korean style' and 미국식 *mikwuk-sik* (America-) 'American style'

**(c) Category-preserving prefixes**: Let us now look at derivational prefixes in Korean, which do not change the category of their input. (24) presents the derivation rule for the SK negative prefix *pwul-* 'not'.

(24) a. N → PREFIX (NEGATIVE) - N
  b. PREFIX (NEGATIVE) → 불 *pwul* 'not'
  c. N → 가능 *kanung* 'possibility', 규칙 *kyuchik* 'regularity', 만족 *mancok* 'satisfaction', 성실 *sungsil* 'sincerity'

(25) contains a list of typical NK prefixes that derive nouns (Sohn 2001, Lee and Ramsey 2000).

(25) a. 가랑 *kalang-* 'small, dead' in 가랑비 *kalang-pi* (-rain) 'drizzle' and 가랑잎 *kalang-ip* (-leaf) 'dead leaves'
  b. 맨 *mayn-* 'bare' in 맨밥 *mayn-pap* 'rice without side dishes' and 맨발 *mayn-pal* 'bare foot'
  c. 맏 *mat-* 'eldest' in 맏형 *mat-hyeng* 'oldest brother' and 맏물 *mat-mwul* 'first harvest'
  d. 풋 *phus-* 'unripe' in 풋과일 *phus-kwail* 'unripe fruit' and 풋사랑 *phus-salang* 'puppy love'
  e. 외 *oy-* 'only' in 외아들 *oy-atul* 'only son' and 외길 *oy-kil* 'only way'

f. 참 *cham-* 'true, real' in 참기름 *cham-kilum* 'sesame oil' and 참말 *cham-mal* 'truth'
g. 날 *nal-* 'raw' in 날고기 *nal-koki* 'raw meat' and 날생선 *nal-sayngsen* 'raw fish'

(26) shows some representative SK noun-deriving prefixes.

(26) a. 전 *cen-* 'entire' or 'former' in 전세계 *cen-seykey* (-world) 'the whole world' and 전대통령 *cen-taythonglyeng* (-president) 'former president'
b. 가 *ka-* 'temporary' in 가건물 *ka-kenmwul* (-building) 'temporary building' and 가처분 *ka-chepwun* (-treatment) 'temporary sentence'
c. 신 *sin-* 'new' in 신세대 *sin-seytay* (-generation) 'new generation' and 신기술 *sin-kiswul* (-skill) 'new technology'
d. 다 *ta-* 'multi' in 다목적 *ta-mokcek* (-goal) 'multi-function' and 다세대 *ta-seytay* (-household) 'multi-household'
e. 대 *tay-* 'great' in 대가족 *tay-kacok* (-family) 'extended family', 대기업 *tay-kiep* (-company) 'big company'

### *4.2.1.2 Verb/Adjective Derivation*

**(a) Category-changing suffixes**: Some Korean suffixes take nouns as inputs and derive verbs. The derivation rule in (27) is for such a suffix, *-lop* 'be characterized by', which is attached to a noun such as *cayu* 'freedom' and derives a verb *cayu-lop-ta* 'be carefree'.

(27) a. V/A → N – VERBALIZER
b. VERBALIZER → 롭 *-lop* 'be characterized by'
c. N → 자유 *cayu* 'freedom', 향기 *hyangki* 'fragrance', 해 *hay* 'harm', 슬기 *sulki* 'wisdom', 지혜 *cihyey* 'wisdom'

(28) is a list of verb-deriving suffixes in Korean, all of which are from NK stock. SK affixes only derive nouns and they are not category changing.

(28) a. 지 *-ci* 'be characterized by', 그늘지다 *kunul-ci-ta* (shade-) 'get shaded' and 밑지다 *mith-ci-ta* (bottom-) 'suffer a loss'
b. 겹 *-kyep* 'be full' in 흥겹다 *hung-kyep-ta* (fun-) 'be fun' and 눈물겹다 *nwunmul-kyep-ta* (tear-) 'be sad/touching'
c. 맞 *-mac* 'give the impression of' in 익살맞다 *iksal-mac-ta* (humor-) 'be humorous' and 방정맞다 *pangceng-mac-ta* (rashness-) 'be rash'
d. 스럽 *-sulep* 'be suggestive of, seeming' in 사랑스럽다 *salang-sulep-ta* (love-) 'lovely' and 수다스럽다 *swuta-sulep-ta* (chat-) 'be talkative'
e. 답 *-tap* 'be like' in 정답다 *ceng-tap-ta* (affection-) 'be affectionate' and 남자답다 *namca-tap-ta* (man-) 'manly'

**(b) Category-preserving suffixes**: The derivational rule for the causative suffixes is given in (29) and some other verb-deriving suffixes are given in (30). Note that causatives and passives are lexically derived in Korean, unlike English, which forms passives and causatives syntactically. The allomorphs are phonologically determined.

(29) a. V → V – CAUSATIVE
b. CAUSATIVE → 이/히/리/기/우/구/추 *-i/hi/li/ki/wu/kwu/chwu*
c. V → 먹다 *mek-ta* 'eat', 굽다 *kwup-ta* 'bend', 울다 *wul-ta* 'cry', 웃다 *wus-ta* 'laugh', 지다 *ci-ta* 'carry on the back', 돋다 *tot-ta* 'rise', 낮다 *nac-ta* 'low'

(30) a. 치 *-chi* intensifier in 덥치다 *teph-chi-ta* (cover-) 'attack'
b. 뜨리 *-ttuli* intensifier in 깨뜨리다 *kkay-ttuli-ta* (break-) 'smash'
c. 조리 *-coli* 'gently' in 읊조리다 *ulph-coli-ta* (recite-) 'recite gently'
d. 다랗 *-talah* 'rather' in 커다랗다 *khe-talah-ta* (big-) 'biggish'
e. 스름/스레하 *-sulum/suleyha* '-ish' in 거무스름하다 *kemwu-sulumha-ta* (black-) 'blackish'

**(c) Category-preserving prefixes**: (31) is the derivational rule that produces a verb from a verb by attaching a prefix. The verb *cis-palp-ta* 'overrun' consists of the verb root *palp-* 'step on' and an intensifier prefix *cis-* 'roughly'.

(31) a. V → PREFIX – V
b. PREFIX → 짓 *cis-* 'roughly'
c. V → 이기다 *iki-ta* 'knead', 누르다 *nwulu-ta* 'press', 밟다 *palp-ta* 'step on'

In (32), we list some representative category-preserving verbal prefixes.

(32) a. 처 *che-* 'recklessly' in 처먹다 *che-mek-ta* (-eat) 'devour' and 처부수다 *che-pwuswu-ta* (-break) 'destroy'
b. 내 *nay-* 'outwardly' in 내놓다 *nay-noh-ta* (-put) 'put out' and 내던지다 *nay-tenci-ta* (-throw) 'throw out'
c. 비 *pi-* 'twisted' in 비웃다 *pi-wus-ta* (-laugh) 'scorn' and 비틀다 *pi-thul-ta* (-twist) contort'
d. 엿 *yes-* 'stealthily' in 엿듣다 *yes-tut-ta* (-hear) 'eavesdrop' and 엿보다 *yes-po-ta* (-see) 'spy on'

### *4.2.1.3 Adverb Derivation*

**(a) Category-preserving suffixes**: The rule in (33) specifies that the suffix *-(h)i* derives adverbs from adverbs.

(33) a. ADV → ADV - SUFFIX
b. SUFFIX → 히/이 *-h(i)*
c. ADV → 일찍 *ilccik* 'early', 가득 *katuk* 'full'

There are a few other suffixes that derive adverbs from adverbs with a change in meaning.

(34) a. 장 *-cang* intensifier in 곧장 *kot-cang* (direct-) 'straightaway'
b. 내 *-nay* 'finally' in 마침내 *machim-nay* (just in time-) 'at last'

**(b) Category-changing suffixes**: As shown in (35), the adverb *caymiiss-key* 'with fun' is formed by putting the adverb forming suffix -key after an adjective root *caymiiss-ta* 'to be fun'.

(35) a. ADV → V - SUFFIX
b. SUFFIX → 게 *-key*
c. V → 재미있다 *caymiiss-ta* 'be fun', 하얗다 *hayah-ta* 'be white', 급하다 *kupha-ta* 'be in a hurry'

(36) contains some adverbial suffixes that take nouns as input.

(36) a. 이-*i* in 나날이 *na-nal-i* (day-) 'day by day' and 낱낱이 *nath-nath-i* (units-) 'one by one' (occur after reduplicated noun)
b. 히 *-hi* in 확실히 *hwaksil-hi* (certainty-) 'surely' and 속히 *sok-hi* (speed-) 'quickly' (SK noun)
c. 껏 *-kkes* 'to the utmost' in 마음껏 *maum-kkes* (heart-) 'with full satisfaction' and 힘껏 *him-kkes* (strength-) 'with all one's might'

## 4.2.2 Compounding in Korean

**Compounding** is a word-formation process in which new words are formed from two or more independent words, rather than using affixes. Examples of compounding include *yeca-chinkwu* 'girlfriend' and *pohem-hoysa-cikwon* 'insurance company agent'.

In English, word-compounding is made up of constituents belonging to one of the categories noun, adjective, verb, or preposition (e.g., *sunshine*, *nationwide*, *farfetched*, *outlive*, etc.). Root-compounding is made up of bound roots of Greek-Latin origin (e.g., *automobile*, *pentagon*, *microscope*, etc.) (Selkirk 1982). Similarly, in Korean, there are native compounds and Sino-Korean compounds. Native compounds are made up of native words belonging to noun, verb, adjective, or adverb categories. Some examples are given in (37). As shown in (37f), Korean has very productive **reduplicative compounds**.

(37) a. 눈물 *nun-mul* (eye-water) 'tear' (N)
b. 목소리 *mok-soli* (throat-sound) 'voice' (N)
c. 빛나다 *pich-na-ta* (light-come out) 'shine' (V)
d. 달려가다 *talie-ka-ta* (run-go) 'run' (V)
d. 값싸다 *kaph-ssa-ta* (price-cheap) 'cheap' (ADJ)
e. 밤낮 *pam-nac* (night-day) 'day and night' (ADV)
f. 가지가지 *kaci-kaci* (kind-kind) 'all kinds' (reduplicated N)

We can assume that the following word formation rules apply to generate the compounds in (37).

(38) a. N → N – N
b. V → N – V
c. V → V – V
d. ADV → N – N

### *4.2.2.1 Noun Compounds*

Sino-Korean compounds are made up of Sino-Korean roots, which are usually monosyllabic. Affixes are bound morphemes, but not all bound morphemes are affixes. (39) shows some examples. Note also that there are only noun SK compounds.

(39) a. 대학 *tay-hak* (big-learn) 'college'
b. 자동 *ca-tong* (self-move) 'automatic'

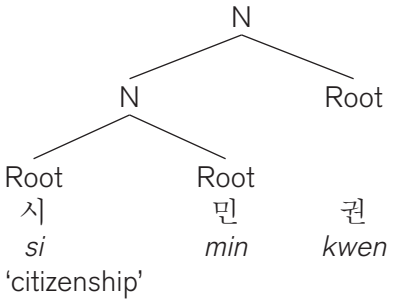
When more than two SK morphemes form a compound, it usually results in **asymmetric compounds** (Han 1994). In (40), the first two bound roots form a word and it combines with the root, whereas the examples in (41) are constructed by the combination of a root plus a word. For example, in *si-min-kwen* 'citizenship', *min-kwen* is not a word, but *si-min* 'citizen' is.

(40) a. 시민권 [si-min][kwen] (citizen-right) 'citizenship'
b. 세계사 [se-kye][sa] (world-history) 'world history'
c. 언어학 [en-e][hak] (language-study) 'linguistics'

(41) a. 여배우 [ye][pay-wu] (female-actor) 'actress'
b. 암거래 [am][ke-lay] (dark-deal) 'illegal trade'
c. 단거리 [tan][ke-li] (short-distance) 'short distance'

The derivational tree can show the difference between the compounds in (40) and those in (41).

(42) a.




b.

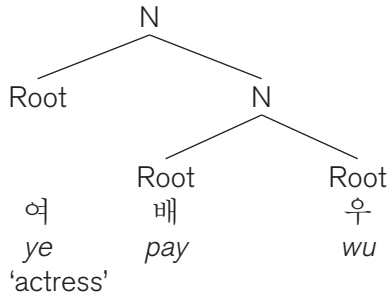



**Figure 4.3** Asymmetric compounds

The properties of native compounds and SK compounds are different as evidenced by their different phonological behaviors. For example, n-insertion applies only to native compounds but does not apply to SK compounds consisting of two roots (Han 1994).

(43) a. 민요 *min-yo* (people-song) 'folksong' → 민요 [min-yo] but not 민뇨 *[minnyo]
b. 부엌일 *pwuek-il* (kitchen-work) 'housework' → 부엌닐 [pwuek-nil]

If each word in a compound has equal and independent semantic status, it is called a **coordinate compound**. If one word modifies the other, it is called a **subordinate compound** (Cho 1994). This difference has a phonetic reflex: Bindung /s/ applies only to subordinate compounds, as shown in (44); [t], which is [s] in orthography, is inserted and then assimilated to the following obstruent, tensifying it. e.g., *pom-palam* → *pom-/t/-palam* → *pom-/p/-palam* → *pom-ppalam*. As in (45), Bindung /s/ does not apply to coordinate compounds. This is because Bindung /s/ originated from the genitive marker (Cho 1994).

(44) a. 봄바람 *pom-palam* → [pom-ppalam] 'spring wind'
b. 바다가 *pata-ka* → [pata-kka] 'seashore'
c. 시내물 *sinay-mul* → [sinay-mmul] 'stream water'

(45) a. 눈비 *nwun-pi* 'snow and rain'
b. 논밭 *non-path* 'rice field and dry field'
c. 물불 *mul-pul* 'water and fire (hardship)'

There are also verbal compounds (e.g., *babysitter*, *bull-fighting*), which have a predicate–argument structure. As we see in (46), verbal compounds are formed by the nominalizing suffixes *-i*, *-um*, and *-ki*.

(46) a. 글짓기 [kul][cis-ki] (writing-make-nominalizer) 'composition'
b. 해돋이 [hay][tot-i] (sun-rise-nominalizer) 'sunrise'
c. 바람잡이 [palam][cap-i] (wind-catch-nominalizer) 'hawker/peddler'

Sino-Korean verbal nouns are similar to verbal compounds in that they also have a predicate–argument structure, as shown in (47).

(47) a. 물장사 *mul-cangsa* (water-sale) 'running a bar'
b. 불구경 *pwul-kwukyeng* (fire-watch) 'ambulance chasing'
c. 기분전환 *kipwun-cenhwan* (spirit-change) 'lift of the spirits/diversion'

Although they have predicate–argument structures, these verbal compounds and SK verbal nouns are lexical compounds, rather than phrasal concatenations such as *yenge kongpwu* 'studying English'. There are some tests to distinguish lexical compounds from phrasal concatenations. First, there is a semantic drift for verbal compounds, e.g., *mwul cangsa* means 'running a bar', not 'selling water'. Second, if you put the accusative case marker between the object and the predicate, a phrasal construction does not change its meaning, but a lexical compound does, e.g., *yenge-lul kongpwuhata* 'to study English' vs. *pwul-ul kwukyenghata* 'to watch fire'. In some verbal compounds, you cannot even insert the accusative case marker, e.g., *mom puli-m* 'struggling' but not **mom-ul puli-ta* '(intended) to struggle' (Cho 1994).

**Loan and hybrid compounds** are also possible, as shown in (48). These compounds consist of a SK word plus an English loanword.

(48) a. 암달라 *am-tala* (dark-dollar) 'black market dollars'
b. 고속터미널 *kosok-theminel* (express-terminal) 'express bus terminal'

### *4.2.2.2 Verb Compounds*

Korean also has very productive compounding of verbs. Verbal compounds either consist of a noun plus a verb, as in (49), or two verbs connected with or without a complementizer, as in (50). Korean has a very productive **light verb construction** process, shown in (49f), which turns phrases into words, e.g., *kongpwu-lul hata* becomes *kongpwu-hata* 'to study'. The compounding in (50) is called **serial verb constructions**, which are basically verbal compounding, e.g., *tali-e-kata* 'to run'.

(49) a. 겁나다 *kep-nata* (fear-come out) 'be scared'
b. 길들다 *kil-tulta* (road-enter) 'get used to'
c. 숨지다 *swum-cita* (breath-fall) 'die'
d. 애쓰다 *ay-ssuta* (effort-use) 'make efforts'
e. 마음먹다 *maum-mekta* (heart-eat) 'intend, plan'
f. 밥/공부/청소하다 *pap/kongpwu/chengso-hata* (rice/work/cleaning-do) 'cook/study/clean'

(50) a. 굶주리다 *kwulm-cwulita* (starve-hungry) 'go hungry'
b. 매달다 *may-talta* (tie-suspend) 'bind up, hang'
c. 알아듣다 *al-a-tutta* (know-hear) 'understand'
d. 파고들다 *pha-ko-tulta* (dig-enter) 'look into'

## 4.3 KOREAN LEXICON

**Lexicon** is the repository of all information about the established (i.e., conventionalized) words of a language. Lexicon is perhaps the most variable component of a grammar, as new words are constantly created and added while unused words disappear. The lexicon specifies properties of each word, such as its sound, part of speech category, meaning, etc. Lexicon consists of simplex and complex words, the latter of which are created by morphological rules of a language such as inflection, derivation and compounding. In addition to morphology, borrowing, phrases becoming words, and coinage of new words are added sources of lexicon.

Let us present some distinctive characteristics of Korean lexicon. The majority of Korean words (about 60 percent) are Sino-Korean (SK). Sino-Korean vocabulary should not be considered loanwords just as the Latinate vocabulary and neologisms found in English are not. All SK words are nouns, and new words are created by combining SK roots. This process is productive because SK roots are in general monosyllabic with clear meanings. For example, *il* means 'one', and it combines with other SK roots to form different words containing the same meaning, as shown in (51).[3]

[3] If there are both SK words and native words with the same meaning, SK words sound more formal and dignified (deferential) and less personal than their native counterparts (Sohn 2001).

(i) a. 편지 *phyenci* vs. 서한 *sehan* 'letter'
b. 딸 *ttal* vs. 여식 *yesik* 'daughter'
c. 아내 *anay* vs. 부인 *pwuin* 'wife'
d. 어머니 *emeni* vs. 모친 *mochin* 'mother'

(51) a. 유일 唯一 (only-one) *yu-il* 'being unique'
b. 제일 第一 (order-one) *cey-il* 'the first'
c. 통일 統一 (governing-one) *thong-il* 'reunification'
d. 일등 一等 (one-rank) *il-tung* 'first rank'
e. 일심 一心 (one-heart) *il-sim* 'wholeheartedness'
f. 일보 一步 (one-step) *il-po* 'one step'

About 35 percent of Korean lexicon consists of native Korean. Native words express natural objects, basic actions and states, concrete concepts, and

grammatical relations (Sohn 2001). Numbers up to 99, basic color terms, kinship terms for three generations, and classifiers (see 6.2.3) are also native Korean words. In addition, native Korean words include several thousand sound-symbolic (or ideophonic) words. Many sound-symbolic words come in pairs observing vowel harmony, where **bright (Yang) vowels** connote brightness, sharpness, lightness, smallness, thinness, and quickness, whereas **dark (Yin) vowels** connote darkness, heaviness, dullness, slowness, deepness, and thickness (Sohn 2001). Some examples are given in (52).

(52) a. 파닥 *phatak* vs. 퍼덕 *phetek* 'flapping, flopping, splashing'
b. 고소하다 *kosohata* vs. 구수하다 *kwuswuhata* 'taste or smell like sesame'
c. 반짝 *panccak* vs. 번쩍 *penccek* 'glittering'
d. 짤랑 *ccallang* vs. 쩔렁 *ccellang* 'jingling'

About 5 percent of Korean lexicon is loanwords, but they are continuously increasing. Japanese loanwords were widespread during the Japanese colonial period (1910–1945). After independence, Koreans eradicated Japanese loanwords through a language purification movement. Some examples are given in (53).

(53) a. 다꾸앙 *takkwuang* → 단무지 *tanmwuci* 'pickled radish'
b. 와리바시 *walipasi* → 나무 젓가락 *namwu ceskalak* 'wooden chopsticks'
c. 스시 *susi* → 초밥 *chopap* 'sushi'

English loanwords are predominant in contemporary Korean. New words are constantly formed based on English loans. For example, **blending** (combination of the first part of one word with the second part of another, e.g., *brunch*) is used in words such as *mas-tohphia* 'taste-utopia' and *men-pung* 'mental-breakdown'.

## 4.4 INFLECTIONS IN KOREAN

**Inflection** refers to the process of creating different grammatical forms of words. For example, the plural form of *salam* 'person' is made up of the root and the inflectional suffix *-tul*, i.e., *salam-tul* 'people', and the honorific form of *ka-ta* 'to go' is created by attaching the inflectional suffix *-si* after the verb stem, i.e., *ka-si-ta* '(a respected person) to go'. All inflectional affixes in Korean are suffixes. These are **morpho-syntactic categories** because their function straddles morphology and syntax. In fact, it is very difficult to draw a clear boundary between inflectional morphology and syntax in Korean, and depending on the theory, all of the suffixes discussed in this sub-section can be treated in syntax.

### 4.4.1 Nominal Inflections

The inflectional suffixes that are attached to noun phrases in Korean include **number** and **case** markers, postpositions, and so-called **delimiters**. Let us discuss number and case markers first. Observe (54), which shows the inflection of the Korean word *salam* 'person'. Each form of this word has properties with respect to two inflectional categories, number and case, each of which has more than one value. There are two values for number: **singular** and **plural**, and three different values for case: **nominative**, **accusative**, and **genitive** (or possessive). Korean does not have **gender** and **person** categories and therefore there is no agreement with the verb. Case markers such as nominative and accusative indicate grammatical relations between the noun and the verb, marking the noun's dependency on the verb. The genitive case, on the other hand, marks the relations between nouns. Since the relation is determined by the syntactic context in which a noun occurs, it is called a **structural case**. Structural case markers are frequently omitted in casual conversation in Korean (H. Lee 2010).

(54) a. 사람들이 *salam-tul-i* — NUMBER: PLURAL
'person-PL-NOM' — CASE: NOMINATIVE
b. 사람을 *salam-ul* — NUMBER: SINGULAR
'person-ACC' — CASE: ACCUSATIVE
c. 사람들의 *salam-tul-uy* — NUMBER: PLURAL
'person-PL-GEN' — CASE: GENITIVE

We have seen the rule for determining the plural form in (4) above, which is repeated in (55) below. The rule states that if we add the ending *-tul* to the stem form of a (countable) noun, we create a noun with the feature PLURAL.

(55) a. N → N - PLURAL
b. PLURAL → 들 *-tul*

(56) presents the rule for case marking in Korean.

(56) a. N → N - CASE
b. CASE
NOMINATIVE → 이 *-i* / C___ & 가 *-ka* / V___
ACCUSATIVE → 을 *-ul* / C___ & 를 *-lul* / V___
GENITIVE → 의 *-uy*

Note that nominative and accusative cases have allomorphs: *-i* and *-ul* after a noun ending with a consonant, and *-ka* and *-lul* after a noun ending with a vowel.

In addition to the three structural case markers, namely, nominative, accusative, and genitive, Korean has many **postpositions** marking other semantic relations.

Postpositions are more or less like prepositions in English, except that they are bound morphemes in Korean. The specific case of the noun indicated by postpositions expresses a specific semantic relation of the noun to the verb. Therefore, it is called an **inherent case**. Unlike structural case markers, postpositions are not optional in colloquial speech.

(57)

| | CASE |
|---|---|
| 인호에게 *Inho-eykey* 'Inho-to' | DATIVE |
| 학교에 *hakkyo-ey* 'school-to' | DIRECTIVE |
| 학교에서 *hakkyo-eyse* 'school-at' | LOCATIVE |
| 학교까지 *hakkyo-kkaci* 'school-till' | GOAL |
| 학교하고 *hakkyo-hako* 'school-and' | CONJUNCTIVE |
| 학교나 *hakkyo-na* 'school-or' | DISJUNCTIVE |
| 학교보다 *hakkyo-pota* 'school-than' | COMPARATIVE |
| 칼로 *khal-lo* 'knife-with' | INSTRUMENTAL |

We can write rules such as the following to specify this inflectional process.

(58) a. N → N – POSTPOSITION
b. POSTPOSITION → *eykey* (dative), *ey* (directive), *eyse* (locative), *kkaci* (goal), etc.

Whereas case markers and postpositions indicate syntactic relations among major nominal arguments, delimiters provide a special discourse meaning with little or no syntactic function. They include morphemes such as *-man* 'only', *-to* 'also' *-(n)un* 'as for (topic marker)', *-cocha* 'even', among others. In English, these are separate words, but in Korean they are bound suffixes. Yang (1972) distinguishes delimiters into three groups, X, Y, and Z-delimiters, in that order. From each group, at most one member can occur within a noun phrase. Z-delimiters take the same slot as syntactic case markers and hence they cannot co-occur with case markers. (59) shows an example of a noun followed by a postposition, X-delimiter *-kkaci* 'up to', Y-delimiter *-man* 'only' and Z-delimiter *-(n)un* 'as for'. Nominative marker *-i/ka* cannot follow the noun phrase because a Z-delimiter *-(n)un* already occupies the position.

(59) 미나한테까지만은
Mina-hanthey-kkaci-man-un-*i
Mina-DAT-GOAL-ONLY-TOP-*NOM
'only up to Mina'

(60) contains the list of inflectional suffixes that come after nominal expressions.

(60) a. Plural marker 들 *-tul*
b. Honorific marker 님 *-nim*
c. Case markers: Nominative 이/가/께서 *-i/ka/kkeyse* (honorific)
Accusative 을/를 *-ul/lul*
Genitive 의 *-uy*
d. Postpositions: Dative 에게/한테/께 *-eykey/hanthey/kkey* (honorific) 'to'
Locative 에/에서 *-ey/eyse* 'at, in'
Instrumental (으)로 *-ulo* 'with'
Directive 에/으로 *-ey/ulo* 'to, towards'
Source 부터 *-pwuthe* 'from'
Goal 까지 *-kkaci* 'till, until'
Comitative 하고/과/와 *-hako/kwa/wa* 'with'
Conjunctive 하고/과/와 *-hako/kwa/wa* 'and'
Disjunctive (이)나 *-(i)na* 'or'
Comparative 보다 *-pota* 'than', 처럼 *-chelem* 'like'
Vocative 아/야 *-a/ya*
e. Delimiters: X-delimiter 까지/마저 *-kkaci/mace* 'even,' 마다 *-mata* 'each, every'
Y-delimiter 만 *-man* 'only', 조차 *-cocha* 'even', 밖에 *-pakkey* 'only'
Z-delimiter 은/는 *-un/nun* 'as for, regarding', 도 *-to* 'also', (이)라도 *-(i)lato*
'even', 이야말로 *-(i)yamallo* 'the very, no other than', 이나 *-(i)na* 'or so, something like', 이야 *-(i)ya* 'as only for'

The inflectional nominal suffixes have a fixed order, as shown in (61a). An example is given in (61b).

(61) a. Nroot + (Honorific) + (Plural) + (Postposition) + (conjunctives) + (X-delimiter) + (Y-delimiter) + (Z-delimiter/Case marker)
b. 선생님들께하고 미나한테만은
sensayng-nim-tul-kkey-hako Mina-hanthey-man-un
teacher-HON-PL-DAT-CONJ Mina-DAT-ONLY-TOP
'only to the teachers and to Mina'

Unlike derivational affixes, whose order reflects a hierarchical structure of word formation and its corresponding compositional semantics, inflectional suffixes can be expressed by means of **templates**, which have a flat, rather than hierarchical, structure. In general, contextual inflection such as Case is peripheral to inherent inflection such as postpositions and delimiters (Booij 2007, 120).

## 4.4.2 Verbal Inflections

Major verbal inflection categories in Korean include the **tense**, **aspect**, and **mood** (TAM) system, **voice** (active vs. passive), **nominalization**, and **honorifics**. As we have mentioned, Korean does not have person, number, or gender agreement marking on the verb but only honorific marking specifies the property of the participants (usually the subject) of the event. Aspect refers to the way in which a situation is presented. **Perfective aspect** presents a situation as completed, whereas **imperfective aspect** presents a situation as ongoing. Korean has a number of aspect constructions, in which an auxiliary verb follows a complementizer. For example, a complementizer *-ko* plus the verb of existence *iss-ta* indicates the progressive aspect, whereas a complementizer *-a/e* plus the verb *noh-ta* 'to put' expresses a perfective aspect. Tense locates a situation in time with respect to the time of speech, and has three values, Past, Present, and Future. Mood describes the actuality of an event. For example, **indicative mood** is the mood of realis whereas imperative forms denote an **irrealis mood**. Korean, in addition to the universal category of indicative and interrogative, has separate inflectional suffixes for imperative, exhortative and promissive. These different mood suffixes conjugate according to the **speech level** (deferential, polite, familiar, etc.), which marks the relationship between the speaker and the addressee.

(62) contains a list of typical inflectional suffixes that are attached to verb stems.

(62) a. Honorific. (으)시 *-(u)si*
b. Tense. Past 었/았/ㅆ *-ass/ess/ss* & Non-past/Present 는/은/Ø *-nun/un/Ø*
c. Pre-nominal modifier. Past 은 *-un*, Present 는 *-nun*, Future 을 *-ul*
d. Complementizer. 어/아 *-e/a*, 게 *-key*, 지 *-ci*, 고 *-ko*, (어/아)야 *-(e/a)ya*
e. Mood. Indicative 습니다/ㅂ니다 *-(su)pnita* (deferential), 아/어요 *-a/eyo* (polite), 아/어 *a/e/ta* (familiar)
Interrogative 습니까/ㅂ니까? *-(su)pnikka* 아/어요? *-a/eyo?* 아/어/니? *-a/e/ni?*
Exhortative (으)ㅂ시다 *-(u)psita*, 아/어요 *-a/eyo*, 자 *-ca*
Imperative (으)십시오 *-(u)sipsiyo*, 아/어요 *-a/eyo*, (아/어)라 *-(a/e)la*
Promisive 겠습니다 *-keysssupnita*, 겠어요 *-keysseyo*, (으)마 *-(u)ma*
f. Discourse. 네(요) *-ney(yo)*, 군(요) *-kwun(yo)*, 지(요) *-ci(yo)*, 더라고(요) *-telako(yo)*, 니까(요) *-nikka(yo)*

Some researchers argue that there is no coherent syntactic category of comp(lementizer) in Korean (Yoon 2005). Even so, complementizers still have embedding functions and their form is selected by the higher predicate.

(63) a. Comp1 allow none of the other verbal suffixes, e.g., 아/어 *-a/e* 잡아 보다 *cap-a po-ta* 'try holding' *잡으시어 보다 *cap-usi-e po-ta*
b. Comp2 allow only the honorific suffix, e.g., 지 *-ci*, 고 *-ko* 잡으시지 않다 *cap-usi-ci ahn-ta* 'does not hold' *잡았고 있었다 *cap-ass-ko iss-ess-ta* 'was holding'
c. Comp3 allow honorific and tense markers but not mood or discourse suffixes, e.g., 아/어야 *-a/eya* 잡으셨어야 했다 *cap-usi-ess-eya ha-ta* 'should have held' *잡으셨어야다했다 *cap-usi-ess-eya-ta hay-ss-ta*
d. Comp4 allow mood but not discourse suffixes, e.g., 고 *-ko* 잡으시었다고 했다 *cap-usi-ess-ta-ko hay-ss-ta* 'said that (a respected person) held' 잡으시었다네고 했다 **cap-usi-ess-ta-ney-ko hay-ss-ta*

The verbal suffixes follow the order given in (64a). This is in line with the generalization that aspect markers tend to appear more closely to the stem than tense markers, and tense markers more closely than mood markers (Bybee 1985:35). The ordering may reflect the degree to which the meaning expressed by the verbal root is affected by these different markers. For instance, aspect markers, which are closest to the verbal root, have a direct effect on the kind of event that is denoted by the verb. Tense markers do not affect the meaning of the verb directly but express the temporal location of the described event. In addition to these inherent inflections on the verbs, verbs also exhibit contextual inflections of speech level in Korean. As with the nominal inflection, contextual inflection is peripheral to inherent inflection. An example is given in (64b).

(64) a. V-stem – (Comp1) – (Honorific) – (Comp2) – Tense – (Comp3) – Mood – (Comp4) – (Discourse)
b. 읽어 보시고 있었어야 했다니까요
ilk-e po-si-ko iss-ess-eya hay-ss-ta-nikka-yo
read-Comp1-Hon-Comp2-Past-Comp3-Mood-Comp4-Discourse
'(a respected person) should have been reading (I am telling you)'

Delimiters, which we saw in the previous section, can also occur as verbal inflections when the verb is followed by either a complementizer or a mood marker (Yoon 2005).

(65) a. 먹어만 보았지
Mek-e-man po-ass-ci.
eat-COMP-only try-PST-DIS
'(I) only tried tasting.'
b. 가도 된다
Ka-a-to toy-n-ta.
go-COMP-ALSO become-PRS-MOOD (Indicative, Familiar)
'(You) may go.'

c. 보기조차 싫어요
Po-ki-cocha silh-eyo.
see-NOM-EVEN hate-MOOD (Indicative, Polite)
'(I) hate even seeing (it).'

d. 잡으셨다고만
Cap-usi-ess-ta-ko-man.
catch-HON-PST-MOOD-COMP-ONLY
하셨습니다
ha-si-ess-supnita.
do-HON-PST-MOOD (Indicative, Deferential)
'(A respected person) said that he/she only held (it).'

Some verbs have allomorphic variation when an inflectional suffix is attached. They are called **irregular verbs** and Korean has a few of them. Let's look at an example. In (66), the final consonant [p] is weakened to [w] when followed by an inflectional suffix beginning with a vowel. In the citation form and the last form in which the verbs are followed by a suffix beginning with a consonant, [p] is preserved.

(66) 덥다 *tep-ta* 'to be hot' 춥다 *chwup-ta* 'to be cold'
더워요 *tew-eyo* 'hot-DEC' 추워요 *chwuw-eyo* 'cold-DEC'
더워서 *tew-ese* 'hot-so' 추워서 *chwuw-ese* 'cold-so'
덥지만 *tep-ciman* 'hot-but' 춥지만 *chwup-ciman* 'cold-but'

In such cases, we choose one form as more **basic (underlying form)** than the other and derive one **allomorph** from the other. We know that *tep-* is the basic form because it has wider distribution (**elsewhere condition**) and *tew-* is observed in a limited context (only before a vowel). A derivation shows the steps from the input to the output.

(67) Word structure rule: Verb – informal polite ending
Lexical insertion: *tep – eyo* 'hot-DEC'
Consonant weakening rule: *tew-eyo*
Final output: *teweyo* 'It is hot.'

## 4.4.3 Word Formation versus Inflection

If word-formation (derivation and compounding) and inflection are different sub-systems of morphology, are they placed in different parts of the linguistic system? The **split morphology model** views word-formation as pre-syntactic rules and inflection as post-syntactic rules. That is, word-formation serves to enlarge the set of lexical items that can be inserted into syntactic structure, whereas in inflection the specific form of a lexical item depends on its syntactic context and therefore is post-syntactic.

(68) word-formation → syntax → inflection

Arguments for a non-lexical (syntactic, either phrasal or clitic) treatment of inflectional suffixes (Baker 1988) come from scope relations. For example, the Nominative marker is a property of the whole noun phrase (NP) and not just N. Moreover, inflection, unlike word-formation rules, is productive and systematic, allowing no **paradigm gaps** or true exceptions (N. Kim 1986).

However, the fact that inflection depends on syntax does not necessarily mean that it must be post-syntactic. The alternative view is called **strong lexicalism**, which states that the morphological component of the grammar computes new lexical items and the different inflectional forms of lexical items, which then serve as input to syntax.

(69) morphology → syntax

In this view, rules of contextual inflection will have the function of **checking mechanisms**: they check if the morpho-syntactic features of the words in a particular syntactic configuration can go together. If not, the sentence is ungrammatical.

There are several arguments for lexical treatment of inflectional suffixes in Korean. For example, the ordering of noun and verb suffixes is more rigid than that of syntactic ordering in Korean. As we will see in the next chapter, word order is relatively free in Korean. Moreover, the verbal form to which affixation of delimiter particles applies must be at least disyllabic. If these delimiters are not attached lexically, then the syntax would have to be given sensitivity to the syllabic phonological condition.

(70) a. 먹어만 주세요 *mek-e man cwuseyyo* 'give the favor (only) of eating'
b. *가만 주세요 **ka-man cwuseyyo* 'give the favor (only) of going'

In (73), *hanthey* 'DAT' is selected by the verb *cwuessta* 'gave'. It is difficult to treat the intervening delimiters *kkaci* 'up to' and *nun* 'TOP' as separate syntactic phrasal projections, because the Dative argument Mina must be next to the verb that selects it (this is called the principle of locality of subcategorization and argument selection) (Sells 1995:285).

(71) 미나한테까지는 주었다
Mina-hanthey-kkaci-nun cwu-ess-ta.
Mina-DAT-UP TO-TOP give-PST-DEC
'(I) gave (it) only up to Mina.'

We will not settle this issue in this introductory book. Interested readers should read the relevant literature and construct their own argument in favor of either position. More discussion on inflection and its treatment will follow in the Syntax chapter.

## 4.5 EXERCISES

1. In the paradigm below, identify the phonological material in each column or row that contributes the meaning of that column or row.

| | | | |
|---|---|---|---|
| *mekta* 'to eat' | *meknunta* 'eat' | *mekessta* 'ate' | *mekkeyssta* 'will eat' |
| *cwukta* 'to die' | *cwuknunta* 'die' | *cwukessta* 'died' | *cwukkeyssta* 'will die' |
| *chamta* 'to endure' | *chamnunta* 'endure' | *chamassta* 'endured' | *chamkeyssta* 'will endure' |

Based on the data above, fill in the blanks.

eat _____ Present Tense _____ Past Tense _____

Future Tense _____ die _____ endure _____

2. Circle free morphemes and underline affixes. Which ones are compounds? Which ones are derived words?

사과 *sakwa* 'apple' 나무 가지 *namwu-kaci* 'tree branch' 소녀 *so-nye* 'a girl'
잠꾸러기 *cam-kkwuleki* 'sleepyhead' 행복하다 *hayngpok-hata* 'to be happy'
초자연 *cho-ca-yen* 'supernatural' 안기다 *an-ki-ta* 'to be held' 고양이들 *koyangi-tul* 'cats'
넓다 *nelp-ta* 'be wide' 증오스럽다 *cungo-sulep-ta* 'be hateful' 밤낮 *pam-nac* 'night and day'
불행 *pwulhayng* 'unhappiness' 해돋이 *hay-tot-i* 'sunrise' 맡기다 *math-ki-ta* 'to put in charge'
젖먹이 *cec-mek-i* 'infant' 군살 *kwun-sal* 'extra flesh/fat' 맨발 *mayn-pal* 'barefoot'
아이스티 *aisu-thi* 'ice tea' 음주 *um-cwu* 'drinking'

3. In each group of words that follows, identify the part of speech of the root word and the part of speech of the whole (derived) word.

얼룩지다 *ellwuk-ci-ta* (stain-become-DEC) 'become stained'
값지다 kaps-ci-ta 'valuable'
집게 *cip-key* 'tweezers'
울보 *uwl-po* 'cry-baby'
새로이 *saylo-i* 'newly'
예쁘게 *yeyppu-key* 'pretty'

4. The following words are made up of either one or more morphemes. 1) Isolate the morpheme, 2) decide for each if it is free or bound, 3) decide what kind of affix is involved, 4) decide if the affix is inflectional or derivational, and 5) identify the part of speech of the root word and the part of speech of the whole (derived) word. Finally, provide a rule/template for the internal structure of each word.

   E.g. 내놓았다 *nay-noh-ass-ta* 'to put out'
   Four morphemes
   내 bound; derivational prefix
   놓 free; root; verb
   았 bound; inflectional suffix (past tense)
   다 bound; inflectional suffix (indicative mood)

   The derived word is a verb.
   $[[\text{nay-}]_{\text{V-prefix}}[\text{noh-}]_{\text{V-stem}}\text{-}[\text{ass-}]_{\text{suffix-Past}}[\text{-ta}]_{\text{suffix-Mood}}]_{\text{V}}$
   짓이기다 *cis-iki-ta* (roughly-knead) 'to mash'
   풋내기 *phwus-nay-ki* (unripe-come out-Nominalizer) 'unexperienced person'
   날계란 *nal-keylan* (raw-egg) 'raw egg'
   자연스럽다 *cayen-sulep-ta* (nature-characterized by) 'natural'
   빼기 *ppay-ki* (subtract-Nominalizer) 'subtraction'
   걸음 *kel-um* (walk-Nominalizer) 'footsteps'
   먹읍시다 *mek-up-si-ta* (eat-SUG-HON-DEC) 'let's eat'
   숨지다 (breath-fall) *swum-ci-ta* 'to die'
   고통스럽다 *kothong-sulep-ta* (pain-like) 'to be painful'
   초등학교 *chotung-hakkyo* (elementary-school) 'elementary school'
   속이다 *sok-i-ta* (get tricked-CAU) 'to deceive'
   처먹었어요 *che-mek-ess-eyo* (randomly-eat-PST-DEC) 'devoured'
   깨뜨리다 *kkay-ttu-li-ta* (break-intensifier) 'to break into pieces'
   꺽쇠 *kkek-soy* (break-iron) 'clamp'
   본보기 *pon-po-ki* (example-see-nominalizer) 'model'
   얼룩소 *elluk-so* (mottled-cow) 'brindled cow'
   생사 *sayng-sa* (live-die) 'life and death'
   겁나다 *kep-na-ta* (fear-come out-declarative ending) 'be scared'
   값싸다 *kaph-ssa-ta* (price-cheat-declarative ending) 'be cheap'
   덥치다 *teph-chi-ta* (cover-intensifier-declarative ending) 'attack'

5. The following groups of words have something in common. Identify what features classify them as a group. For example, the group of words in A are all nouns derived using native Korean prefixes. Pick two words from each category, draw a tree diagram showing the construction history, and provide a rule to generate them.

**A:**
알몸 *al-mom* 'naked body'
홀몸 *hol-mom* 'unmarried person'
숫놈 *swus-nom* 'male animal'
덧신 *tes-sin* 'overshoes'

**B:**
전사장 *cen-sa-cang* 'former president'
중공업 *cwung-kong-ep* 'heavy industry'
가건물 *ka-ken-mwul* 'temporary building'
구시대 *kwu-si-tay* 'old age'

**C:**
모가지 *mok-aci* 'neck' (derogatory)
끝장 *kkuth-cang* 'the very end'
멋쟁이 *mes-cengi* 'dandy' (N)
걸레질 *kelllay-cil* 'mopping'

**D:**
비과학적 *pi-kwa-hak-cek* 'unscientific'
동창회 *tong-chang-hoy* 'alumni association'
비상구 *pi-sang-kwu* 'fire exit'
역사상 *yek-sa-sang* 'in history'

**E:**
늦되다 *nuc-toy-ta* 'ripe/grow late'
비웃다 *pi-uws-ta* 'scorn'
설익다 *sel-ik-ta* 'be half-cooked'
엿보다 *yes-po-ta* 'spy on'

**F:**
밑지다 *miph-ci-ta* 'suffer a loss'
배다 *pay-ta* 'conceive'
빗다 *pis-ta* 'comb'
띠다 *tti-ta* 'tie a belt'

**G:**
눈물겹다 *nwun-mwul-keyp-ta* 'be touching'
익살맞다 *ilksal-mac-ta* 'be humourous'
수다스럽다 *swuta-selep-ta* 'be talkative'
정답다 *ceng-tap-ta* 'be affectionate'

**H:**
같이 *kath-i* 'together'
멀리 *mel-li* 'far away'
재미있게 *caymiiss-key* 'with fun'
급하게 *kupha-key* 'hurriedly'

**I:**
참기름 *cham-kilum* 'sesame oil'
이슬비 *isul-pi* 'drizzle'
철새 *chel-say* 'migratory bird'
물개 *mwul-kay* 'seal'

**J:**
전답 *cen-tap* 'paddies and dry fields'
천지 *chen-ci* 'universe'
주야 *cwu-ya* 'day and night'
이해 *i-hay* 'advantages and disadvantages'

**K:**
계란후라이 *keylan-hwulai* 'fried egg'
짚차 *ciph-cha* 'jeep'
통근버스 *thong-kun-pesu* 'commuting bus'
양담배 *yang-tampay* 'American cigarette'

**L:**
가셨습니다 *ka-si-ess-supnita* '(a respected person) has gone.' (talking to a respected person)
가겠다고만 했어 *ka-key-ta-ko-man hay-ss-e* '(she/he) said that she/he will only go.' (talking to a friend)
가고 싶니? *Ka-ko siph-ni?* 'Do you want to go?'
가기만은 했어야 했다 *ka-ki-man-un hay-ss-eya hay-ss-ta* '(I) at least should have gone.'

**CHAPTER 5**

# Syntax



## 5.1 INTRODUCTION

The study of syntax pertains to the discovery and examination of the rules and principles that govern phrasal and sentential structure. In this chapter, we discuss how these rules and principles of syntax play out in Korean. One of the most intriguing discoveries we will make is that by employing just a few simple rules of syntax, we can generate an infinite number of sentences. We will also explore how what we find in our examination of Korean can be applied to the study of syntax in a more general, cross-linguistic sense.

The study of syntax as it is presented in this chapter can be termed **theoretical syntax**. Similar to what was discussed in Chapter 1 regarding the theoretical study of language in general, theoretical syntax is the study of what a speaker knows when he or she knows syntax. It can be thought of like this: just as a physicist uses mathematics to create a model of how the universe works, theoretical syntacticians use rules, axioms, transformation algorithms, etc. to build a model of what it is a person knows when she or he knows syntax.

In order to begin a study of syntax, we first need data to analyze. Often, this data comes in the form of **grammaticality judgments**. In fact, the vast majority of work on syntax relies on the notion of grammaticality, and an understanding of it will be crucial as we proceed. Grammaticality can be thought of as the intuition that a native speaker of a given language has with regard to the well-formedness of a sentence. For example, consider the following sentence in (1) below.

(1) *때렸다 인호를 친구가.
Ttayly-ess-ta Inho-lul chinkwu-ka
hit-PST-DEC Inho-ACC friend-NOM

To a native speaker of Korean, the sentence above in isolation sounds unnatural and odd, or **ungrammatical**. What this tells us is that there is some rule of the grammar that the speaker knows that is being violated. What is interesting and worth thinking about in some depth is that the speaker is for the most part unaware of why it is that the sentence is ungrammatical. When a native speaker is questioned as to why it is that a given sentence is ungrammatical, they often respond by saying that it just sounds bad or unnatural to them. In the case

above, the rule that is being violated is that, in Korean, verbs must appear at the end of the sentence. A native speaker of Korean has internalized this rule during childhood. As we will discuss later, while verbs in general must occur at the very end of a sentence, the word order for other parts of the sentence is much freer. For the time being, however, the basic observations above will suffice to illustrate the notion of grammaticality.

In doing syntax research, the notion of grammaticality is the central tool used to gather data. A syntactician uses the native speaker's intuitions of grammaticality and ungrammaticality to uncover the rules and principles that underlie the structure of the language. For example, we could begin a study of word order in Korean by starting with the above observation that a verb must appear at the end of a sentence, which was derived from the native intuition that (1) was ungrammatical. Following this, we may create a hypothesis about the language with respect to word order.

(2) **Korean Word Order Hypothesis**: Verbs must appear in the sentence-final position.

Given this hypothesis, we can begin to look for counter-examples to this generalization and perhaps refine our model of the grammar. One process a syntactician might use along this line of research is to first develop a fundamental understanding of how the language is built, say by reading books like this. Following this, he or she can begin to build sentences that contradict his theory and question a native speaker as to their grammaticality. For example, one can indeed say the grammatical sentence in (3).

(3) 인호야! 뭐하는 거야 지금?
Inho-ya! Mwehanun.keya cikum?
Inho-VOC what.doing now
'Hey Inho! What are you doing now?'

In the grammatical sentence in (3), the verb is not in the final position, but rather the adverbial *cikum* 'now' is. The reading that this sentence has, however, is one of emphasis, where the speaker is showing his or her strong feelings regarding the situation. Having found this exception to the hypothesis we previously proclaimed, we need to make the exception that, for the purposes of emphasis, the verb-final requirement can be violated at least by the adverb *cikum*. In short, our theory needs to be changed or something must be added to it in order to account for how Korean syntax works. From here all sorts of questions could be addressed that may or may not lead to further changes in the theory:

1. What other sorts of adverbs can appear in this position?
2. Can any other types of word appear after the verb?
3. What about embedded clauses?

The above are just a few possibilities and we will not discuss them here. The purpose of the above argumentation is simply to show how grammaticality judgments can be used to conduct syntax research. This is the basic paradigm of theoretical syntax research.

Now that we have a basic understanding of what we are researching and how we can go about doing it, we can begin to explore the fundamentals of Korean syntax. In the following section, we will discuss how words and groups of words, or **constituents**, combine together in predictable ways to form parts of sentences. A thorough understanding of this phenomenon will be important, as later it will be shown that syntactic rules operate on these units almost exclusively.



## 5.2 CONSTITUENCY

In this section, we will address the idea that syntax operates on meaningful units or chunks of information called **constituents**. Furthermore, we will illustrate that while there is obviously a word-level and a sentence-level in syntax, there is also an intermediate level called the **phrase**. This notion is best illustrated with a series of examples. Consider the example in (4) below.

(4) 그 남자는 빨간 사과를 먹었다.
Ku namca-nun ppalkan sakwa-lul mek-ess-ta.
that man-TOP red apple-ACC eat-PST-DEC
'That man ate the red apple.'

In the above example, it is clear that there are words such as *namca* 'man' and *sakwa* 'apple' that make up the sentence. As Korean is an agglutinating language (as discussed in Chapter 1), these words also have various morphemes attached to them, such as the topic marker *-un/nun* and the accusative marker *-ul/-lul*.[1] Exactly what these morphemes do will be examined in due course. For the time being, we will assume that, as far as the syntax is concerned, these markers are morphologically and syntactically part of the word and they perform some grammatical function. Later in this chapter, we will explore the possibility that these markers are in fact separate units manipulated independently by the syntax.

[1] These are phonologically conditioned morphemes. For the topic marker, *-un* is used after a stem ending in a consonant and *-nun* is used following a stem ending in a vowel. Likewise for the accusative, *-ul* is used after a stem ending in a consonant and *-lul* is used following a stem ending in a vowel.

While these words can easily and intuitively be seen as coherent and meaningful units of the sentence, what are less obvious are the larger units within the sentence. Consider the sentence in (4) above again. In (4), there is a natural

intuition that there are certain chunks of words that seem to go together and other chunks that do not. For example, the following word groupings appear to form coherent chunks or meaningful units:

(5) a. 그 남자는
ku namca-nun
that man-TOP
'that man'
b. 빨간 사과를 먹었다.
ppalkan sakwa-lul mek-ess-ta.
red apple-ACC eat-PST-DEC
'ate the red apple.'

However, some combinations of words certainly do not seem in any intuitive sense to form a coherent unit.

(6) a. *남자는 빨간
ku namca-nun ppalkan
that man-TOP red
b. *그 남자는 빨간 사과를
ku namca-nun ppalkan sakwa-lul
that man-NOM red apple-ACC

Given this sort of data based on native speaker intuitions, the groupings of words in (5) can be seen as constituents which form meaningful units, while those in (6) cannot.

Another way to show that there are constituents in a given sentence is through the examination of **structural ambiguity**.

(7) 두꺼운 책(의) 표지[2]
twukkewun chayk(uy) phyoci
thick book-GEN cover
'the thick book's cover.'

[2] The parentheses indicate the optionality of a given morpheme.

In (7) above, there are actually two separate interpretations. Firstly, if *twukkewun* 'thick' modifies *chayk* 'book' only, forming a constituent, then the meaning is that there is a thick book and this book has a cover, which can be of any thickness. The grouping of the constituents in this case would look like the following:

(8) [[두꺼운 책]의 표지]
[[twukkewun chayk](uy) phyoci]

In (8), you can see that the adjective *twukkewun* 'thick' is grouped with *chayk* 'book' to represent that these two words form a meaningful unit, or a constituent. Furthermore, this constituent is grouped with *phyoci* 'cover'.

The other meaning, illustrated in (9), occurs when the adjective *twukkewun* 'thick' modifies both *chayk* 'book' and *phyoci* 'cover'. In this case, the meaning would be that there is a book, which could be of any thickness, and the cover of that book is thick. In this reading, book and cover are acting as a constituent, with 'thick' modifying them.

(9) [두꺼운 [책의 표지]]
[twukkewun [chayk](uy) phyoci]]

Given the above analysis, what is ambiguous in (7) is the possibility of having two different structural representations, hence the sentence is structurally ambiguous. What one can begin to see here is that, through the use of basic intuitions and the examination of structural ambiguity, we can show that constituents are in fact real parts of sentence structure. Indeed they must be if we are to explain the meaning differences in (7).

What we have shown in the above argumentation is that not only are there words within a sentence, but there is certainly another size constituent that is bigger than the word, but smaller than the sentence. In the next section we will show that this constituent is what we call the **phrase**.

## 5.3 THE PHRASE

Now that we have established that constituents exist, how then do we represent these intuitions? The answer lies in the notion of the **phrase**. Before jumping into the structure of the phrase in Korean, it is best to begin with a brief discussion of word categories. There are two major classes of words that are important to syntax, **lexical** and **nonlexical** categories. Lexical categories are content words, words that actually mean something tangible. These are nouns (N), verbs (V), postpositions (P), adjectives (A) and adverbs (Adv). Nonlexical categories are those words that serve a functional or grammatical purpose in the sentence. These are things such as determiners (DET), numerals (NUM) and certain varieties of postpositional markers which will be explored later in this chapter.

Back to the idea of a phrase: technically speaking, a phrase consists minimally of an obligatory **head** and may also contain a **specifier** and a **complement**. When complements are obligatorily required by the head, we say that the head **subcategorizes** for these elements.

A head can be thought of as the main word of the phrase, the one that defines which category it belongs to. Heads can be any of the word categories listed above. As already mentioned, the two other possible parts of the phrase are the specifier and the complement. Specifiers often serve to make the

meaning of the head more specific, while complements are those units that are required by the head and provide some sort of information with respect to the meaning of the head, such as location or a description.

In syntax, we graphically represent phrasal structure (and sentential structure) with **tree diagrams**. The following in (10) is the general schematic for a phrase in syntax. A more concrete example is given in (11), which we will dissect in detail below.

(10)

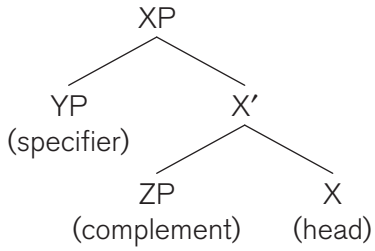



Figure 5.1 General schematic for a phrase in syntax

(11)

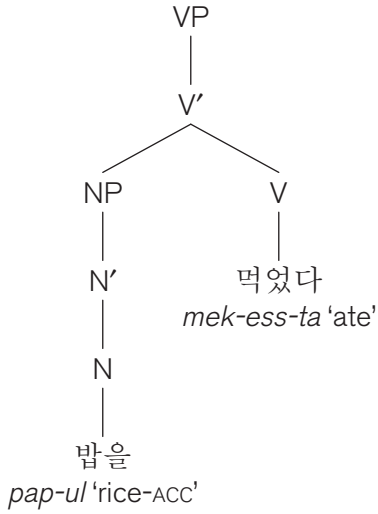



Figure 5.2 Schematic for an example phrase in syntax

(10) is a schematic representation of a basic phrase in syntax. Consider X to be a variable that stands for some word category, such as a noun or a verb. X is also considered to be the **head of the phrase**. As you can see in the diagram, X is directly connected to X′ (read as '**X-bar**'), X′ is an intermediate level and will be discussed later. For now, it is best to simply accept it is there as part of the phrase until the next section, where we will provide you with proof of its existence. The X′ level is then connected to XP, where X stands for the category of the head and P stands for phrase. In order to understand the

structural relationship of the specifier and complement to the head, a few basic notions of phrase structure are required. Luckily, we have certain terms at our disposal we can use to discuss how various parts of the tree above are related to other parts of the tree. In short, these terms relate to the **structural relations** within the sentence.

First consider the notion of a **node**. In simple terms, a node is any point on the tree where a **branch**, represented by lines, terminates. The point at XP is a node, as is the point at X′, etc. Now, when one node is higher in the tree than another node is, we say that the higher node **dominates** the lower one. In the phrase diagram above, XP dominates YP, X′, X and ZP. Furthermore, when one node is only one node above another, we say that that node **immediately dominates** the other. For example, X′ in (10) immediately dominates ZP and X. (12a–b) below outlines these ideas in a concise and formal manner. A thorough understanding of these terms is necessary for a serious study of syntax. It is therefore recommended that the reader become entirely familiar with these notions before moving on in his or her study of syntax.

(12) **Major Structural Relations**

a. **Dominance**: A node α *dominates* a node β iff (if and only if) α is higher in the tree than β and a line can be traced from α to β by tracing downwards.

b. **Immediate Dominance**: A node α *immediately dominates* a node β iff α is higher in the tree than β and there is no node γ that intervenes between α and β.

Now that we have explained some basic terms of structural relations, we can focus on the specifier and the complement of the phrase. The specifier YP is connected under XP and, in technical terms, is a **sister** to X′. We say that any constituent α is a sister to β when there is only one node on the tree that immediately dominates both α and β. The specifier is also what we call a **daughter** of XP, where daughter is defined as the node immediately dominated by another node. In this way, a specifier is structurally defined as a sister to a bar-level node and the daughter of a phrasal node. As for complements, they are always a sister to the head of the phrase, as well as a daughter of a bar-level node. In this example, ZP is a sister to the head X and a daughter to X′ and is therefore the complement of the phrase. It is important to note that in Korean, complements come to the left of the head, unlike in English.

There is an important distinction that has until now been left undiscussed. In addition to specifiers and complements, there is a class of constituents called **adjuncts**. These sorts of constituents are sisters to X′ and daughters of separate X′ nodes. As with complements, adjuncts often appear to the left of their heads. (13) provides a tree diagram showing the above structural relations as they are in English. As we proceed we will see that Korean differs only in

the relative ordering of complements and adjuncts, while the structure remains the same.

(13)

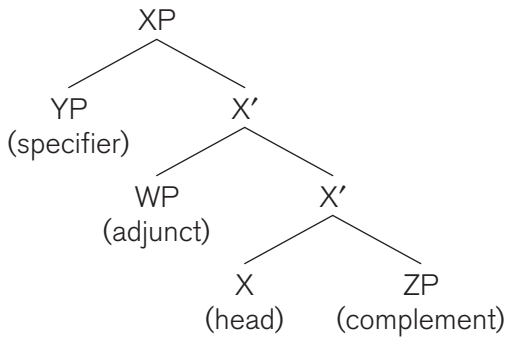



**Figure 5.3** Major structural relations in English

The above discussion of structural relations, however brief, will suffice to carry us through our discussion of phrasal syntax. All of this technical information about the structure of the phrase may seem a bit abstract at first. However, a few concrete examples will help you begin to understand. We will continue our discussion of phrases with the traditional lexical categories nouns and verbs. Each noun and verb is the main unit of the phrase they are the head of. More technically, we say that these heads **project** their phrase.

Beginning with nouns, we see that a diagram of the noun phrase for *sakwa-lul* 'apple-ACC' would look as follows.

(14)


**Figure 5.4** Noun phrase for *sakwa-lul* 'apple-ACC'

In (14), the noun heads the noun phrase. If we would like to make the noun more specific, we could add the demonstrative *ku* 'that', which will force the reading that there is a specific set of apples the speaker is referring to. *Ku* 'that' would be in the position of the specifier as follows. Later on, we will see that the demonstrative may head its own phrase, but we will simplify for now with the following.

(15)

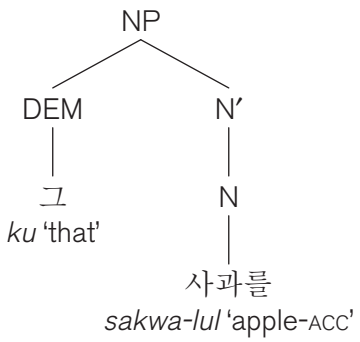



**Figure 5.5** Noun phrase with a specifier

If we wanted to describe the head in more detail, we could add a complement or an adjunct. In this case, we will add an adjunct which is also a phrase, *ppalkan* 'red' in front of *sakwa-lul* 'apple'. While we will not venture into a detailed discussion of adjuncts versus complements here, we note that in general, **adjuncts** are those phrases that are not required by the head, while **complements** are.[3] As stated above, adjuncts are sisters to bar-level projections and daughters of bar-level projections. In addition, Korean complements and many adjuncts come to the left of the head. Given these structural definitions, we have the following diagram of the phrase thus far.

[3] See Radford (1988) or Carnie (2001) for detailed discussions on the adjunct/complement distinction.

(16)

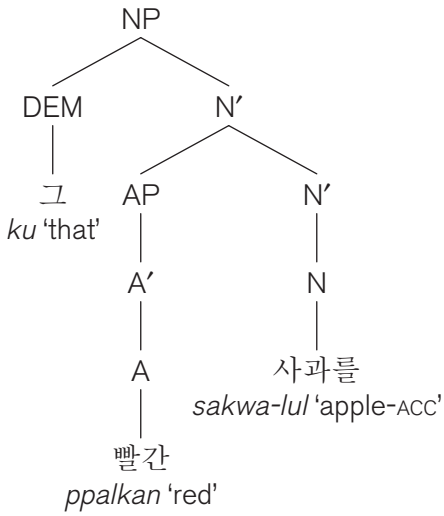



**Figure 5.6** Noun phrase with an adjunct

With the phrase in (16) above, we see the structure of a phrase, consisting of a head, a specifier and an adjunct conforming to X-bar theory. While the above

seems simple enough, there does exist in Korean linguistics some controversy as to the nature of the adjective phrase and its relation to the head. This will be discussed later in this chapter, but for now the simplification above will do.

Moving on to verbs, we see in the following example that *mekessta* 'ate' is a verbal head that projects a **verb phrase**.[4]

[4] Mekessta, is in fact composed of a verb stem, *mek-*, a past tense marker, *-ess*, and a declarative marker, *-ta*. In Section 5.4.2 we discuss these in detail. For now, however, we gloss over these details for the sake of making our point about phrase structure simpler.

(17)

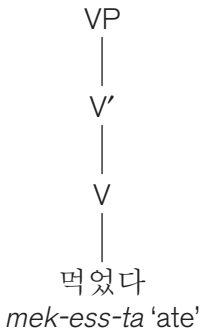



**Figure 5.7** Verb phrase

One thing we have not seen yet in our empirical look into **X-bar theory** is a complement. In the case of *mekessta* 'ate' we can use the object noun *sakwa* 'apple' as the complement. Recall that complements are structurally defined as sisters to heads and daughters of bar-level projections, here illustrated in (18).

(18)

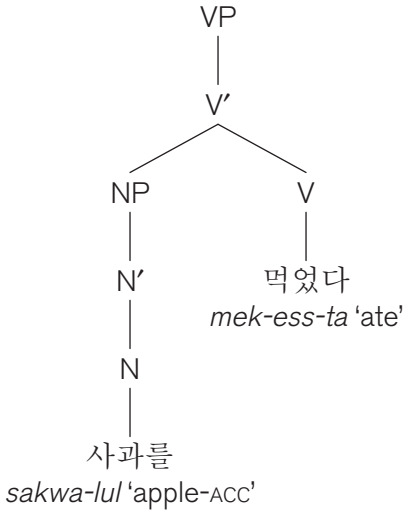



**Figure 5.8** Complement

We could also add an adjunct to the above phrase, say *masisskey* 'tastily'.

(19)

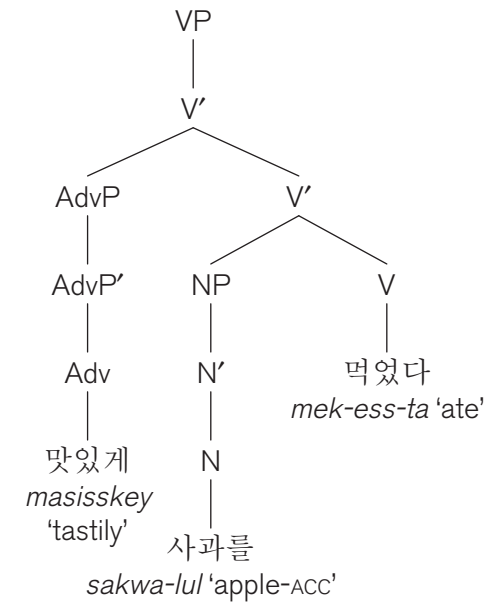



**Figure 5.9** Adjunct

Before moving on with our discussion of phrases, it is useful to pause for a moment and consider in more detail what is beginning to emerge from our discussion. What we are seeing now, and will see more of as we progress, is that the general phrasal structure in (10) is being played out again and again across categories of words. In other words, the schematic for phrasal structure in (10) seems to be the structure for phrases, regardless of head type. As we move through our discussion of Korean syntax, we will see that specifier, head, complement and adjunct positions are all present in every sort of phrase. This is not just coincidence, it is in fact good theorizing. Consider for a moment what a good theory of phrasal structure might look like to you. Would it be one that has an entirely different structure for each word type, or one that has one structure that explains all word types? The latter is certainly more explanatory in that we can explain a lot of data with one structure and it allows us to make **generalizations** about the language. That is, in Korean, we can say that, according to (10), heads come to the right of complements, specifiers to the left and, as we will soon see, a whole host of other generalizations become possible. In linguistic research, one should always seek to explain the most data with the fewest possible assumptions.[5] Furthermore, if these assumptions can be independently motivated to function elsewhere in the grammar our theory becomes even stronger.

[5] This sort of thinking stems from what is known as Occam's Razor, stemming from the works of William of Ockham (c1287–1347). The approach to logic and argumentation states that, when choosing between two or more hypothesis, the one with the fewest assumptions should be selected.

Moving back to our discussion of phrases, we will now consider **postpositional phrases**. These markers are not wholly unlike the English prepositional phrase. Just as with English prepositions, Korean postpositions never occur in isolation and always occur with a complement, namely a NP. These postpositional markers in Korean also head their own projection. In the example in (20), the phrase *hwun-eykey* 'to Hwun' consists of a postpositional marker plus the NP complement.

(20)

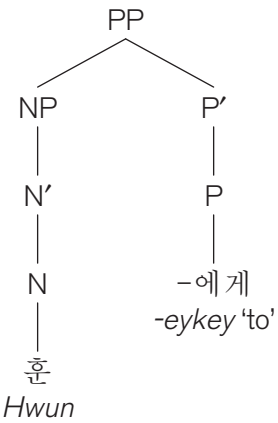



**Figure 5.10** Postpositional phrase

Unlike English, however, these markers are in fact bound morphemes (as discussed in Chapter 4) as they always occur attached to a noun. They are 'postpositional' in Korean, as they only occur after the noun. It is at this point we begin to see that it might in fact be possible to account for other bound morpheme markers in Korean as heading their own phrases. This will be discussed later in the chapter when we discuss the possibility of almost all agglutinating morphemes heading their own projections.

## 5.3.1 Proving Phrase Structure

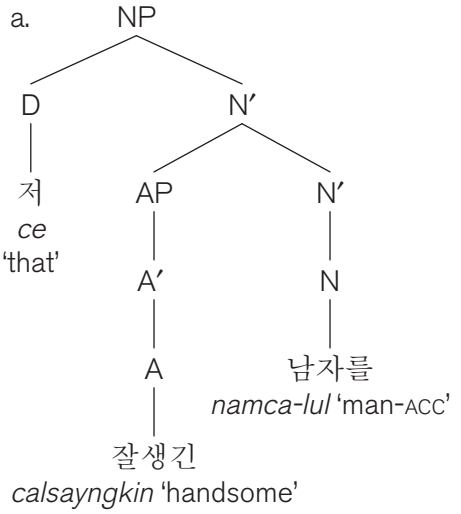
While the above seems plausible, given the data at hand, the astute reader should be questioning whether or not we actually need to postulate a phrasal level. As mentioned previously, our main goal in doing linguistics is to develop a model of what it is that a person knows when they know a language. The argumentation provided in the previous section is, at this point, simply a theoretical construct with no hard empirical proof. In other words, we have provided a theory of constituency and phrasehood, but we have not empirically proved that we actually need to construct our theory this way according to real world data. In the following, we illustrate that phrasehood is in fact a real empirical phenomenon. In order to argue this, it will be necessary to introduce the idea of a **constituency test**. These tests are essentially comparisons of sentences that show us what a phrase is.

First, consider the **pronoun replacement test**. The idea behind this test is that if some sequence of words can be replaced by a pronoun and convey the same meaning, then that sequence of words must be a phrasal constituent of the same type as the pronoun. This type of example is illustrated in (21) below.

(21) 가: 저 잘생긴 남자를 알아?
Ce calsayngkim namca-lul ala?
that handsome man-ACC know
'Do you know that handsome guy?'
나: 응, 걔 잘 알아.
ung, kyay cal ala.
yeah that person well know
'Yeah, I know him (that handsome guy) well.'

In (21), the constituents *ce cal sayngkin namca-lul* 'that handsome man' and *kyay* 'that person' can refer to the same man. In this scenario, *kyay* not only refers to the man, but also carries with it the meaning that he is handsome. We can see from this test that both constituents are full-fledged NPs regardless of how many words they contain. This type of data gives credence to our analysis of the noun phrase in the previous section, where both of these constituents would be treated as NPs. The trees in (22a–b) illustrate this line of thinking, showing that both constituents, regardless of word length, are NPs.

(22) a.




b.

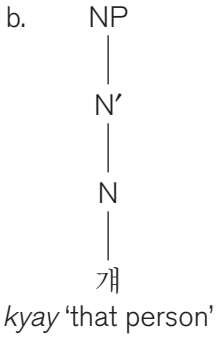


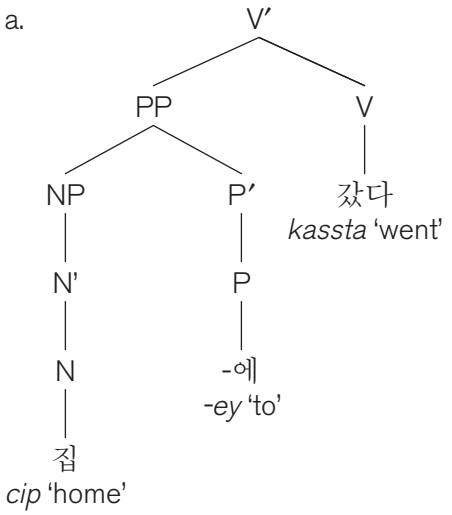

Figure 5.11 Pronoun replacement

Another test of constituency is the **substitution test**, which is not wholly different from the pronoun replacement test. In the following example, we can see that a verbal constituent can be replaced by *kulay-ess-ta* 'did the same'.

(23) 인호가 집에 갔고 미나도 그랬다.
Inho-ka cip-ey ka-ass-ko Mina-to kulay-ess-ta.
Inho-NOM home-LOC go-PST-CONJ Mina-also same.do-PST-DEC
'Inho went home and Mina did too.'

The meaning of this sentence is that Inho went home and Mina also went home. The verb *kulihata* 'do the same' essentially replaces, or substitutes for, *cipey kassta* 'went home'. We can therefore assume that these phrases are both VPs, regardless of the fact that one phrase has more words than the other. This is illustrated in the trees below.

(24) a.




b.

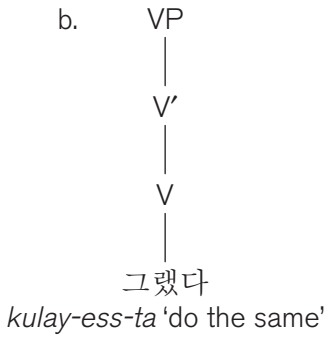



Figure 5.12 Substitution

**Coordination** is another test of constituency commonly used in syntax. This test can be used to show both verbal and nominal constituency. In (25a) we see that we can coordinate noun phrases and in (25b) we see the same in the verbal domain.

(25) a. 인호하고 미나가 케이크를 먹었다.
Inho-hako Mina-ka khayikhu-lul mek-ess-ta.
Inho-CONJ Mina-NOM cake-ACC eat-PST-DEC
'Inho and Mina ate cake.'

b. 미나야. 신발을 신고 나가자.
Mina-ya sinpal-ul sin-ko naka-ca.
Mina-VOC shoes-ACC put.on-CONJ go.out-EXH
'Hey Mina. Put on your shoes and let's go.'

The above argumentation gives us some empirical proof that the idea of a constituent is in fact viable. Furthermore, we see that regardless of how many

words these phrases contain, the syntax treats them the same. That is, the syntactic operations of substitution and coordination operate on the level of the phrasal constituent.

### 5.3.2 Proving X-bar Theory

In Section 5.2, you were asked to suspend judgment regarding the X-bar level in syntax and merely accept its existence. No good syntactician, however, would let this suffice for long! Indeed, if we propose that some level in syntax occurs between the word and the phrase. We should provide empirical proof of its existence. In order to do this, first consider that one can use the element *kes* 'thing' to refer back to a noun. By doing this, we can show that *kes* 'thing' must be able to represent the head of a phrase.

(26) 이 사과는 맛있는데 그 건 맛없어.
I sakwa-nun masiss-ko ku kes-un maseps-e
DEM apple-TOP tasty-CONJ DEM thing-TOP not.tasty-DEC
'This apple is good and that one is not good.'

In the above example, *sakwa* 'apple' and *kes* 'thing' both stand for 'apples'. In addition, they are both preceded by a demonstrative. Finally, they both are able to take topic marking. These pieces of evidence indicate that they are both the heads of NPs.

Following this type of analysis, consider the sentence below.

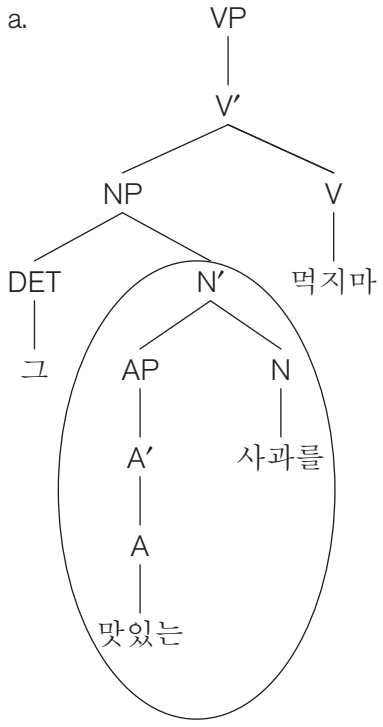
(27) 이 맛있는 사과 먹고 그 건 먹지마.
i masiss-nun sakwa-lul mek-ko ku kes-un mek-cima
DEM tasty-RC apple-ACC eat-CONJ DEM thing-TOP eat-do.not
'Eat this tasty apple and not that one.'

We can see from the above example that *kes* 'thing' stands not only for an apple, but a tasty one at that. In other words, *kes* must be replacing a phrase at least as big as *masissnun sakwa* 'delicious apple'. However, *kes* has a demonstrative preceding it, and therefore cannot be an entire NP, as we know that an NP cannot have two demonstratives.

(28) *그 그 사과
ku ku sakwa
DEM DEM apple

Therefore, we must draw the conclusion that there is in fact some sort of intermediate projection between the word and phrasal level, as *kes* in the above sentence targets exactly that. By employing our X-bar schema, we directly account for such a phrase.

(29) a.




b.

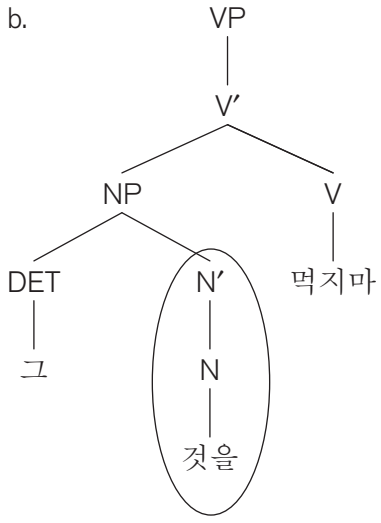



**Figure 5.13** Substitution of N′

As can be seen above, *kes* in (29b) targets the entire N′ projection in (29a). As illustrated by the circles, we can see that this phrasal projection is N′ for both constructions. Without the X-bar schema, providing the proper structure for these kinds of facts would be difficult.

## 5.4 THE SENTENCE AND FUNCTIONAL CATEGORIES

In this section we focus on the possibility that the sentence level must adhere to the X-bar schema. In addition, we explore various projections thought to exist above the level of the sentence.

### 5.4.1 Functional Phrases: the Structure of the Sentence

In the section on phrases, we showed that with just one X-bar schema, we could describe the structure of all of the major phrases in syntax. The question remains, however: can we extend this idea to the level of the sentence? In order to address this question, first recall the X-bar schema presented above in (10), repeated here in (30).

(30)

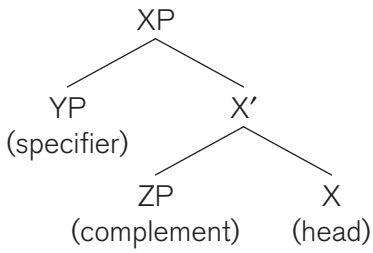



Figure 5.14 General schematic for a phrase in syntax (repeated)

If we assume that the sentence level also follows this structure, we will need to then figure out what the head of this phrase will be. Using an English example, we see that the most likely candidate for the head of a sentence is a category called inflection – INFL for short. In 'Jim will go home', for example, all other material in the sentence is contained in other phrases, therefore the auxiliary 'will' seems to be the only head left. If we assume that the auxiliary is generated under an inflectional category, INFL, and this heads an inflection phrase IP, then our X-bar schema would necessitate the following tree.

(31)

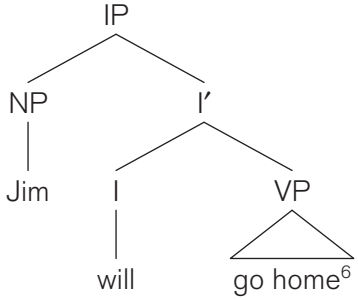



Figure 5.15 Change into inflectional phrase

[6] A triangle is used as a kind of shorthand in drawing trees. Its use indicates that one can assume the structure of the phrase in question to be present, but due to the non-relevance of the phrase to the current argument, the author chooses not to fully represent the structure – thus making one's argumentation more concise.

This phrase is often referred to as **Tense Phrase** (TP) by many authors. We will adopt that notion here for Korean. The reason for this is that Korean does not exhibit the rich inflectional/agreement systems seen in many languages such as Spanish, French and Italian. In fact, many scholars have suggested that Korean has no agreement markers at all and that the inflectional category of verbal markers is limited to tense only. It is for this reason that we will assume that IP in Korean is in fact TP and we will employ this nomenclature throughout the remainder of this text, at least for the Korean examples.

Note also that tense inflection is in complementary distribution with auxiliaries. This means that you will never find auxiliaries such as 'will' in the same sentence as tense markers.

(32) a. Jim walked home.
b. *Jim is walked home. (ungrammatical unless passive)
c. *Jim will walked home.

Given this type of data, it is not wholly unreasonable to assume that these elements are initially generated in the same position. The assumption then, is that all inflectional material, whether auxiliaries or tense markers, is **base-generated** under I (inflection) and thus project, via the projection principle, an IP according to the X-bar schema. While the auxiliary material stays there, the tense material is lowered to the verb, i.e. affix lowering. This type of movement is assumed to leave behind a trace, commonly labeled as *t*.

(33)

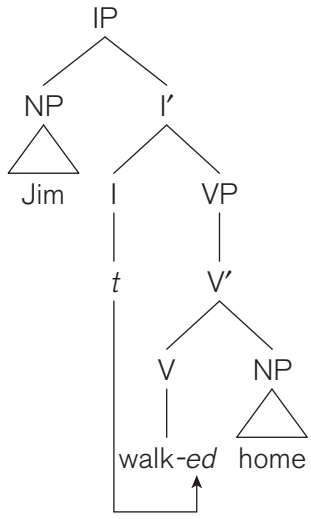



**Figure 5.16** Affix lowering

What we are seeing here is not only the extension of X-bar theory to the level of the sentence, but we are also approaching the notion that there are different levels to the generation of a sentence. It seems reasonable at this point to assume some sort of base or kernel structure, where the basic configuration of the sentence is established. After this level, **transformations** apply, in this case a **movement transformation**. After the application of any transformations, we reach a sort of surface, or output, structure.[7] We will discuss this in depth in the

[7] The notions of deep and surface structure have changed over the years. Indeed, in modern Chomskyan grammars (post 1995), the notions of deep and surface structure are done away with entirely (see Hornstein et al. 2006 for a particularly clear explanation of this).

following sections. For now, however, we will simply note that sentences begin their life in some sort of canonical form and various transformations apply to them to yield a grammatical output form. This is in essence a generative approach to syntax pioneered by Chomsky, arguably beginning in the 1950s with *Syntactic Structures* (1957).

Extending this type of argumentation to Korean, we might assume that tense is base-generated under I. However, we should be cautious and see what the Korean data has to tell us. In fact, we do not need to make the assumption that tense is lowered onto the verb. Given the SVO word order in Korean, the correct order of the verb and its tense marker is already there at the deep structure level.

(34)

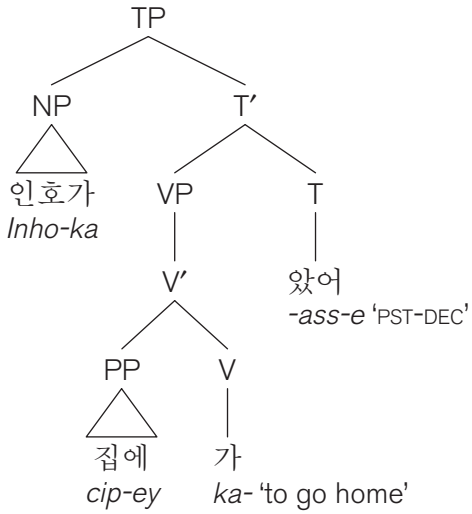



**Figure 5.17** Base generation of tense

With an analysis such as that in (34), we can see that there is no need to assume that affix hopping or lowering occurs in Korean.[8] Not all scholars agree, however, that the verb stays put in sentences such as (34). There is good reason in fact to assume that it does not. We saw with English, that the verb was combined with its tense marker in the syntax. It seems reasonable then, to postulate that the same sort of mechanism applies in Korean. One of the reasons we assume this about English is that a verb and its tense markers form a **phonological word**, in that it cannot be separated. The same holds true for Korean, only this time the verb moves to the T (tense) position.

[8] The tense marker *-ess/ass-* is phonologically conditioned via a vowel harmony rule (see Chapter 2) that requires agreement in vowel quality with the final vowel in the verb stem.

(35)

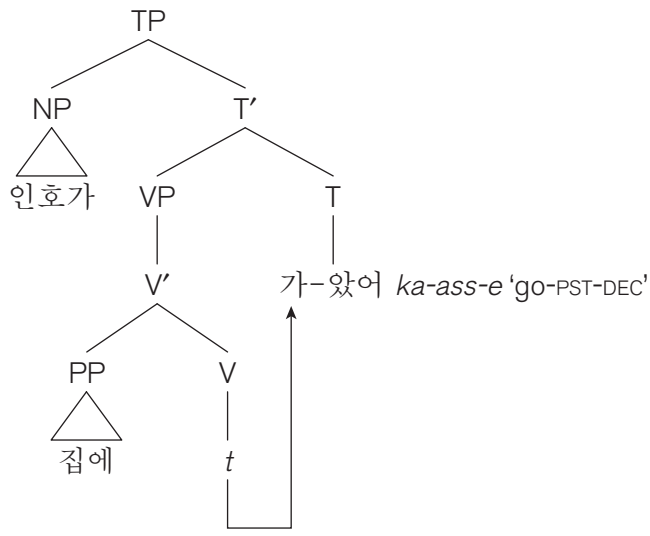



Figure 5.18 Verb movement

Theoretically, or empirically for that matter, there is nothing in our theory up to now that necessitates that movement be involved at all. In order to have the strongest theory possible, one would ideally like an addition or assumption to it to be logically necessary – and this does not seem to be the case here. There are numerous ways one could construe this process. Another possibility, for example, is to assume that T is specified for tense, the verb is base generated and the two are linked though some sort of agreement process without movement at all.

The idea that T (or I) is the head of the sentence that projects a TP phrase in Korean syntax has been around for some time. Not only has verbal inflection been thought to head its own phrase, but other functional categories such as case (Gunji 1987), demonstratives and topic markers (Tonoike 1991, Whitman 1989) and a host of others (Jung 1991, J. Lee 1993). More recently, it has been suggested that what is going on here is in fact **phrasal movement** and not head movement (Koopman 2005). In opposition to this sort of thinking, there are researchers such as Cho and Sells (1995) and Sells (1995) who make the case that verbs combine lexically with their inflectional morphemes in a process separate from syntax. We leave readers to explore the various approaches and decide for themselves which approach makes the most sense. For the beginning syntactician, the important thing to take away from this cursory discussion is that one should let empirical evidence guide one's theoretical analysis. What is often taken as empirical proof in one language does not necessarily hold up in another. Korean is notorious for providing us with counterexamples to mainstream theoretical syntax arguments. This is part of the enjoyment that can be found by studying this language in depth.

## 5.4.2 More Functional Categories

Functional categories are essentially those categories that are non-lexical in nature; this includes the TP sentence level category outlined above. In what follows, we will explain the complementizer phrase and various other functional phrases claimed to exist in Korean.

### *5.4.2.1 Complementizer Phrase, Mood Phrase and Embedded Clauses*

If we extend the approach from the previous section that tense suffixes head their own projections, we might expect that other functional markers also head their own projections. Consider the simple monoclausal example below.

(36) 인호가 집에 갔다.
Inho-ka cip-ey ka-ass-ta.
Inho-NOM home-LOC go-PST-DEC
'Inho went home.'

As shown in the previous section, the tense morpheme, *-ess/ass* is generated under T. This was motivated from previous analyses of English. If this is so, then what about the declarative marker *-ta*? So far in our trees, we have no room for this element. In order to find a good candidate of functional category for this element to fall under, it is best to first examine embedded clauses, which are essentially sentences within sentences.

Up until now, we have been building our model of Korean syntax based on monoclausal examples. There are times, however, when we can embed sentences within sentences. For example, verbs such as *malhata* 'to speak/say/tell' can take an entire sentence as a complement, which we are now calling a TP. Consider the example in (37) below.

(37) 인호가 [빌이 김치를 먹었다고] 말했다.
Inho-ka Bill-i kimchi-lul mek-ess-ta-ko malha-yess-ta.
Inho-NOM Bill-NOM kimchi-ACC eat-PST-DEC-COMP say-PST-DEC
'Inho said that Bill ate kimchi.'

If we look at the above sentence, we see that the object of *malhata* 'say' is in fact the entire clause *Bill-i kimchi-lul mek-ess-ta-ko* 'that Bill ate kimchi'. In this clause, we have a verb, a past tense marker, and what appears to be the declarative morpheme seen in the matrix clause example. This marker, *-ko* is often called the quotative marker *-ko* (Sohn 2001). What concerns us here are the morphemes *-ta* and *-ko*: the ones our theory, until now, has no real room for. In the literature concerning these markers, there is little consensus on the syntactic status of these elements. Some authors treat *-ta* as a complementizer, at least in monoclausal situations and others treat it is a modal category, which we will explain as we proceed to mood markers. Here, however, we will follow

the analysis of J. Cho (1995). Cho illustrates that there are two types of **complementizers**. First there are the ones that have some type of **illocutionary force**, meaning that these complementizers somehow encode the speaker's intention when he/she utters the sentence. The other type is those that do not have any illocutionary meaning whatsoever. The marker *-ko* is a type of complementizer that has no illocutionary force; it merely encodes the grammatical status of the verb's complement as being an entire clause. The morpheme *-ta*, however, is seen as a **mood marker** which does have an associated illocutionary force, in this case, marking the clause as a declarative statement. Both of the categories head their own projections, yielding the following structure (C = Complementizer, CP = Complementizer Phrase).

(38)

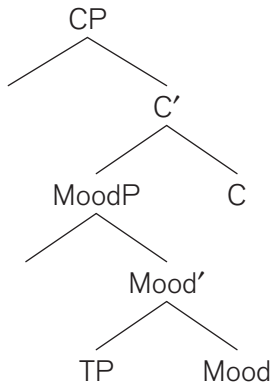



**Figure 5.19** Complementizer and complementizer phrase

Given this sort of structure, the tree for the sentence in (36) would look like the following.

(39)

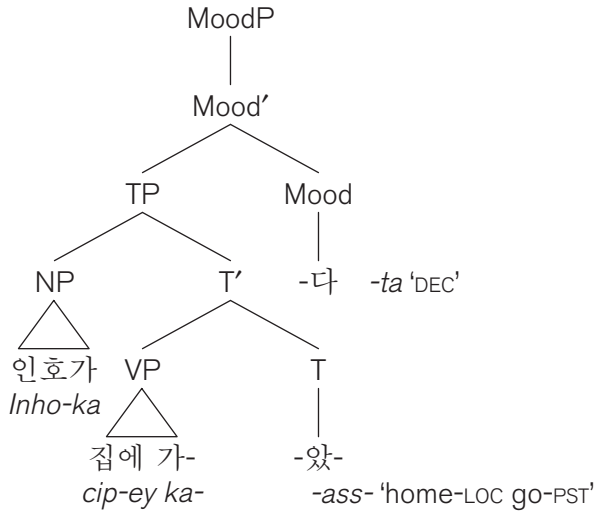



**Figure 5.20** Tree diagram for (36)

The tree diagram for (37) would be as in (40) below.

(40)

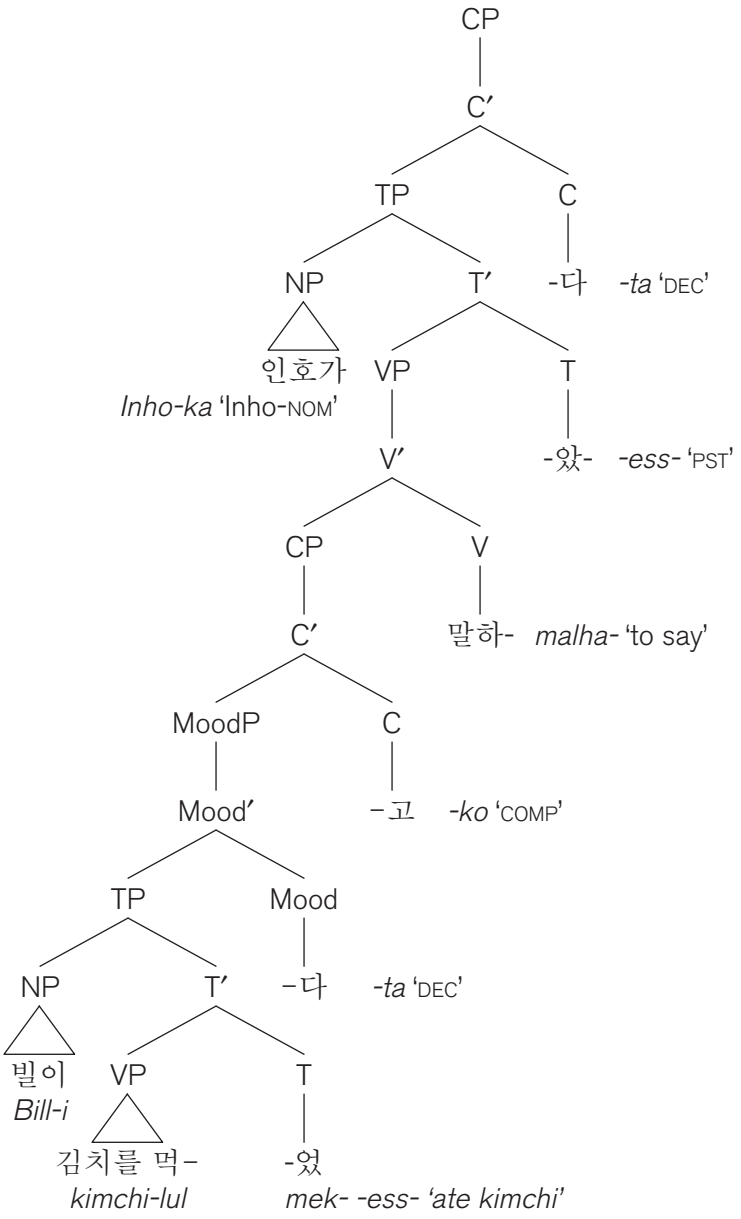



**Figure 5.21** Tree diagram for (37)

As can be seen in the tree above we can account for all of the markers at the left periphery of the sentence (and embedded clause) by making a distinction between mood markers and complementizers and assuming that they head their own projections.

### 5.4.2.2 Determiner Phrase (and Number Phrase)

Ever since the work of Abney (1987), it has generally been assumed that **determiners** head their own phrases. At the core of this idea is the observation that there seems to be sufficient evidence to assume that noun phrases behave much like sentential clauses. Consider the following sentences:

(41) a. Jim destroyed the document.
b. Jim's destruction of the document.

In (41a), we have a simple canonical sentence. In (41b), however, we have a noun phrase that essentially carries the same propositional meaning, namely that Jim is the person who destroyed the document. Both sentences also have a subject, 'Jim', and a complement. The difference in the complements is that the complement of the verb in (41a) is a noun phrase and the complement of the noun in (41b) is a prepositional phrase. We assume that the reason a PP is allowed after the noun is due to the inability of the noun to assign case. **Case** will be discussed in depth in Section 5.5. For now. however, consider case to be a certain form that a noun or pronoun takes when it is in various argument positions relative to the verb. In generative grammar it is generally assumed that all noun phrases must receive case in order to be considered legitimate nouns. This is often viewed as a sort of **licensing** process. Most instances of case are furthermore assumed to be assigned by some sort of head. In the simplest of these sorts of systems, T assigns case to the subject of the sentence (i.e. **nominative** case) and V assigns case to the object (**accusative** case). The head P assigns other forms of case, namely dative, ablative, etc., to its complement noun. This sort of reasoning is what leads us to believe that the PP is allowed after the noun in (41b). It does not need case, as it is not a noun, and the noun that selected for the PP cannot assign it either.

Moving back to our comparison of (41a) and (41b), if we take this kind of argumentation seriously, then we would like to assume that (41a–b) have similar structures. By assuming that the category D heads its own phrase, we can achieve such results.

(42)

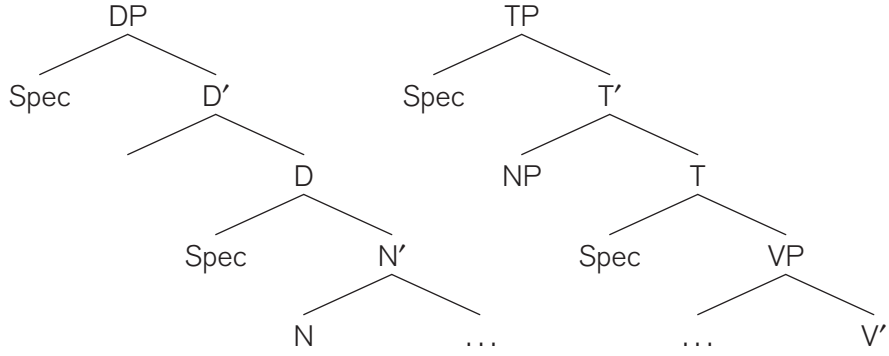



Figure 5.22 Tree diagrams for (41a) and (41b)

There is also a good amount of theory-internal evidence to believe that the DP structure in (42) is correct. Remember in our definition of X-bar theory that all heads project their own phrases. Given the X-bar schema, we expect the D should project its own phrase and have a specifier and complement position. This theory-internal reason is backed up by empirical evidence in numerous ways. For instance, the specifier of DP can now be viewed as a landing site for wh-phases to move to. Furthermore, if we assume the genitive clitics are also D-heads, as in (42b), then our complement position is filled with the following possessed nominal and the D head can assign the genitive case in a similar way as the T head would assign the nominative case in a matrix clause (43).

(43)

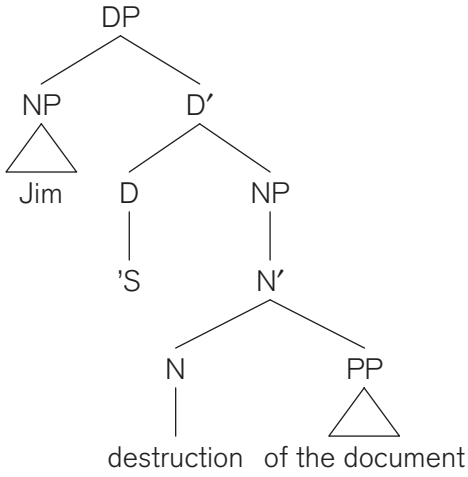



**Figure 5.23** Determiner phrase

Moving on to Korean, the question remains as to whether the DP hypothesis holds up. First of all, it will be noted that the class of determiners in Korean is relatively impoverished.[9] The set of determiners, or demonstratives to be more specific, are *i* 'this', *ku* 'that' and *ce* 'that over there'. In addition, one might consider the genitive case marker *-uy* as a D, as well as various quantifiers. We will discuss these all in turn below. Consider then that a simple noun with a demonstrative, such as *ku chayk* 'that book' would have the following structure.

[9] Whether we can even call the elements determiners is also subject to much debate. See Suh (2005) for an in-depth analysis on this subject.

(44)

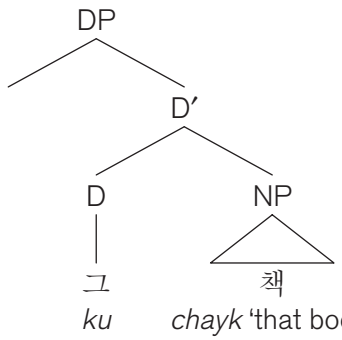



Figure 5.24 Noun with demonstrative

While the above diagram looks nice enough, we would like to see some evidence that this sort of structure is in fact empirically correct. First of all, Abney's original idea that DPs are parallel in structure to TPs rests on the assumption that like T, D would have to host some sort of agreement function. Since morphological agreement in Korean is almost completely lacking,[10] this is not the best source of evidence.

[10] See the sections on honorifics and plurality for possible exceptions.

Abney also notes the strong co-occurrence restrictions in English as evidence for the DP-hypothesis.

(45) *the woman's the book

In an example such as (45), the assumption is that the genitive fills the D-head and thus disallows the use of a determiner. If we assume that the genitive clitic in English is the head of its own phrase, then it makes sense that (45) is ungrammatical because the head is already filled with the clitic and the extra determiner cannot be employed.

(46)

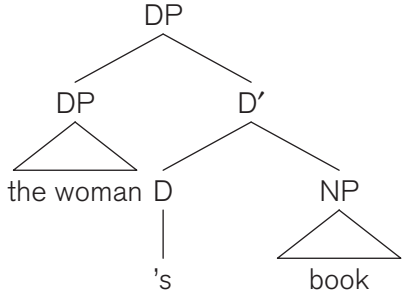



Figure 5.25 Genitive as D head

In Korean, however, we can see that both a genitive case marker and a demonstrative may be used in the same phrase (Suh 2005).

(47) 나의 그 책
na-uy ku chayk
I-GEN that book
'that book of mine.'

Given this sort of analysis for English, why is it that Korean (47) is acceptable? Does this mean that the **DP hypothesis** does not hold for Korean? The crucial difference here lies in the incorrect assumption that the genitive case element functions as the head of D in all languages. Instead, the genitive in Korean seems to function as a case marker and we do not want to assume that case markers are D-heads (Suh 2005). For now, at least, there seems to be no reason to accept the DP-hypothesis in Korean nor to reject it.

There is at least some indirect evidence to assume that demonstratives in Korean head their own phrase. Consider the following paradigm below:

(48) a. 학생이 왔다.
Haksayng-i oassta. ⇦ one or more students came
student-NOM came

b. 학생들이 왔다.
Haksayng-tul-i oassta. ⇦ more than one student came.
student-PL-NOM came

c. 그 학생이 왔다.
Ku haksayng-i oassta. ⇦ only one student came/*more than one student came.
DEM student-NOM came

d. 그 학생들이 왔다.
Ku haksayng-tul-i oassta ⇦ more than one student came.
DEM student-PL-NOM came

The example in (48a) shows that plural marking in Korean seems to be optional, as a bare plural (i.e. a noun without plural marking) can be plural or singular. When a plural marker is added, however, only a plural reading is possible in (48b). (48c) is where things get interesting. In this example, we see that when the demonstrative is employed, only a singular reading is available. If a plural reading is intended, then when a demonstrative is used, the plural marking must be overtly used.

Now, consider what the above data means. If by using a demonstrative we must obligatorily mark plurality, then where does the plural marker go? Furthermore, is this sort of thing number agreement? C. Kim (2005), suggests that in Korean, a D-head forces the projection of a **number phrase**, NumP, for purposes of agreement.

(49)

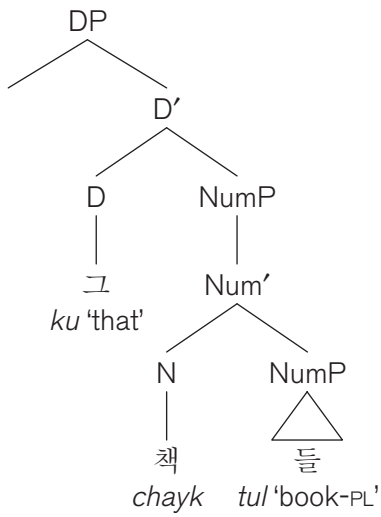



Figure 5.26 Number phrase

As shown above, if we assume that there is in fact a DP in Korean, we can neatly account for the existence, or lack thereof, of plural markers. So, there does seem to be some sort of evidence for the existence of DPs in Korean. However, whether or not all nouns have an obligatory DP structure is still open for future research.

## 5.5 THE KOREAN CASE SYSTEM

As mentioned briefly above, we can think of case as the form a noun or pronoun takes when it is in various argument positions relative to the verb. Specifically, Case is the morphological form a noun takes which is dictated by the syntactically defined grammatical relations between the noun in question and the verb. As we proceed, we will see that defining case this way in Korean is not so clear cut. In fact, serious issues arise in Korean syntax when we try to strictly define the morphological form of a word by its syntactic distribution. Even so, we will begin with this generalization, as it does cover a lot of empirical ground.[11]

[11] There is an important lesson to be learned here about the process of developing theories which should predict true empirical data. Often, you will find yourself with an explanation and/or description of a phenomenon that covers a great deal of data, but not all of it. It is important to not immediately abandon one's previous analysis when presented with counterevidence. Often what is needed are only slight modifications to the theory to extend the range of one's predictions.

A basic distinction made in most languages are case forms in the subject versus object positions. In English, this is relatively straightforward and can be seen only in pronouns.

(50) *I* saw *him*.

In (50), the pronoun in the subject position takes what is called the **nominative** form, as opposed to its object, or **accusative**, form 'me'. The pronoun in the object position appears in its accusative form 'him', as opposed to its nominative form 'he'. Here we see the morphological form of the pronoun changing depending on its grammatical relation to the verb. Unlike languages such as English, Korean has case markers that are affixed post-positionally as bound morphemes (as opposed to the suppletive English forms) to the nouns they modify, which we will see in the section below.

It is important to understand that Case forms and their grammatical relations do not correlate perfectly with **thematic roles**. For example, 'I' in (50) is syntactically the subject of the sentence. In addition, it is also the **agent** of the verb 'saw'. It might be tempting to conclude that grammatical relations and thematic ones are the same thing. This would also make our theory more streamlined as we could collapse two parts of the theory into one. There are times, however, where the nominative form may appear when the pronoun is not an agent. Consider the passive sentence below in (51).

(51) I was bitten by my angry dog.

'I' in (51) is certainly the nominative form of the first person pronoun. However, the thematic role of this pronoun is **theme** and the agent is the dog. So, we can see that thematic roles do not drive which case forms surface. Instead, it is the syntactic grammatical relation the pronoun has to the verb that does so; in this case it is the subject of the verb, just as it is in (50). In the following sub-section we explore case in Korean in some detail and provide some things to think about along the way that do not necessarily fit so neatly into the above definition of case.

### 5.5.1 Nominative and Accusative Case

If one examines the literature on case in Korean, he or she will quickly see that not all scholars agree on how many case markers Korean has. Some researchers list as many as 17 cases (Sohn 2001) and others as few as two or three (e.g. O'Grady 1989). The issue here lies in a lack of consensus as to what case is in the first place. For our purposes, we will stick to our original definition that case is the certain form a noun or pronoun takes when it is in various syntactic argument positions relative to the verb, and we will limit our discussion to the nominative, accusative, dative, and possessive.

Let's begin our examination of the Korean case system with an example sentence.

(52) 인호가 김치를 먹었다.
Inho-ka kimchi-lul mek-ess-ta.
Inho-NOM kimchi-ACC eat-PST-DEC
'Inho ate kimchi.'

In the above sentence, if we follow the SOV order of Korean, it is easy to see that *Inho* is the subject of the sentence and *kimchi* is the object. The subject is normally marked with the nominative marker *-i/-ka*, while the object takes the accusative case using *-ul/-lul*.[12,13] One must be very careful not to assume that **precedence** defines what a subject or an object is. Word order in Korean is relatively free, leading to a phenomenon known as **scrambling**. Consider (53) below:

(53) 김치를 인호가 먹었다.
kimchi-lul Inho-ka mek-ess-ta.
sausage-ACC Inho-NOM eat-PST-DEC
'Inho ate kimchi.'

[12] This is a morphophonemically conditioned marker, *-i* is used after stems ending in a consonant and *-ka* after stems ending in a vowel.

[13] *-ul* is used after stems ending in a consonant and *-lul* after stems ending in a vowel.

In (53) we can see that the subject, *Inho*, has been inverted with the object *kimchi*. This inversion provides no significant change in meaning between the two sentences. Since word order is not strict in Korean, what is the subject and what is the object is marked with the post-nominal case markers.

**Scrambling** is usually viewed as a transformation where a basic SOV sentence is modified to generate a sentence with a new word order. This makes good theoretical sense, as one would like to maintain the assumption that grammatical roles are assigned in certain structural configurations relative to the verb. Otherwise, we would have to have a different explanation of how grammatical roles are assigned for all possible word orders. The former is clearly a more elegant solution. If this is so, we still need to figure out where the original nominative marked subject and accusative marked object reside. We will begin be examining the nominative subject.

The tree in (54) is a basic SOV sentence. We can see structurally where this subject resides.

(54)

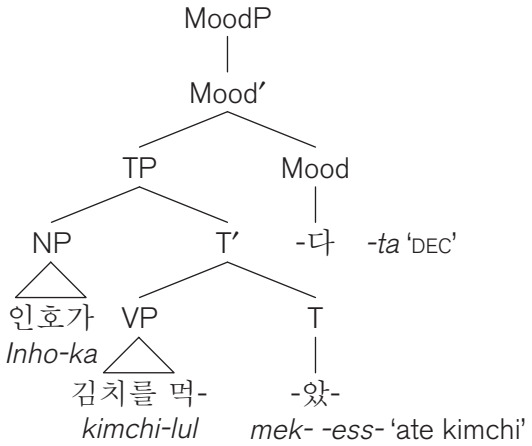



Figure 5.27 Basic SOV sentence

Our technical definition of where the nominative case marked subject resides would be as follows:

(55) **Nominative Case (Structural Definition)** – Specifier of TP

What we have done thus far is simply describe in what position a noun needs to be in order to appear with the nominative case. On the other hand, we do not have any explanation of how this has happened or why this must be the case. Many syntacticians have made the claim that case is in fact **assigned** or **checked** by another element in the syntax. In the case of the nominative, we will assume that it has to do with the head of TP. This is because, technically, the nominative case occurs in the specifier of a **finite** T. We know this because the nominative case cannot occur in the specifier position of a **non-finite** verb, as shown below.

(56) *Jim promised Mary *I* to go home.

In (56), the nominative 'I' cannot occur in the embedded specifier or T. The reason for this is that there is no tense in the embedded clause, as it contains **infinitival** '*to*', which lacks any sort of tense or agreement. From here we assume that there is then some connection between finite, or tensed T and the nominative case we find in its specifier. Ultimately, we would like to provide the same sort of argumentation for Korean. However, a true infinitival T has yet to be reliably shown to exist in Korean. For now, we will have to employ an analogous analysis for Korean without a complete analysis. As in English, then, we will assume that finite T is required to have the nominative case in Korean.

There are many ways to formalize this sort of analysis. Here we will adopt a fairly theory neutral, case checking system involving **case features**. Consider again the sentence in (52) reproduced below in (57).

(57) 인호가 김치를 먹었다.
Inho-ka kimchi-lul mek-ess-ta.
Inho-NOM kimchi-ACC eat-PST-DEC
'Inho ate kimchi.'

To tie together the observation that finite T is related to nominative case-marked nouns in the specifier of TP, we need a syntactic mechanism to account for this. First of all, consider that all nouns seem to have a set of features. All nouns have what are called **phi-features**, which are person, number, and gender. *Inho*, for example, has the following phi-feature set: [third person, masculine, singular]. In addition, nouns also have case features. T also has features, namely past and nominative. We will also add a bit of machinery called the **case filter**, which states that all nouns require case to be considered a legitimate object by the syntax. Taking this into account, we propose that T and N check each other's features.

(58)

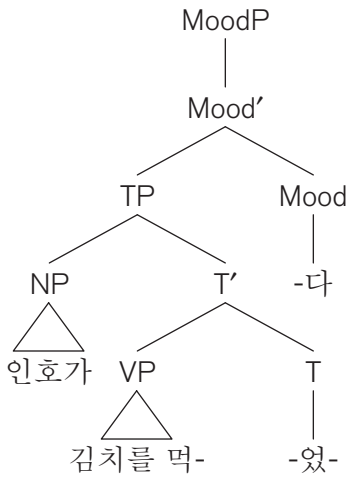



**Figure 5.28** Feature checking of nominative case

Moving on to the accusative case, let's take a closer look at the structure of the VP in our example sentence.

(59)

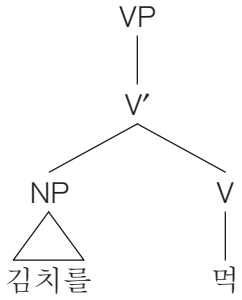



**Figure 5.29** Structure of VP in (57)

Just like the nominative, accusative nouns appear in certain positions, namely as complements of V. Again, we can view case as a checking procedure, wherein features are checked off between the case-bearing noun and, in this case, the verb.

(60)

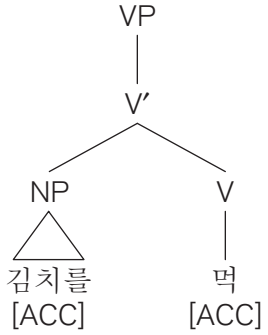



**Figure 5.30** Feature checking of accusative case

The dative marker in Korean seems at first glance as though it may be a case marker, and indeed many languages have such things. The indirect object *Hwun* in the example below takes the dative case marker.

(61) 인호가 훈한테[14] 김치를 먹으라고 했다.
Inho-ka Hwun-hanthey kimchi-lul mek-ula-ko hay-ss-ta.
Inho-NOM Hwun-DAT kimchi-ACC eat-IMP-COMP say-PST-DEC
'Inho told Hwun to eat kimchi.'

[14] Another form the dative takes is *-eykey*, being a little less colloquial than *-hanthey*, and *-kkey*, which is used when the indirect object is of honorific status.

In (61), the dative marker *-hanthey* marks the direct object position. There is at least some reason to be suspicious of the Korean dative as a true case marker, however. Numerous scholars instead view *-eykey/hantey* as postpositional markers such as the ones discussed above. The reasons for this are both syntactic and semantic. We will stick to the syntactic reasons here, most notably proposed by O'Grady (1989).

First, *-eykey* can co-occur with a topic marker as well as a delimiter. These are behaviors that are consistent with postpositions, but not case markers.

(62) a. 존에게는 내가 책을 주었다.
John-eykey-nun nay-ka chayk-ul cwu-ess-ta.
John-DAT-TOP I-NOM book-ACC give-PST-DEC
'As for John, I gave the book to him.'
b. 개에게만 존이 물렸다.
Kay-eykey-man John-i mwul-li-ess-ta.
dog-DAT-only John-NOM bite-PASS-PST-DEC
'John was bitten by only the dog.' (O'Grady 1989)

Also, as with postpositions, dative markers are not optional, while case markers are.

(63) 개*(에게) 존이 물렸다.
Kay-*(eykey) John-i mwul-li-ess-ta.
dog-DAT John-NOM bite-PASS-PST-DEC
'John was bitten by the dog.'

These are some arguments that suggest that the dative in Korean patterns is more of a postpositional marker, rather than a true case marker. Therefore, as we did in Section 5.3, we will consider it as having the same PP structure as illustrated below.

(64)

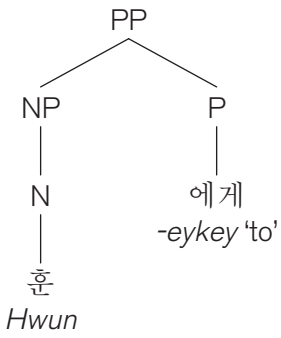



Figure 5.31 Dative case as postposition

Finally, we will move on to the **genitive case**. The genitive case can be thought of as being analogous to a possessive, although there are other semantic functions associated with its use.[15] The true possessive meaning is given in (65).

[15] In fact, there are researchers such as An (2014) who have attempted to show that *-uy* is not a case marker at all (see An 2014 for a discussion of *-uy* as an allomorphic variant of an abstract K-suffix).

(65) 인호의 친구가 다쳤다.
Inho-uy chinkwu-ka tachi-ess-ta.
Inho-GEN friend-NOM hurt-PST-DEC
'Inho's friend got hurt.'

In modern generative grammar, genitive morphology in English is not universally assumed to be case marking. Even so, the general assumption is that the genitive marker heads a DP and assigns, or checks case with its specifier, as illustrated in (66) below.

(66)

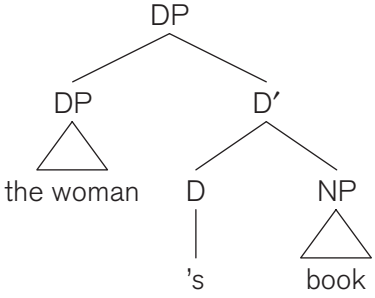



Figure 5.32 Genitive in English

As mentioned in the previous section on DPs, one reason a structure such as that in (66) is assumed is that genitive case markers appear to be in complementary distribution with determiners.

(67) *The woman's the book

This being true, it is assumed that both the genitive case marker and the determiner occupy the same head, as in (66). Remember also, that determiners and genitive morphology are not in complementary distribution in Korean. One way to account for this, as suggested by Suh (2005), is to use the idea of a **Case Phrase** (KP) in the tradition of Jo (2000). In this sort of analysis, all case markers head a KP. Consider the following structure in (68) – I have left out X-bar details in order to simplify our discussion.

(68)

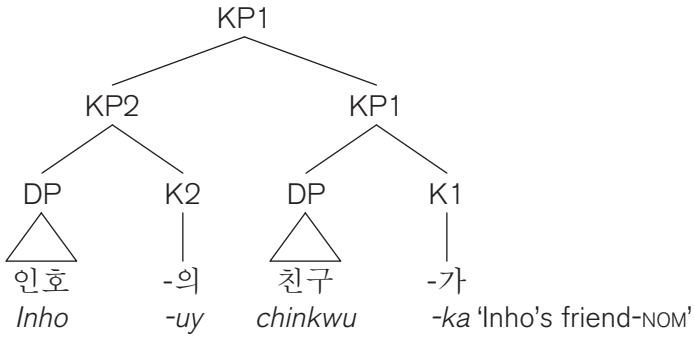



Figure 5.33 Case phrase

In the structure in (68), the genitive case marker heads a KP phrase with the possessor in the specifier position, much as in the English example above. However, we can also account for the non-complementarity of determiners and case markers, as there is an open determiner position in the DP under KP1.

## 5.5.2 Occurrences of Multiple Case-Marking

In the previous section, we cautioned against viewing case as an indicator of thematic roles. It is intuitive to think that it might be, as even the scrambled sentences in (62) and (63) above retain the thematic role to case marker correspondence. In fact, there are instances where the nominative case can appear more than once in a sentence, which calls into question not only the correspondence of thematic role to case marker, but also the very function of the nominative marker as marking the grammatical subject of the sentence. Below are some examples of this phenomenon.

(69) a. 순이가 머리가 빗겨지고 있다.
Suni-ka meli-ka piki-eci-ko-iss-ta
Suni-NOM hair-NOM comb-PASS-PRG-DEC
'Suni's hair is being combed.'

b. 유미가 팔이 부러뜨려졌다.
Yumi-ka phal-i pulettuli-eci-ess-ta.
Yumi-NOM arm-NOM break-PASS-PST-DEC
'Yumi's arm is broken.'

c. 바나나가 껍질이 까졌다.
Panana-ka kkepcil-i kka-ci-ess-ta.
banana-NOM rind/skin-NOM peel-PASS-PST-DEC
'The banana was peeled.' (Mailing and Kim 1992)

(70) 존이/의 손이 크다.
John-i/-uy son-i khu-ta
John-NOM/GEN hand-NOM big-DEC
'John's hand is big.' (Kim and Sells 2007)

Apart from syntax, there is a semantic relationship between the two nominative marked nouns, namely that of the part–whole relationship. For example, in (69a) the first noun *Yumi* is the whole and the second noun *phal* 'arm' is a part of her. One thing these examples show us is that the nominative case seems to have little or nothing to do with thematic roles. For example, the nominative marked NPs we have shown until now have all been agents, as is often the case with subjects. However, the NP 'Yumi's arm' is a theme. To make matters worse, we have the part–whole relationship, which the nominative markers seem to have nothing to say about. If we abandon the idea that thematic roles have some correspondence with case markers, then we still need to decide how case is assigned to multiple NPs. The possible analyses are numerous.

The most intuitive analysis would appear to be one that involves an analogous analysis of possessive constructions. Another possible approach is a case-agreement of some sort, where V assigns case to one NP and the other one agrees with that NP and its case feature **percolates** up to it. Yet another option put forth by Mailing and Kim (1992), is that the verb independently assigns two separate cases. The controversy over a correct analysis continues today. For our purposes here, it is enough to simply acknowledge the issues and problems that stem from such a construction.

Just as with the multiple nominative constructions shown above, Korean can also employ the use of multiple accusative marked nouns.

(71) 존이 메리를 팔을 때렸다.
John-i Mary-lul phal-ul ttayli-ess-ta.
John-NOM Mary-ACC arm-ACC hit-PST-DEC
'John hit Mary on the arm.'

Again, note that there is a possessive reading where the first accusative marked noun is the whole of which the second is a part. These constructions are not limited to just two accusative marked nouns, and instead seem to be able to have an unlimited number of them.[16]

[16] It is worth noting that Japanese is restricted to just two accusatives in these sorts of constructions. This is call the **double-o** constraint (Harada 1973).

(72) a. 존이 메리를 팔을 왼쪽을 끝을 때렸다.
John-i Mary-lul phal-ul oynccok-ul kkut-ul ttayli-ess-ta.
John-NOM Mary-ACC arm-ACC left-ACC end-ACC hit-PST-DEC
'John hit Mary on the left end of the arm (Lit. John hit Mary, the arm, the left, the end).'

b. 존이 메리에게 팔에 왼쪽에 끝에
John-i Mary-ekey phal-ey oynccok-ey kkut-ey
John-NOM Mary-DAT arm-dat left-DAT end-DAT
주사를 놓았다.
cwusa-lul noh-ass-ta.
injection-ACC give-PST-DEC
'John gave an injection to Mary in the left end of the arm (Lit. John gave an injection to Mary, to the arm, to the left, to the end)

c. 존이 어머니가 고향이 서울이다.
John-i emeni-ka kohyang-i sewul-i-ta.
John-NOM mother-NOM hometown-NOM Seoul-COP-DEC
'It is John whose mother's hometown is Seoul.'

## 5.6 ANAPHORA AND BINDING

Perhaps no area of Korean syntax is more contentious than that of **anaphora** and **binding**. Korean has a rich system of **pronouns** and **reflexives**, and the status of some of these elements is still controversial today. In the following subsections, we will explore Korean anaphora and binding in some depth and provide a brief introduction to some of these controversies along the way.

### 5.6.1 The Korean Pronominal System

#### *5.6.1.1 Pronouns*

The Korean system of pronouns is unique in many ways. First of all, there is a distinction between polite usage and plain, more intimate usage. This can be seen in the chart below.

**Table 5.1** The Korean pronouns

| *Person* | *1st* | | *2nd* | | *3rd* |
|---|---|---|---|---|---|
| | Humble | Plain | Non-honorific | Plain | |
| Sg | 저 *ce* | 나 *na* | 당신 *tangsin* | 너 *ne* | 그 *ku* |
| Pl | 저희 *cehuy* | 우리 *wuli* | 당신들 *tangsintul* | 너희(들) *nehuy(tul)* | 그들 *kutul* |

It can be seen from the above table, that the first and second person pronouns have various forms. In the first person, there are two forms. Firstly, the **intimate**

*na* 'I' is used among close friends, peers, with/among children, or more generally in a situation where the use of honorifics is not called for. The other form is the **humble form**, *ce* 'I', which is used in a situation which requires the speaker to employ some sort of deference with respect to whom he or she is speaking to or about. The plural forms of these pronouns are *wuli* 'we' and *cehuy* 'we', respectively.[17]

[17] The plural marker *-tul* can be added to both of the first person pronouns: *cehuy-tul* and *wuli-tul* 'we'. Apparently there is little change in meaning between the plural form with or without *-tul*. This is, however, a question that remains open for further research, as some researchers claim that the addition of the plural marker does in fact change the meaning and/or function in slight ways. One example is that the usage of *-tul* makes a distributive reading possible, whereas a bare noun does not allow a distributed reading, exemplified in i) below.

i) 학생들이/#학생이 각자 선생님께 질문을 했다.
Haksayng-tul-i/haksayng-i kakca sensayngnim-kkey cilmwun-ul heyssta.
student-PL-NOM/student-NOM each teacher-DAT question-ACC did
'The students each asked the teacher a question.'

The choice of which second person pronoun to use is also dictated by the context of the utterance. The plain form *ne* 'you' is used with intimates, while the non-honorific form *tangsin* 'you' is mainly used between spouses, but may also be used in a rude way when the speaker is involved in a confrontation. There are many other second person pronoun-like words such as: *caney*, *elusin*, *kuccok*, *tayk*, *kwiha* and *kutay*. The usage of all of these pronouns is limited by the context the speaker finds himself in. Since these do not directly relate to matters of syntax, we will set these aside for now.

Unlike the first and second person, the third person has only one basic form. It should be noted that the existence of the third person pronoun in Korean is relatively recent and is most commonly understood to be used in written form rather than spoken Korean. It has in fact been stated in the literature that *ku* as a pronoun actually sounds quite awkward to native Korean speakers as a pronoun in spoken discourse (Park 1985). In actual conversational usage, what would be used would be best considered a complex demonstrative, meaning that a noun is combined with a demonstrative to refer to a third person. In this way, all third person forms have at least some roots in a demonstrative or complex demonstrative form. For example, when referring to a third person, the phrase *ku salam* is often used, literally meaning 'that person'.

There are some complex demonstratives that are phonologically reduced and in such wide usage colloquially that we may want to seriously consider them as third person pronouns. A few examples are *kunye* 'she' a contracted form of *ku yeca* 'that woman' and *kyey*, a contracted form of *ku ay* 'that child'. While we will not cover these here, what the reader should be aware of is that to classify something as a pronoun, one would ideally like to see an analysis where the

word in question is shown to behave syntactically in all respects like other well-known pronouns.

### 5.6.1.2 Binding Conditions and Korean Pronouns

If we look at pronouns in English, we see that which referent may serve as the antecedent for a particular pronoun is actually limited in a predictable way. Consider the following sentences in English.

(73) $\text{Jim}_1$ thinks that $\text{Bill}_2$ likes $\text{him}_{1/*2/3}$.

In the example above, *him* can refer to Jim or some other person outside the sentence, as indicated by the subscripts. What is striking is that *him* cannot refer to *Bill.* What we can extract from this sort of example, is that it appears that a pronoun cannot have an antecedent in the same clause as itself. It is examples like this that led Chomsky to outline what is today known as the **Binding Theory** (Chomsky 1981). The Binding Theory is an attempt to explain the distribution of referential elements in the syntax. The behavior captured in (73) above points to a principle in the theory known as Principle B.

(74) **Principle B**: A pronoun must be locally free.

This principle is an attempt to explain which nouns in which syntactic positions relative to the pronoun can or cannot function as an antecedent for that pronoun. What we mean by **local** in the above principle is essentially defined as being in the same clause, or TP. How to exactly define what we mean by 'local' has been a subject of much debate over the decades, beginning mainly with the work of Chomsky in *Lectures on Government and Binding* (1981). While this is indeed an interesting area of study, we will streamline our approach here by assuming that 'local' simply means 'in the same clause (i.e. in the same TP)'.

In Korean, we can see that the pronouns do in fact adhere to this principle.

(75)

| | | | | | |
|---|---|---|---|---|---|
| 인호$_1$가 | [훈$_2$이 | 그$_{1/*2/3}$를 | TV에서 | 봤다고] | 했다. |
| Inho-ka | Hwun-i | ku-lul | tv-eyse | po-ass-ta-ko | hay-ss-ta. |
| Inho-NOM | Hwun-NOM | he-ACC | tv-LOC | see-PST-DEC-COMP | say-PST-DEC |

'Inho said that Hwun saw him on TV yesterday.'

In the above example, the third person pronoun *ku* 'he' refers to either the matrix subject *Inho* or a referent outside the sentence. It seems difficult, however, to refer to the embedded subject *Hwun* unless a special context is supplied. This is congruent with **Condition B** of the binding theory, as *Hwun* and *ku* are both in the same clause – indicated by the brackets. It seems then, that Chomsky's Binding Theory makes the correct predictions about Korean. We will see in the following sections, however, that this is not always the case.

## 5.6.2 Local and Long-Distance Reflexives

**Reflexives** are those pronominal elements that must obligatorily take their reference from some sentence-internal nominal. For example, in English, 'himself/herself' is a type of reflexive.

(76) $Jim_1$ thinks $Bill_2$ hates himself.$_{1/2/*3}$.

In the example in (76) above, the only possible referent for 'himself' is the local subject *Bill*. The long-distance matrix subject 'Jim' is strictly out, as is any extra-sentential antecedent. What we see here is a pattern that seems to be in complementary distribution with pronouns in terms of syntactic distribution. In plain terms, the antecedent for reflexives must be found locally. According to the binding theory, this is because of **Condition A**.

(77) **Condition A**: A reflexive must be bound locally.

This condition correctly predicts the behavior of English reflexives. We will see in the following section that the story for Korean is not so simple.

Consider the chart below which lists the Korean reflexives.

**Table 5.2** The Korean reflexives

| *Person* | *1st* | *2nd* | *3rd* | |
|---|---|---|---|---|
| | | | Local | Long-distance |
| Sg | 자신 *casin* | 자신 *casin* | 자기자신 *caki casin* | 자기 *caki* |
| Pl | 자신들 *casin-tul* | 자신들 *casin-tul* | 자기자신들 *caki casin-tul* | 자기들 *caki-tul* |

As can be seen in the chart above, there is no system of politeness with regard to the morphological form of the reflexives as there is with the pronoun system. Another difference relates to the third person which is divided into **local** and **long-distance** reflexives (Kim and Yoon 2009a). This difference between these two categories will become clear below.

### *5.6.2.1 Local Reflexives*

We will begin our analysis with the local reflexive *caki-casin*. We first outline some of the basic properties of potential antecedents. As described in the chart above, *caki-casin* can only take an antecedent in the third person.

(78) 너/나는 *자기자신의 수학 실력을 잘 알고 있니?
Ne/na-nun *caki-casin-uy swuhak silyek-ul cal al-ko iss-ni?
you/I-TOP self-GEN math ability-ACC well know-RRG-QUE
'Do you know your own ability in math?' (Kim and Yoon 2009a)

(78) shows that *caki-casin* cannot take an antecedent in the first or second person. In addition, it also cannot refer to an inanimate noun.

(79) 그 나무가 자기 자신 옆에 세워져
*Ku namwu-ka caki-casin yeph-ey seywecie* iss-nun
that tree-NOM self beside-LOC parked be-RC
있는 자동차 위로 넘어졌다.
catongcha wuy-lo nemeci-ess-ta.
car top-LOC fall-PST-DEC
'The tree fell on the car next to it(self).'

In the above example, the usage of *caki-casin* is ungrammatical because the only possible antecedent is *namwu* 'tree', an inanimate noun.

Regarding the syntactic distribution of possible antecedents for *caki-casin*, much like the English reflexives, they must be local.

(80) 훈은 인호가 자기자신을
$Hwun_1$-un $Inho_2$-ka caki-casin$_{1/2}$-ul
Hwun-TOP Inho-NOM self-ACC
원망한다고 생각한다.
wenmangha-n-ta-ko sayngkakha-n-ta.
blame-PRS-DEC-COMP think-PRS-DEC
'Hwun thinks Inho blames himself.'

In (80), the long-distance noun is not a possible antecedent, while the local one is. Given only this example, we can say that Korean reflexives obey **condition A**.

Local reflexives in Korean begin to diverge from English when we look at embedded clauses. *Caki-casin* can be found in a nominative subject position, as shown in (81b) (Yang 1983, Sung 1990). This is not, however, possible in English (81a).

(81) a. *Jim knows himself likes Jim.
b. 인호가 자기자신이 똑똑하다고 말했다.
[Inho-ka [caki-casin-i ttokttokha-ta]$_{TP}$-ko malha-ess-ta]$_{TP}$.
Inho-NOM self-NOM smart-DEC-COMP say-PST-DEC
'Inho said that he is smart.'

If we look at these examples with respect to Condition A, we find that the Condition as stated above incorrectly predicts that the Korean sentence should be ungrammatical. This is so because there is no potential antecedent in the same clause as *caki-casin*. This reasoning is why Condition A correctly predicts (81a) in English to be ungrammatical.

Why then is the Korean example acceptable? While we will not come to a concrete conclusion regarding this issue here, it will prove instructive to at least

look at how one might go about solving this problem. Remember that when developing any theory, such as the Binding Theory, one approach is to treat the theory as a hypothesis. One can test a hypothesis by constructing sentences that should be ruled out by the hypothesis. After this, we can ask native speakers whether the proposed sentence is good or bad, which in essence tells us whether the theory is correct or not. In this case, our hypothesis is Condition A. Having constructed a sentence such as the one in (81b) and checking with a few native speakers, we find out that Condition A gives us an incorrect prediction. We then assume that our hypothesis is somehow incorrect, at least for Korean, and we head back to the drawing board to change our theory to account for all of the new data.

The first suggestion someone might make is that *caki-casin* is in fact not subject to a locality restriction at all. This is in fact not true, given examples such as (82). In short, we need some definition of locality in Condition A. It could be that we need a different definition from that for English, or it could also be that there is something different about Korean that should be included in the original theory. How do we begin to test this? An obvious data point that we need to answer this question is one that will tell us if (81b) is subject to any constraints regarding distance of potential antecedents at all. In order to do this, we need to construct a sentence such as (81b) where *caki-casin* has potential antecedents that are even further away. Consider (82) below:

(82) 존은 메리가 자기자신이 똑똑하다고
John-un Mary-ka [[caki-casin-i ttokttokha-ta]-ko
John-TOP Mary-NOM self-NOM smart-DEC-COMP
생각한다고 말했다.
sayngkakha-n-ta]-ko malha-ess-ta.
think-PRS-DEC-COMP said
'John said that Mary thinks that she is smart.' (Sung 1990, 74)

The only potential antecedent in (82) is the closest one *Mary*, while *John* is not allowed as a potential antecedent. Going back to our hypothesis Condition A, it does appear that we need a definition of locality, but for Korean at least, that definition cannot be the TP containing the reflexive, as is the case with English. From here, we again go back to the drawing board, and imagine how we might redefine Condition A so as to account for the new data without losing the explanation of all previous data.

### 5.6.2.2 Long-Distance Reflexives

Turning back to Table 5.2 above, we see that the third person column is divided into local and long-distance reflexives. In this section, we will look at the reflexive *caki* in some depth. First, consider that the mere usage of a term such as 'long-distance' reflexive is suspect, considering the binding theory developed thus far.

However, before diving into the syntactic distribution of *caki*, we will first consider the restrictions it places on its potential antecedents.

(83) a. 인표는 경찰청이 자기가 숨긴
Inphyo-nun kyengchalcheng–i caki-ka swumki-n
Inphyo-TOP the police.agency-NOM self-NOM hide-RC
증거물을 찾아냈다고 말했다.
cungkemwul-ul chacanay-ess-ta-ko malhay-ss-ta.
exhibit-ACC find-PST-DEC-COMP say-PST-DEC
'Inphyo said that the police found the exhibit he (self) had hidden.' Yoon (2009)

b. *호랑이/인호가 자기를 물었다.
*Holangi/Inho-ka caki-lul mulessta.
tiger/Inho-NOM self-ACC bit
'The tiger/Inho bit himself.'

The examples in (83a–b) illustrate that not only does *caki* require an animate antecedent, but also requires its antecedent to be human (83b). Also, like *caki-casin*, *caki* only allows third person antecedents, as shown below.

(84) *내/*너/인호/미나가 자기를 비판했다.
*Nay/*Ne/Inho/Mina-ka caki-lul piphanhessta.
1st/2nd/Inho/Mina-NOM self-ACC criticized
'*I/*You/Inho/Mina criticized himself/herself.'

In order to outline the syntactic distribution of *caki*, let's begin by considering what Condition A has to say about what it may look like. What we expect is that a reflexive will at least obey some sort of locality condition. With this in mind, consider the following example.

(85) 미나가 훈이 자기가 상을 받았다고
Mina$_1$-ka Hwun$_2$-i caki$_{1/2}$-ka sang-ul pat-ass-ta-ko
Mina-NOM Hwun-NOM self-NOM prize-ACC receive-PST-DEC-COMP
생각한다고 믿는다.
sayngkakha-n-ta-ko mit-nun-ta.
think-PRS-DEC-COMP believe-PRS-DEC
'Mina believes that Hwun thinks that he got the prize.'

(85) shows that *caki* can be bound not only by the local antecedent *Hwun*, but also by the long-distance antecedent *Mina*. In fact, *caki* can be bound by an antecedent potentially an infinite distance away. Showing this is difficult, as Korean is an SOV language, and is head final (i.e., the head comes after the complement). Because of this, when embedded in clauses, all of the subjects of the sentence follow each other at the beginning of the sentence. It very

quickly becomes very difficult to keep all of these subjects in one's memory while waiting for the verbs to which they are agents of. Even so, the following example shows an example with three available long-distance antecedents.

(86) 프레드는 존이 메리가 자기가 똑똑하다고
Fred$_1$-nun [John$_2$-i [Mary$_3$-ka [caki$_{1/2/3}$-ka ttokttokha-ta]-ko
Fred-TOP John-NOM Mary-NOM self-NOM smart-DEC-COMP
말한 것을 시인한다고 생각했다.
malha-n-ket-ul] siin-han-ta]-ko sayngakha-yess-ta.
speak-RC-thing-ACC admit-DEC-COMP think-PST-DEC
'(lit.) Fred$_1$ thought that John$_2$ admitted that Mary$_3$ said that self$_{1/2/3}$ is smart.' (Park 1985)

If we take the binding theory literally, a reflexive which takes long-distance antecedents should not exist. This has been the subject of much debate over the years, with various scholars claiming that one can reduce *caki* to a local antecedent (e.g. Cole et al. 1990) to claims that *caki* falls outside the scope of binding theory all together (Han and Storoshenko 2012) and is in fact best accounted for in semantics. Either way, hopefully the reader can see that the binding theory as it stands runs into some difficulties when Korean is viewed under its lens.

### *5.6.2.3* Casin

Finally, we will discuss *casin*. In the table above, it is described as a long-distance anaphor which can take an antecedent of any person. Indeed it is true that *casin* can take any person as its antecedent.

(87) 내/너/인호가 자신을 원망한다.
Nay/ney/Inho-ka casin-ul wenmangha-n-ta.
I/you/Inho-NOM self-ACC blame-PRS-DEC
'I/you/Inho blame myself/yourself/himself.' (Sung 1981)

Much like *caki* and *caki-casin*, however, it does require an animate antecedent.

(88) *그 나무가 자신 옆에 세워져 있는 자동차
*Ku namwu$_1$-ka casin$_1$ yeph-ey seywecie iss-nun catongcha
that tree-NOM self beside-LOC parked be-RC car
위로 넘어졌다.
wuy-lo nemeci-ess-ta.
top-LOC fall-PST-DEC
'The tree fell on top of the car parked next to it(self).'

As for *casin*'s syntactic distribution, given the following example, it seems as though it behaves in a similar way to *caki*.

(89) 미나가 훈이 자신이 상을 받았다고
Mina$_1$-ka Hwun$_2$-i casin$_{1/2}$-i sang-ul pat-ass-ta-ko
Mina-NOM Hwun-NOM self-NOM prize-ACC receive-PST-DEC-COMP
생각한다고 믿는다.
sayngkakha-n-ta-ko mit-nun-ta.
think-PRS-DEC-COMP believe-PRS-DEC
'Mina believes that Hwun thinks that he got the prize.'

In (89) we can see that *casin* can have an antecedent which is indefinitely far away, making it a true long-distance anaphor.

The idea of long-distance anaphors has been known for some time, as mentioned in the section on *caki*. They have been shown to exist in numerous languages such as Chinese, Japanese, and Hindi just to name a few. Exactly what the properties of these anaphors are is still the subject of much debate. It is important however, to look into such questions, especially in Korean. Consider that, given the analyses above, we might want to classify *caki* and *casin* as being essentially the same thing, other than the fact that casin can take an antecedent in the first and second person. This, however, is certainly not warranted when one looks further.

Consider a well-known effect in long-distance anaphors known as the **blocking effect**. The observation here is that a pronoun of a different person cannot intervene between a long-distance anapahor and its antecedent. Here is an example in Chinese.

(90) *Zhangsan renwei [wo zhidao [Wangwu xihuan ziji]].
Zhangsan thinks I know Wangwu like self
'Zhangsan thinks that I know that Wangwu likes himself.'

In this example, the first person pronoun *wo*, intervenes between the anaphor *ziji* and the long-distance antecedent *Zhangsan*. The presence of the pronoun 'blocks' that ability of the reflexive to take the potential antecedent *Zhangsan*.

Knowing this about LD reflexives, consider an example with *casin*.

(91) 인호는 내가 자신을 사랑한다고 생각한다.
*Inho$_1$-nun [nay-ka casin$_1$-ul salangha-n-ta-ko] sayngkakha-n-ta.
Inho-TOP I-NOM self-ACC love-PRS-DEC-COMP think-PRS-DEC
'*Inho thinks I like himself.'

Here we see the same behavior with *casin* as we do with Chinese *ziji*. A first person pronoun blocks potential antecedents higher up in the sentence. Now consider an analogous example using *caki*.

(92) 인호는 내가 자기를 사랑한다고 생각한다.
Inho$_1$-nun [nay-ka caki$_1$-lul salangha-n-ta-ko] sayngkakha-n-ta.
Inho-TOP I-NOM self-ACC love-PRS-DEC-COMP think-PRS-DEC
'Inho thinks I like self.'

Here we do not see a blocking effect with *caki*. We will not give a full explanation here of what *caki* in fact is, and in reality there is no real consensus in the current literature. The point of the story here is that one must be very careful when making a comparison between two given elements in syntax. If we are going to say that something is a long-distance anaphor, it must behave like all other long-distance anaphors in all ways.

## 5.7 MOVEMENT AND TRANSFORMATIONS

It is well known that in natural language words are often displaced from their original position. In the course of the development of modern syntax, movement played a central role and still does today. For example, in English, we can see that if one wants to form a **yes–no question**, then the auxiliary verb is moved from its canonical position directly in front of the verb to the beginning of the sentence.

(93) a. Jim can bring the dessert.
b. Can Jim bring the dessert?

In the syntactic theory presented thus far, we would say that the auxiliary moves to the head of CP, as shown in the tree in (94). Furthermore, we assume that the auxiliary moves to check off a question feature located on the head of C.

(94)

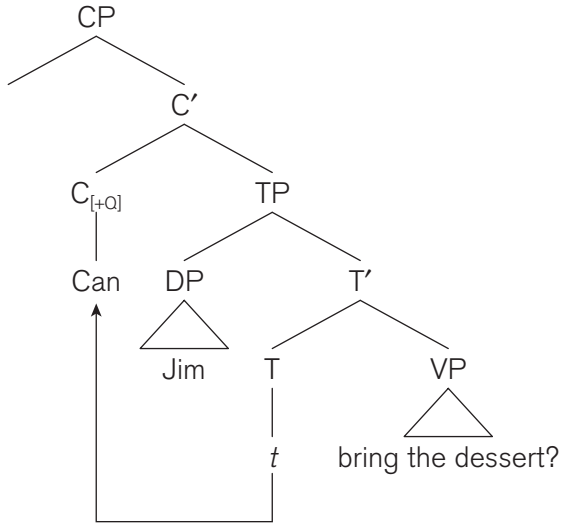



Figure 5.34 Auxiliary movement

As discussed earlier, inherent in the analysis presented above is the idea that there is some sort of kernel sentence, or **deep structure**, and that **transformations** are then applied to this structure to provide a surface structure. The transformation in (94) above can be formalized in the following way:

(95) **Yes–no Question Formation (T-C movement)**
Move AUX in T to the head of CP

In Korean, however, movement is not necessary to ask a yes–no question. Instead, depending on the situation, a simple change in intonation is all that is needed.

(96) a.
나중에 같이 먹을거야?
Nacwungey kathi mek-ulkeya.
later together eat-will
'Would you like to eat with me later?'

b. 나중에 같이 먹을거야.
Nacwungey kathi mek-ulkeya.
later together eat-FUT
'We will eat together later.'

**Figure 5.35** Question intonation

In the above examples, the curved line represents the intonational contour of the sentences. In order to form a question, as in (96a) the intonation is simply raised at the end of the sentence. This is in contrast to a declarative statement, which has a more falling intonation, as in (96b). What we can see is that movement is not necessary in Korean to form yes–no question as it is in English.

While movement may not necessarily be needed to account for the Korean data, we can actually use Korean data to show that the feature component of the analysis, which drives the movement in English, is a reasonable feature to assume – even though it is not morphologically realized. Recall the case features we used previously to explain the relationship between the case-marked nouns and the heads that dictate which case they may be marked with. We assumed these features exist because there is a morphologically overt marker that appears on the nouns. Ideally, we would like all proposed features to have a morphologically overt marker that indicates their presence. While English lacks such a marker indicating question features, Korean does not. Consider the following sentences which make use of the formal sentence ender.

(97) a. 나중에 같이 먹을 겁니까?
Nacwungey kathi mek-ul ke-pni-kka?
later together eat-FUT.FORMAL-QUE
'Would you like to eat with me later?'

b. 나중에 같이 먹을 겁니다.
Nacwungey kathi mek-ulke-pni-ta.
later together eat-FUT.FORMAL-DEC
'We will eat together later.'

Note that the formal sentence particle is followed by a question marker, *-kka* and the declarative sentence ends with a declarative marker, *-ta*. While there may not be movement involved with yes–no questions, the existence of these markers is evidence that languages do indeed have a question feature on C, since that is where these markers are located. In some languages this would be overt, as in Korean, and in others it would be covert, as in English.

What we have provided above are rules that a native speaker has internalized with respect to forming yes–no questions. There are many such rules in natural language. For example, when asking a wh-question in English (i.e. questions using *who*, *what*, *when*, *where*, *how*) there are actually two transformations involved. First, we apply the T-to-C rule above. Following this, the question word, or wh-word as it is commonly referred to, is moved from its canonical position as the object of the verb to the specifier of the CP. Consider the derivation of (98b) from (98a) illustrated in the tree diagram in (99).

(98) a. Jim will eat what. b. What will Jim *t* eat *t*?

(99)

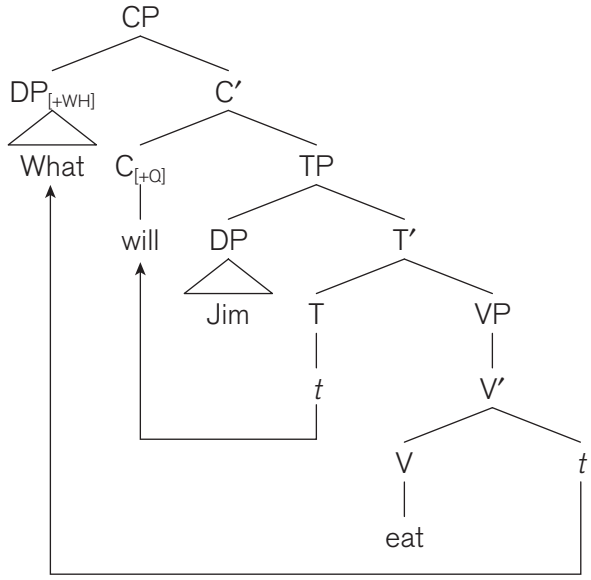



Figure 5.36 Wh movement

Not surprisingly, Korean works differently than English in that movement is not required. These sorts of language are called **wh in-situ** languages. An example is as follows:

(100) 인호가 뭘 먹었니?
Inho-ka mwu-ul mek-ess-ni
Inho-NOM what-ACC eat-PST-QUE
'What did Inho eat?'

As can be seen from the example, it is not necessary to move the wh-word to the front of the sentence. It will also be noted that the end of the sentence has a question morpheme. While this is allowed, just as with the yes–no questions above, it is optional provided the proper intonation is used.

At this point, many students find this type of theorizing a bit abstract. The fact is, we could just as easily postulate that that (98b) is base-generated instead of assuming that (98a) is the base-generated sentence. But think of what we will lose if we make this kind of postulation. We must assume at some level that the verb assigns thematic meaning to its object in a canonical position. Since 'what' in (98) is questioning the object, it makes sense that we keep this intact. Also, by assuming transformations, we can keep our theory simpler by first assuming a canonical order, and applying transformations to get surface representations. Without this type of mechanism, every sentence that contains a displaced element would need a new rule. The grammar would quickly become over-complicated.

In this section we have seen that some of the major movement transformations that we see as central to theorizing about English syntax actually do not involve movement at all in Korean. This is not to say that movement is absent from Korean syntax, as will be shown in the following sub-sections.

## 5.7.1 Scrambling

The most obvious form of movement in Korean is **scrambling**, which is best described as a change in word order with no appreciable difference in meaning. Some examples of this are given below:

(101) a. 인호가 음식을 먹는다.
Inho-ka umsik-ul mek-nun-ta.
Inho-NOM food-ACC eat-PRS-DEC
'Inho eats food.'
b. 음식을 인호가 먹는다.
umsik-ul Inho-ka mek-nun-ta.
food-ACC Inho-NOM eat-PRS-DEC
'Inho eats food.'

In the examples above, there is no significant meaning or grammatical change whatsoever. What appears to be the case is that Korean allows free word order, unlike languages such as English.

(102) a. Jim ate the apple.
b. *Jim the apple ate.

Later in the section we will see that scrambling in Korean is restricted in some ways. However, the facts in (101a–b) still remain and need to be accounted for in our syntax at some basic level. How then are we to characterize this sort of phenomenon in the syntax? Perhaps the most common way is to use **adjunction**.[18] First consider that adjuncts are distinct from the complements we have seen thus far. For example, how are we to diagram the following example?

[18] There is much debate in the literature about what sort of operation scrambling is in Korean. The other option here is that movement is not involved at all and that so-called scrambled NPs are base-generated in their surface position.

(103) 인호가 빨리 길을 건너갔다.
Inho-ka ppalli kil-ul kenneka-ss-ta.
Inho-NOM quickly road-ACC cross-PST-DEC
'Inho quickly crossed the road.'

Given the X-bar framework we have developed up to this point, there seems to be no room for the adverb *ppali* 'quickly'. We wouldn't necessarily want to call the adverb a complement of the verb, as adverbs are optional, which is a feature unlike complements. Perhaps even more importantly, the sub-categorizational frame of the main verb allows for only one complement. What then are we to do? The answer lies in a slight modification to our X-bar theory. In order to allow for adjuncts, we need to allow **multiple X-bar projections**. In this way, the definition of an adjunct is as follows:

(104) Adjunct = an XP which is immediately dominated by a bar-level projection and is also a sister to a bar-level projection

A tree diagram of (103) would thus look like this:

(105)

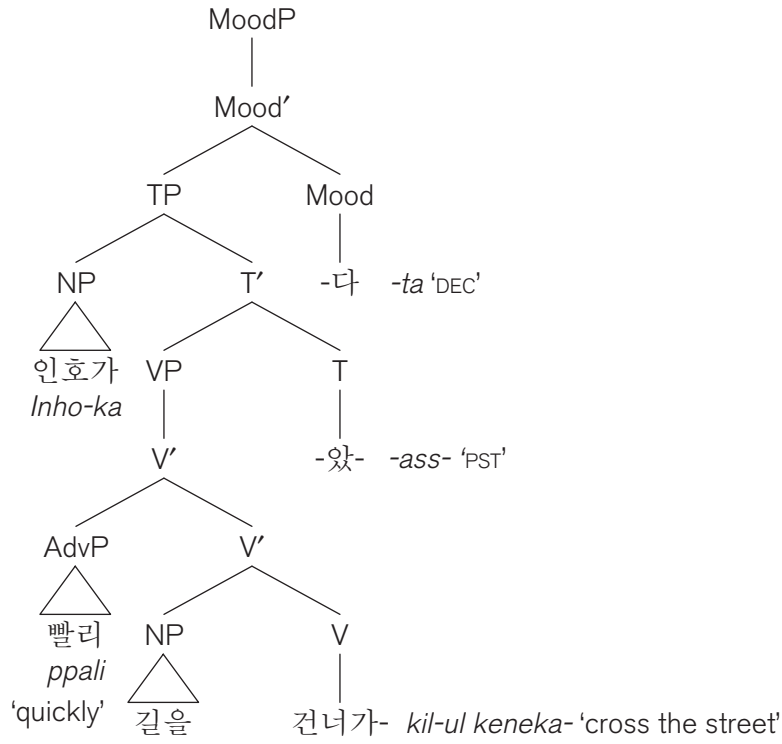



**Figure 5.37** Tree diagram of (103)

If we assume that scrambling is a form of adjunction, only involving movement, then the scrambled object in (101b) could be said to be adjoined at TP. In this case, we assume that the type of adjunction involved is that of left adjunction, which acts as a sort of extension of the TP.

(106)

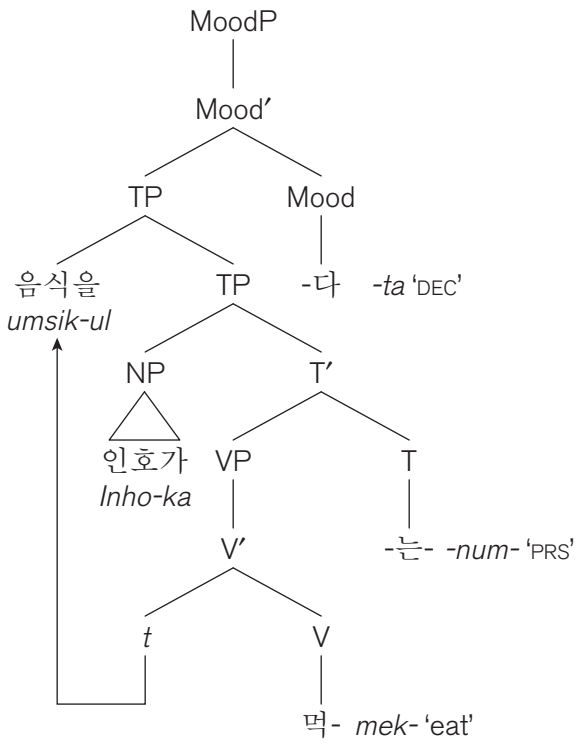



**Figure 5.38** Tree diagram of (101b)

While the explanation seems rather cut and dried, the facts of scrambling in Korean are rather complicated. In the remainder of this section we will provide a brief introduction to these issues. First of all, the mere description of the process of scrambling implies that word order is free in Korean. While this is an intriguing idea, the facts suggests otherwise. First consider that there seems to be no rightword scrambling allowed over a verb.

(107) *철수가 영희가 먹었다고 밥을 말했다
Chelswu-ka Younghee-ka mekessta-ko pap-ul malhyassta
Chelswu-NOM Younghee-NOM ate-COMP meal-ACC said
'Chelswu said that Younghee ate a meal.' (Lee 2007)

In addition, it seems that one cannot scramble an NP over another NP which bears the same case.

(108) a. 구름이 비가 된다
kwulum-i pi-ka toy-n-ta
cloud-NOM rain-NOM become-PRS-DEC
'The cloud becomes the rain.' (E. Lee 2007)

b. *비가 구름이 된다
pi-ka kwulum-i toy-n-ta
rain-NOM cloud-NOM become-PRS-DEC

There are numerous other restrictions on scrambling in Korean that need to be accounted for. How to accomplish this goal is a matter of much current debate. One issue that deserves to be examined in a bit more detail is whether or not Korean exhibits A-scrambling, A-bar-scrambling, or both. We will explore this in detail below.

In order to enter into this discussion, we must first cover what the difference between A-scrambling and A-bar scrambling is. A-positions, or **argument positions**, are just that, those positions associated with a grammatical function or a given thematic role. For example, two of these would be Spec TP and the complement of VP. **A-movement** to these positions, would include constructions such as passive constructions, which will be explained below. A-bar positions are those positions that have no grammatical function associated with them. A good example of movement to an **A-bar position** would be movement to Spec CP. This occurs in so-called wh-movement, where the wh-phrase moves to spec CP to form a question. A-scrambling and A-bar scrambling, then, are different types of scrambling, where the scrambled phrase moves to an A-position or an A-bar position respectively.

In order to look at this, we will consider the work of Cho (1994). Cho demonstrates that Korean exhibits both A- and A-bar scrambling. As for A-bar scrambling, she provides three tests that show that scrambling in Korean can indeed exhibit properties of A-bar movement. We will consider one of these tests here which has to do with binding effects and Condition A. This example requires some discussion of what is called **reconstruction effects**. Reconstruction effects are observed when an element is moved from its canonical position, but behaves as if it had never moved. What exactly this means will become clear with a few examples. Looking first to English, consider the following paradigm of examples.

(109) a. Tom Hanks$_1$ likes the movie about himself$_1$.
b. Which movie about himself$_1$ does Tom Hanks like $t_1$?
c. Tom Hanks'$_1$ movie seems to him $t_1$ to be horrible.

(109a) is a simple sentence involving a reflexive. In this example, 'Tom Hanks' is the antecedent for 'himself'. In (109b), we have turned the sentence into a question concerned with which movie about himself it is that Tom Hanks likes. It is still possible for *Tom Hanks* to be an antecedent for 'himself'. This is unexpected, since antecedents typically must *precede* the reflexive they antecede, as illustrated below.

(110) *himself looked at Jim in the mirror.

In reality, precedence is not the real issue. If it were, then 'Jim' and 'himself' would be grammatical, and it is not (in standard English).

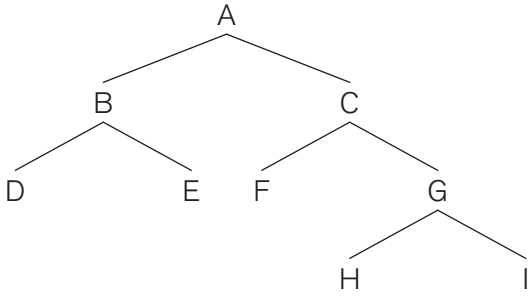
(111) [Jim$_1$'s brother]$_2$ hates himself$_{*1/2}$.

In this example we see that while *Jim* does indeed precede the reflexive, it cannot be co-indexed with it. The entire NP 'Jim's brother', on the other hand, can be coindexed with the reflexive. The actual rule being violated here is that an antecedent must **c-command** its reflexive. C-command can be thought of in the following way:

(112) **C-command**: The structural relation between two syntactic nodes such that:
1. Node 1 and node 2 do not dominate each other,
2. The lowest branching node that dominates node 1 also dominates node 2.

With this definition, we can see the following C-command relationships in the tree.

(113)




**C-command Relations**
D c-commands E
E c-commands D
B c-commands C, F, G, H and I
C c-commands B, D, and E
F c-commands G, H, and I
G c-commands F
H c-commands I
I c-commands H

**Figure 5.39** C-command relationships

Moving back to our example in (111), we see the reason that Jim cannot be an antecedent for himself is that Jim does not c-command the reflexive, as illustrated below.

(114)

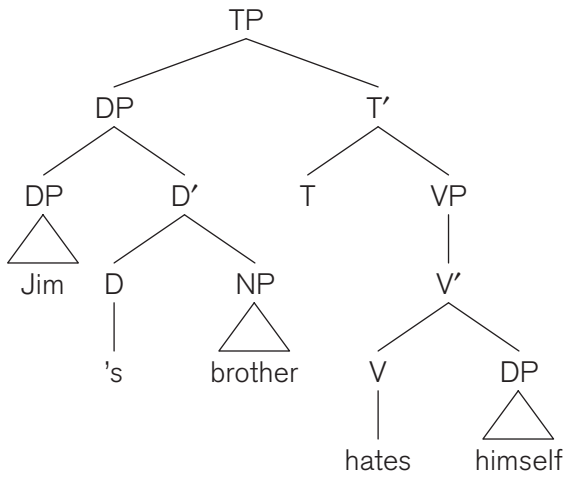



**Figure 5.40** Tree diagram of (111)

In (114), we can see that while the entire DP 'Jim's brother' c-commands 'himself', the NP *Jim*, does not. It is therefore thought that reflexives must have a c-commanding antecedent.

Moving back to our examples of reconstruction, listed again in (115) below, we are now in a position to see what is really going on.

(115) a. Tom Hanks$_1$ likes the movie about himself$_1$.
b. Which movie about himself$_1$ does Tom Hanks like $t_1$?
c. Tom Hanks'$_1$ movie seems to himself $t_1$ to be horrible.

In (115b), the **antecedent** does not c-command the reflexive. While this seems to be a problem, we can account for this data by simply assuming that the moved phrase returns to its original position, hence reconstruction, at that point in the derivation after the sentence has reached surface structure, or spell-out.[19] Through assuming that reconstruction takes place, then we can account for the binding facts.

[19] This level of syntax is often referred to as LF, or **logical form**, and in theoretical linguistics refers to those aspects of semantic interpretation that are determined by syntax.

What is relevant to us is that reconstruction only seems to take place with A-bar movement. This is the case with the wh-movement example. On the other hand, consider cases of A-movement, such as the raising example in (115c). Raising constructions are analyzed as the matrix subject beginning the derivation in the subject position of the embedded clause, noted by the co-indexed trace. Because the infinitival *to* in the embedded clause cannot assign, or check, case, the NP moves to the matrix Spec TP position to receive the nominative case. Note that in (115c) reconstruction is not possible. If it were, we would expect

a Condition A violation again as the NP 'Tom Hanks' would not c-command the reflexive.

So, with that rather lengthy explanation, what have we learned? We have learned that when it comes to reconstruction, it is generally only possible with instances of A-bar movement. How then do we apply this to scrambling? As stated above, Cho (1994) used reconstruction effects to show that Korean exhibits A-bar scrambling. Given our previous discussion of reconstruction, the prediction would be that if Korean exhibits A-bar scrambling, a scrambled phrase should be able to undergo reconstruction and show no Condition A violations. Consider the example in (116).

(116) 자기의 아들을 그가 때렸다.
[Caki$_2$-uy atul]$_1$-ul ku$_2$-ka $t_1$ ttaylyessta.
self-GEN son-ACC he-NOM hit
'He hit his son.' (Cho 1994)

In (116), the accusative marked phrase *caki-uy atul-ul* 'his son-ACC' is scrambled to the front of the sentence. This is indicated by the co-indexed trace between the subject and the verb. In addition, we see that *caki* can be bound by *ku* 'he'. Given that *caki* does not c-command *ku* at the surface structure, we must assume that the phrase undergoes reconstruction. A tree illustrating this process is given in (117) below.[20]

[20] Note we have collapsed MP and TP for the sake of convenience.

(117)

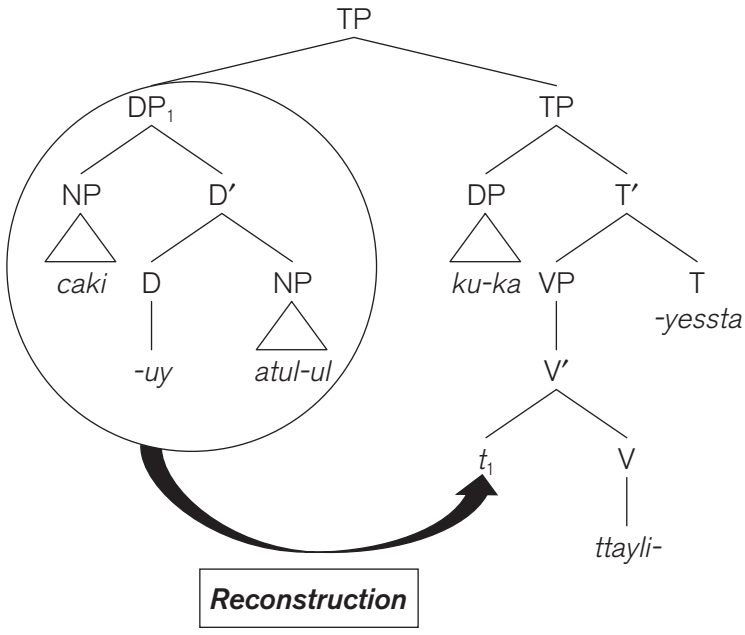



Figure 5.41 Reconstruction

Looking at the diagram, we can see that indeed the scrambled DP must reconstruct if we are to account for the binding facts. Since we have seen that **reconstruction** is a property of A-bar movement, we can therefore conclude that Korean does exhibit A-bar scrambling.

Having shown that Korean exhibits A-bar scrambling, we can examine whether or not A-scrambling also exists. Given that previously we described scrambling as movement that involves no appreciable change in meaning, we would think that A-scrambling should not exist, since A-positions involve some sort of thematic role assignment. Even so, there is reason, however, to believe that Korean scrambling does take the form of A-scrambling.

Looking back to the work of Cho (1994) and also E. Lee (2007), we can think about what kind of data we would like to see to prove whether or not A-scrambling exists in Korean. First of all, ask yourself, what would I expect to see? If we take the binding of anaphors as a case study again, perhaps we would expect to see a binding relation that can only be created by the scrambled NP in surface form and not by its underlying form. E. Lee (2007) provides the following examples.

(118) a. *서로의 선생님이 철수와
Selo$_1$-uy sensayngnim-i [Chelswu-wa
each.other-GEN teacher-NOM Chelswu-and
영희를 꾸짖었다.
yenghuy]$_1$-lul kkwucic-ess-ta.
Yenghuy-ACC scold-PST-DEC
'Each other's teachers scolded Chelswu and Younghuy.'

b. 철수와 영희를 서로의
[Chelswu-wa yenghuy]$_1$-lul Selo$_1$-uy sensayngnim-i *t*
Chelswu-and Yenghuy-ACC each.other-GEN teacher-NOM
선생님이꾸짖었다.
kkwucic-ess-ta.
scold-PST-DEC
'Each other's teachers scolded Chelswu and Younghuy.'
E. Lee (2007)

In the canonical sentence in (118a) that binding of *selo* 'each other' is not possible. This is because there is no c-commanding antecedent for *selo*. However, when the object *Chelswu-wa Yenghuy* 'C and Y' is scrambled to the beginning of the sentence, we can see that a binding relation is indeed possible. If this was A-bar movement and reconstruction took place, we would expect it to be ungrammatical as is the canonical sentence. We therefore draw the conclusion that because it is grammatical, that reconstruction must not take place and it is therefore A-scrambling. This is the sort of thing we see with movement to A-positions.

## 5.7.2 Phrasal Movement in Korean

### *5.7.2.1 Passives*

A passive construction is one where the theme is the subject of the sentence rather than the agent. (119a) is a canonical active English sentence, where the subject is the agent of the sentence and the object is the theme. The opposite is true in (119b), where the subject is now the theme, but the agent has been demoted, so to speak, to an oblique by-phrase.

(119) a. The dog bit Jim.
b. Jim was bitten by the dog.

The traditional assumption is that (119b) is derived from the following **kernel sentence**.

(120) __ was bitten Jim (by the dog)

With (120) being our basic sentence with which to start the derivation of a passive, we can still maintain our account of the fact that the complement of the verb receives a theme role in both (119a–b). From here, we assume that *Jim* moves to the subject position of the sentence. Why this happens is because the passive participle gets rid of the accusative case it usually assigns. Remember that in the section on case we suggested that all NPs need case to be legitimate objects. In (120), T still has nominative that it can assign and the subject position is open. Therefore, Jim moves to the subject position to receive the nominative case. Another reason relates to satisfying what has been called the **Extended Projection Principle** or EPP for short. This principle states that all sentences must have subjects, which is in fact true. If we assume that this is a requirement, then perhaps also the theme object moves to the subject of the sentence to satisfy this requirement. In addition, we need some sort of operation that will insert the optional agentive by-phrase. We will ignore this issue here and instead focus on the movement of the object to the subject position.

It is generally assumed that there are two different kinds of passives in Korean. These are the **lexical** or **morphological** and the **periphrastic passive** or **syntactic passive**. Periphrastic passives are the ones like we have seen in English, which consist of an auxiliary and a main verb participle. Lexical passives are created only by adding a specific morpheme to the main verb stem. These are as follows: *-i-*, *-hi-*, *-ki-*, *-li-*. In the literature, the passives are commonly called *-hi* passives. The set of verbs that can be passivized with these morphemes is rather small and certainly fixed. An example is given in (121).

(121) 그 책이 거의 모든 사람에게 읽혔다.
Ku chayk-i keuy motun salam-eykey ilk-hi-yess-ta.
DEM book-NOM almost all people-DAT read-PASS-PST-DEC
'That book has been read by almost all people.'

A periphrastic passive employs the use of auxiliary, namely *-ci-*, shown below.

(122) 책상이 존에 의하여 만들어졌다.
Chayksang-i John-ey uyhaye mantule-ci-yess-ta.
table-NOM John-by make-PASS-PST-DEC
'A desk was made by John.' (Park 2001)

This question now is, can we give the passives in (121) and (122) the same analysis as in the English example above? As we will see, they answer comes down to whether or not movement is happening or not in these constructions. We will look at two properties from the argumentation presented by Park (2001) and Park and Whitman (2005) as a guide in attempting to understand this issue.

The first piece of evidence we will consider has to do with idiom chunks, specifically **object idiom chunks**. An example of an object idiom chunk is given below.

(123) 주의를 기울이다
Cwuui-lul kiwuli-ta
attention/care-ACC devote-DEC
'pay particular attention to'

Object idioms, are particular noun objects licensed by the verb in a fixed way in that we often find these two in combination together in a very restricted way. In simple terms, these two elements are interpreted as one thematic chunk. If we find the verb and the object separated then, and the basic meaning intact, then it is logical to assume that the two originated together in underlying structure. This is indeed the case with *-ci* passives.

(124) 주의가 철수에 의하여 기울여졌다.
Cwuuy-ka Chelswu-ey uyhay(e) kiwulye-ci-ess-ta.
attention-NOM Chelswu-by devote-PASS-PST-DEC
'Attention was devoted by Chelswu.'
(Park and Whitman 2005)

With the morphological passives, however, idiom chunks are not passivizable, as shown below. This idiom chunk involves the object *nai*, meaning 'age' and *mek-*, meaning 'eat'. Together, this combination means that one is advanced in years.

(125) *나이가 메리에게 먹혔다.
*Nai ka Mary eykey mek-hi-ess-ta.
age-NOM Mary-DAT eat-PASS-PST-DEC
'Age was eaten by Mary.' (Park and Whitman 2005)

This indicates that the matrix subject, in morphological passives, was never actually the object of the verb and was instead base-generated in subject position, hence involving no movement. In summary, what these examples show us is that periphrastic passives seem to involve movement of the object to the matrix subject, while morphological passives do not (see Park 2001 for further arguments).

### 5.7.2.2 Control Constructions

One construction that has been crucial to modern syntax is the **control construction**. The reason is that this construction raises important questions about many central concerns in syntax. Examples of control sentences in English are given below.

(126) a. Jim promised *e* to cook dinner.
b. Mary persuaded Bill *e* to leave the party.

The *e* in the above examples stands for an 'empty' category or a null noun of sorts with no phonetic content. This may seem strange at first, assuming there is a covert syntactic object. But there are good theoretical grounds to assume it does in fact exist. We assume that there is some sort of null noun in the subject of the embedded clause in order not to lose our earlier observation that all verbs have a subject. Indeed there is some sort of subject there, as there must be an agent for 'cooking' in (126a) and 'leaving' in (126b).

Now let's consider the thematic roles in the above sentences. In (126b), Jim is not only the one is promising, but he is also the one who will be cooking dinner. It makes little sense to assume that Jim has two theta-roles, and we have no evidence that verbs can assign additional theta-roles at a distance. Therefore, we assume that there is an embedded silent subject that receives the embedded verb's theta-roles and there is the matrix subject that receives the matrix verb's theta-role. Furthermore, we assume that the two are somehow construed together, because we also need to establish that these two positions represent the same person. This is known as a **subject control** sentence, as it is the matrix subject which is in a sense controlling the embedded null one, as they share the same features. The example in (126b) is an **object control** sentence in that it is the object of the matrix verb, 'Bill', which controls the embedded null subject. Before jumping into a theory of control, we will first examine some analogous Korean sentences.

(127) a. 인호가 집에 가겠다고 약속했다.
Inho-ka cip-ey ka-keyss-ta-ko yaksokha-yess-ta.
I-NOM home-LOC go-FUT-DEC-COMP promise-PST-DEC
'Inho promised to go home.'

b. 인호가 미나에게 집에 가라고
Inho-ka Mina-eykey cip-ey ka-la-ko
Inho-NOM Mina-DAT home-LOC go-IMP-COMP
명령했다.
myenglyengha-yess-ta.
order-PST-DEC
'Inho orderd Mina to go home.'

The sentence in (127a) is a subject control sentence in that the matrix subject *Inho* is the one going home and the one who is promising. (127b) is an object control sentence because the matrix object is the one performing the action in the embedded clause.[21]

[21] There are many other types of control: partial control, adjunct control, split control, etc. For a more thorough review of control structures, including in Korean, please see Madigan (2008) and Landau (2001, 2013).

Up until this point in our theory, each noun can only have one thematic role. How then are we to represent this fact in our model of syntax? In some way we must relate the embedded silent noun to the matrix one. There are two possibilities in current syntax, movement or a system that involves Agreement. The movement approach, championed by Norbert Hornstein, suggests just that the matrix subject begins the derivation as the subject of the embedded clause in Spec TP and is subsequently moved to Spec TP of the matrix clause. A sample derivation of (127a) would look like the following:

(128)

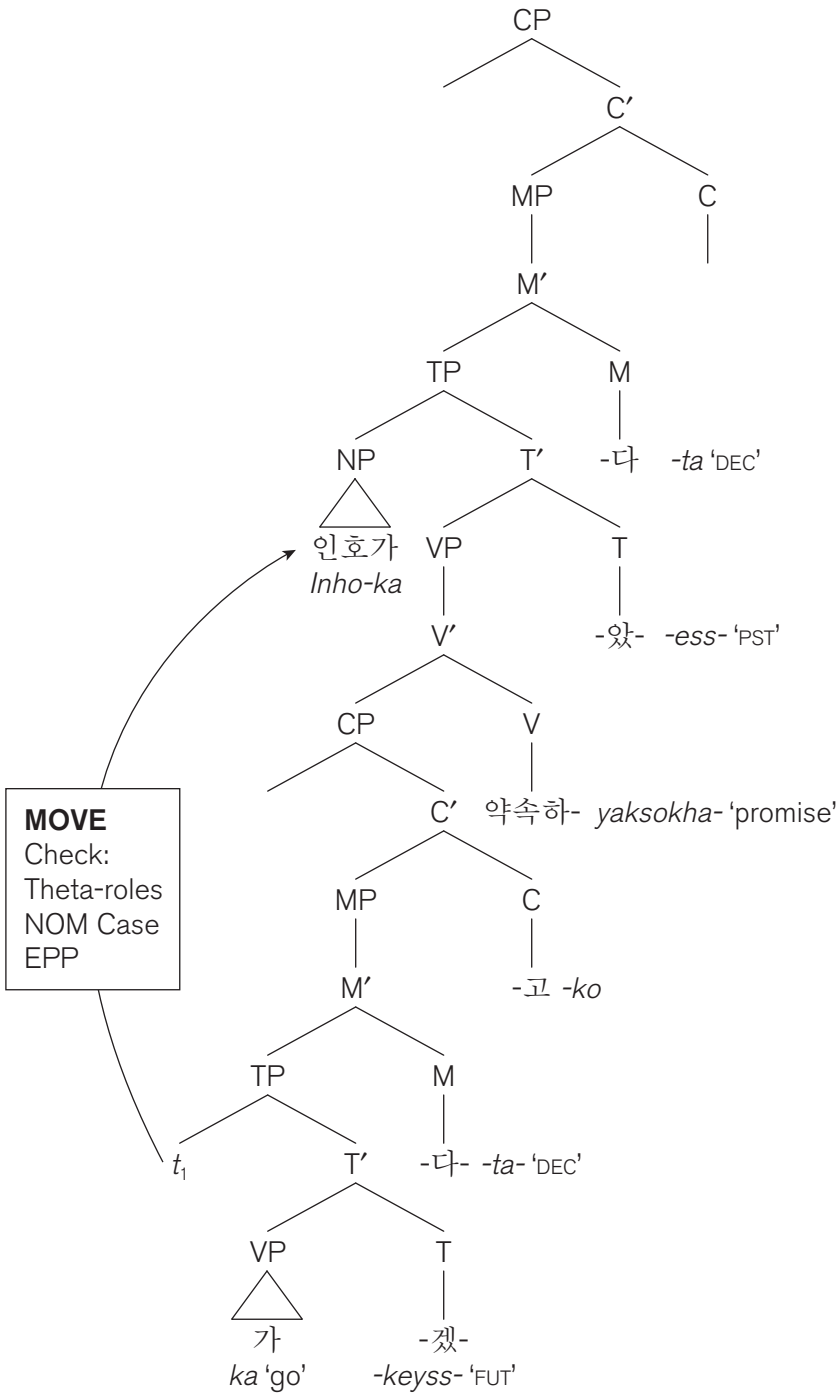



Figure 5.42 Sample derivation of (127a)

There are a few assumptions that need to be made with respect to the derivation above. First of all, we need to make the assumption that one noun can have multiple thematic roles. It is also an assumption of this approach that thematic roles are in fact features. Given this, in the embedded clause, the noun Inho would check for a theta-role feature and check another in the matrix subject position. The motivation for its movement would be to check nominative case in the matrix clause, as there would be none available in the embedded clause. In addition, it would check an EPP feature.

Another possibility is that there is in fact no movement, but rather an agreement operation between the matrix subject and the embedded **null subject** (see Landau 2001, 2013). In this way, all of the features would be checked in the usual way, while thematic roles are left to be assigned by the verbs in question. While each of the analyses seem plausible, only empirical evidence can differentiate which one is correct. Due to a lack of space, and a large amount of theoretical ground that would need to be covered, we certainly cannot cover this argument here. We will say this, however, in order to guide the student along the way in exploring this topic. If the proper analysis is a movement-related one, it should obey all restrictions that other types of A-movement obey. If the Agreement approach is the correct one, we should find similar parallels in other forms of agreement. It is only by these types of comparisons that a proper analysis can be arrived at. This can be seen as a classic case of Hypothesis A versus Hypothesis B style of argumentation covered in the first chapter.

## 5.8 RELATIVE CLAUSES IN ENGLISH AND KOREAN

In this section we will discuss relative clauses. A relative clause is a sentential complement to a noun that shares the same referent. In this section, we will be talking about **restrictive relative clauses** in particular. These types of relative clauses have the effect of restricting the reference of the noun they modify. For example, the following bolded CP in the NP in (129) is a relative clause in English.

(129) a. [The man [**who$_1$ $t_1$ wrote the book**]$_{CP}$]$_{NP}$
b. [The dog [**which$_1$ I fed $t_1$**]$_{CP}$]$_{NP}$

In (129), we can see that the relative clauses (RCs) modify the nouns they are a complement of. Note too, we assume that the wh-words in RCs move, just as in our analysis of regular wh-questions. This is illustrated by the trace in the subject position of the RC in the **subject relative** in (129a) and the trace in the object position of the RC in the **object relative** in (129b).

So, our analysis of RCs seems cut and dried. As is usually the case in linguistics, however, things are not always so simple once we look a bit deeper. Consider the followings RCs that do not contain wh-words.

(130) a. The man [that wrote the book]
b. The dog [(that) I fed]

We have an issue regarding the arguments, or lack thereof, of the verbs in the RCs. 'Wrote' in (130a) has no subject and 'fed' in (130b) has no object. It is standard to assume that there is an empty/null wh-word, often called a null **operator**, which occupies these places (see Chomsky 1982). This way our theory remains congruent with our assumptions about subcategorization frames. Our sentences in (130a–b) now look like those in (131a–b).

(131) a. The man [$Op_1$ [that wrote the book $t_1$]].
b. The dog [$Op_1$ [(that) I fed $t_1$]]

The assumption here is that null wh-operators also move to check a +wh feature. In this way we can have an analysis which is parallel to those examples that contain overt wh-operators. This is the basic analysis of the English RC.

Relative clauses in Korean are quite frequent in daily usage. This is in part due to the morphosyntactic similarities between adjectives and verbs. In this section, we present the basic structure of the Korean relative clause in all its variations and provide a syntactic analysis of them.

Relative clauses are clauses which modify the meaning of a noun. In Korean, there is a straightforward way of marking relative clauses, as shown below.

(132) a. 산을 덮는 눈
san-ul teph-nun nwun
mountain-ACC cover-RC snow
'the snow which covers the mountain'
b. 김치를 먹은 노인
kimchi-lul mek-un noin
kimchi-ACC eat-RC elderly.person
'the elderly person who ate kimchi'
c. 책을 쓸 학자
chayk-ul ssu-l hakca
book-ACC write-RC scientist
'the scientist who will write a book'

The relative clauses above are marked with a special relative clause marker. Second, tense is encoded in those markers. Example (132a) uses the present tense RC marker *-nun*. The past tense RC marker *-(u)n* is used in (132b) and the future tense RC marker *-(u)l* in (132c).

How then are we to analyze these structures? Do we assume that there is movement of a null wh-operator, as in English? The proof would lie in some sort of argumentation that shows empirically that movement of some null operator must exist. In order to do this, we must first consider why it is that we assume

that null operators move in English. Following Ross (1967), we can look to restrictions on wh-movement called **islands**.[22] It turns out the wh-words cannot just move out of any phrase at all.

[22] This has been further illustrated by countless textbooks; see Radford (1988) for a particularly detailed exposition.

(133) a. She mentioned the fact that Sean was strange.
b. *Who$_1$ did she mention the fact that $t_1$ was strange?

What we see here in (133b) is that a wh-word cannot be moved out of a CP complement of a noun. This sort of thing is often called an **island constraint**. Other island constraints include any movement out of subjects or adjunct clauses.

We now know that wh-movement is restricted by island constraints. Recall then that we are assuming that null operators in RCs are undergoing wh-movement. We are now in a position to test this hypothesis. The sort of data we need then is to construct a RC. Consider the following data provided by Radford (1988).

(134) a. someone who he engineered the downfall of.
b. *someone who the government collapsed after the downfall of.

The example in (134b) is ungrammatical because the wh-operator has been moved out of an adjunct, which is an island to movement. Radford gives the following examples of null wh-operator movement to show that movement must be involved.

(135) a. someone that he engineered the downfall of.
b. *someone that the government collapsed after the downfall of.

The ungrammatical example in (135b) is easy to account for if we assume that there is a null operator that has undergone wh-movement out of an island, as illustrated below.

(136) *someone Op$_1$ that the government collapsed after the downfall of $t_1$.

We are now in a position to apply this analysis to Korean RCs. The prediction is that if Operator movement is involved in Korean RCs, we should see movement violations in the proper environments. The following examples provided by Han and Kim (2004) show violations involving operator movement (i.e. relativization) out of a complex NP island, and an adjunct respectively.[23]

[23] See D.W. Yang (1983) for a more complete analysis.

(137) *존이 그 남자를 만났기 때문에 수가
*[[John-i ku namca-lul $e_i$ manna-ss-ki ttaymwuney] sue-ka
John-NOM that man-ACC meet-PST-NOM because Sue-NOM
화난 시간
hwakana-n] sikan
be.angry-RC time
'the time when$_i$ Sue was angry [because John met that man e]'

The fact that relativizing out of an adjunct in (137) and a complex NP is ungrammatical suggests that, just as in English relative clauses with covert wh-operators, Korean too has these operators and movement is involved.[24]

[24] It would seem as though we have arrived at an analysis of RCs in Korean. In reality, however, there is still much debate regarding whether or not there is movement of null wh-operators in Korean RCs. Some of this evidence comes from island constraints that are *not* violated. The most notable island violation that we see not violated in Korean is a kind of Complex NP Constraint, expressed in Korean as a double relative clause. As mentioned above, a complex NP is essentially a noun plus a clausal complement. So, it would make sense that one could not relativize out of a relative clause embedded in another relative clause. It turns out that Korean actually allows this possibility. According to our analysis so far, this should not be possible. Consider the following example:

i) 좋아하는 강아지가 죽은 아이
$[_{RC1}[_{RC2}e_i\ e_j$ cohaha-nun] kangaci-ka$_j$ cwuk-un] ai$_i$
like-RC dog-NOM die-RC kid
'the kid who the dog which [he] liked died.' (Han and Kim 2004)

This example is extremely difficult for a non-native speaker of Korean to grasp. The meaning, paraphrased and translated, is that there is a kid who liked a dog and that dog died. The subject in RC1, has been relativized out of RC2; this is not an issue. The issue is that the noun *ai* 'kid', has been relativized out of RC2, which is structurally contained with RC1. This should be an island violation as the null operators should not be able to move through a complex NP. See Han and Kim (2004) for a thorough discussion of the issues and an analysis that involves movement.

Having covered the structure of the relative clause, we are in a position to ask a more advanced question, one that will begin to take us beyond syntax and into the realm of semantics. This question pertains to the status of Korean adjective phrases as distinct from relative clauses, a question examined in detail by M. Kim (2002). Kim's major hypothesis is that there is no category of adjective in Korean. Instead, she claims that what appear to be adjectives are in fact stative relative clauses.

First consider that adjectives used to modify nouns look an awful lot like relative clauses.

(138) a. 저 예쁜 여자
ce yeppu-n yeca
that pretty-RC girl
'that pretty girl'
b. 어제 떠난 남자
ecey ttena-n namca
yesterday left-RC man
'the man who left yesterday' (M. Kim 2002)

We can see from these examples that the adjective clause and the true relative clause use the same morphology, namely *-(u)n*, which is added to the end of the adjective or verb. The implication here is that the syntactic structure is identical. In other words, they are both relative clauses. As Kim states, the mere fact that an adjective cannot modify a noun without being in a relative clause, suggests that they in fact are not adjectives at all.

Kim provides further evidence that for declassifying adjectives and suggesting they are part of some sort of verbal relative clause by noting that in certain instances they can take tense markers.

(139) 저 예뻤던 여자
Ce [$e_1$ yeppu-ess]-ten$_1$ yeca
that [pretty-PST]-RC woman
'That woman who used to be/was pretty'

The existence of tense in (139) shows that the 'adjective' must be inside a full TP, and not an NP, which would be normal for an adjective.

In addition she shows that when adjectives are used like a predicate they do not occur with a copula. This is a behavior associated with verbs, rather than nouns.

(140) a. *저 여자가 예쁘이다.
*Ce yeca-ka yeppu-i-ta
that woman-NOM pretty-COP-DEC
b. 저 여자가 예쁘다.
Ce yeca-ka yeppu-ta
that woman-NOM pretty-DEC
'That woman is pretty.'

(141) a. 저 여자가 학생이다.
Ce yeca-ka haksayng-i-ta
that woman-NOM student-COP-DEC
'That woman is a student.'
b. *저 여자가 학생다.
*Ce yeca-ka haksayng-ta
that woman-NOM student-DEC

Compare this to English adjectives, which when used predicatively, do need copular support.

(142) That baby (*is) cute.

Kim's final argument is that Korean 'adjectives' do not inflect for comparison, a trait commonly associated with true adjectives – i.e. greener. However, we do not find any special marking for comparative meaning and instead, just as with verbs, we must use the lexical item *te* 'more'.

(143) a. 메리가 수잔보 다 더 예쁘다.
Mali-ka Susan pota te yeppu-ta
Mary-NOM Susan than more pretty-DEC
'Mary is prettier than Susan.'
b. 메리가 수잔보 다 제니를 더 좋아한다.
Mali-ka Susan pota Jeni-ul te chohaha-n-ta
Mary-NOM Susan than Jenny-ACC more like-PRS-DEC
'Mary likes Susan more than (she likes) Jenny.'

What Kim has done in her analysis is to utilize syntactic and morphological data to show that with respect to these domains, we need to consider adjectives in Korean as some sort of verb. Kim goes on to argue that what appear to be adjectives are in fact stative verbs that denote some sort of state. We refer the reader to the original source for details regarding this semantic aspect of her analysis.

## 5.9 HONORIFICS

As briefly mentioned in Chapter 1, Korean has a rich system of honorification that manifests itself through the use of specialized pronouns, verbal marking and certain case markers. In this section, we explore the syntactic components of this system.

### 5.9.1 The Honorific System

In this section, our main object of study will be the honorific verbal marker *-si* which is used in stems ending in a vowel, or *-usi* used with stems ending in a consonant. This marker must be used specifically when the subject of the sentence is of honorific status relative to the speaker. In the example below, a student is talking about the fact that his teacher checked the student's homework.

(144) 선생님께서 꼼꼼히 숙제를
Sensayngnim-kkeyse kkomkkomhi swukcey-lul
teacher-NOM.HON carefully homework-ACC
검사하셨다.
kemsaha-si-ess-ta.
check-HON-PST-DEC
'The teacher checked our homework carefully.'

Since the subject in this example is of honorific status relative to the speaker and the speaker wishes to show deference, the honorific marker *-si* is used on the main verb. In addition, the nominative case marker takes the honorific form *-kkeyse* as opposed to the normal *-i/ka*.[25]

[25] In addition to honorific marking, there are many cases where a separate honorific form of the verb must be used – i.e. *mek-ta -> tusi-ta* 'to eat'.

From a syntactic point of view this is an interesting case. It appears as though what we are seeing is the first hint of any sort of **morphological agreement** in Korean. It seems as though the matrix subject is agreeing with the verb syntactically, as evidenced by the honorific morphological forms. In the following section, we will explore this possibility.

## 5.9.2 Honorific Marking as Subject Agreement

As mentioned repeatedly, in doing syntax we often make hypotheses about a certain phenomenon and test them against real world data. Given our brief discussion of honorific marking above, we can see that we already have formed a hypothesis, namely that honorific marking in Korean is a syntactic phenomenon. What type of data will we need to prove or disprove our hypothesis? First, let's consider what a syntactic account of honorific agreement might look like. (145) is the tree diagram for (144).

(145)

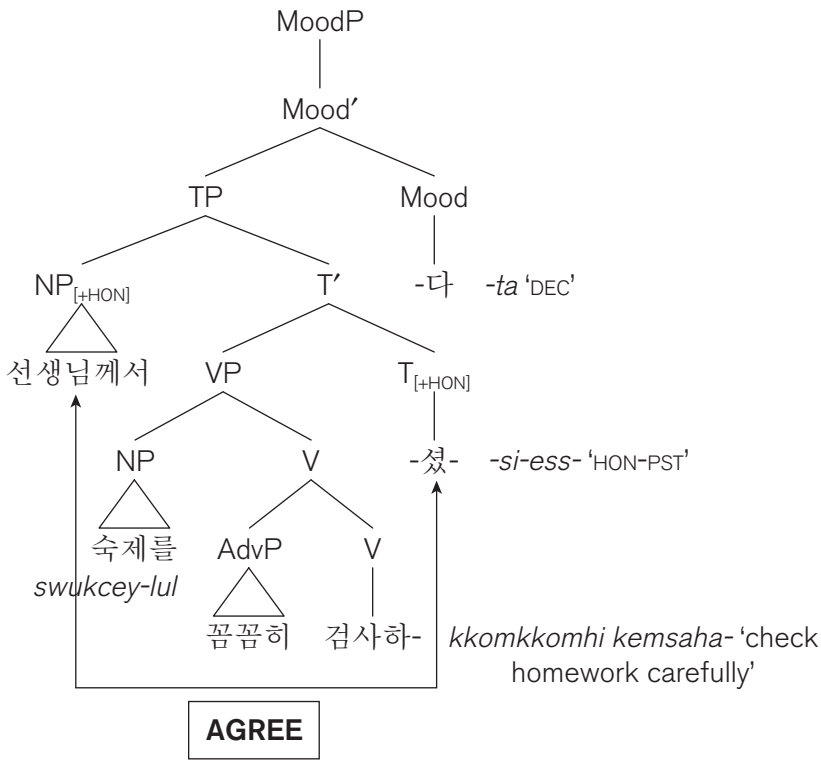



**Figure 5.43** Honorific agreement: tree diagram for (144)

In the tree above, we can see that the subject of the sentence has an honorific feature, [+HON], that the verb either inherits, values, or agrees with depending on your theory of agreement. For our purposes here, simply noting that there would need to be some feature involved in syntactic agreement is sufficient. In addition, the verb also has some sort of honorific feature. This is a reasonable assumption to make, as we have already postulated various features that correspond to overt morphemes, i.e. tense, case, etc. So, how do we prove that this is actually syntactic agreement?

The first issue is that what at first seems like morphological agreement between the subject and the verb is in fact not strictly required. In the following example, it is perfectly acceptable for a student to sometimes drop the honorific *-si* verb marker.

(146) 선생님 일찍 왔어요.
Sensayng-nim ilccik wasseyo.
Teacher-HON early came
'Teacher, you came early.'

Given examples such as (146), if honorification is syntactic agreement, then at the very least, the verbal honorific marker should appear. For the subject, perhaps we can assume that the nominal can bear [+/–hon] with no overt morphological counterpart, then this ceases to be an issue. In fact, it has been noted that the use of *kkeyse* in these constructions provides an extra level of honorification (Lee and Ramsey 2000 as cited by Kim and Sells 2007). This makes sense if we consider that not all nouns can carry this feature. For example, dogs would never be considered an entity that deserved honorific status and therefore could not enter into an honorific agreement relation with the verb.

Looking for further evidence, most theories of agreement take into account the notion of c-command (e.g. Chomsky 1998). If we look at the subject it does indeed c-command the goal verb. We can test this by placing teacher inside a genitive construction.

(147) *[선생님의 강아지]가 집에 가셨다.
Sensayngnim-uy kangaci-ka cip-ey ka-si-ess-ta.
teacher-GEN puppy-NOM home-LOC go-HON-DEC
'The teacher's dog went home.'

We can see from the example in (147) that when we place the honorific noun teacher inside the genitive phrase 'teacher's dog', we no longer can employ the use of the honorific marker on the verb. This is because 'teacher' no longer c-commands the verb.

In short, it seems as though we are building a solid case for at least some sort of syntactic agreement in Korean. There are scholars, however, who disagree with this approach. Kim and Sells (2007) provide a rather detailed analysis suggesting that subject honorification is in fact not agreement, but rather best handled in semantics and pragmatics.

## 5.10 EXERCISES

1. Identify all of the bound morphemes and their functions in the following sentences. You may need to consult a traditional grammar, and/or locate a Korean speaker to help you along.
   (a) 이번 일요일에 무엇을 할까요?
   ipen ilyoiley mwuesul halkkayo?
   'What should we do this weekend?'
   (b) 철수는 차동자를 얼마에 샀어요?
   Chelswunun chadongcalul elmaey sassayo?
   'How much did Chelswu buy the car for?'
   (c) 인호는 민수한테 집에 가라고 말했다.
   Inhonun minswuhanthey cipey kalako malhayessta.
   'Inho told Minswu to go home.'

(d) 이 사과가 너무 맛있지?
i sakwaka nemwu masissci?
'This apple is tasty isn't it?'
(e) 자기의 나라에서 영어를 할 수 있는 사람이 많습니까?
Cakiuy nalaeyse yengelul halswuissnun salami manhsumnikka?
'Are there a lot of people in your country who can speak English?'

2. Locate a Korean speaker to use as a consultant and determine whether the following sentences are grammatical or ungrammatical. Indicate ungrammaticality by placing an asterisk at the beginning of the sentence. If an example is ungrammatical, provide an explanation as to why.
(a) 친구가 한국 음식이 좋아한다.
Chinkwuka hankwuk umsiki coahanta.
(b) 우리의 엄마를 사랑해요.
Wuliuy emmalul salangheyyo.
(c) 학생들이 세명을 왔다.
Haksayngtuli seymyengul wassta.
(d) 인호는 민수가 좋아한다고누구를말했다.
Inhonun minswuka coahantako nwukwulul malhayssta.
(e) 민수가 철수한테 한국에 가본 적이 있냐고 물어봤다.
Minswuka chelswuhanthey hankwukey kaponceki issnyako mwulepwassta.
(f) 친구들이 음식을 세명 먹었다.
Chinkwutuli umsikul seymyeng mekessta.
(g) 선생님께서 언제 학교에 와?
Sensayngnimkkeyse encey hakyoey wa?

3. Use constituent tests to identify the following phrases in bold. You may need to locate a Korean speaker to help you along.
(a) 강아지가 먹이를 먹는다.
Kangaci-ka meki-lul meknunta.
Puppy-NOM dog.food eats
'The puppy eats dog food.'
(b) 예쁜 여자를 시장에 만났다.
Yeyppun yeca-lul sicang-ey mannassta.
pretty girl-ACC market-LOC met
'(I) meet a pretty girl at the market.'
(c) 요즘에는 나의 태도가 변했다.
Yocum-ey-nun na-uy thayto-ka pyenhayessta.
recently-LOC-TOP 1st-GEN attitude-NOM changed
'Recently, my attitude has changed.'
(d) 어느 나라에서 왔어요?
Enwu nala-eyse wasseyo?
Which country-from came
'Which country do (you) come from?'

(e) 내가 아빠한테 집에 가고 싶다고 했다.
Nay-ka appa-hanthey cip-ey ka-ko siphtako hayessta.
2nd-NOM father-to home-LOC go-COMP want did
'You told Dad you want to go home.'

4. In the following sentences, indicate whether each word (and its associated morphemes) is an open or closed class word and provide its word category (i.e. part of speech). In addition, provide at least one reason why you choose to place a word in a particular part of speech.
(a) 지난 주에 제주도에서 맛있는 매운탕을 먹었다.
Cinan cwuey Ceycwutoeyse masissnun maywunthangul mekessta.
last week ceycwuto.in tasty spicy.stew ate
'I ate spicy stew last week in Ceycwuto.'
(b) 한국 영화는 요즘에 인기가 많다.
Hankwuk yenghwanun yocumey inkika manhta.
Korean movie lately popularity a lot
'Korean movies are very popular these days.'
(c) 치타가 빨리 달릴 수 있다.
Chithaka ppalli talliltwuissta.
Cheetah fast run.can
'Cheetahs can run very fast.'
(d) 호랑이가 쥐를 잡고 먹었다.
Holangika cwilul capko mekessta
tiger mouse catch.and ate.
'The tiger caught and ate the mouse.'
(e) 뉴스에서 날씨가 나빠질 거라고 들었다.
Nwusueyse nalssika nappacilkelako tulessta.
news.from weather will.get.bad heard
'On the news I heard the weather will get bad.'

5. Draw tree structures for the following phrases. Indicate whether each word is a specifier, head or complement.
(a) 그 책
ku chayk
that book
(b) 음식을 요리하다
umsik-ul yoli-ha-yess-ta.
Food-ACC cook-do-PST-DEC
(c) 맛있는 케이크
masiss-nun kheyikhu
tasty-RC cake
(d) 집에 가라고 명령했다
cip-ey ka-la-ko myenglyeng-ha-yess-ta
home-to go-IMP-C order-do-PST-DEC

(e) 우리의 행복한 시간
wuli-uy hayngbok-ha-n sikan
our-GEN happy-do-RC time

6. Identify all phrases in the following examples and provide full tree diagrams for the sentence.
   (a) 이 빨간색 사과를 먹을 거예요.
   i ppalkansayk sakwa-lul mek-ul keyey-yo
   this red apple-ACC eat-FUT-DEC
   (b) 친구가 집에 갔어요.
   Chinkwu-ka cip-ey ka-ss-eyo
   friend-NOM home-LOC go-PST-DEC
   (c) 그 남자 정말 짜증 나.
   Ku namca cengmal ccaccung na
   that man really annoying
   (d) 빨리 와!
   ppalli wa
   fast come
   (e) 엄마한테 그렇게 말하지마.
   emma-hanthey kulehkey malhacima
   mom-to that.way talk.do.not
   (f) 인호는 미나가 친절하다고 생각한다.
   Inho-nun Mina-ka chincel-ha-ta-ko sayngkakha-n-ta
   Inho-TOP Mina-NOM kind-do-DEC-COMP think-PRS-DEC

7. Korean has another anaphoric word not mentioned in the text, *kucasin* 'himself'. Given the following data, create an argument using Binding Theory that identifies *kucasin* as a pronoun, a reflexive or a long-distance reflexive.
   (a) 철수가 그자신을 자랑한다.
   Chelswu$_1$-ka kucasin$_{1/*2}$-ul calanghanta.
   Chelswu-NOM kucasin-ACC proud
   'Chelswu is proud of SELF.'
   (b) 영수는 철수가 그자신을
   Yengswu$_i$-nun Chelswu$_j$-ka kucasin$_{*i/j/*k}$-ul
   Yengswu-TOP Chelswu-NOM himself-ACC
   너무 믿는다고 생각한다.
   nemwu mit-nun-ta-ko sayngkakhanta.
   too.much trust-PRS-DEC-COMP think
   'Yengswu thinks Chelswu trusts SELF too much.'

8. Korean syntax is often said to be very similar to Japanese. There are however, many differences if one looks closely. Identify the differences in data sets below and come up with an explanation for what is going on.

**Japanese**

(a) Mary-ga John-*o/ni hon-o yom-ase-ta
Mary-NOM John-ACC/DAT book read-CAUS-DEC
'Mary made John read the book.'

**Korean**

(b) 메리가 존을/에게 책을 읽게 했다.
Mary-ka John-ul/eykey chayk-ul ilk-key ha-yess-ta
Mary-NOM John-ACC/DAT book read-CAUS do-PST-DEC
'Mary made John read the book.'

CHAPTER 6

# Semantics



## 6.1 BASIC NOTIONS OF SEMANTICS

Semantics is a subfield of linguistics devoted to the study of the interpretation of linguistic expressions such as words, phrases and sentences. In this chapter, we employ a **formal semantics** framework to describe and analyze Korean. Although formal semantics is somewhat technical and difficult, it is the main framework in which sentence semantics has been developed in modern linguistics. In what follows, we will introduce its central notions and methods step by step in an effort to understand Korean semantics. Along the way, we will discover that many common assumptions and tools are ill-suited to describe Korean. This will inevitably lead to more advanced discussions which will allow us to test and improve existing theories with regard to more universal implications, as we did in syntax.

### 6.1.1 Truth-Conditional Semantics and the Principle of Compositionality

#### *6.1.1.1 Truth-Conditional Semantics*

To know the meaning of a sentence is at the very least to know its **truth-conditions**, the conditions under which the sentence is true or false. For example, we may or may not know whether (1) is true in the real world, but we do know what the world should be like in order for it to be true. In this instance, it must be the case that an individual named *Inho* is performing the action of running at the time of speech. The string of words put together in (1) describes a situation in the world, and knowing when it holds true is an important component of a native speaker's intuition concerning linguistic meaning.

(1) 인호가 달리고 있다.
Inho-ka tali-ko iss-ta.
Inho-NOM run-PRG-DEC
'Inho is running.'

By uttering sentences such as (1) above, we convey information to one another about ourselves and the world. Truth-conditional semantics focuses on this information-exchanging aspect of language, seeing semantics as a connection between language and the external world we talk about. Therefore, it is also called 'denotational' semantics, because meaning connects linguistic forms to what they denote or refer to in the world. It seems clear that the **denotation** of the name 'Inho' in (1) is the actual person Inho. The denotation of the whole sentence, however, is less obvious. It is some sort of situation, which is more abstract than an **individual**. Formal semantics takes the denotation of a sentence to be its **truth value**, which is either true or false. As we will see, this assumption enables us to define the truth conditions of an infinite number of sentences in a precise and systematic way.

Besides the formal semantic approach, there are **mentalistic theories of meaning**, which focus on the cognitive significance of meaning. These theories view meaning as a mapping between linguistic expressions and cognitive or mental representations in our brain, rather than the outside world. However, it raises the question of what the language of the mind means. Moreover, since each individual would have different mental representations of the same word or sentence depending on his/her experiences, the subjectivity of mental representation or cognitive significance makes meaning elusive. Another related approach to semantics is called **pragmatics** and it deals with use of language by speakers/a language community. Pragmatics is more concerned with speaker-meaning and context-dependent meaning, rather than straightforward denotational meaning. The meaning of sentences no doubt depends on the linguistic and extralinguistic context in which they occur. However, we assume that these variable, context-dependent, and social meanings derive from a sentence's core, denotational meaning that is invariable and solely determined by linguistic form. Note, however, that this is only a hypothesis we adopt to model a linguistic system; in reality, these different components of meaning (social, mental, and denotational/truth conditional) might interact more closely and concurrently than we assume. In this chapter, we will focus on truth-conditional semantics to analyze Korean.

### *6.1.1.2 The Principle of Compositionality*

We have witnessed in the syntax chapter that the linguistic system of a language can generate an infinite number of sentences via a finite number of syntactic rules. From a semantic point of view, this means that such a linguistic system enables us to express a countless number of thoughts. We humans understand and produce sentences we have never heard or said before every day. For instance, even if you don't know who Inho is and have never heard (1) before, you have no problem understanding it. As we have explained at the beginning of this book, this is a remarkable fact about language that modern generative linguistic theories try to explain.

One simple answer is that we are able to 'compute' the meaning of sentences from the meaning of their parts (words) and the way they are put together (syntactic rules). This requires knowledge of the meaning of words, which we discussed in the morphology chapter, and knowledge of semantic compositions corresponding with syntactic operations, the latter of which were the main topic of the syntax chapter. Assuming that a language has only a finite number of words and syntactic rules, combining them in various ways as well as applying the rules recursively (i.e., over and over again) will generate an infinite number of sentences. This explains the productivity of language, in spite of our limited memory. It would be implausible to assume that we learn language by memorizing all the sentences we hear. Moreover, if there is a tight one-to-one correspondence between syntactic rules and semantic interpretations, the latter will simply fall out from the former. This is called the Principle of Compositionality or Frege's Principle.[1] In the next section, we will see how this principle plays out with simple sentences in which subjects and predicates are combined.

[1] Gottlob Frege was a late nineteenth-century German philosopher who started symbolic logic and the formal semantics of natural language.

(2) **The Principle of Compositionality**: the meaning of a complex expression is determined by the meaning of its parts and the syntactic rules by which they are combined.

Doing semantics, in essence, is developing a theory of meaning composition, breaking sentences down into their parts and figuring out the contribution of each part to the truth-conditions of the whole.

## 6.1.2 Compositional Interpretation of Simple Korean Sentences

### *6.1.2.1 Sets and Functions*

In truth-conditional semantics, the mathematical concepts of sets and functions play a crucial role in semantic composition. Before we show how the meaning of simple Korean sentences is compositionally derived, let us offer a brief introduction of sets and functions. A **set** is a collection of any (random) objects, either finite or infinite. The objects in a set are called the **members** or **elements** of that set. Sets are defined by either listing their members or by abstraction, i.e., by stating a property that an object must possess to qualify as a member. For a concrete example, let A be the set of all dogs. To define this set by listing, you put the names of its members inside curly brackets separated by commas, as in (3a). In (3a), Fido, Lady, and Tramp are names of dogs in the world (or in our universe or **domain of discourse**). To define it by abstraction, you state a condition or a property that all the members of the set share after a colon

following the first occurrence of a variable, which stands for no particular objects but rather indicates what the property applies to, as in (3b). (3b) is read 'the set of all x such that x is a dog'.

(3) a. A = {Fido, Lady, Tramp, . . .}
b. A = {x: x is a dog}

Set membership is expressed by the symbol ∈: 'a ∈ A' means a is an element (or member) of the set A, and 'a ∉ A' means that a is not an element of A. In (3), Fido ∈ A, but Garfield ∉ A. It is not the case that every set has to have a member. There is a set with no members. The symbol for an **empty set** is ∅.

Given two sets A and B, we can perform some set theoretic operations on them. First, if one set is completely inside the other, we call it set **inclusion**. ⊆ is the symbol for this relation: 'A ⊆ B' means set A is a **subset** of set B and B is a **superset** of A, which holds when all of the members of the set A are also members of the set B. The diagram below illustrates this.

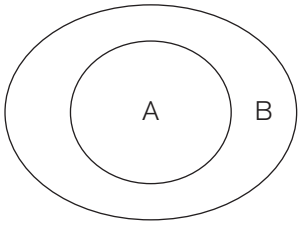



**Figure 6.1** Set inclusion

Second, two sets can intersect with each other, as in the diagram below. **Intersection** of set A and set B, 'A ∩ B', includes common members of A and B. In the diagram below, intersection of A and B only includes the members in the overlapping area. **Union** of set A and B, 'A ∪ B', includes all members of A and B. **Complement** 'A − B' includes all members of A which are not in B.

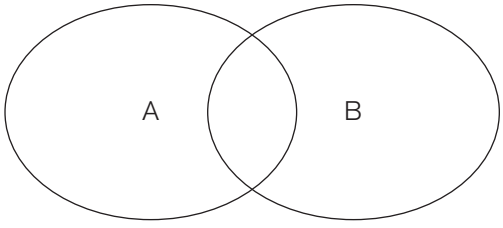



**Figure 6.2** Intersecting sets

Finally, two sets can be **disjoint** if they have no common member, as illustrated in the diagram below.

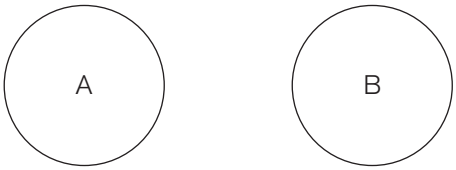



Figure 6.3 Disjoint sets

If we have two objects x and y, we can form an **ordered pair** <x, y>. Ordered pairs and sets are different. Since two sets with identical members are themselves identical, the order does not matter, i.e., {a, b} = {b, a}. This is not the case with ordered pairs, i.e., <a, b> ≠ <b, a>. A **function** is a set of ordered pairs in which the second member of each pair is uniquely determined by the first. Let us call the first member of an ordered pair an **argument** and the second member a **value**. We can think of a function as a machine that, when fed an argument as its **input**, gives a value as its **output** by operating on the argument. Every function has a **domain** and a **range**, which are sets of individuals. When A is the domain and B is the range of f, we say that f is from A and to B and write it as 'f: A → B'. Whenever f is a function and x is an element of its domain, there is a unique y in its range such that <x, y> ∈ f.

Just like sets, a function can be defined by listing its elements, as in (4), in the form of a table, as in (5), or in words, as in (6). F is a function because, although both a and c are mapped to the same element in the range (that is, b), the value of each member of the domain (a, c, and d) is uniquely determined. By contrast, a set of ordered pairs {<a, b>, <a, c>} is not a function, because a is mapped to both b and c, and we cannot determine the unique value of a. In such a case, it is called a **relation**, but not a function.

(4) f = {<a, b>, <c, b>, <d, e>}

Table 6.1 Function in a table form

(5) $f = \begin{pmatrix} a \rightarrow b \\ c \rightarrow b \\ d \rightarrow e \end{pmatrix}$

(6) f is a function with domain {a, c, d} such that f(a) = f(c) = b and f(d) = e.

In (5), the left column lists the domain and the right column lists the range and an arrow points from each argument to the value it is mapped to. In (6), the symbol 'f(a)' is read as f applied to a or the value of f for the argument a. In this instance, it is b, i.e., f(a) = b.

Just as we define sets by specifying the conditions on their members, we can define functions in a similar way, especially for those with infinite domains. (7) is an example. The function in (7) adds 1 to the set of natural numbers. It will map 1 to 2, 2 to 3, 3 to 4, and so on and so forth.

(7) f: N → N (N is the set of all natural numbers)
for every x ∈ N, f(x) = x + 1.

### 6.1.2.2 Interpretation of Intransitive Sentences

We have said that semantic analyses involve meaning composition by breaking sentences down into their parts (which we learned how to do in the syntax chapter) and figuring out the contribution of each part to the truth-conditions of the whole sentence. Now that we have familiarized ourselves with the basic tools of sets and functions, we are ready to dive into the actual semantic composition. In short, semantic composition is **functional application**.

Let us compute the meaning of a simple intransitive sentence such as (8). Intransitive sentences are those that lack objects.

(8) 미나가 달린다.
Mina-ka tali-n-ta.
Mina-NOM run-PRS-DEC
'Mina runs.'

The syntactic structure of (8) is given in (9). Our task is to figure out how the subject NP *Mina* combines with the VP *talinta* to derive the denotation of the whole sentence.

(9) $[_S\ [_{NP}$ Mina-ka $[_{VP}$ talinta]]]

As we have mentioned, the denotations (= meaning) of proper names such as *Inho* and *Mina* are the actual individuals Inho and Mina in the real world. Let us form a set of all individuals (people and objects) in the world, and call it D, standing for **domain of individuals**. Then, Inho and Mina are members of this set, as illustrated in (10).

(10) D = {Inho, Mina, . . . .}

As we have briefly mentioned, the denotation of a sentence is its truth value, which is represented by the set containing the two numbers 1 for true and 0 for false.

(11) {0, 1}

Now we have to determine the denotation of the VP. Given the individual denoted by the subject NP as an argument, the VP must produce the value of the whole sentence. Here is where the functional application kicks in. The denotation of the VP-node must be a function from individuals such as Mina to truth values. In the case of (8), it denotes a function that maps those who run to 1 and all

others to 0. Finally, the function is applied to a particular argument such as *Mina*, and we get 1 if she runs and 0 if she doesn't. An example of such a function is given in table form in (12).

**Table 6.2** Characteristic function

(12)

| | |
|---|---|
| Inho | → 0 |
| Mina | → 1 |
| Hun | → 1 |

The full composition process is laid out in (13). We use double brackets to represent the denotation of an expression: For any expression α, [[α]] is the denotation of α. [[Mina]], the denotation of *Mina* is the person Mina, as in (13a). [[talinta]], the denotation of the VP *talinta* 'runs', is the function from the domain of individuals to the set of truth values such that for any individual x in the domain, f(x) = 1 if and only if x runs and f(x) = 0 if and only if x does not run, as in (13b). (13c) shows the process of this function denoted by VP being applied to the argument [[Mina]] to produce the truth condition of the whole sentence. Note that the argument [[Mina]] appears in the double brackets on the right side of the function [[talinta]], following the general format of f(x). The sentence denotes a truth value: it is 1 iff Mina runs and 0 iff Mina does not run.

(13) a. [[Mina]] = Mina
b. [[tali-n-ta]] = f: D → {0, 1} such that for all x ∈ D, f(x) = 1 iff x runs.
c. [[Mina-ka tali-n-ta]] = [[tali-n-ta]]([[Mina]])
= [f: D → {0, 1} such that for all x ∈ D, f(x) = 1 iff x runs](Mina)
= 1 iff Mina runs.

Let us summarize the semantic composition process we employed to compute the meaning of the sentence from its constituent parts. First, we determined the denotation of each expression, i.e., proper names denote individuals, sentences denote truth values, and intransitive verbs denote functions from individuals to truth values. In order to do this, we needed the set of all individuals D and the set of truth values {0, 1}. Second, we derived the truth condition of the whole sentence using a function application, i.e., we applied the function (VP) to the argument (NP) to reach the truth value of the whole expression (S). The following rule in (14) reveals the semantic composition of a simple sentence. In (14), the denotation of the whole sentence S is derived by applying the subject NP argument to the function denoted by the VP. Note that this algorithm is general enough to derive an infinite number of simple sentences in Korean (and incidentally in English as well).

(14) [[S]] = [[VP]]([[NP]])

We have defined the denotation of an intransitive verb such as *talinta* 'run' in a functional term, i.e., [[talinta]] is a function from D to {0, 1} such that all for x in D, f(x) = 1 if x runs. This function should be able to, in principle, generate the set of all runners in the world. Because of this close tie, functions and sets are interchangeable. In fact, there is a one-to-one mapping between a set and its **characteristic function**, which tells you 1 or 0 for every member of the domain D. The definition of a characteristic function is given in (15).

(15) The characteristic function of a set A is the function f such that, for any $x \in A$, f(x) = 1, and for any $x \notin A$, f(x) = 0.

(12) above is a characteristic function. This function will generate a set of all runners, like (16).

(16) [[talinta]] = {Mina, Hun, . . . .}

Given this, we can define the truth condition of sentences like (8) in set theoretic terms equally well. For example, [[talinta]] denotes a set of all runners and [[Mina-ka talinta]] 'Mina runs' is true iff Mina is a member of this set.

(17) [[Mina-ka talinta]] = 1 iff Mina $\in$ [[talinta]]

### 6.1.2.3 Interpretation of Transitive Sentences

Let us now extend our semantics to sentences with transitive verbs such as (18).

(18) 인호가 미나를 좋아한다.
Inho-ka Mina-lul cohaha-n-ta.
Inho-NOM Mina-ACC like-PRS-DEC
'Inho likes Mina.'

(19) contains the syntactic phrase structure for (18). The transitive verb combines with its direct object to form a VP, and the VP combines with the subject to form a sentence.

(19) $[_S\ [_{NP}$ Inho-ka $[_{VP}\ [_{NP}$ Mina-lul$][_V$ cohahanta$]]]$

We have seen that the denotations of NP-nodes dominating proper names are individuals. Therefore, [[Inho]] = Inho and [[Mina]] = Mina. The denotation of VP-nodes are functions from individuals to truth values. Then, the denotation of a transitive verb is a function embedded in a function <e, <e, t>> (a function from individuals to functions from individuals to truth values). To define such

a function, we embed one definition of a function inside another. (20) is the denotation of *cohahanta* 'like'.

(20) [[cohahanta]] = f: D → {g: g is a function from D to {0, 1}} such that for all x, y ∈ D, f(x)(y) = 1 iff y likes x.

The function denoted by the transitive verb, [[cohahanta]], takes individuals who are liked (direct object) as arguments. When we apply this function to an object argument such as Mina, we get (21). It is a function that maps those who like Mina to 1 and all others to 0. The direct object, the argument that is closest to a transitive verb, is dealt with before the subject. This is reflected in the formula f(x)(y), in which the direct object argument x comes as the first argument f.

(21) [[Minal-ul cohahanta]] = [[cohahanta]]([[Mina-lul]])
= [f: D → {g: g is a function from D to {0, 1}}
For all x, y ∈ D, f(x)(y) = 1 iff y likes x](Mina)
= f: D → {0, 1} such that for all y ∈ D, f(y) = 1 iff y likes Mina

Finally, we apply this function to the subject argument Inho. The whole sentence is true if Inho is a member of the set of all individuals who like Mina.

(22) [[Inho-ka Mina-lul cohahanta]] = [[cohahanta]]([[Mina-lul]])([[Inho-ka]])
= [f: D → {0, 1} such that for all y ∈ D, f(y) = 1 iff y likes Mina](Inho) = 1 iff Inho likes Mina

We need a new rule for the semantic treatment of transitive verbs, which is given in (23). A transitive VPt is a function that takes its direct object as an argument.

(23) [[VPt]] = [[V]]([[NP]])

We have observed that sets and their characteristic functions are interchangeable. (24) presents the truth condition of (18) in the set theoretic notation. Here, the transitive verb *cohahanta* is a set of ordered pairs of individuals in which the first member of the pair likes the second member. If the ordered pair <Inho, Mina> is a member of this set, the sentence is true.

(24) [[Inho-ka Mina-lul cohahanta]] = 1 iff <Inho, Mina> ∈ [[cohahanta]]

Perhaps now it would do well to reconsider what we have up to this point. The possible denotations so far include individuals (for proper names), truth values (for sentences), functions from individuals to truth values or a set of individuals (for intransitive verbs), and functions from individuals to functions from individuals to truth values or a set of ordered pairs of individuals (for transitive verbs).

Throughout the rest of the chapter, we will expand our inventory of possible denotations to cover a variety of more complex constructions in Korean. Before we do so, let us introduce a convenient way of dealing with complex denotations in the next section.

## 6.1.3 Theory of Types and the Lambda Operator

### *6.1.3.1 Semantic Types*

In the previous section we have seen that transitive verbs have more complex denotations than intransitive ones, that is, they are functions applied to functions. We can imagine even more complex denotations such as a function applied to a function applied to a function! Our strategy so far has been to simply add more complex cases into our existing inventory. For example, when we encountered a sentence with a transitive verb, we added a new denotation, a function from individuals to a function from individuals to truth values, into our stock of denotations. However, it would be convenient if there was a way to systematize such a growing inventory of possible denotations. A **theory of types** does just that.

We need only two basic types of denotation, individuals and truth values. All the others are derived through functional application. Let us use the labels 'e' and 't' for the two basic types. The domain of the type e, $D_e$, is the same as the domain of individuals, D. The domain of type t, $D_t$, is the set of truth values.

(25) a. e is the type of individuals.
$D_e = D$
b. t is the type of truth values.
$D_t = \{0, 1\}$

By using just the two basic types of denotations, namely individual (type e) and truth value (type t), we can define any number of functional types. For instance, intransitive verbs denote functions from individuals e to truth values t. Therefore, they are of **semantic type** <e, t>. In <e, t>, we put the domain of the function on the left and the range on the right separated by a comma in brackets (remember an ordered pair <x, y> is a function if there is a unique y for each x in the domain?). Here is the definition of this functional type.

(26) $D_{<e,t>} = \{f: f \text{ is a function from } D_e \text{ to } D_t\}$

The denotation of transitive verbs is of type <e, <e, t>>, a function from individuals to a function from individuals to truth values. As we can see, it is a function embedded in a function.

(27) $D_{<e, <e, t>>} = \{f: f \text{ is a function from } D_e \text{ to } D_{<e,t>}\}$

In fact, we can define an infinite set of semantic types using combinations of only two basic types, namely, e and t. Think about a ditransitive verb such as *sokayhata* 'to introduce' for example. What function type would it be? It is a function from $D_e$ to $D_{<e,<e,t>>}$ because this verb takes three arguments.

### 6.1.3.2 Lambda (λ) Notation

**Lambda (λ) notation** is a much less cumbersome way of logically representing functions (Heim and Kratzer 1998). Since we use functions a lot in semantics and lambda notation is commonly used in semantics literature, becoming familiar with this notation will pay off. This operator forms a property when applied to a sentence by abstracting over individuals or predicates. Compare (28a) with (28b). An intransitive verb *talinta* 'run' denotes a function from individuals to truth values which maps those who run to true (1) and all others to false (0). (28b) describes the same function denoting the property of running. We assume that x is from the domain D.

(28) a. [[tali-n-ta]] = f: D → {0, 1} such that for all x ∈ D, f(x) = 1 iff x runs.
b. λx[talinta(x)]

We can add an argument to yield the truth condition. The argument replaces the variable x occurring after the verb, and at the same time deletes the lambda term (this is called **lambda conversion**).

(29) λx[talinta(x)](Mina) = **λx**[talinta(x)](Mina) = talinta(Mina) = 1 iff Mina runs.

Now let us look at the lambda notation of the function expressed by transitive verbs. Compare the full-fledged functional specification of *cohahanta* 'like' in (30a) with its corresponding λ notation.

(30) a. f: D → g: g is a function from D to {0, 1} such that
For all x, y ∈ D, f(x)(y) = 1 iff y likes x.
b. λxλy[cohahanta<y, x>]

Let us see how arguments are added to produce a complete sentence to which a truth value can be given. In (31a), x is replaced with *Mina*, yielding a function that maps those who like Mina to 1. In (31b), y is replaced with *Inho*, which would make the whole sentence true if Inho likes Mina. Note that the function applications proceed from the object argument (because the transitive verb combines with the object first) indicated by the outer lambda operator λx to the subject argument indicated by the second lambda operator λy.

(31) a. λxλy[cohahanta<y, x>](Mina) = λy[cohahanta <y, Mina>]
b. λy[cohahanta<y, Mina>](Inho) = [cohahanta <Inho, Mina>] = 1 iff Inho likes Mina.

As we can easily see, lambda (λ) notation takes much less space and is easier to read than set theoretic or functional notation while providing basically the same information. We will frequently use this notation from now on while also making reference to sets and functions when necessary.

## 6.1.4 Logical Connectives

The simple sentences whose meaning compositions we have discussed in some detail so far can be negated, or connected with logical connectives such as the conjunction 'and', the disjunction 'or', and the implication/conditional 'if'. The meaning of these logical words is logically determined regardless of the content of the sentence(s) on which they operate. In this section, we will briefly discuss the truth functional meaning of these logical connectives.

### *6.1.4.1 Negation*

Negation is a one place truth-functional operator: it combines with a sentence to yield another sentence with the opposite truth value. We can represent this in the following truth table. ¬ is the symbol for negation. The table shows that, if S is true (1), then the negation of S, ¬S, is false, and vice versa.

**Table 6.3** Negation truth table

| *S* | ¬*S* |
|---|---|
| 1 | 0 |
| 0 | 1 |

Let us look at an example of a negated sentence in Korean, given in (32).

(32) a. 인호가 안 잔다.
Inho-ka an ca-n-ta.
Inho-NOM NEG sleep-PRS-DEC
'Inho is not asleep.'
b. $[_S\ [_{NP}$ Inho-ka $[_{VP}\ [_{NEG}$ an $[_V$ canta]]]]

Even though the negative particle *an* occurs inside the VP in Korean, as we observe in (32b) above, we treat it as a logical operator that has a semantic scope over the entire sentence, as in (33a).

(33) a. [[¬[sleep(Inho)] ]] = 1 iff [[sleep(Inho)]] = 0
b. [[sleep(Inho)]] = 0 iff Inho ∉ [[sleep]]

One will easily be able to provide the truth condition of this sentence. (33) is true iff Inho does not sleep, i.e., Inho is not a member of the set of sleepers in our model.

In addition to the negative form in (32) above, which is called **short form negation**, Korean has another type of negation: one where the marker of negation *anh-* follows the verb, called **long form negation**, as exemplified in (34).[2] The negative auxiliary verb *anh-* can be inflected for tense and selects a verbal complement with the complementizer *-ci*.

[2] This is consistent with the observation made in Dahl (1979) and Dryer (1988) that SOV languages have two typical negation patterns. It is usually the case that inflected negative markers appear in the long form negation; preverbal negators are uninflected particles, which holds true for Korean.

(34) 인호가 자지 않는다.
Inho-ka ca-ci anh-nun-ta.
Inho-NOM sleep-COMP NEG-PRS-DEC
'Inho does not sleep.'

The truth condition for (33) and (34) is the same: both short form and long form reverse the truth value of the sentence in its scope. Then why does Korean have two separate forms of negation? It is controversial what exactly the difference between the two forms of negation is, or whether the difference is semantic or simply pragmatic. One obvious observation is that the long form can be employed to do something additional that the short form cannot, because it is an auxiliary verb, not a particle, that can be inflected and stressed, and is separated from the main verb by the complementizer (Carston and Noh 1996). For example, the long form may optionally assign overt case or topic marking to this complement for emphasis, as shown in (35). This option is not available for the short form negation.

(35) 인호가 자지(를/는) 않는다.
Inho-ka ca-ci(-lul/nun) anh-nun-ta.
Inho-NOM sleep-COMP(-ACC/TOP) NEG-PRS-DEC
'Inho does not sleep.'

Because of this extra function, it has been argued that the long form is used for so-called **meta-linguistic negation** (Horn 1972, 1985). Meta-linguistic negation is a negation of linguistic expressions themselves, rather than negation of the state of affairs, as illustrated in (36).

(36) a. I don't LIKE this. I LOVE it!
b. We did not see hippopotamuses. We saw hippopotami.

### *6.1.4.2 Conjunction*

The conjunction *-ko* 'and' and the disjunction *-kena* 'or' connect two independent sentences, as shown in (37).

(37) a. 인호는 밥을 먹(었)고 미나는 빵을 먹었다.
Inho-nun pap-ul mek-(ess)-ko Mina-nun ppang-ul mek-ess-ta.
Inho-TOP rice-ACC eat-(PST)-and Mina-TOP bread-ACC eat-PST-DEC
'Inho ate cooked rice and Mina ate bread.'

b. 인호는 학교에 갔거나 집에 있다.
Inho-nun hakkyo-ey ka-ass-kena cip-ey iss-ta.
Inho-TOP school-LOC go-PST-or home-LOC be-DEC
'Inho went to school or he is home.'

The following truth table shows the computation of conjoined sentences. ∧ is the symbol for conjunction (& is also used), and ∨ is for disjunction. $S_1$ and $S_2$ is true iff both $S_1$ is true and $S_2$ is true. $S_1$ or $S_2$ is true if $S_1$ is true or $S_2$ is true.

**Table 6.4** Conjoined sentences truth table

| $S_1$ | $S_2$ | $S_1 \wedge S_2$ | $S_1 \vee S_2$ |
|---|---|---|---|
| 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 |
| 0 | 1 | 0 | 1 |
| 0 | 0 | 0 | 0 |

In natural languages, conjunction often implies sequentiality or causality. For example, (38a) means something very different than (38b). Here the order matters, and a simple addition of truth values does not seem to faithfully convey what these conjoined sentences express. However, our strategy in semantics is to adopt the most general meaning. Specific meaning in certain contexts, such as the sequential/causal interpretation in (38), is assumed to be derived in terms of extralinguistic means such as our world knowledge.

(38) a. John died and was buried.
b. John was buried and died.

The Korean conjunction *-ko* is claimed to be ambiguous between adjunction and coordination (Yoon 1995, Kwon 2004). When it is used as an adjunct (like an adverbial phrase), it lacks tense markers and encodes sequentiality or causality, as in (39a), or describes state concurrent with action, as in (39b).

(39) a. 백설 공주가 사과를 먹고/*먹었고 죽었다.
Paysel kongcwu-ka sakwa-lul mek-(*ess)-ko cwuk-ess-ta.
white snow princess-NOM apple-ACC eat-(*PST) and die-PST-DEC
'Snow White ate an apple and died.'

b. 인호가 모자를 쓰고/*썼고 학교에 갔다.
Inho-ka moca-lul ssu-(*ess)-ko hakkyo-ey ka-ass-ta.
Inho-NOM hat-ACC wear-(*PST)-and school-LOC go-PST-DEC
'Inho went to school, wearing a hat.'

In natural languages, disjunction can be used either exclusively or inclusively. **Exclusive disjunction** is true when one of the disjuncts is true, but is false when both disjuncts are true. Logical disjunction is inclusive (i.e., p or q is true if p is true and q is true) because **inclusive disjunction** is more general than the exclusive one. The narrower exclusive interpretation of disjunction, again, can be obtained through pragmatic means. For example, (37b) above is exclusive because Inho cannot be at school and at home at the same time. In this case, however, what excludes the inclusive interpretation is our world knowledge rather than the logic of the disjunction. As illustrated by the following example, disjunction can have an inclusive interpretation when the disjuncts are not incompatible with each other based on our world knowledge, i.e., it could be the case that Mina both worked hard and is smart (and that's why she did well at school).

(40) 미나가 공부를 열심히 했거나 머리가 좋다.
Mina-ka kongpwu-lul yelsimhi hay-ss-kena meli-ka coh-ta.
Mina-NOM studying-ACC diligently do-PST-or brain-NOM good-DEC
'Mina worked hard or she is smart.'

### 6.1.4.3 Implication

The last logical connective to be discussed is **implication**. The symbol for implication is →, and the truth condition is given in the following table. In implication $S_1 \rightarrow S_2$, $S_1$ is called the **antecedent** and $S_2$, the **consequent**. $S_1 \rightarrow S_2$ is false only when the antecedent is true and the consequent is false; in all other cases, it is true. This makes sense because, if the antecedent is false, there is no way of falsifying the whole implication.

**Table 6.5** Implication truth table

| $S_1$ | $S_2$ | $S_1 \rightarrow S_2$ |
|---|---|---|
| 1 | 1 | 1 |
| 1 | 0 | 0 |
| 0 | 1 | 1 |
| 0 | 0 | 1 |

In natural languages, since we cannot be 100 percent sure whether the conclusion drawn is a logical consequence, the implication or conditional often indicates the relation between the speaker's epistemic states, meaning that the knowledge of the truth of the antecedent is a sufficient condition for concluding the truth of the consequent. Conditionals in natural language are often used for imagining a hypothetical situation that is not true in the actual world and drawing a conclusion from it. This is called a **counterfactual** marker, which implies that the antecedent is false. The conditional conjunction *-myen* 'if' in Korean can be used as a factual antecedent. This contrasts with the English conditional 'if', which cannot

be used in such a situation, as the English translation shows. In this case, *-myen* has temporal meaning, not conditional. The counterfactual *-tamyen* 'if' cannot be used as a factual antecedent, as shown in (41b) (Han 2006, Noh, 2009).

(41) a. 봄이 오면 꽃이 핀다.
Pom-i o-nyen kkoch-i phi-n-ta.
spring-NOM come-if flower-NOM bloom-PRS-DEC
'When/*If spring comes, flowers bloom.'
b. *봄이 온다면 꽃이 핀다.
Pom-i on-tanyen kkoch-i phi-n-ta.
spring-NOM come-if flower-NOM bloom-PRS-DEC
'*If spring comes, flowers bloom.'

The semantics of counterfactuals is somewhat complicated for an introductory book like this so interested readers are referred to the relevant literature (Karttunen and Peters 1979, Kratzer 1991, Han 1998, Iatridou 1996).

## 6.1.5 Model Theory

We have so far equated knowing the meaning of a sentence with knowing its truth condition, but not with the actual verification of its truth. This is because knowing the actual truth value requires more world knowledge than we have. We do not know for every individual in the world whether she or he runs, for example. Is it then impossible to find out a truth value of a sentence? How do we capture the fact that, when a speaker encounters an actual situation in the world, she can easily map that situation with a sentence that truthfully describes it? Since we do not know everything in the world, semanticists often interpret linguistic expressions as true or false relative to a **model**, a simulated or made-up specification of what the world is like. We represent this relativity of denotation using a superscript, i.e., the denotation of α relative to a model M is $[[\alpha]]^M$. A model M consists of the **domain of universe** D, which is the set of individuals, and an **interpretation function** F, which assigns a denotation to each linguistic expression. Let us look at an example of a simple model, given in (42). The domain D includes a set of individuals, and the interpretation function F takes descriptive vocabulary and proper names as its input and gives a set of things as output. Among the descriptive vocabulary, **one-place predicates** such as 'walk' denote a set of individuals, in this case, a set of walkers, and **two-place predicates** such as 'talk to' denote a set of ordered pairs, in which the first member of the pair talks to the second member.

(42) Model = <D, F>
D: {Socrates, Aristotle, Plato}
F(walk) = {Socrates, Aristotle}
F(talk to) = {<Socrates, Aristotle>, <Plato, Socrates>}

Let us verify the truth of the following sentences relative to this model.

(43) a. $[[\text{Socrates walks}]]^M = 1$ iff Socrates $\in$ $[[\text{walk}]]^M$
because Socrates is a member of $[[\text{walk}]]^M$, it is TRUE.
b. $[[\text{Aristotle talks to Plato}]]^M = 1$ iff $\langle$Aristotle, Plato$\rangle \in [[\text{talk to}]]^M$
because this ordered pair is not a member of $[[\text{talk to}]]^M$, it is FALSE.
c. [[Aristotle walks and it is not the case that Socrates talks to Aristotle]]$^M = 1$ iff $[[\text{Aristotle walks}]]^M = 1$ and $[[\text{it is not the case that Socrates talks to Aristotle}]]^M = 1$.
$[[\text{Aristotle walks}]]^M = 1$ iff Aristotle $\in$ $[[\text{walk}]]^M$, which is the case.
$[[\text{it is not the case that Socrates talks to Aristotle}]]^M = 1$ iff $[[\text{Socrates talks to Aristotle}]]^M = 0$.
$[[\text{Socrates talks to Aristotle}]]^M = 0$ iff $\langle$Socrates, Aristotle$\rangle \notin [[\text{talk to}]]^M$, which is the case, so the whole sentence is TRUE.

An interesting aspect of model theory is that there are some logically true properties of expressions about and relations between them no matter how the model is set up; logicians and formal semanticists have spent a great deal of time and effort discovering such properties and relations. For example, if p and q are sentences, p and q = 1 iff p = 1 and q = 1 regardless of what the actual content of p and q are. P could be 'John is smart' or 'it is raining', or any other arbitrary sentences.

## 6.1.6 Semantic Relationships between Sentences

Other than knowing the truth conditions of sentences, thus being able to match the meaning of the sentences with the state of affairs they truthfully describe, native speakers of a language also possess intuitions about certain relationships between the meanings of sentences. When we utter a sentence, the basic and literal meaning of it is not all that is conveyed. Based on the sentence, we make a variety of inferences as well as draw certain conclusions. In this section, we will discuss three important implication relations that are crucial to semantic analyses.

### *6.1.6.1 Entailment*

A sentence $S_1$ entails a sentence $S_2$ iff whenever $S_1$ is true, $S_2$ is true as well. If $S_1$ entails $S_2$, $S_1$ and not $S_2$ is contradictory. For example, (44a) entails (44b).

(44) a. 인호가 빨리 달린다.
Inho-ka ppali tali-n-ta.
Inho-NOM quickly run-PRS-DEC
'Inho runs quickly.'

b. 인호가 달린다.
Inho-ka tali-n-ta.
Inho-NOM run-PRS-DEC
'Inho runs.'

An **entailment** relation can hold between one sentence or any number of sentences and another sentence. (45a) and (45b) together entail (45c). The entailed sentence, (45c), is a **valid conclusion** we can draw when the entailing sentences, (45a) and (45b), are true. An entailment relation is a semantic relation that holds by virtue of the truth of sentences.

(45) a. 미나는 학생이다.
Mina-nun haksayng-i-ta.
Mina-TOP student-COP-DEC
'Mina is a student.'
b. 미나는 키가 크다.
Mina-nun khi-ka khu-ta.
Mina-TOP height-NOM big-DEC
'Mina is tall.'
c. 미나는 키가 큰 학생이다.
Mina-nun khi-ka khu-un haksayng-i-ta.
Mina-TOP height-NOM big-RC student-COP-DEC
'Mina is a tall student.'

### *6.1.6.2 Implicature*

Language users are in general very good at going beyond what is explicitly said to what is only contextually implied. It is important to distinguish semantic entailment from **conversational (pragmatic) implicature**, the latter of which derives from rules of conversation, not from the invariable truth of sentences. Among the different types of implicatures, so-called **scalar implicature** has received a lot of attention. It is based on the Gricean maxim of cooperation, especially the maxim of **quantity** (say only what you believe true) and **quality** (be only as informative as required for current conversational purposes).[3] In (46), if the speaker knew that all students did well on the test, based on the maxim of quantity and quality, she/he would have said so. Since the speaker did not, one can infer (46b). A number of linguistic scales can be formed (some < every; warm < hot; good < excellent; possible < necessary, etc.) and an item lower on the scale implicates the negation of the item higher on the scale (Horn 1972). For example, 'some' or 'several' implies 'not all'. Likewise, 'good' implies 'not excellent'.

[3] Paul Grice provided a systematic account of the principles governing pragmatic implication. He proposed that conversation is regulated by principle of cooperation between speaker and hearer, which he calls maxims, to achieve the purpose of their conversation. The other two maxims are relation (be relevant) and manner (be brief and orderly and avoid obscurity and ambiguity).

(46) a. 몇명의 학생들이 시험을 잘 보았다.
Myech myeng-uy haksayng-tul-i sihem-ul cal po-ass-ta.
several CL-GEN student-PL-NOM test-ACC well take-PST-DEC
'Some of the students did well on the test.'
b. 시험을 못 본 학생들이 있다.
Sihem-ul mos po-n haksayng-tul-i iss-ta.
test-ACC badly take-RC student-PL-NOM exist-DEC
'There are students who did not do well on the test.'

However, these implications are not semantic entailments. As evidence, unlike entailments, implicatures can be cancelled. Continuing (46a) with 'in fact, all students did well on the test' does not result in a contradiction, as shown in (47a). On the other hand, entailment is not cancellable or defeasible, as shown in (47b).

(47) a. 몇명의 학생들이 시험을 잘 보았는데
Myech myeng-uy haksayng-tul-i sihem-ul cal po-ass-nuntey
several CL-GEN student-PL-NOM test-ACC well take-PST-but
어쩌면 모든 학생들이다 시험을 잘 봤을 수도 있다.
eccemyen motun haksayng-tul-i sihem-ul cal po-ass-ul swu-to iss-ta.
perhaps every student-PL-NOM test-ACC well take-PST-possible-DEC
'Some of the students did well on the test, and perhaps all.'
b. 몇명의 학생이 시험을 잘 보았지만
*Myech myeng-uy haksayng-tul-i sihem-ul cal po-ass-ciman
several CL-GEN student-PL-NOM test-ACC well take-PST-but
사실 시험을 잘 본 학생이 하나도 없다.
sasil sihem-ul cal po-n haksayng-i hanato ep-ta.
in fact test-ACC well take-RC student-NOM none exist-DEC
'Some of the students did well on the test, but in fact there's no student who did well on the test.'

### *6.1.6.3 Presupposition*

The last kind of implication to be discussed is **presupposition**. Presupposition, as the name suggests, is a sentence that is assumed to be already part of the background knowledge or taken for granted by speaker and hearer. For example, (48a) presupposes (48b). In this instance, the verb *kkunh-ta* 'quit' triggers the presupposition.

(48) a. 인호는 담배를 끊었다.
Inho-nun tampay-lul kkunh-ess-ta.
Inho-TOP cigarette-ACC cut-PST-DEC
'Inho quit smoking.'

b. 인호는 담배를 피웠었다.
Inho-nun tampay-lul phiwu-essess-ta.
Inho-TOP cigarette-ACC smoke-D.PST-DEC
'Inho used to smoke.'

If a sentence S presupposes another sentence S′ then denying, questioning, hypothesizing S will still presuppose S′. Therefore, in order to test whether a certain implication is a presupposition or not, we put it to this **S family test**. As shown in (49), a question in (49a), a negation in (49b), and a conditional in (49c), still presupposes (49b) above.

(49) a. 인호가 담배를 끊었니?
Inho-ka tampay-lul kkhunh-ess-ni?
Inho-NOM cigarette-ACC cut-PST-QUE
'Did Inho quit smoking?'
b. 인호가 담배를 안 끊었다.
Inho-ka tampay-lul an kkhunh-ess-ta.
Inho-NOM cigarette-ACC NEG cut-PST-DEC
'Inho did not quit smoking.'
c. 인호가 담배를 끊으면 미나가 좋아하겠다.
Inho-ka tampay-lul kkhunh-umyen Mina-ka choaha-keyss-ta.
Inho-NOM cigarette-ACC cut-CONJ Mina-NOM like-MOD-DEC
'If Inho quits smoking, Mina will like it.'

## 6.2 QUANTIFICATION

### 6.2.1 Universal and Existential Quantifiers

So far, we have only dealt with the semantics of proper names such as Inho and Mina among NPs, which denote individuals in the domain D. In this section, we will talk about the semantics of **quantified NPs** in Korean, such as *etten haksayng* 'a student' and *motun sensayngnim* 'every teacher', as shown in the examples in (50). Quantified NPs do not denote individuals but rather express generalizations about what quantity of the individuals in the domain have been the given property.

(50) a. 모든 학생이 잔다.
Motun haksayng-i ca-n-ta.
all student-NOM sleep-PRS-DEC
'Every student sleeps.'
b. 어떤 학생이 잔다.
Etten haksayng-i ca-n-ta.
some student-NOM sleep-PRS-DEC
'Some student sleeps.'

Let us first deal with the common noun part, *haksayng* 'student', that follows the quantificational determiners *motun* 'every' and *etten* 'some'. Unlike proper names, common nouns such as *haksayng* 'student' do not refer to any particular student, but to students in general or the property of being a student. Hence, common nouns denote a function from individuals to truth values or a set of individuals. For example, 'student' denotes a set of students in the world or a characteristic function that yields 1 (true) only when an individual in the domain D is a student. (51a), (51b), and (51c) equally define the meaning (denotation) of a common noun 'student'.

(51) $[[\text{student}]]^M$ =
  a. f: D $\rightarrow$ {0, 1} such that for all x $\in$ D, f(x) = 1 iff x is a student
  b. {x : x is a student}
  c. λx[student(x)]

This is the same denotation as that of intransitive verbs. For example, the intransitive verb *canta* 'sleep' also denotes a function from individuals to truth values; it gives 1 only if an individual sleeps, generating the set of all sleepers. Both common nouns and intransitive verbs are one-place predicates, i.e., they require one argument.

(52) $[[\text{sleep}]]^M$ =
  a. f: D $\rightarrow$ {0, 1} such that for all x $\in$ D, f(x) = 1 iff x sleeps
  b. {x : x sleeps}
  c. λx[sleep(x)]

Since common nouns denote sets of individuals, they cannot directly combine with verbs, which also denote a set of individuals, to make a sentence. In order to combine with the verbs, they need a determiner such as 'a', 'every', or 'the'.

Now let us discuss the semantics of quantifiers. *Motun* 'every/all' in (50a) is called a **universal quantifier** because it quantifies over everything in the domain. What does 'quantify over' mean? We can think of the truth conditional meaning of (50a) by pointing at a different student until each student in the domain has been pointed at. Let us employ a **variable assignment function** g for this purpose. As we have seen when we introduced lambda notation and set abstraction, unlike proper names, a variable does not have a fixed denotation but its value 'varies' or changes depending on a given condition. We can think of the variable assignment function as something that can keep replacing the value of a variable with an individual in D, similar to the pointing. In this case, the function g will assign a student as the denotation of a variable x and see if the sentence comes out true under this assignment. It will repeat this process until every student in the domain serves as the value of x. If each student, when it replaces x, satisfies the predicate *canta* 'sleep', then (50a) is true.

(53) is the truth condition of (50a). ∀ (all) is the logical symbol for universal quantifier. The variable x occurs right after the universal quantifier and again

in the formula that is in the **scope** of the quantifier. This means that x in the formula is bound by the universal quantifier, i.e., x's value must be determined by what ∀ does. Since we employ variable assignment functions, we will relativize the denotation of an expression not only to the model M but to the variable assignment function g as well, putting both of them as superscripts after the double bracket. In (53), g[u/x] means the variable assignment function g assigns u as the value of a variable x. (53) basically means that for all individuals u in our domain, if u is a student, then u sleeps. The logical implication → reads 'if . . . then'. It requires that if a variable satisfies the predicate in the antecedent, it also has to satisfy the predicate in the consequent. The interpretation function F assigns values to the descriptive vocabulary and proper names, as usual.

(53) $[[\forall x(\text{student}(x) \rightarrow \text{sleep}(x))]]^{M,g} = 1$ iff for all $u \in D$, if $u \in [[\text{student}]]^{M,g}$, then $[[\text{sleep}]]^{M,g[u/x]} = 1$

Let's see how the truth value of a universally quantified sentence is computed with respect to the following model in (54).

(54) M = <D, F> where
  a. D = {Inho, Mina, Hun}
  b. F(student) = {Inho, Mina}
     F(teacher) = {Hun}
     F(sleep) = {Inho, Hun}
     F(study) = {Mina}
     F(talk to) = {<Inho, Mina>, <Hun, Mina>}
  c. g is an assignment function.

$[[\forall x(\text{student}(x) \rightarrow \text{sleep}(x))]]^{M,g} = 1$ iff for all $u \in D$, if $u \in [[\text{student}]]^{M,g}$, then $[[\text{sleep}]]^{M,g[u/x]} = 1$. Only Inho and Mina are in F(student) in M, and we have to compute only $[[\text{sleep}]]^{M,g[\text{Inho}/x]}$ and $[[\text{sleep}]]^{M,g[\text{Mina}/x]}$. Starting with the former, $[[\text{sleep}]]^{M,g[\text{Inho}/x]} = 1$ iff Inho is in $[[\text{sleep}]]^{M,g}$, which is the case. The latter is true iff Mina is in $[[\text{sleep}]]^{M,g}$, which is not the case. Therefore, the whole sentence is FALSE relative to M.

*Etten* 'some' is called an **existential quantifier** and represented as ∃ (some). To calculate the truth value of (50b), g needs to assign a student to x and see if the sentence is true under that particular assignment. If we can find at least one student in the domain that satisfies the predicate, (50b) is true. (55) means that there is some individual u in our domain that u is both a student and a sleeper. The conjunction ∧ basically yields a set intersection: an individual must satisfy the predicates in both conjuncts.

(55) $\exists x[\text{student}(x) \wedge \text{sleep}(x)]^{M,g} = 1$ iff for some $u \in D$, $u \in [[\text{student}]]^{M,g}$ and $[[\text{sleep}]]^{M,g[u/x]} = 1$

Let us calculate the truth value of (50b) in the model in (54). Let g assign Inho as the denotation of x first. Then (55) is true iff $[[\text{sleep}]]^{M,g[\text{Inho}/x]} = 1$. Since this is indeed the case, (55) is TRUE. Note that, if we had tried Mina first for the value of x, we would have had to continue with Inho to make sure that no student is sleeping, in order to falsify the existentially quantified formula.

It would be ideal if we could give a separate denotation to the quantified NPs themselves, rather than the whole sentences. After all, we are interested in how the sentence meaning is compositionally obtained by putting together words and phrases that occur in it (principle of compositionality!). We can utilize the lambda operator to accomplish this. Although we have only seen lambda abstraction over an individual, we can also abstract over predicates. In (56), the predicate is abstracted, so any VP can combine with *motun haksayng* 'every student' and *etten haksayng* 'some student' to yield the desired truth condition of the whole sentences.

(56) a. 모든 학생 motun haksayng 'every student' = $\lambda P \forall x[\text{student}(x) \rightarrow P(x)]$
b. 어떤 학생 etten haksayng 'some student' = $\lambda P \exists x[\text{student}(x) \wedge P(x)]$

(57) and (58) show how these quantified NPs combines with the predicate *canta* 'sleep'. As we can see, when VP combines with a quantified NP, it becomes an argument of the subject NP. Note that this is the opposite of what we observed with proper names. Proper names, which denote individuals, are arguments of the VPs, which denote a set of individuals. Quantified NPs are not individuals and do not refer to a particular object. As we have seen, they are specifications on what kind of operations are performed on a variable. Therefore, they are functions that take VP as argument.

(57) a. 모든 학생이 잔다
Motun haksayng-i ca-n-ta.
'Every student sleeps'
b. $\lambda P \forall x[\text{student}(x) \rightarrow P(x)](\text{sleep})$
$= \forall x[\text{student}(x) \rightarrow \text{sleep}(x)]$

(58) a. 어떤 학생이 잔다.
Etten haksayng-i ca-n-ta.
'Some student sleeps'
b. $\lambda P \exists x[\text{student}(x) \wedge P(x)](\text{sleep})$
$= \exists x[\text{student}(x) \wedge \text{sleep}(x)]$

## 6.2.2 Scope Ambiguity

When there are more than one quantified NPs in a sentence, they can interact with one another, yielding **scope ambiguity**. For those who are not trained in semantics, such ambiguity is not easy to detect. See if you can determine

whether the English sentence in (59a) is ambiguous, and what are possible interpretations. (59a) could mean that every man loves the same woman, or that every man loves a different woman. Scope ambiguity is represented by two distinct formulas with different quantifier scope. (59b) has the universal quantifier wide scope reading: for every man, there is a (possibly different) woman that he loves. In (59c), the existential quantifier takes a wide scope with respect to the universal quantifier, yielding the meaning that there is a unique woman whom every man loves.

(59) a. Every man loves a woman.
b. [∀x[man(x) → ∃y[woman(y) ∧ x loves y]]]
For every man, he loves some woman (or other). (all < some)
c. [∃y[woman(y) ∧ ∀x[man(x) → x loves y]]]
There is some woman whom every man loves. (some < all)

Korean also exhibits the scope ambiguity between quantified NPs, as shown in (60).

(60) 모든 남자가 어떤 여자를 사랑한다.
Motun namca-ka etten yeca-lul salangha-n-ta.
every man-NOM some woman-ACC love-PRS-DEC
'Every man loves a woman.'

Let us compute the truth value of the universal wide scope reading of (60) with respect to a model M in (61).

(61) M = <D, F> where
a. D = {Inho, Mina, Hun, Yuna}
b. F(man) = {Inho, Hun}
F(woman) = {Mina, Yuna}
F(love) = {<Inho, Mina>, <Hun, Yuna>}

Let us compute the universal quantifier wide scope reading first, i.e., for every man, there is a (possibly different) woman that he loves. $[[\forall x[man(x) \rightarrow \exists y[woman(y) \wedge x \text{ loves } y]]]]^{M,g} = 1$ iff for all u ∈ D, if u ∈ F(man), then $[[\exists y[woman(y) \wedge x \text{ loves } y]]]^{M,g} = 1$. Since Inho and Hun are in F(man) in M, we have to compute $[[\exists y[woman(y) \wedge x \text{ loves } y]]]^{M,g[Inho/x]}$ and $[[\exists y[woman(y) \wedge x \text{ loves } y]]]^{M,g[Hun/x]}$. $[[\exists y[woman(y) \wedge x \text{ loves } y]]]^{M,g[Inho/x]} = 1$ iff for some u′ ∈ F(woman), $[[x \text{ loves } y]]^{M,g[[Inho/x]u'/y]} = 1$. Mina and Yuna are in F(woman) so let us compute $[[x \text{ loves } y]]^{M,g[[Inho/x]Mina/y]}$ first. It turns out that <Inho, Mina> is in F(love), so $[[x \text{ loves } y]]^{M,g[[Inho/x]Mina/y]}$ is true. This also makes $[[\exists y[woman(y) \wedge x \text{ loves } y]]]^{M,g[Inho/x]}$ true, because Inho loves some woman is true. Now let us move on to computing $[[\exists y[woman(y) \wedge x \text{ loves } y]]]^{M,g[Hun/x]}$. Again, this formula is true iff for some u′ ∈ F(woman), $[[x \text{ loves } y]]^{M,g[[Inho/x]u'/y]} = 1$. Let us assign Yuna for u′ and see.

$[[x \text{ loves } y]]^{M,g[[Inho/x]Yuna/y]} = 1$ because <Hun, Yuna> is in F(love). Therefore, $[[\ \forall x[man(x) \rightarrow \exists y[woman(y) \wedge x \text{ loves } y]]\ ]]^{M,g} = 1$.

Now let us compute the other reading, in which the existential quantifier has a wide scope and see if it is true in M. $[[\exists y[woman(y) \wedge \forall x[man(x) \rightarrow x \text{ loves } y]]\ ]]^{M,g} = 1$ iff for some $u \in F(woman)$, $[[\forall x[man(x) \rightarrow x \text{ loves } y]]\ ]]^{M,g[u/y]} = 1$. Mina and Yuna are in F(woman) so let us compute $[[\forall x[man(x) \rightarrow x \text{ loves } y]]\ ]]^{M,g[Mina/y]}$. $[[\forall x[man(x) \rightarrow x \text{ loves } y]]\ ]]^{M,g[Mina/y]} = 1$ iff for all $u' \in F(man)$, $[[x \text{ loves } y]]\ ]]^{M,g[Mina/y]u'/x]} = 1$. Let us assign Hun for the value of u′ first, keeping in mind that, if it comes out true, we then need to assign Inho for the value of u' to verify the whole formula, which is universally quantified. $[[x \text{ loves } y]]\ ]]^{M,g[Mina/y]Hun/x]}$ is not true because <Hun, Mina> is not in F(love). Now that Mina has failed as the value for u, we have to try Yuna to see if every man loves her. $[[\forall x[man(x) \rightarrow x \text{ loves } y]]\ ]]^{M,g[Yuna/y]} = 1$ iff for all $u' \in F(man)$, $[[x \text{ loves } y]]\ ]]^{M,g[Yuna/y]u'/x]} = 1$. Let us apply Inho for u′. $[[x \text{ loves } y]]\ ]]^{M,g[Yuna/y]Inho/x]} = 0$ because <Inho, Yuna> $\notin$ F(love). Therefore, the whole formula is FALSE: There is no unique woman whom every man loves. We see that the same sentence can yield different truth conditions and truth values depending on two logically different readings, because of the interaction of operators such as quantifiers in a single sentence.

## 6.2.3 Numeral Classifier Constructions

When a specific cardinal number of the given object is concerned, Korean employs the **numeral classifier construction**. This construction has the form of numerals indicating the measured quantity followed by a so-called 'classifiers', which are bound morphemes indicating units of counting and measurement. Korean has many different classifiers depending on the object that they count or measure. For example, *myeng* is for people, *kay* is for small items and *can* is for glasses, as illustrated in (62). As shown in (62a), Number + Classifier can either precede or follow a common noun, although CN (common noun) + Number + Classifier is more common and unmarked (Kang 1994). When Number + Classifier precedes the noun, a genitive (or possessive) marker *-uy* connects the two. However, there seems to be no difference in meaning between these two constructions. Note also that both count nouns such as *haksayng* 'student' and *sakwa* 'apple' and mass nouns such as *mwul* 'water' take the classifier construction. This is different from English, which uses classifier constructions only for mass nouns (e.g., 'two glasses of water'), but mark the cardinal number of count nouns simply by putting the numeral in front of the noun without the aid of a classifier (e.g. 'two students' or 'three apples'). We will discuss this property further in the next section.

(62) a.

| 학생 | 두 명/ | 두 명의 | 학생 |
|---|---|---|---|
| haksayng | twu myeng/ | twu myeng-uy | haksayng |
| student | two CL(person) | two CL(person)-GEN | student |

'two students'

b. 사과 두 개
sakwa twu kay
apple two CL(item)
'two apples'
c. 물 두 잔
mwul twu can
water two CL(glass)
'two glasses of water'

The truth condition of (63a) is given in (63b). In this case, g has to find two successful instances of x replaced by a student that satisfies the predicate.

(63) a. 학생 두 명이 잔다.
haksayng twu myeng-i ca-n-ta.
student two CL-NOM sleep-PRS-DEC
'Two students sleep.'
b. $\exists x \exists y[\text{student}(x) \wedge \text{student}(y) \wedge \text{sleep}(x) \wedge \text{sleep}(y) \wedge x \neq y]^{M,g} = 1$ iff for two u, u′ ∈ D, u, u′ ∈ $[[\text{student}]]^{M,g}$ and $[[\text{sleep}]]^{M,g[u/x]} = 1$ and $[[\text{sleep}]]^{M,g[u'/x]} = 1$

A very interesting feature of Korean numeral classifiers is that they 'float' quite freely. English quantifiers can float sometimes, as in *the students all came*, but in general it is prohibited (**students two sleep*). As you can see in (64), the classifier is outside the subject NP and optionally takes a case marker. It appears that a floating quantifier falls outside the subject NP. For instance, adverbs such as *ecey* 'yesterday' and *uwyenhi* 'by chance' can appear between the host NP and the floating quantifier. This means that a floating quantifier forms an independent constituent from its host NP (Hong 1990).

(64) a. 학생이 어제 두 명(이) 왔다.
Haksayng-i ecey twu myeng(-i) o-ass-ta.
student-NOM yesterday two CL-(NOM) come-PST-DEC
'Two students came yesterday.'
b. 인호가 학생을 우연히 두 명(을) 만났다.
Inho-ka haksayng-ul wuyenhi twu myeng(-ul) manna-ass-ta.
Inho-NOM student-ACC by chance two CL-(ACC) meet-PST-DEC
'Inho ran into two students.'

There are two different approaches to floating quantifiers. The first approach treats them as noun modifiers like determiners. An alternative approach views them as verbal modifiers like adverbs (see Kang 2002 for discussion and analyses).

## 6.2.4 Negative Polarity Items

Korean does not have the negative determiner 'no'; instead, an indefinite noun *amwu* (N) 'any (N)' plus the additive particle *-to* 'also, even' triggers the quantificational reading in question. One can also put a noun after *amwu*, e.g., *amwu kes-to* 'anything', *amwu tey-to* 'anywhere', etc. If there is no noun following *amwu-*, it refers to a person. This form must be followed by the negated predicate, as shown in (65).

(65) a. 아무도 오지 않았다.
Amwu-to o-ci anh-ass-ta.
no one come-COMP NEG-PST-DEC
'No one came.'
b. *아무도 왔다.
Amwu-to o-ass-ta.
no one come-COMP NEG-PST-DEC
'Anyone came.'

Because these forms must be licensed by the negation, they are called **Negative Polarity Items** (henceforth NPI). NPIs are those items that must occur inside the scope of some kind of negative operator. English 'any' is an example. As shown in (66), like the Korean *amwuto* 'anyone', 'any' cannot occur in an affirmative sentence.

(66) a. I did not see anyone.
b. *I saw anyone.

However, unlike English 'any', Korean NPIs cannot be licensed by modals (e.g., can in (67b)), conditionals (e.g., if in (68b)), or questions (e.g., (69b)). They can only be licensed by negated predicates (Nam 1994). This means that NPIs in different languages have different strengths: English 'any' is a **weak NPI** because it is licensed by a variety of loosely negative (i.e., non-affirmative) contexts, whereas Korean *amwu-to* 'anyone' is a **strong NPI** because it is only licensed by an overt negation in the predicate.

(67) a. 아무도 갈 수 없다.
Amwu-to ka-l swu ep-ta.
anyone go-cannot-DEC
'No one can go.'

b. *아무도 갈 수 있다.
*Amwu-to ka-l swu iss-ta.
anyone go-can-DEC
'Anyone can go.'[4]

[4] 'Any' here is called a **Free Choice Item** (Giannakidou 2001). In Korean, Free Choice (FC) is expressed by an indefinite noun plus disjunctive particle *-(i)na*, e.g., *amwu-na ka-l swu iss-ta* 'anybody can go'. See Lee (1999), Gill et al. (2004), Sells and Kim (2006), An (2007), Kim and Kaufman (2007), Choi and Romero (2008), among others, for Korean NPI and FC.

(68) a. 아무도 안 가면 내가 가겠다.
Amwu-to an ka-myen nay-ka ka-keyss-ta.
anyone NEG go-if I-NOM go-will-DEC
'If no one goes, I will go.'
b. 아무도 가면 내가 가겠다.
*Amwu-to ka-myen nay-ka ka-keyss-ta.
anyone go-if I-NOM go-will-DEC
'If anyone goes, I will go.'

(69) a. 아무도 안 갔니?
Amwu-to an ka-ss-ni?
anyone NEG go-PST-QUE
'Did nobody go?'
b. *아무도 갔니?
*Amwu-to ka-ss-ni?
anyone go-PST-QUE
'Did anyone go?'

The truth condition of *amwu-to* 'anyone' is given in (70) (Nam 1994).

(70) [amwu-P-to](Q) = 1 iff $P \cap Q = \varnothing$ where P and Q are properties, i.e., denotations of a common noun or a VP.

NPIs only occur in negative contexts because they are typically **minimizers**, which denote the lowest element on a scale (Fauconnier 1975). Compare the sentences in (71). (71a) entails that John can solve easier problems as well. (71b) does not trigger such an implication; we cannot determine whether he can also solve more difficult problems. In fact, (71b) sounds somewhat awkward because it does not say much and therefore we wonder why someone would say something like this. The situation changes if we negate the sentence. (71c) expresses a much stronger statement than (71b), because it implies that John cannot solve any problem whatsoever. In other words, if he cannot solve the easiest problem, he certainly cannot solve more difficult ones. We observe that the direction of entailment goes from the easiest to hardest, thanks to negation.

(71) a. John can solve the hardest problem.
b. John can solve the easiest problem.
c. John cannot solve the easiest problem.

In an affirmative sentence, the entailment goes from top to bottom on a scale in the diagram below. In a negative sentence, the direction of entailment gets reversed. Such reversal ends up allowing minimizers (smallest element) to contribute to a stronger statement. That is, by denying the possibility that even the

smallest entity has the described property, the whole sentence makes a very strong statement.

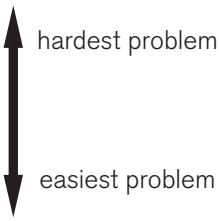



**Figure 6.4** Entailment

To reflect this, Korean NPIs often include the smallest cardinal number, one, as in *hana-to* 'even one thing', *han salam-to* 'even one person', etc. If it is true that 'not even one person came', we know that nobody came. An example is given in (72).

(72) a. 인호가 한 사람도 안 만났다.
Inho-ka han salam-to an manna-ss-ta.
Inho-NOM one person-also NEG meet-PST-DEC
'Inho did not meet anyone.'
b. 인호가 한 사람도 만났다.
*Inho-ka han salam-to mana-ss-ta.
Inho-NOM one person-also meet-PST-DEC
*'Inho met anyone.'

English NPIs also include many minimizers. An example is given in (73).

(73) a. John did not lift a finger to help.
b. *John lifted a finger to help.

In (73) above, 'lift a finger' refers to a minimal action. By denying that John did it, it makes a strong statement that John did not do anything to help.

## 6.2.5 Bare Common Nouns and Plurals

### *6.2.5.1 Bare Common Nouns*

We have observed that, since common nouns denote sets of individuals just like predicates, they need a determiner in order to combine with the latter, as illustrated in (74).

(74) a. *Dog barks.
b. A/the/every/some dog barks.

Korean, by contrast, does not require obligatory determiners, and bare common nouns can stand alone, occupying an argument position by themselves. In fact, bare nouns are the most frequently used NP forms in Korean. The interpretation largely depends on context when a noun is not overtly marked with determiners. For example, (75) can mean, depending on context, that a student, the student, or students came. Definiteness and number are totally underspecified. Of course, when overtly marked with a determiner, such ambiguity disappears, as we saw in (50) and (62) above.

(75) 학생이 왔다.
Haksayng-i o-ass-ta.
student-NOM come-PST-DEC
'A/the student/students came.'

Given that the denotation of common nouns is a set of individuals, how can they combine with the VP without a determiner in Korean? There are two ways to go about this. First, we can assume that there is an empty determiner that is underspecified in definiteness and number in (75). Alternatively, we take what we see at face value, i.e., bare common nouns ARE arguments in Korean. Note that bare plurals such as 'dogs' and mass terms such as 'water' also can occur as arguments without a determiner in English. Languages that allow bare nouns as arguments are often claimed to be languages that treat all nouns as mass nouns (Gil 1989, Chierchia 1998). As evidence, Korean does not seem to distinguish between count and mass nouns and employs classifier systems for both, as we have observed in Section 6.2.3 above. The denotation of bare singular nouns in languages such as Korean, and mass nouns and bare plurals in English has been claimed to be names of a **kind**, rather than a set of individuals (Chierchia 1998, Krifka 1995). For example, *sakwa* is the name of the kind 'apple'. Then, just like proper names *Inho* and *Mina*, it can be an argument for the VP to yield a sentence. (75) above means the 'student' kind came. This explains the flexible interpretation.

If we assume that bare nouns exclusively refer to names of kinds, however, we cannot explain how they can combine with determiners or classifiers, as in (76a), and occur as predicates, as in (76b). For example, (76b) is true iff Inho is a member of the set of students. We have also observed in the previous sections that Korean also has quantificational determiners such as *motun* 'every' and *etten* 'some' as well as numeral classifiers that precede the common noun.

(76) a. 그 사과가 맛있다.
Ku sakwa-ka masiss-ta.
the apple-NOM delicious-DEC
'The/that apple is delicious.'

b. 인호는 학생이다.
Inho-nun haksayng-i-ta.
Inho-TOP student-COP-DEC
'Inho is a student.'

For this reason, we need some operation that turns kinds to sets of individuals after all. Let us postulate a realization relation R which maps between names of kinds and predicates; λxR(x, k) where R maps kind k to individual specimens of k (Krifka 1995).

(77) a. NP → N
b. $[[\ [_{NP}[_{N}\ \alpha]]\ ]]^{M,g} = \lambda x.R(x, k)$

We assume that the bare noun denotes a name of the kind by default, and the other use is derived by the rule in (77). Assuming an operation such as (77) in Korean that turns names of kinds to individuals, we can explain how they can occur with or without a determiner and as predicates.

### 6.2.5.2 Plurals

Korean has a plural suffix *-tul*, but it is not obligatory, as we can see from the fact that bare singular nouns can refer to plural entities, in (75) above. When overly marked with *-tul*, as in (78), the NP only refers to plural entities.

(78) 학생들이 왔다.
Haksayng-tul-i o-ass-ta.
student-PL-NOM come-PST-DEC
'Students came.'

What is the denotation of *haksayng-tul* 'students'? Plural terms must denote plural individuals rather than singular ones. We can come up with plural individuals by 'adding' singular individuals. Let's say there are three students, Inho, Mina, and Hun, in our domain. The singular NP 'student' will denote a set containing these three individuals, as shown in (79a) below. How can we form a set of plural individuals out of this set? Let us introduce an operator *, working on one-place predicate P (i.e., intransitive verbs and singular common nouns), which generate all the individual sums of members of the extension of P (Link 1983). Then, [[*P]], the denotation of *P, would include both singular and plural individuals like (79b).

(79) a. [[student]] = {Inho, Mina, Hun}
b. [[*student]] = {Inho, Mina, Hun, Inho + Mina, Mina + Hun, Inho + Hun, Inho + Mina + Hun}

The plural NP 'students' will denote a set containing only plural individuals, i.e., the set in (79b) minus the set of singular students (79a), i.e., [[*P]] – [[P]]. (80) contains such a set of plural individuals.

(80) [[*student]] – [[student]] = {Inho + Mina, Mina + Hun, Inho + Hun, Inho + Mina + Hun}

A question arises as to why the meaning of Korean singular nouns includes that of plural nouns. In other words, why does Korean have plural nouns if singular nouns can express the plural meaning? The suffix *-tul* must have a function other than delivering plural entities. The suffix *-tul* in fact has properties that are quite different from a simple plural suffix. It can be attached to various syntactic categories other than nouns, such as locative NPs and adverbs, as shown in (81b). Moreover, *-tul* attached to elements inside the VP gives rise to the so-called **distributive reading**. (81a) is ambiguous between the distributive reading and the **collective reading**. In the former, each child happily played at possibly different parks at different times. In the latter, children happily played together at the same park. (81b), in which *-tul* occurs after the locative phrase and the adverb, on the other hand, only has distributive reading. For (81b) to be true, for each child, there must have been a separate event of playing at a park.

(81) a. 아이들이 공원에서 즐겁게 놀았다.
Ai-tul-i kongwon-eyse culkepkey nol-ass-ta.
child-PL-NOM park-LOC happily play-PST-DEC
'Children happily played at a park.'

b. 아이들이 공원에서들 즐겁게들 놀았다.
Ai-tul-i kongwon-eyse-tul culkepkey-tul nol-ass-ta.
child-PL-NOM park-LOC-PL happily-PL play-PST-DEC
'Each child happily played at a park.'

Given this, the plural suffix *-tul* delivers the plurality (or distributivity) of the **events** rather than plural individuals when it is attached to constituents other than NPs (Kwak 1996, Song 1997). Similar to floating quantifiers, *-tul* in this case seems to function as a verbal modifier, like an adverb.

## 6.3 NOUN MODIFIERS: ADJECTIVES AND RELATIVE CLAUSES

So far, we have discussed the semantics of proper names, common nouns, quantifiers and determiners. In this section, we will discuss the meaning of complex NPs, which include **modifiers**. Korean nouns can be optionally modified by an adjective, as in (82a), or a relative clause, as in (82b) to give more specific information about them. Adjectives and relative clauses have the same structure, namely, predicate + noun modifying (adnominal) suffix *-(nu)n* conjugated

according to tense + head noun. A relative clause precedes a head noun because Korean is a **head-final language**. In contrast, an English relative clause follows the head noun because English is a **head-initial language**. When we look at examples such as (82b), we get the sense that something is missing in the relative clause and it is in fact what the head noun refers to. We represent this as a **coindexation** between the head noun *totwuk* 'thief' and a gap ( __ ) inside the relative clause.

(82) a. 빨간 꽃
[ppalka-n] kkoch
red-RC flower
'a red flower'
b. 도망가는 도둑
[___$_1$ tomangka-nun] totwuk$_1$
run away-RC thief
'a thief who is running away'

In the next subsection, we will discuss the semantics of adjectives as in (82a).

## 6.3.1 Adjectives

There are three types of adjectives: intersective, subsective, and non-intersective. **Intersective adjectives**, as the name suggests, simply intersect the denotation of common nouns and adjectives, as shown in the following diagram.

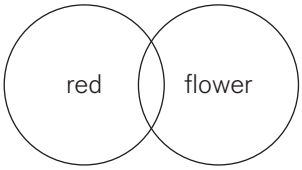



Figure 6.5 Intersective adjectives

Because the set includes both red objects and objects that are flowers, (83a) and (83b) are logically equivalent.

(83) a. This is a red flower.
b. This is red and this is a flower.

**Subsective adjectives** do not make (84a) and (84b) logically equivalent. Note that even small elephants are pretty big.

(84) a. Dumbo is a small elephant.
b. Dumbo is small and Dumbo is an elephant.

One must say that Dumbo is small for an elephant. In this case, the set of small elephants must be a subset of the set of elephants.

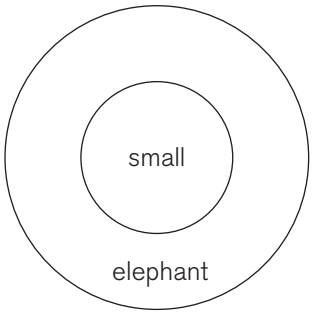



**Figure 6.6** Subsective adjectives

Finally, **non-intersective adjectives** do not allow intersection or subset relations between the adjective denotation and the noun denotation. One cannot even think of a set of former things!

(85) George Bush is the former president.

Intersective adjectives can be given the semantic interpretation in (86b). It denotes the property of being a flower and being red, i.e., a function from individuals to truth values that gives 1 iff x is a flower and x is red.

(86) a. 빨간 꽃
[ppalka-n] kkoch
red-RC flower
'a red flower'
b. λx[red(x) ∧ flower(x)]

Unlike English, Korean adjectives take the adnominal suffix with tense, as shown in (86). However, a non-intersective adjective such as *cencik* 'former' does not, as shown in (87b) (M. Kim 2002). It forms a compound NP, as in (87a).

(87) a. 전직 상원의원
cencik sangwonuywon
former senator
'former senator'
b. *전직인 상원의원
*cencik-in sangwonuywon
former-RC senator
[intended] 'former senator'

In English, 'Mina is a beautiful dancer' is ambiguous between intersective and non-intersective readings. It either means 'Mina is beautiful and she is a dancer' (intersective) or it means 'Mina dances beautifully' (non-intersective). The former entails that Mina is beautiful but the latter does not. The corresponding sentence in Korean only has only an intersective reading (M. Kim 2002).

(88) 미나는 아름다운 무용수이다.
Mina-nun alumtaw-un mwuyongswu-i-ta
Mina-TOP beautiful-RC dancer-COP-DEC
'Mina is a beautiful dancer.'

This seems to suggest that Korean only has intersective adjectives, which take an adnominal suffix conjugated with tense and interpreted as a set intersection. Contrary to this expectation, Korean also allows subsective adjectives to modify the head noun with adnominal suffixes. Subsective adjectives such as 'skillful', 'big', etc. must denote a set of skillful individuals who are subsets of a set of individuals in the noun denotation. In other words, (89) means Inho is skillful as a surgeon, but does not necessarily mean that Inho is skillful (at everything) because he could be a lousy cook. In this case, the set of skillful individuals must be a subset of the set of surgeon.

(89) 인호는 능숙한 외과의사이다.
Inho-nun nungswukha-n oykwauysa-i-ta.
Inho-TOP skillful-RC surgeon-COP-DEC
'Inho is a skillful surgeon.'

Since both intersective and subsective adverbials have the same morpho-syntactic structure (adnominal suffix + tense), it would be desirable to assign the same kind of denotation as well. We can achieve this by assuming that subsective adjectives such as 'skillful', 'big', etc., contain an implicit argument supplied by context (Heim and Krazter 1998, M. Kim 2002), as in (90).

(90) a. 능숙한 *nungswukhan* 'skillful' = λPλx[x is P ∧ x is skillful as P] where the value of P is supplied by context
b. 능숙한 외과 의사 *nungswukha-n oykwauysa* 'a skillful surgeon' = λx[x is a surgeon ∧ x is skillful as a surgeon]

Now adjectives can be uniformly represented as the conjunction of a noun denotation and an adjective denotation in Korean.

## 6.3.2 Relative Clauses

Now let us turn to relative clauses. In (82b), which is repeated in (91a), the head noun is interpreted as the subject of the relative clause; the thief is

running away. Korean also allows object relativization as in (91b), and postpositional phrase relativization as in (91c). In the case of postpositional phrase relativization, the postposition (in this example, locative *-eyse*) is dropped from the head noun.

(91) a. [___$_1$ 도망가는] 도둑$_1$
tomangka-nun] totwuk
run away-RC thief
'a thief who is running away'
b. [인호가 ___$_1$ 먹은] 사과$_1$
Inho-ka mek-un sakwa
Inho-NOM eat-RC apple
'the apple that Inho ate'
c. [인호가 미나에게 ___$_1$ 영어를 가르친] 대학$_1$
Inho-ka Mina-eykey yenge-lul kaluchi-n tayhak
Inho-NOM Mina-DAT English-ACC teach-RC university
'the university where John taught English to Mina.'

The interpretation of the whole complex NP is straightforward for both Korean and English. As shown in (92b), it is a function from individuals to truth values that gives 1 iff x is an apple and Inho ate x. Note that these two properties are conjoined. Therefore, the same semantic treatment is given to adjectives and relative clauses in Korean, which is a welcome result because they have the same morpho-syntactic form of predicate + adnominal suffix + head noun.

(92) a. [인호가 ___$_1$ 먹은] 사과$_1$
the apple$_1$ (which/that) Inho ate __$_1$
b. λx[apple(x) ∧ ate(Inho, x)]

Whereas English has only one type of relative clause, namely, a gappy one, Korean has another type: so-called an **internally headed relative clause**. Unlike regular relative clauses, in which a gap is co-indexed with the head noun, internally headed relative clauses are gap-less since the head noun occurs inside, and it is followed by *kes* 'thing'.[5] There is also an important semantic difference between a regular relative clause and an internally headed one. While the former restricts the head noun, the latter restricts the embedding clause or is asymmetrically coordinated with it, as indicated by the English translations. For an internally headed relative clause to be acceptable, there has to be some kind of causal relation or temporal overlap relation between the embedded clause and the embedding clause (M. Kim 2007).

[5] There are other languages (South and Central American and African languages) that have internal heads (Keenan and Comrie 1977).

(93) a. 인호가 [$e_1$ 도망가는] 도둑$_1$을 잡았다.
Inho-ka tomangka-nun totwuk-ul cap-ass-ta.
Inho-NOM run away-RC thief-ACC catch-PST-DEC
'Inho caught a/the thief who was running away.'

b. 인호가 [[도둑$_1$이 도망가는] 것$_1$]을 잡았다.
Inho-ka totwuk-i tomangka-nun kes-ul cap-ass-ta.
Inho-NOM thief-NOM run away-RC thing-ACC catch-PST-DEC
'Inho caught a/the thief when he was running away.' or
'A/the thief was running away and Inho caught him.'

We can treat *kes* as a **pronoun** that is coindexed with an argument inside the relative clause and it serves as the object of the matrix verb. In the case of (94), *kes* would be coindexed with *totwuk* 'thief' and the argument of the catching. Then, internally headed relative clauses can be given the same semantic representation as regular relative clauses as set intersection.

(94) λx[thief(x) ∧ run away(x)]

The challenge to such analysis is that what an internally headed relative clause refers to depends on discourse context. (95a) can mean the speaker caught a cat, a mouse, or even both (Chung and Kim 2003).

(95) 고양이가 쥐를 쫓는 것을 잡았다.
Koyangi-ka cwi-lul ccoch-nun kes-ul cap-ass-ta.
cat-NOM mouse-ACC chase-RC thing-ACC catch-PST-DEC
'A cat was chasing a mouse and I caught it/them.'

Therefore, what *kes* can be coindexed with must be given more flexible interpretation. Some scholars have argued that what *kes* refers to in internally headed relative clauses is events, rather than individuals (see Chung and Kim 2003, and M. Kim 2007, for further discussion). Assuming this, *kes* can refer to any participant in the described event.

## 6.4 INTENSIONALITY

### 6.4.1 Intensional Contexts and Possible Worlds Semantics

So far we have equated the meaning of an expression with its denotation. If this is correct, substitution of co-referring NPs in the same sentence will not change its truth condition. (96) illustrates this. If (96a) and (96b) are true, (96c) is true as well.

(96) a. 인호가 미나를 만났다.
Inho-ka Mina-lul mana-ss-ta.
Inho-NOM Mina-ACC meet-PST-DEC
'Inho met Mina.'
b. 미나는 훈의 동생이다.
Mina-nun Hun-uy tongsayng-i-ta.
Mina-TOP Hun-GEN sister-COP-DEC
'Mina is Hun's sister.'
c. 인호가 훈의 동생을 만났다.
Inho-ka Hun-uy tongsayng-ul mana-ss-ta.
Inho-NOM Hun-GEN sister-ACC meet-PST-DEC
'Inho met Hun's sister.'

However, substitution of co-referring NPs fails in so-called **intensional contexts**. Verbs such as 'seek', 'try to find', 'believe', 'doubt', etc. create an intensional context. We cannot conclude (97c) from (97a) and (97b). Inho might not know that Hun's sister is Mina, and his belief is only about Hun's sister.

(97)
a. 인호는 훈의 동생이 예쁘다고 생각한다.
Inho-nun Hun-uy tongsayng-i yeppu-ta-ko sayangkakha-n-ta.
Inho-TOP Hun-GEN sister-NOM pretty-DEC-COMP think-PRS-DEC
'Inho thinks that Hun's sister is pretty.'
b. 미나는 훈의 동생이다.
Mina-nun Hun-uy tongsayng-i-ta.
Mina-TOP Hun-GEN sister-COP-DEC
'Mina is Hun's sister.'
c. 인호는 미나가 예쁘다고 생각한다.
*Inho-nun Mina-ka yeppu-ta-ko sayangkakha-n-ta.
Inho-TOP Mina-NOM pretty-DEC-COMP think-PRS-DEC
'Inho thinks that Mina is pretty.'

Tense and modality create intensional contexts, as well. For example, the truth value of the past tense sentence (98b) cannot be determined by the denotation of *is hungry* in M. To determine whether (98b) is true or not, we need to know the denotation of *is hungry* in situations that held in earlier times.

(98) a. 인호가 배고프다.
Inho-ka paykophu-ta.
Inho-NOM hungry-DEC
'Inho is hungry.'

b. 인호가 배고팠다.
Inho-ka paykophu-ass-ta.
Inho-NOM hungry-PST-DEC
'Inho was hungry.'

Similarly, to evaluate (98b), it is not enough to know the denotation of 'is hungry' in M. Modality such as possibility creates an intensional context, as well.

(99) 인호가 배고플 수 있다.
Inho-ka paykophu-ul swu iss-ta.
Inho-NOM hungry-possible-DEC
'It is possible for Inho to be hungry.'

In order to interpret intensional sentences, we need alternative sets of states of affairs other than the given one, which are called **possible worlds**. Taking intensionality into account, denotation becomes a function from possible worlds/times to extensions. Our model is expanded to consist of not only domain of individuals, D, and the interpretation function, F, but also a set of worlds, W, a set of temporal instants, T, and ordering on T, $<$.

(100) Model M = $<$D, F, W, T, $<>$

Here is an example of an intensional model. As we can see, the denotation of a one-place predicate such as 'hungry' is now relativized in terms of worlds and times. It denotes different sets in different times and different worlds. $< = \{<i_1, i_2>\}$ means $t_1$ is earlier than $t_2$.

**Table 6.6** Intensional model

(101) M = $<$D, F, W, T, $<>$ where
a. U = {Inho, Mina}, W = $\{w_1, w_2\}$, T = $\{t_1, t_2\}$, $< = \{<t_1, t_2>\}$
b. F(hungry) =

| | $t_1$ | $t_2$ |
|---|---|---|
| $w_1$ | {Inho, Mina} | {Inho} |
| $w_2$ | {Mina} | {Inho, Mina} |

c. g is a variable assignment function

Intuitively, the past tense sentence in (98b) above evaluated in $t_2$ is TRUE because 'Inho' is in $[[\text{hungry}]]^{M,g,w,t}$ at an earlier time $t_1$. Similarly, the modalized sentence in (99) above is TRUE because we can find at least one world, $w_2$, where 'Inho' is in $[[\text{hungry}]]^{M,g,w,t}$. We will discuss tense and modality in more detail in the following sections.

Our inventory of types now includes the intensional type $<s, a>$, which is a function from possible circumstances, i.e., worlds/time pairs, (type s) to type a, the latter of which could be any basic type or functional type, presented in the table below (from Chierchia and McConnel-Ginet 2000).

Table 6.7 Intensional and extensional types

| *Syntactic category* | *example* | *intension* | *extension* |
|---|---|---|---|
| VP | is hungry | Property<br>Function from possible circumstances to sets | Set of individuals |
| S | It rains | Proposition<br>Function from possible circumstances to truth values | Truth values |
| NP | the president | Individual concept<br>Function from possible circumstances to individuals | Individual |

## 6.4.2 Tense

### *6.4.2.1 Tense Logic and Event Semantics*

Truth-conditional analyses of tense are based on tense logic. In **tense logic** (Prior 1967), sentences are interpreted at moments in time, with an 'earlier than' relation between moments. There are two operators, F and P, which are to be read as 'it will at some point in the future be the case that' and 'it was at some point in the past the case that', respectively. (102a) below is a simple tenseless proposition p. (102b), in which p is prefixed by the operator F, is meant to express the future tense. (102c), in which the operator P is used, corresponds to the past tense.

(102) a. p: 인호가 공부한다.
Inho-ka kongpwuha-n-ta.
Inho-NOM study-PRS-DEC
'Inho studies.'
b. Fp: 인호가 공부할 것이다.
Inho-ka kongpwuha-l kes i-ta.
Inho-NOM study-FUT-DEC
'Inho will study.'
c. Pp: 인호가 공부했다.
Inho-ka kongpwuhay-ss-ta.
Inho-NOM study-PST-DEC
'Inho studied.'

The truth-conditions of the F and P operators are provided in (103). (103a) states that F(S) at t is true iff there is a time t' that follows t and S is true at t'. (103b) says that P(S) at t is true iff there is a time t' that precedes t and S is true at t.'

(103) a. $[[F\ S]]^{M,w,t,g} = 1$ iff. for some $t' \in T$ such that $t < t'$, $[[S]]^{M,w,t',g} = 1$
b. $[[P\ S]]^{M,w,t,g} = 1$ iff. for some $t' \in T$ such that $t' < t$, $[[S]]^{M,w,t',g} = 1$

Let us compute (98b), which is repeated in (104a), in the model in (101).

(104) a. 인호가 배고팠다.
Inho-ka paykophu-ass-ta.
Inho-NOM hungry-PST-DEC
'Inho was hungry.'
b. $[[\text{P Inho-ka paykophu-ta}]]^{M,w,t,g} = 1$ iff for some $t' \in T$ such that $t' < t$, $[[\text{Inho-ka paykophu-ta}]]^{M,w,t',g} = 1$ $[[\text{Inho-ka paykophu-ta}]]^{M,w,t',g} = 1$ iff Inho $\in [[\text{paykophu-ta}]]^{M,w,t',g} = 1$, which is the case.
Therefore, $[[\text{P Inho-ka paykophu-ta}]]^{M,w,t,g} = 1$

Tense logic based on **tense operators** and temporal instants, however, is not best suited to account for natural language tenses. First, the treatment of tense as a logical operator needs further examination. This point can be brought home by looking at sentences in which tense and other operators interact (we saw in the section on scope ambiguity that logical operators can interact with one another causing ambiguity). For example, (105a) below does not mean that in any past time, there was no event of turning off the stove, which is the negation wide-scope interpretation, represented in (105b). Nor does it mean that there was a time in the past that the speaker did not turn off the stove, which is the existential past tense wide-scope interpretation, given in (105c). It means that, at a particular time in the past which is contextually salient, the speaker failed to turn off the stove.

(105) a. 스토브를 안 껐다.
Stove-lul an kku-ess-ta.
stove-ACC NEG turn off-PST-DEC
'I didn't turn off the stove.' (Partee 1984)
b. ¬P(I turn off the stove)
c. P¬(I turn off the stove)

Let us look at another example.

(106) 인호가 어제 학교에 갔다.
Inho-ka ecey hakkyo-ey ka-ass-ta.
Inho-NOM yesterday school-LOC go-PST-DEC
'Inho went to school yesterday.'

Assuming that *ecey* 'yesterday' introduces an operator Y, neither PY(S) nor YP(S) correctly represent the truth condition of (106). Note that both make Inho going to school sometime before yesterday true: PYp is true if p is true at some time before yesterday, and YPp is true if p is true at a day earlier than some past time.

Second, evaluating sentences at instants of time is also problematic. Natural language tensed sentences often cannot be evaluated at moments. In (107a), 'Mina was sleeping' at t is true iff 'Mina' belongs to the extension at t

of 'asleep'. However, it is difficult to set up the model such that at the instant t 'Mina' and 'a letter' stand in the 'write' relation at t in (107b). Note that we are not justified in concluding from some letter-writing type of activity holding at a moment t the whole event of letter writing.[6]

[6] This is called the 'imperfective paradox' of the progressive, and has been extensively discussed in the literature (Dowty 1979, Landman 1992).

(107) a. 미나가 자고 있었다.
Mina-ka ca-ko iss-ess-ta.
Mina-NOM sleep-PRG-PST-DEC
'Mina was sleeping.'
b. 미나가 편지를 쓰고 있었다.
Mina-ka phyenci-lul ssu-ko iss-ess-ta.
Mina-NOM letter-ACC write-PRG-PST-DEC
'Mina was writing a letter.'

To remedy these shortcomings, semanticists have introduced **event semantics** for the interpretation of tensed sentences. Event semantics argues that verbs have an extra argument for events to represent the action of the verb, as in (108b) (Davidson 1976).

(108) a. Classic: λx[run(x)]
b. Davidsonian: λxλe[run(x)(e)]

So far, verbs denote relations of nominal arguments, i.e., a function from individuals to truth values. For example, *nolta* 'play' is a function that, when applied to an argument x, yields 1 if x plays. In (108) above, *talita* 'run' denotes a function from individuals to events, rather than a function from individuals to truth values.

Assuming an extra event argument e for action verbs, we no longer need to treat tense as a sentential operator.[7] Tense can be represented as a simple conjunction specifying the temporal relation between the described event and the utterance time n in (109). Adverbial modification can be treated as a simple conjunction as well, explaining why Inho went to school yesterday entails Inho went to school. We end up with an existentially quantified event, instead of a truth value for the denotation of a sentence. In other words, sentences no longer denote truth values but make statements about the existence of certain events.

[7] Besides tense, there is ample evidence to justify the use of event semantics in Korean (Kwak 1996). We observed that the plural suffix *-tul* not only pluralizes individuals but also events. In order to represent the meaning of *-tul* as an event pluralizer, we must modify the semantics of the VP to include atomic and plural events. In addition, what the internally headed relative clause refers to appears to be an event, rather than an individual. As we will observe, topic and focus markers as well as case markers can be attached to verbs in addition to nouns, restricting the interpretation of events, rather than individuals, in Korean.

(109) $\exists e[\text{go to school}(\text{Inho})(e) \wedge e \subseteq \text{yesterday} \wedge e < n]$[8]

[8] In (109), the verb takes an event argument as well as an individual argument. Alternatively, we can assume that the verb only takes an event argument and individual arguments are related to the event argument via the semantic roles they play (this is called **neo-Davidsonian event semantics**). The function that something has in a relationship expressed by a sentence is called **thematic roles**. In (i), Inho is the person doing the going. We use the term **agent** to indicate the individual that intentionally initiates some action.

(i) Inho went to school = $\exists e[\text{go to school}(e) \wedge \text{agent}(e) = \text{Inho} \wedge e < n]$

Other thematic roles include **patient**, which refers to an object that is affected by an action, and **theme**, which denotes someone who undergoes a change of state or has a certain property.

Now that we have become acquainted with general issues in temporal semantics, let us briefly discuss the specifics of the Korean temporal system. Tense is by no means an obligatory grammatical category. Languages can locate situations in time by recourse to other linguistic means such as mood, aspect and temporal adverbials (Bybee et al. 1994). Korean is not a tenseless language such as Mandarin or Burmese in that it has overt verbal suffixes *-ess* and *-nun/* zero for past and non-past distinction. There are two forms that are related to past time reference in Korean, namely, the simple past *-ess*, the double past *-essess*. We have seen a past tense sentence in (106) above. (110b) describes the use of the so-called double past marker *-essess*, which indicates that the result state of the described event no longer obtains at the speech time. Therefore, with a verb with some salient result state, there is a clear semantic difference between *-ess* and *-essess* (E.H. Lee 2007).

(110) a. 아기가 잠들었다.
Aki-ka camtul-ess-ta.
baby-NOM fall asleep-PST-DEC
'The baby fell asleep (and is still sleeping).'
b. 아기가 잠들었었다.
Aki-ka camtul-essess-ta.
baby-NOM fall asleep-D.PST-DEC
'The baby fell asleep (but is awake now).'

*-Ess* introduces a past tense rule, as in (111a), whereas *-essess* entails that the result state no longer obtains at the utterance time, as in (111b) (Lee 1987). In (111b), $e \supset\subset s$ means that the state s and the event e abut, i.e., s starts immediately after e ends. This holds when s is a resulting state of the event e. It specifies that the absence of such a state is temporally included in the utterance time n, ensuring that the result state no longer obtains at the speech time.

(111) a. ∃e[fall asleep(e, the baby) ∧ e < n]
b. ∃e∃s[fall asleep(e, the baby) ∧ e ⊃⊂ s ∧ ¬s ⊆ n]

The present (or non-past) time reference is indicated by the suffix *-(nu)n* or zero in Korean. Adjectives take zero while verbs take *-nun*.

(112) a. 미나는 영리하다.
Mina-nun yengliha-∅-ta.
Mina-TOP intelligent-PRS-DEC
'Mina is smart.'
b. 인호는 밥을 잘 먹는다.
Inho-nun pap-ul cal mek-nun-ta.
Inho-TOP rice-ACC well eat-PRS-DEC
'Inho eats cooked rice well.'

The suffix *-nun* can also indicate a future event, as in (103a).

(113) a. 미나가 내일 한국에 간다.
Mina-ka nayil hankwuk-ey ka-n-ta.
Mina-NOM tomorrow Korea-LOC go-PRS-DEC
'Mina goes (is going) to Korea tomorrow.'
b. ∃e[go to Korea'(e, Mina) ∧ e ⊇ n]

*-Nun/*zero is semantically represented in (114b) above. It means that the utterance time is included in the described eventuality, thus including the future meaning.

### *6.4.2.2 Aspect*

While tense locates a situation in time, **aspect** refers to the internal temporal constituency of an event (Comrie 1976, 1985). Aspect is further divided into **lexical aspect** and **grammatical aspect**. Verbs have inherent lexical aspect categories by virtue of their lexical meanings. The most basic lexical aspectual distinction is that between **events** and **states**. Among events, there are subcategories such as activities, accomplishments, and achievements, depending on whether the event described by the verb has a natural end point (called **telicity**) and whether durative or punctual (Vendler 1967). **Activities** in (114a) indicate events that do not have a natural end-point (called **atelic**). **Accomplishments**, as in (114b), describe durative events that have built-in goals or culmination (those verbs with a natural endpoint are called **telic**). **Achievements**, as in (114c), consist just of their culmination points; the phase leading up to the culmination point is not part of such an event. They are 'instantaneous' transitions in a semantic or conceptual sense.

(114) a. 인호가 달렸다.
Inho-ka tali-ess-ta. (ACTIVITY)
Inho-NOM run-PST-DEC
'Inho ran.'
b. 인호가 그 집을 지었다.
Inho-ka ku cip-ul cis-ess-ta. (ACCOMPLISHMENT)
Inho-NOM that house-ACC build-PST-DEC
'Inho built the house.'
c. 인호가 죽었다.
Inho-ka cwuk-ess-ta. (ACHIEVEMENT)
Inho-NOM die-PST-DEC
'Inho died.'

**States** as in (115), on the other hand, form a class of indefinitely extending states of affairs that involve no dynamics.

(115) 고래는 포유류에 속한다.
Kolay-nun phoyulyu-ey sokha-n-ta. (STATE)
whale-TOP mammal-LOC belong-PRS-DEC
'Whales belong to mammals.'

**Grammatical aspect**, on the other hand, is marked by aspectual morphemes or constructions such as progressives and perfectives, which are operators that change the aspectual property of the lexical predicate. Perfective versus imperfective is a fundamental grammatical aspectual contrast made in many languages. **Perfective** describes a situation as a total bounded whole, including the beginning point and the endpoint of the situation (Comrie 1976, Smith 1991). **Imperfective** describes a situation from within, disregarding its beginning or final point. Korean has many grammatical aspect constructions. Imperfective aspect is marked by the constructions *-ko iss* 'be ing', *-a/e ka* 'has started and in the process of completing', *-a/e o* 'has started in the past and has been doing', *-(n)un cwung* 'in the middle of doing', *-a/e iss* 'in the state of having done', *-a/e tay* 'doing repeatedly', and *-kon ha* 'doing something repeatedly in the past'. Perfective aspect is expressed by the forms *-a/e noh*, *-a/e twu*, 'have done and set aside', *-a/e nay* 'accomplish something difficult', *-a/e peli*, *-a/e chiwu* 'do away with', and *-ko mal* 'end up doing'. As we can see, these different constructions convey not only the truth functional meaning of an event continuing and completing, but also involve a variety of pragmatic and emotional meanings.

Let us examine the most frequently discussed form, the progressive form *-ko iss* (Choe 1971, K. Lee 1993, N. Kim 1986, H. Lee 1991, Martin 1992, E.H. Lee 2008). The progressive operator changes an event description *talita* 'run' to an on-going state description *tali-ko iss-ta* 'is running' in (116a). The truth condition of (116a) is given in (116b). It states that there is an event of

running in which Inho is the argument, and the utterance time n is included in the event time.[9]

[9] Semantics of the progressive is a complex issue that has been much discussed in the literature. It is commonly assumed that it creates an intensional context, like tense and modals. For example, it is claimed that the progressive operator PROG quantifies over possible worlds in which future events follow the course of development most compatible with the past course of events, called inertia world (Dowty 1979, Landman 1992). However, in sentences such as 'John was hit by a truck when he was crossing the street', if the truck is seconds away from John, it will hit him in all inertia worlds, making the progressive sentence false. This is against our intuition and calls for a different approach than postulating inertia worlds. Here we use event semantics to avoid problems with intensional analyses of the progressive.

(116) a. 인호가 달리고 있다.
Inho-ka talli-ko iss-ta.
Inho-NOM run-PRG-DEC
'Inho is running.'
b. ∃e[run(e, Inho) ∧ n ⊆ τ(e)] (τ is a temporal measure function of an event, i.e., an event's running time)

One of the diagnostics to determine whether a predicate is a state or an event is the progressive form. If a predicate can occur in the progressive form, then it denotes an event; if not, it denotes a state. One interesting thing about Korean lexical aspect is that, unlike its English counterpart, emotive and cognitive verbs such as *salangha-ta* 'to love' and *al-ta* 'to know' are most naturally categorized as events rather than states. (117) shows that *al-ta* 'to know' combines with the progressive form *-ko iss*.

(117) 인호가 그 사실을 알고 있다.
Inho-ka ku sasil-ul al-ko iss-ta.
Inho-NOM the fact-ACC know-PRG-DEC
'*Inho is knowing the fact.'

Therefore, languages differ in terms of lexical aspect categorization of verbs. This is interesting because it shows a divergence between conceptual domain and linguistic domain. Although one would think that *know* or *love* are conceptually stative, Korean encodes them as eventive (E.H. Lee 2006).

### 6.4.3 Modality

**Modality** specifies the speaker's attitude (degree of certainty) towards a proposition (Kratzer 1977, 1991). Like tense, modals create intensional contexts, where knowing the denotation is not sufficient to know their truth conditions.

For example, to evaluate 'Inho may/must pass the test', knowing the truth of 'Inho passes the test' is not sufficient. It might be that Inho has never passed the test or never will. But the speaker perceives it as quite possible or even necessary. We have employed **possible worlds semantics** to evaluate and represent modal sentences. As we have observed, possible worlds are every possible assignment to constants, describing all non-actual, alternative situations. In a possible world semantics, a predicate such as *paykophuta* 'is hungry' is a function from possible worlds to a set of individuals; we call this a **property**. The denotation of *paykophuta* 'is hungry', therefore, can vary from one world (possibility, situation) to another. If it happens to be the case that Inho in fact is not hungry, the denotaiton of *be hungry* does not contain Inho in the actual world (let's say $w_0$), but it does include him in the worlds that are compatible with what the speaker of (99) above, which is repeated in (118), presumes.

(118) 인호가 배고플 수 있다.
Inho-ka paykophu-ul swu iss-ta.
Inho-NOM hungry-MOD-DEC
'It is possible for Inho to be hungry.'

In this way, possible worlds semantics enables us to provide a truth condition for sentences such as (119). A sentence denotes a function from possible worlds to truth values, which we call **propositions**. Therefore, a sentence refers to a set of worlds in which the sentence is true. We use the symbol ^ for intension, which not only depends on the way the world is currently, but also depends on all the possibilities that the world might have been.

(119) If ϕ is a sentence, ^ϕ is a proposition, i.e., $[[^\phi]] = \{w: [[\phi]] = 1\}$

In **modal logic**, the **necessity operator** □ and the **possibility operator** ◊ are prefixed to a proposition. □p means it is necessarily the case that p, and ◊p means it is possibly the case that p. The former universally quantifies over all the possible worlds (scenarios) compatible with the speaker's assumptions, while the latter existentially quantifies over the possible worlds.

(120) a. $[[\Box\ \phi]]^{M,w,t,g} = 1$ iff for all $w' \in W$ and all $t' \in T$, $[[\phi]]^{M,w',t',g} = 1$
b. $[[\Diamond\ \phi]]^{M,w,t,g} = 1$ iff there exists $w' \in W$ and $t' \in T$, $[[\phi]]^{M,w',t',g} = 1$

Let us compute (118) in the model given in (119) above.

(121) $[[\Diamond$(Inho-ka paykophu-ta)$]]^{M,w,t,g} = 1$ iff there exists $w' \in W$ and $t' \in T$,
$[[$Inho-ka paykophu-ta$]]^{M,w',t',g} = 1$
$[[$Inho-ka paykophu-ta$]]^{M,w',t',g} = 1$ iff Inho $\in$ [[be hungry]] = 1 at some $w'$ and some $i'$, which is the case at $\langle w_1, t_1\rangle$, $\langle w_1, t_2\rangle$, and $\langle w_2, t_2\rangle$.
Therefore, $[[\Diamond$(Inho-ka paykophu-ta)$]]^{M,w,t,g} = 1$

Natural language modals are more varied and require more than a simple universal or existential quantification over all possible circumstances. Modalized sentences are often interpreted against a particular conversational background. A basic distinction among subtypes of modality is that between situational or **circumstantial** (also called **root**) **modality** and **epistemic modality**. Situational possibility and necessity arise from the current conditions, which can be either general circumstances of the situation or a permission or obligation that is imposed. The latter is called **deontic modality**. English employs the same auxiliary verbs *must* and *can* for both epistemic and circumstantial modality.

(122) a. John can be the criminal.
b. You can leave now.

(123) a. The ancestors of the Maoris must have arrived from Tahiti.
b. All Maori children must learn the names of their ancestors.
(Kratzer 1977:338, 2012:4)

The 'can' in (122a) meaning 'possible in view of the available evidence' and the 'must' in (123a) meaning 'necessary in view of what is known' encode epistemic modality, which relates to our knowledge of the worlds where what we know is true. The 'can' in (122b) meaning 'possible in view of what you are permitted to do' and the 'must' in (123b) meaning 'necessary in view of what their tribal duties are' encode circumstantial modality, which has to do with the relevant circumstances.

Modal constructions express various forms of necessity and possibility in Korean. First, situational (circumstantial, root) possibility is expressed by the internally headed relative clause *-(u)l swu iss*, in which the adnominal suffix with future meaning *-ul* and a bound noun *swu* 'means; possibility' occurs with the copula (or existential verb) *-iss* 'be; exist; have', as in (124) (Nauze 2008).

(124) 인호는 수영을 할 수 있다.
Inho-nun swuyeng-ul ha-l swu iss-ta.
Inho-TOP swimming-ACC do-MOD-DEC
'Inho can swim.'

This construction can also express epistemic possibility (Wymann 1996, Ammann and Auwera 2002), as in (125).

(125) 인호가 시험에 떨어질 수(도) 있다.
Inho-ka sihem-ey tteleci-l swu(-to) iss-ta.
Inho-NOM exam-LOC fail-MOD-DEC
'It is possible that Inho will fail the test'.

Deontic possibility (permission) is expressed by concessive/additive particle *-to* 'also; even' followed by the verb *toy-* 'become'.

(126) 너는 가도 된다.
Ne-nun ka-to toy-n-ta.
you-TOP go-MOD-PRS-DEC
'You may go.'

Situational necessity is expressed by *-a/eya ha-ta*.

(127) 미나는 학교에 가야 한다.
Mina-nun hakkyo-ey ka-ya ha-n-ta.
Mina-TOP school-LOC go-MOD-PRS-DEC
'Mina must go to school.'

Unlike circumstantial modality, epistemic modality is concerned with the judgment of the speaker as to the likelihood of a situation to be realized. Korean uses the construction *-(u)l kes kath* for epistemic possibility.

(128) 비가 올 것 같다.
Pi-ka o-l kes kath-ta.
rain-NOM come-MOD-DEC
'It may rain.'

Epistemic necessity is expressed by either a periphrastic form *-(u)l kes i* or a verbal suffix *-keyss*.

(129) 미나가 피곤할 것이다/피곤하겠다.
Mina-ka phikonha-l kes i/keyss-ta.
Mina-NOM be tired-MOD-DEC
'Mina must be tired.'

The table below presents central modal constructions of Korean (Ammann and Auwera, 2002:110)

**Table 6.8** Central modal constructions of Korean

| | *Situational* | *Epistemic* |
|---|---|---|
| Possibility | 을 수 있다 *-ul swu iss-ta*,<br>면 되다 *-myen toy-ta* | 을 수 있다 *-ul swu iss-ta*,<br>것 같다 *kes kath-ta* |
| Necessity | 어야 하다 *-e/a-ya ha-ta*,<br>지 않으면 안 된다<br>*-ci anh-umyen an toy-ta* | 것이다 *kes i-ta*,<br>겠다 *-keyss-* |

Kratzer's (1977) theory of modality is treated as classic or standard within formal semantics. She points out that the interpretation of a modal depends on context and it can be fixed linguistically. For example, (120) above, which is repeated in (130), can be paraphrased as follows: the 'in view of' phrase in (131a) gives an epistemic reading of (130a), whereas the 'in view of' phrase in (130b) makes it explicit that *must* has a deontic reading of (131b).

(130) a. The ancestors of the Maoris must have arrived from Tahiti.
b. All Maori children must learn the names of their ancestors.

(131) a. *In view of what is known*, the ancestors of the Maoris must have arrived from Tahiti.
b. *In view of what their tribal duties are*, the Maori children must learn the names of their ancestors.

The 'in view of' phrase denotes a function f from possible worlds to sets of propositions: for any world w, f(w) = the set of propositions which the speaker knows in w for epistemic modal, as in (132). For circumstantial (root) modals, f(w) will generate a set of propositions that are true and relevant for the described situation. By simply adjusting the modal base, then, we can account for the context-dependency of modal expressions.

(132) f(w) = {p, q, r, . . .} where p, q, r are propositions that the speaker knows to be true.

A proposition p is a set of possible worlds in which p is true. Since f(w) is a set of propositions, it is a set of sets of worlds, as represented in (133a) below. We can turn this set of propositions into a set of worlds (i.e., into a single proposition) by intersecting all of the propositions in the set. $\cap$f(w) then becomes the set of worlds in which all of the propositions in f(w) are true, as in (133b). Here, let us assume that the proposition p is true in $w_1$ and $w_2$, q is true in $w_1$, $w_2$, and $w_3$, etc. This is called the *modal base*, and serves as the conversational background.

(133) a. $f(w) = \{\{w_1, w_2\}, \{w_1, w_2, w_3\}, \{w_1, w_2, w_4\}\}$
b. $\cap f(w) = \{w_1, w_2\}$

Once the modal base is determined, *-ul swu iss-ta* 'can' and 'might' express consistency with the given modal base and *-a/eya ha-ta* 'must' states that something is a logical consequence of a given modal base.

(134) a. $[[\text{must } \phi]]^{M,w,t,g} = 1$ iff $\cap f(w) \subseteq \{w' : [[\phi]]^{M,w,t,g} = 1\}$
b. $[[\text{can } \phi]]^{M,w,t,g} = [[\text{might } \phi]]^{M,w,c,g} = 1$ iff $\cap f(w) \cap \{w' : [[\phi]]^{M,w,t,g} = 1\} \neq \varnothing$

### 6.4.4 Reported Speech and Belief Contexts

Like modals, whether (135) is true or not does not depend on the truth of the embedded clause. Inho might believe that Mina left whether in fact she did or not. Belief reports also create an intensional context.

(135) 인호는 미나가 떠났다고 말했다/믿었다.
Inho-nun Mina-ka ttena-ass-ta-ko malhay/mit-ess-ta.
Inho-TOP Mina-NOM leave-PST-DEC-COMP say/believe-PST-DEC
'Inho said/believed that Mina left.'

In order to semantically represent belief reports such as (135), we employ possible worlds semantics, as we did with modals. The denotation of *ttena-ta* 'leave' does not contain Mina in the actual world $w_0$, but it does include her in all the worlds that are compatible with what Inho believes (Inho's belief world $w_1$). Embedded clauses are analyzed as propositions, and *malha-ta* 'say' and *mit-ta* 'believe' is a relation between an individual and propositions such that the individual believes him/herself to be in the worlds in which the embedded sentence is true.

(136) a. If ϕ is a sentence, ^ϕ is a proposition, i.e., $[[^\phi]] = \{w: [[\phi]] = 1\}$
b. $[[\text{believe [Inho, } ^\text{left(Mina)] }]]^{M,w,t,g} = 1$ iff
$\langle \text{Inho}, [[^\text{left(Mina)}]]^{M,w,t,g} \rangle \in [[\text{believe}]]^{M,w,t,g}$

## 6.5 CONTEXT

### 6.5.1 Indexicals and Demonstrative Pronouns

#### *6.5.1.1 Indexicals*

The interpretation of (137b), unlike that of (137a), depends on who produced the sentence. If Inho uttered the sentence in (135b), the two sentences denote exactly the same proposition. If somebody else said (137b), it will express a different proposition than (137a). The truth of (137b) not only depends on which individuals are tired in circumstances $\langle w, i \rangle$, but on the extralinguistic **context** in which it is uttered. The first person pronoun *na* 'I' in (137b) refers to **the speaker**, whoever it is at the time of speech.

(137) a. 인호는 피곤하다.
Inho-nun phikonha-ta.
Inho-TOP tired-DEC
'Inho is tired.'
b. 나는 피곤하다.
Na-nun phikonha-ta.
I-TOP tired-DEC
'I am tired.'

The expressions whose denotations are determined by context of utterance are called **indexicals**. Indexical expressions include *na/ce* 'I', *ne/tangsin* 'you', *i kes* 'this (thing)', *ce kes* 'that (thing) over there', *ku kes* 'that (thing)', *yeki* 'here', *cikum* 'now', among others. *Ne* 'you' refers to the addressee, demonstrative pronouns such as *i kes* 'this (thing)', *ce kes* 'that (thing) over there', and *ku kes* 'that (thing)' refer to objects in the speech situation, *yeki* 'here' refers to the location of the speech, and *cikum* 'now' refers to the time of speech. Therefore, it is essential for the interpretation of indexicals to have information about the speech situation, rather than simply what the world is like, the latter of which only provides information about the denotation of constants. In other words, there is a fundamental semantic difference between indexical expressions and other expressions. For example, the interpretation of a proper name such as *Mina*, a common noun such as *sakwa* 'apple' or a verb such as *talita* 'run' depend on the way the world is. Unlike indexicals, they do not change from one speech context to another. For example, *sakwa* 'apple' denotes a set of apples regardless of who is speaking, when and where. On the other hand, *i sakwa* 'this apple' refers to a specific apple that is visible and close to the speaker in the speech context. Therefore, its denotation will change from one speech situation to another.

One obvious way to include indexicals in our semantics is to treat contextual factors as an additional coordinate relative to which truth conditions can be given. This is called the **multiple coordinate approach** to indexicality (Lewis 1979). There is no barrier in principle to continuing to add coordinates, so let us add the set of speakers S to our model, as in (138a). Then (138b) follows.

(138) a. $M = \langle D, F, W, I, <, S \rangle$ where $S \subseteq D$ is a set of speakers
b. $[[I]]^{M,w,t,s,g} = [[\text{the speaker}]]^{M,w,t,s,g}$

However, if (139b) holds, replacing 'I' with 'the speaker' should not result in a change in meaning. This is not the case, as we observe in (139). (139a) sounds fine, whereas (139b) is contradictory (Chierchia and McConell-Ginet 2000:271).

(139) a. If I were not the speaker, Joan would be speaking.
b. If the speaker were not the speaker, Joan would be speaking.

An alternative approach to indexicality is a two-stage interpretation (Stalnaker 1974, Kaplan 1977). In this approach, interpretation proceeds in two separate stages. First, we fix the denotation of indexicals as a function from speech contexts to circumstances (world–time pairs). Second, the denotation of an expression is then as usual determined as a function from circumstances to sets of individuals, truth values, etc. Once we figure out who the speaker and the addressee are, etc., we will end up with a sentence without indexicals; if John is speaking at 1 o'clock, for instance, I am hungry would mean John is hungry at 1 o'clock. Then we can proceed with checking whether John is in the

set of hungry individuals at 1 o'clock. If he is, then the sentence is true; if not, it is false.[10]

[10] Kaplan provided such a two-step interpretation procedure for indexicals and called the function from context to content a **character** of an expression.

### 6.5.1.2 Demonstrative Pronouns

Korean has a three-way distinction of demonstrative pronouns: proximal *i* 'this', distal *ce* 'that over there' and medial *ku* 'that'.[11] Among these three, *i* 'this' and *ce* 'that over there' are used only indexically, and *ku* 'that' is ambiguous between an indexical use and an **anaphoric** use. When we discussed quantification, we introduced a variable assignment function g. A variable is not a particular individual, but a sort of place holder whose meaning is determined either by an operator that binds the variable, or by another NP (called an **antecedent**) that is **coreferential** with it, i.e., they refer to the same entity. In (140), *Inho* is the antecedent for the anaphoric pronoun *ku*, which refers back to Inho.

[11] In Korean, overt pronouns are scarcely used in spoken discourse. For example, third person pronouns *ku* 'he' or *kunye* 'she', almost never occur in conversation but only appear in written genres. Instead, a demonstrative plus a bound noun (e.g. *ku-ay* 'that kid,' *ke-ki* 'there', *ke-kes* 'that thing'), which is called an epithet or a quasi-pronoun, is used more frequently in conversation (Oh 2010).

(140) 인호가 그의 형을 만났다.
Inho$_1$-ka ku$_1$-uy hyeng-ul manna-ss-ta.
Inho-NOM he-GEN brother-ACC meet-PST-DEC
'Inho met his older brother.'

To distinguish variables from other individuals, we call predicates such as 'apple' or 'run' **constants**. Variables come in two different kinds. A **bound variable** is bound by an operator such as a quantifier or an antecedent. *Ku* in (140) above is a bound variable. A **free variable**, on the other hand, gets its denotation from the speech context, as exemplified by the indexical use of *ku* in (141).

(141) 그가 왔다.
Ku$_1$-ka o-ass-ta.
he-NOM come-PST-DEC
'He (pointing at Inho) came.'

By assuming that the variable assignment function g comes with an initial specification reflecting the denotation of free variables, we can effectively capture the distinction between bound and free variables. For example, as in the following model in (142), if $g(x_1)$ = Inho, then the discourse-initial sentence in

(141) above will always mean Inho came. In (142), $w_0$ and $t_0$ indicate the actual world and time, respectively.

(142) M = {D, F, W, T, C, <} where
  a. D = {Inho, Mina, Hun}
  b. F(came)($w_0$, $t_0$) = {Inho, Mina}
  c. g is a variable assignment function where g($x_1$) = Inho and g($x_2$) = Mina

In this model, (144) above turns out to be TRUE.

(143) $[[\text{Ku-ka oassta}]]^{M,w,t,c,g} = 1$ iff $g(\text{he}_1) \in [[\text{came}]]^{M,w,t,c,g}$, which is the case.

So far, we have the domain of individuals D, a function that assigns denotations to constants, and variable assignment function g. We now add the contextual coordinate C to our model, as we see in (143) above. The specifics of C are given below (Chierchia and McConell-Ginet 2000).

(144) C = {sp, adr, loc, demloc, time} where
  a. A speaker function sp maps each context c onto sp(c) ∈ D, the speaker in c
  b. An addressee function adr maps c onto adr(c) ∈ D, the addressee in c
  c. A $\text{loc}_n$ function (to interpret *yeki* 'here') can map c onto $\text{loc}_n$(c), the $n^{th}$ location of c
  d. A $\text{demloc}_n$ function (to interpret *ceki* 'over there' and *keki* 'there') can map c onto $\text{demloc}_n$(c), the $n^{th}$ demonstrated location of c
  e. A time function maps c onto time(c) to interpret *cikum* 'now'

*Ku* is also used as a definite determiner. Before we leave this section, let us briefly discuss the meaning of definite NPs. We have observed that the existentially quantified NP *etten haksayng* 'some student' is **indefinite** in that it does not matter which student satisfies the predicate but any random student will do. *Ku haksayng* 'the student', on the other hand, is a **definite** NP, referring to individuals who not only exist and have the property described by the VP, but also are uniquely identifiable. Definite NPs, in addition to the existential condition, are subject to an additional uniqueness condition. (145) says if x is a student and y is a student, x equals y, guaranteeing that there is only one (unique) student in our domain. We treat definite NPs basically the same as other quantified NPs. It is similar to an existential quantifier; the only difference is that the uniqueness condition is added to the existential condition.[12]

[12] This is the traditional Russellian treatment of definite descriptions. More recently, Heim (1983, 1992) advocated the 'familiarity' theory of definites. She argues that definite NPs need not be unique, but only require to be familiar to the discourse participants.

(145) 그 학생 ku haksayng 'the student' = λP∃x[student(x) ∧ ∀y[student(y) → y = x] ∧ P(x)]

For the sake of completeness, let us see how *ku haksayng* 'the student' combines with a VP to form a sentence. The intransitive verb *oassta* 'came' is an argument of the definite NP *ku haksayng* 'the student'. When applied to the subject NP function, the lambda operator is deleted, as the verb replaces the predicate variable P.

(146) a. 그 학생이 왔다.
Ku haksayng-i o-ass-ta.
the student-NOM come-PST-DEC
'The student came.'
b. λP∃x[student(x) ∧ P(x) ∧ ∀y[student(y) → y = x]](came)
= ∃x[student(x) ∧ came(x) ∧ ∀y[student(y) → y = x]]

## 6.5.2 Speech Acts and Illocutionary Force

By speaking, we perform certain actions. There are three kinds of such actions that generate different kinds of sentential forces (Austin 1962). The **locutionary force** refers to what is said, the denotational meaning of a sentence. We will call it 'content'. Content is contrasted with context, which we have just discussed in some detail, as well as illocutionary force. The **illocutionary force** is force that is conventionally associated with the locutionary act. It is conventional because such a force is often triggered by sentence forms. For example, declarative, interrogative, and imperative sentence forces are *stating that*, *ask whether*, and *telling to*, respectively. Finally, **perlocutionary force** is what we accomplish by saying, e.g., convincing, persuading, threatening, requesting, etc.

Korean, in addition to the more common speech act categories of declaratives and interrogatives, has a distinct sentential form for sentences used for expressing a promise, a command, and a suggestion, as in (147). These are realized as sentence final particles, *-ma* for promisive, *-la* for imperative, and *-ca* for exhortative.[13]

[13] The promissive *-ma* is a somewhat antiquated form.

(147) a. 내일 떠나마.
Nayil ttena-ma. (PROMISSIVE)
tomorrow leave-PRM
'I will leave tomorrow.'
b. 지금 떠나라.
Cikum ttena-la. (IMPERATIVE)
now leave-IMP
'Leave now!'

c. 지금 떠나자.
Cikum ttena-ca. (EXHORTATIVE)
now leave-EXH
'Let's leave now.'

This is the same grammatical mechanism used to mark clause types that are universal, declaratives and interrogatives.

(148) a. 어제 떠났다.
Ecey ttena-ass-ta (DECLARATIVE)
yesterday leave-PST-DEC
'I left yesterday.'
b. 어제 떠났니?
Ecey ttena-ass-ni? (INTERROGATIVE)
yesterday leave-PST-QUE
'Did you leave yesterday?'

Promissives, imperatives and exhortatives form a single category called **jussives** because these three share a number of properties (Pak et al. 2008). For example, they are alike in not allowing tense markers.

(149) a. PROMISSIVE
*Ttena-ass/-ul/-nun-u-ma.
leave-PST/FUT/PRS-PRM
b. IMPERATIVE
*Ttena-ass/-ul/-nun-la.
leave-PST/FUT/PRS-IMP
c. EXHORTATIVE
*Ttena-ass-/ul/-nun-ca.
leave-PST/FUT/PRS-EXH

Declaratives and interrogatives, on the other hand, allow tense markers.

(150) a. DECLARATIVE
Ttena-ass/-(u)l kes i/-(nu)n-ta.
leave-PST/FUT/PRS-DEC
'I left.' 'I will leave.' 'I am leaving.'
b. INTERROGATIVE
Ttena-ass/-(u)l kes i/-(nu)n-ni?
leave-PST/FUT/PRS-QUE
'Did you leave?' 'Will you leave?' 'Are you leaving?'

How can we semantically analyze these different speech act types and the forces that accompany them? We have already stated that declaratives denote a proposition. The illocutionary force of declarative sentences is **assertion**. In

order to understand what assertion does, let us introduce the notion of **common ground**. Common ground (CG) or discourse context is the set of propositions that are assumed to be true by both speaker and hearer (Stalnaker 1978).

(151) CG(c) = {p, q, r, . . .} in which for all p ∈ CG(c), sp(c) and adr(c) believe p ∈ CG(c)

Assertion can be modeled as a context-changing function, which adds a new proposition [[S]] to CG to yield an updated CG (Stalnaker 1974, 1978, Heim 1983). In such a view, the denotation of a sentence is no longer its truth value but its **context change potential**. How does such a function work? Just as we did with modals, we can intersect all of the propositions in CG to come up with a single proposition, that is, a set of possible worlds in which all the assumed propositions are true. We will call it a **context set** and represent it as c* (Stalnaker 1987). Let us assume, for example, that two propositions, p and q, are in CG. Since propositions refer to a set of possible worlds in which those propositions are true, CG is a set of sets of possible worlds. Let us assume that p is true in $w_1$, $w_2$, and q is true in $w_1$, $w_2$, $w_3$, $w_4$. Then we end up with a set of worlds {$w_1$, $w_2$} in our context set.

(152) $c^* = \cap CG(c) = \cap\{p, q\} = \cap\{\{w_1, w_2\}, \{w_1, w_2, w_3, w_4\}\} = \{w_1, w_2\}$

As we add more sentences to the existing context set, the latter is bound to shrink because we keep eliminating those worlds in which the new proposition is not true by intersecting the new proposition with others that are in CG. This way of looking at meaning is very different than what we have observed so far. It is useful to model presuppositions and other context-dependent phenomena.

Let us move on to sentential force created by interrogatives. We assume that interrogatives denote possible answers to a question, i.e., sets of propositions (Hamblin 1973). For example, the meaning of (153) is something like {^Inho came, ^Mina came, ^Hun came}.

(153) 누가 왔니?
Nwu-ka o-ass-ni?
who-NOM come-PST-QUE
'Who came?'

Just as assertions are associated with context set, interrogatives can be analyzed using the parallel notion of **question set** (Roberts 2012). Since a question denotes a set of propositions (possible answers), the question set is a set of sets of propositions. The questions in the question set are those that the participants in conversation mutually agree to try to answer; they represent issues which the conversation will resolve.

Let us now discuss jussives. Unlike statements and interrogatives, jussive sentences seem to denote properties rather than propositions. This is supported

by the fact that jussive sentences do not allow tense markers, as we saw in (150) above. The illocutionary force of imperatives is requiring and it adds the required property to the addressee's so-called **To Do List** (Portner 2005, Pak et al. 2008, Zannutini et al. 2012). We assume that To Do List (TDL) function is a function that takes a property and updates the TDL with a new set of properties. TDL is associated with certain discourse participants. $TDL_{adr(c)}$ is a function from the addressee of the context to his/her TDL.

(154) $[[\text{ttena-la}]]^{M,w,t,c,g} = 1$ iff $[[\text{leave}]]^{M,w,t,c,g} \in TDL_{adr(c)}$

For promissives, the property is added to the speaker's To Do List, and exhortatives add the described property to the speaker and hearer's mutual To Do List.

(155) a. $[[\text{ttena-ma}]]^{M,w,t,c,g} = 1$ iff $[[\text{leave}]]^{M,w,t,c,g} \in TDL_{sp(c)}$
b. $[[\text{ttena-ca}]]^{M,w,t,c,g} = 1$ iff $[[\text{leave}]]^{M,w,t,c,g} \in TDL_{adr(c)\&sp(c)}$

The table below nicely summarizes the different sentential forces of different speech act categories (Portner 2005).

**Table 6.9** Sentential forces of different speech act categories

| *Sentence type* | *denotation* | *Discourse component* | *force* |
|---|---|---|---|
| Declarative | Proposition (p) | Common Ground<br>Set of propositions | Asserting<br>CG ∪ {p} |
| Interrogative | Set of propositions (q) | Question Set<br>Set of sets of propositions | Asking<br>QS ∪ {q} |
| Imperative | Property (P) | To Do List function<br>Function from individuals to set of properties | $\text{Requiring}_A$<br>TDL(A) ∪ {P} |
| Promissive | Property (P) | To Do List function | $\text{Promising}_S$<br>TDL(S) ∪ {P} |
| Exhortative | Property (P) | To Do List function | $\text{Suggesting}_{SA}$<br>TDL(S&A) ∪ {P} |

## 6.5.3 Addressee Honorification and Speech Styles

Honorification in Korean is divided into two dimensions, namely subject honorifics and addressee honorifics. (156a) has counterparts with an honorific subject as in (156b) and politeness to the addressee as in (156c).

(156) a. 그 사람이 떠났다.
Ku salam-i ttena-ass-ta.
that person-NOM leave-PST-DEC
'That person left.'

b. 그 분이 떠나셨다.
Ku pwun-i ttena-si-ess-ta.
that person(HON)-NOM leave-HON-PST-DEC
'That (honorable) person left.'

c. 그 사람이 떠났습니다.
Ku salam-i ttena-ass-supnita.
that person-NOM leave-PST-POL
'That person left.' (talking to an honorable addressee)

We have discussed the honorification of an argument in the sentence such as the subject in the Syntax chapter. In (156b) this information is encoded by the suppletive honorific noun *pwun* 'classifier for honorable person' and the suffix *-(u)si*, which recognizes that the subject has some social superiority in the speech context. In this section, we will discuss the addressee honorific or politeness to the addressee, which is closely related to speech acts and **performatives**.

Korean has four different speech levels: plain *-ta*, impolite *-e/a*, polite *-e/ayo*, and formal/deferential *-supnita*. Each level has different forms for various speech acts we discussed in the previous section. We have observed this for plain style ending *ta/ni/la/ca*. (157) shows this for deferential sentence endings.

(157) a. 떠났습니다.
Ttena-ass-supnita.
leave-PST-POL/DEC
'I left.'

b. 떠났습니까?
Ttena-ass-supnikka?
leave-PST-POL/QUE
'Did you leave?'

c. 떠나십시오.
Ttena-si-ipsiyo.
leave-PST-POL/IMP
'Please leave.'

d. 떠나십시다.
Ttena-si-ipsita.
leave-PST-POL/EXH
'Let us leave.'

Honorific meaning is information about context, in particular, the social setting of an utterance (Kim and Sells 2007). We assume a contextual parameter for honorification, CHON, in addition to the usual contextual parameters of speaker, hearer, location, etc. (Potts and Kawahara 2004). Every context requires a specification of at least speaker, hearer, location, and time of utterance. We need an extra requirement, to the effect that contexts are only well-defined if they have the requisite honorification information.

(158) A context is admissible only if $C_{HON}$ contains exactly one triple aRb, where a is the speaker and b is the addressee or a salient individual in the discourse, and R is a numerical relation ranging from –1 to 1 encoding the social hierarchy between a and b. For example, if $C_{HON}$ contains a[0.5, 1]b, this represents a situation where the speaker a honors b to a significant degree (Potts 2006, Kim and Sells 2007).

## 6.6 INFORMATION STRUCTURE

In the previous section, we discussed an aspect of meaning that does not entirely fall in the domain of truth conditional and denotational meaning. We have observed that many natural language expressions require the knowledge of the extralinguistic environment in which an utterance is produced. Despite this, our formal semantic tools were able to formalize and explain such phenomena by introducing new functional concepts (e.g., TDL function, question and context set, etc.) and by viewing the meaning of a sentence as its context change potential, rather than its truth value. In this last section, we will explore another dimension of meaning apart from truth conditional semantics. If you believe that how something is said is as important as what is said, the way in which information is structured will definitely have to be discussed in mainstream semantics. We language users do not structure all information in the same way, but foreground more important or new information over backgrounded information. Distinguishing new information from old information also helps ease processing. Each language employs different means to achieve this. English uses prosody, whereas Korean uses morphology and syntax. Information structure is a very important part of Korean. It is often stated that the topic–comment structure, marked by the post nominal topic marker *-nun* is the fundamental sentence structure in Korean (C. Lee 2007). Korean also has many particles for focus such as *-man* 'only' and *-to* 'also/even'.

### 6.6.1 Topic Marker *-Nun* and Topic-Comment Structure

Korean is frequently cited as a language that overtly marks topic morphologically through the post-nominal topic marker *-nun*. The topic–comment dichotomy, which is thought to be a fundamental part of sentence structure in Korean, divides information into that which is already established (what the rest of the sentence is about) and that which adds something new to the denotation of topic.

Topic-hood is defined in terms of several semantic characteristics. First, topics must be definite. Due to this definiteness requirement, in a discourse-initial sentence, an indefinite NP cannot be marked with the topic marker *-nun*, as shown in (159).

(159) 옛날에 어떤 마을에 한 할머니가/*는 살았다.
Yeysnaley etten maul-ey han halmeni-ka/*nun sal-ass-ta.
old times some village-LOC one old woman-NOM/*TOP live-PST-DEC
'Once upon a time, in a village, there lived an old woman.'

Second, not only is a topic definite but it is also exhaustive, i.e., there is only one individual (or a group of individuals) marked as the topic in the domain of discourse. Therefore, if a quantificational NP is marked with *-nun*, it usually has

a contrastive reading, as in (160a). It presupposes a set of children and asserts that three members of the set went to school. A quantificational NP can have a topic reading when it is definite and exhaustive, as in (160b). In this sentence, we are talking about a contextually salient three children.

(160) a. 세 아이는 학교에 갔다.
Sey ai-nun hakkyo-ey ka-ass-ta. (Contrastive only)
three child-TOP school-LOC go-PST-DEC
'Three (out of ten) children went to school.' (and the rest didn't.)
b. 그 세 아이는 학교에 갔다.
Ku sey ai-nun hakkyo-ey ka-ass-ta. (Topic)
the three child-TOP school-LOC go-PST-DEC
'The three children went to school.'

One way to formally represent topic is to treat *-nun* as an operator TOP(ic) that binds the topicalized entity. When we discussed quantification, the common noun part after a quantifier served as a restriction on quantification. For example, in 'every student sleeps', the quantification must be performed in the restricted domain of a set of students, rather than the entire domain. Likewise, whatever is predicated, it must be about the topicalized entity in the domain but about nothing else. In other words, TOP operator restricts what kind of topic is under discussion, and the rest of the sentence has to be about this topic (Han 1998). (161b) represents this.

(161) a. 인호는 미나를 좋아한다.
[$_S$ Inho-nun [$_{VP}$ Mina-lul cohaha-n-ta.]]
Inho-TOP Mina-ACC like-PRS-DEC
'As for Inho, he likes Mina.'
b. TOPx[x = Inho][x likes Mina]

Sentence-initial *-nun* marks the topic, as in (161a) above, whereas sentence medial *-nun* invariably marks contrastive topic, as in (162a). (162a) triggers an implication that there are people other than Mina in the domain and Inho does not like them. Is *-nun* ambiguous between topic and contrastive topic? In fact, one meaning is derived from the other depending on the syntactic position (Kuroda 2005, K. Kim 1990, Han 1998). If a *nun*-marked NP is inside the VP, then it marks a contrastive topic; if it is outside the VP, it marks a topic. Let us assume a mapping between the syntactic position and informational status. As we see in (162b), the topic part in the brackets between the operator TOPx and the content of the sentence represents old information, because topics are definite and refer to what is already established (i.e., what the rest of the sentence is about). What follows the restriction is new information. When a *nun*-marked NP is inside the VP, it has to provide new information. It presupposes a set of alternatives in the topic entities and picks out a member from the set,

triggering an implication that the negation holds for the other members of the set. As far as the presupposed set is concerned, Contrastive Topic is part of old information; which member among the presupposed set is discussed, however, is new, thus marking CT as new information.

(162) a. 인호가 미나는 좋아한다.
[$_{IP}$Inho-ka [$_{VP}$Mina-nun [$_{V}$ cohahanta.]]]
Inho-NOM Mina-TOP like-PRS-DEC
'Inho likes Mina (but not the others.)'
b. TOPx[ ∃X[x ∈ X]][x = Mina & like(Inho, x)]
Implicature: ∀y[(y ∈ X & y ≠ Mina) → ¬like(Inho, x)]

The topic marker *-nun* can appear on verbs, which is often called predicate cleft construction. In such a case, it invariably triggers a contrastive reading. (163) implies that Inho read the book but he did not go beyond that, e.g., he did not understand it.

(163) 인호가 그 책을 읽기는 했다.
Inho-ka ku chayk-ul ilki-nun hay-ss-ta.
Inho-NOM the book-ACC reading-TOP do-PST-DEC
'Inho read the book (but . . .)'

The topic marker *-nun* also indicates genericity when attached to a common noun. We have observed that bare common nouns in Korean are names of kinds. For example, *sakwa* 'apple' in (156) is the name of the kind 'apple'. Like proper names, they denote some definite group of apples, although they are spatio-temporally scattered in the world (Carlson 1977). (164a) means in general, apples are delicious, and (164b) means in general, dogs bark.

(164) a. 사과는 맛있다.
Sakwa-nun masiss-ta.
apple-TOP delicious-DEC
'Apples are delicious.'
b. 개는 짖는다.
Kay-nun cic-nun-ta.
dog-TOP bark-PRS-DEC
'Dogs bark.'

Let us propose, in this case, that the topic marker *-nun* indicates restriction for the GEN(eric) operator. The GEN operator is similar to the universal quantifier, but allows exceptions.

(165) a. GENx[apple(x)][delicious(x)]
b. GENx[dog(x)][bark(x)]

## 6.6.2 Focus Particles and Alternative Semantics

In the previous section, we have observed that a Korean sentence has information structure partitioned as topic and comment. In this section, we will discuss another informational notion **focus**. Focus is usually defined as the portion of the sentence that the speaker assumes is not known to the hearer. Focus involves an explicit choice among the limited set of contextually given alternatives (Büring 2003, Chafe 1976, Rooth 1987, 1992). The Korean focus particle *-man* 'only' in (166) implies that there are people other than Inho and they did not go to the party (Y. Lee 2005).

(166) 인호만 파티에 갔다.
Inho-man phathi-ey ka-ass-ta.
Inho-only party-LOC go-PST-DEC
'Only Inho went to the party.'

In more technical terms, focus triggers **a set of alternatives**, a set of people who are possible candidates to satisfy the predicate. ALT(x) is a set of alternative individuals (Rooth 1987, 1992, C. Lee 2004, 2007). For (166) above, the focus marker *-man* on Inho would trigger a set of alternative people who go to the party, as shown in (167).

(167) ALT(Inho) = {Inho, Mina, Hun, Yuna}

(166) asserts that, among those alternative people, Inho is the only one who went to the party. This can be represented something like the following: go to the party(Inho) is what is asserted, and for all individuals x in the alternative set (i.e., ALT(Inho)), if x went to the party, then x is Inho, ensuring that only Inho is in [[went to the party]] among the alternatives.

(168) go to the party(Inho) $\wedge$ $\forall x \in$ ALT(Inho): [[went to the party(x)]] = 1 $\rightarrow$ x = Inho

(169) semantically represents the meaning of *-man* 'only'. The individual argument x is focused and thus triggers a set of alternatives; it says the individual argument is the only element in the set that satisfies the predicate argument.

(169) [[x-MAN]] = $\lambda P \lambda x P(x) \wedge \forall z \in$ ALT(x): P(z) = 1 $\rightarrow$ z = x

Now let us turn to another focus particle *-to* 'also,' as illustrated in (170).

(170) 인호도 파티에 갔다.
Inho-to phathi-ey ka-ss-ta.
Inho-also/even party-LOC go-PST-DEC
'Inho also went to the party.'

NP-*to* triggers a presupposition such that there is an entity that is distinct from the individual denoted by the NP and it satisfies the predicate. (171) represents this intuition.

(171) go to the party(Inho) ∧ ∃y[go to the party(y) = 1]

(172) semantically represents the meaning of *-to* 'also'.

(172) [[x-TO]] = λPλxP(x) ∧∃z: [[P(z)]] = 1

*-To* is sometimes interpreted as *even*, when it has a high pitch on it. Then it triggers a scalar implicature that NP in NP-*to* is the least likely individual who satisfies the predicate, as illustrated in (173b).

(173) a. 인호도 파티에 갔다.
Inho-TO phathi-ey ka-ss-ta. (Capital means high pitch)
Inho-even party-LOC go-PST-DEC
'Even Inho went to the party.'
b. go to the party(Inho) ∧ ∃y[go to the party(y) = 1]
Implicature: Inho is the least likely person to go to the party.

We have said that focus triggers a set of alternatives, ALT(x). We can form a scale among the alternative individuals in the alternative set ALT according to the likelihood of going to the party. That is, we can line the people up and rank a person higher on the scale if she or he is more likely to go to the party. An implication relation holds among the members of this scale. Let's say Mina, who is a party animal, is more likely to go to the party than Inho, who is a nerd. Then, Mina will be ranked higher than Inho on the scale, based on the likelihood of party-going. A unilateral implication relation holds from an entity lower on the scale to an entity higher on the scale. Based on this, we infer that if Inho went to the party, Mina must have gone, too. (173) implies that Inho is at the lowest boundary of the scale. Therefore, (173) above implies that since the least likely person Inho went to the party, other candidates in the alternative set must have gone to the party.

## 6.7 EXERCISES

1. Write down the results of the following set theoretic operations.
   (a) {a, b} ∩ {a, c, d} =
   (b) {a, b} ∪ {a, c, d} =
   (c) ∪{{a}, {b}, ∅} =
   (d) ∩{{a, b, c, d}, {a, b, d}, {a, d}} =
   (e) ∩{{a, b}, {c, d}} =
   (f) {a, b, c} − {a, d} =

2. Complete the truth table for the propositional logic.

**Table 6.10** Exercise 2 truth table

| $p$ | $q$ | $\neg(p \vee q)$ | $p \rightarrow q$ | $p \rightarrow (q \rightarrow p)$ | $p \wedge q$ | $(p \wedge q) \leftrightarrow p$ | $(p \wedge q) \vee p$ |
|---|---|---|---|---|---|---|---|
| 1 | 1 | | | | | | |
| 1 | 0 | | | | | | |
| 0 | 1 | | | | | | |
| 0 | 0 | | | | | | |

3. Let M be a pair <U, f> where U is a set of individuals and f assigns an extension in U to the individual constant and the predicates.
U = {0, 3, 9}
f(j) = 0 f(m) = 9
f(P) = {3, 9}
f(Q) = {0, 3}
f(K) = {<0, 0>, <0, 3>, <3, 9>, <9, 3>}

   Compute the value of the following formulas and state whether it is true or false with relation to M.
   (a) $[P(m) \wedge Q(j)]$
   (b) $\neg[[Q(m) \vee P(j)] \leftrightarrow K(m, m)]]$
   (c) $\exists x P(x)$
   (d) $\forall x_1 \exists x_2 K(x_1, x_2)$
   (e) $\exists x_1 \forall x_2 K(x_1, x_2)$

4. Draw a tree diagram for each Korean sentence below and state its truth condition. Give a lambda notation for each denotation and show a computation of each sentence.
   (a) 인호가 잔다
   Inho-ka ca-n-ta
   Inho-NOM sleep-PRS-DEC
   'Inho sleeps.'
   (b) 인호가 미나를 만난다
   Inho-ka Mina-lul mana-n-ta
   Inho-NOM Mina-ACC meet-PRS-DEC
   'Inho meets Mina.'

5. What is the semantic relationship between (A) and (B)? Entailment, implicature, or presupposition?
   (a) A: 인호는 미나가 떠났다고 믿는다.
   Inho-nun Mina-ka ttena-ass-ta-ko mit-nun-ta.
   Inho-TOP Mina-NOM leave-PST-DEC-COMP believe-PRS-DEC
   'Inho believes that Mina left.'

B: 미나가 떠났다.
Mina-ka ttena-ass-ta.
Mina-NOM leave-PST-DEC
'Mina left.'

(b) A: 인호가 미나의 손을 잡았다.
Inho-ka Mina-uy son-ul cap-ass-ta.
Inho-NOM Mina-GEN hand-ACC hold-PST-DEC
'Inho held Mina's hand.'
B: 인호가 미나와 접촉했다.
Inho-ka Mina-wa cepchokhay-ss-ta.
Inho-NOM Mina-with touch-PST-DEC
'Inho touched Mina.'

(c) A: 인호와 미나는 결혼했다.
Inho-wa Mina-nun keylhonhay-ss-ta.
Inho-and Mina-TOP be married-PST-DEC
'Inho and Mina are married.'
B: 인호와 미나는 부부이다.
Inho-wa Mina-nun pwupwu-i-ta.
Inho-and Mina-TOP married couple-be-DEC
'Inho and Mina are a married couple.'

(d) A: 나는 매일 수영을 했었다.
Na-nun mayil swuyeng-ul hay-ssess-ta.
I-TOP every day swimming-ACC do-D.PST-DEC
'I used to swim every day.'
B: 나는 매일 수영을 하지 않는다.
Na-nun mayil swuyeng-ul ha-ci anh-nun-ta.
I-TOP every day swimming-ACC do-NEG-PRS-DEC
'I do not swim every day.'

(e) A: 인호는 언어학을 공부한 것을 후회한다.
Inho-nun enehak-ul kongpwuha-n kes-ul hwuhoyha-n-ta.
Inho-TOP linguistics-ACC study-fact-ACC regret-PRS-DEC
'Inho regrets studying linguistics.'
B: 인호는 언어학을 공부했다.
Inho-nun enehak-ul kongpwuhay-ss-ta.
Inho-TOP linguistics-ACC study-PST-DEC
'Inho studied linguistics.'

(f) A: 백점을 맞은 사람은 미나이다.
Paykcem-ul mac-un salam-un Mina-i-ta.
perfect score-ACC get-RC person-TOP Mina-be-DEC
'It is Mina who got the perfect score.'
B: 누군가 백점을 맞았다.
Nwukwunka paykcem-ul mac-ass-ta.
someone perfect score-ACC get-PST-DEC
'Someone got a perfect score.'

(g) A: 어떤 학생들은 시험에 떨어졌다.
Etten haksayngtul-un sihem-ey tteleci-ess-ta.
some students-TOP exam-at fail-PST-DEC
'Some students failed the exam.'
B: 모든 학생들이 시험에 떨어진 것은 아니다.
Motun haksayngtul-i sihem-ey tteleci-n kes-un ani-ta.
every student-NOM exam-at fail-fact-TOP is not-DEC
'It is not the case that every student failed the exam.'

(h) A: 인호가 미나와 헤어졌다.
Inho-ka Mina-wa heyeci-ess-ta.
Inho-NOM Mina-with break up-PST-DEC
'Inho broke up with Mina.'
B: 인호는 미나와 사귀었었다.
Inho-nun Mina-wa sakwi-essess-ta.
Inho-TOP Mina-with go out-D.PST-DEC
'Inho used to go out with Mina.'

6. What are the denotations of the following NPs?
(a) 학생 *haksayng* 'student'
(b) 우유 *uju* 'milk'
(c) 학생들 *haksayngtul* 'students'

7. Specify the denotations of the following quantified NPs.
(a) 두 아이
twu ai
two child
'two children'
(b) 모든 아이
motun ai
every child
'all children'
(c) 어떤 아이
etten ai
some child
'some child'

8. Give the truth conditions of the following sentences.
(a) 모든 아이가 논다.
Motun ai-ka no-n-ta.
every child-NOM play-PRS-DEC
'Every child plays.'
(b) 어떤 아이가 운다.
Etten ai-ka uw-n-ta.
some child-NOM cry-PRS-DEC
'Some child cries.'

(c) 그 학생이 똑똑하다.
Ku haksayng-i ttokttokha-ta.
the student-NOM smart-DEC
'The student is smart.'

9. Give semantic interpretations of the following complex NPs.
(a) 예쁜 아이
yeppu-n ai
pretty-RC child
'pretty child'
(b) 파란 모자
phala-n moca
blue-RC hat
'blue hat'
(c) 인호가 읽은 책
Inho-ka ilk-un chayk
Inho-NOM read-RC book
'the book that Inho read'
(d) 미나가 만날 사람
Mina-ka manna-l salam
Mina-NOM meet-RC person
'the person that Mina will meet'

10. Give the truth conditions of the following sentences. If the sentence is ambiguous, specify all the readings.
(a) 모든 아이가 빵을 안 먹었다.
Motun ai-i ppang-ul an mek-ess-ta.
every child-NOM bread-ACC NEG eat-PST-DEC
'Every child did not eat bread.'
(b) 아무도 안 왔다.
Amwu-to an o-ass-ta.
anybody-CONJ NEG come-PST-DEC
'Nobody came.'
(c) 모든 학생이 어떤 책을 읽었다.
Motun haksayng-i etten chayk-ul ilk-ess-ta.
every student-NOM some book-ACC read-PST-DEC
'Every student read a book.'

11. Give semantic interpretations of the following sentences using event semantics.
(a) 미나가 밥을 먹고 있다.
Mina-ka pap-ul mek-ko iss-ta.
Mina-NOM food-ACC eat-PRG-DEC
'Mina is eating food.'

(b) 인호가 죽었다.
Inho-ka cwuk-ess-ta.
Inho-NOM die-PST-DEC
'Inho died.'
(c) 미나는 한국에 갔었다.
Mina-nun hankwuk-ey ka-assess-ta.
Mina-TOP Korea-LOC go-D.PST-DEC
'Mina had been to Korea.'

12. Give semantic interpretations of the following sentences.
(a) 인호는 수영을 할 수 있다.
Inho-nun swuyeng-ul ha-l swu iss-ta.
Inho-TOP swimming-ACC do-MOD-DEC
'Inho can swim.'
(b) 미나는 공부를 해야한다.
Mina-nun kongpwu-lul ha-e ya ha-n-ta.
Mina-TOP studying-ACC do-MOD-PRS-DEC
'Mina must study.'
(c) 인호가 학교에 간 것 같다.
Inho-ka hakkyo-ey ka-n kes kath-ta.
Inho-NOM school-LOC go-MOD-DEC
'Inho seems to have gone to school.'

13. Provide semantic interpretations of the following sentences.
(a) 선물을 주마.
Senmwul-ul cwu-ma.
present-ACC give-PRM
'I will give you a gift.'
(b) 빨리 가라.
Ppali ka-la.
quickly go-IMP
'Go quickly.'
(c) 식사를 하십시다.
Siksa-lul ha-sip-si-ta.
meal-ACC do-HON-EXH-DEC
'Let us eat (to a respected person).'

14. Give the semantic interpretations of the following sentences.
(a) 인호는 사과를 좋아한다.
Inho-nun sakwa-lul cohaha-n-ta.
Inho-TOP apple-ACC like-PRS-DEC
'As for Inho, he likes apples.'

(b) 인호가 사과는 먹었다.
Inho-ka sakwa-nun mek-ess-ta.
Inho-NOM apple-TOP eat-PST-DEC
'Inho ate APPLES (but not other fruits).'

(c) 인호도 사과를 먹었다.
Inho-to sakwa-lul mek-ess-ta.
Inho-also apple-ACC eat-PST-DEC
'Inho also ate apples.'

(d) 인호만 사과를 먹었다.
Inho-man sakwa-lul mek-ess-ta.
Inho-only apple-ACC eat-PST-DEC
'Only Inho ate apples.'

(e) 사과는 맛있다.
Sakwa-nun masiss-ta.
apple-TOP delicious-DEC
'Apples taste good.'

(f) 한국어는 어렵다.
Hankwuke-nun eleyp-ta
Korean-TOP difficult-DEC
'Korean is hard.'

(g) 그가 떠났다.
Ku-ka ttena-ass-ta.
he-NOM leave-PST-DEC
'He left.'

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