Logical Structure of the Noun

Linguistics 322

Contents: Proposition Structure | Noun Phrases | Count Nouns | Lexicon - Agreement | Inherent Features | Agreement | Phonological Form | Irregular Affixation | Latinate and Greek Affixes | Bibliography

1   Introduction

The theory of grammar adopted here is that grammar is based on a logical form based on proposition structure. A proposition is that part of a sentence less its modal modifiers—roughly, the node S. A proposition contains a predicate and its arguments. Predicates take two forms: lexical predicates and operators which are the foundation of a grammar (Propositions). An argument can be an object (noun) or it can be an incomplete proposition. If a predicate is an eventuality (event and states), it takes may take a still undetermined number of arguments. If a predicate is an object, it often takes no arguments; if it represents a relationship, it may take one or more arguments. Let us illustrate with a simple verb:

(1)   John saw Mary.

The verb see requires two arguments: John and Mary--the seer and the seen. The names for these arguments, experiencer and theme, respectively, are discussed in theta roles. Let us represent the logical form of the verb and its arguments in sentence (1) as:

(2)   SEE <experiencer: JOHN> <theme: MARY>.

We can also mark this in the following argument structure form:

(3)

JOHN external (experiencer)	Level X
MARY internal (theme)	Level 1

SEE ⟶

1
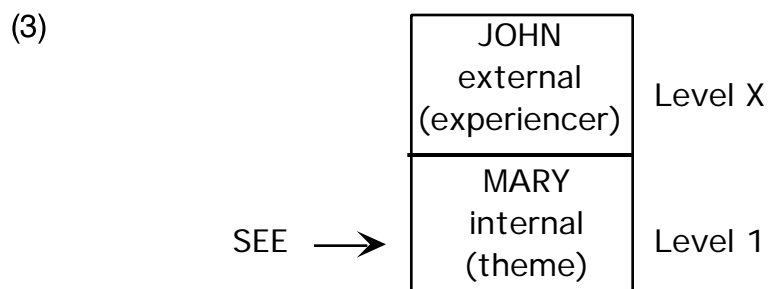
Forms in upper case represent lexical items. Basic morphemes are written in {CAPS} enclosed in braces. Lexical items may contain two or more morphemes: REWRITE = {RE+WRITE}, REAPPLICATION = {RE+AD+PLIC+AT+ION}. We assume without argument here that they are linked to conceptual structures in semantics. Names are also represented in upper case, though they are, strictly speaking, not lexical items; they are referential and somewhat similar to lexical items, and their function is similar. The use of the upper case here is employed for convenience. Note that

(4)   The cat saw a dog.

would have the following logical form ignoring the determiners for the moment:

(5)   SEE <experiencer: CAT> <theme: DOG>.

The representation of noun phrases follows in the next section. In both (2) and (5) SEE is a lexical item whose phonological properties have not been spelled out. That is, SEE has no phonetic form yet. The phonological form of SEE can be determined until certain processes have been applied. This also holds for CAT, DOG, MARY, and JOHN. The processes that apply to nouns are discussed below.

A lexical incomplete proposition such as, (5) can be modified in one of two ways: either by an operator or by a lexical predicate. One example of an operator is TENSE (see verbal operator: tense). An example of a lexical predicate modifier is an adverb:

(6)   a.   John suddenly saw Mary.

      b.   SUDDENLY < SEE <experiencer: JOHN> <theme>: MARY>>.

(6b) shows that (5) is an argument of SUDDENLY. (6b) may be represented in the following tree structure:

(7)

$$V^* = VP$$

A
Suddenly

$V^* = VP$

V^1

NP
JOHN

V^0
SAW

NP
MARY
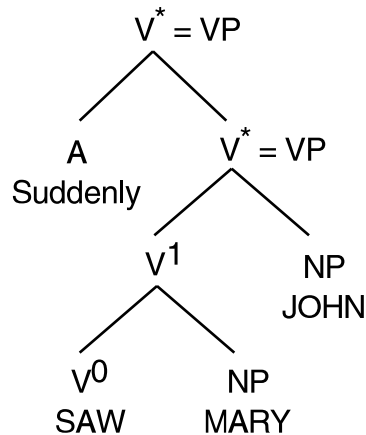
An eventuality (Bach: 1981) contains all events and states. SEE is an event modified by the lexical modifier SUDDENLY. SEE takes two arguments: a theme and an experiencer. An eventuality that is properly modified by the required operators is called an incomplete proposition. See the essay on propositions.[1]

In sum, the lexical predicate (a lexical item) and its arguments can be modified by a lexical predicate (an adverb or adverbial in the syntax) or by an operator such as TENSE.

2   The Noun Phrase -- Part I.

The noun forms the head of a noun phrase. In the logical structure of sentences, the first division is between eventualities and objects. The term eventuality is used to refer to a state or an event. The term object is used to refer to any kind of an object, concrete or abstract, real or imaginary. Let us start with the noun *cat*.

Conceptually, *cat* is an object (a thing in Jackendoff's terminology). The lexical item for cat we will write as "CAT." The theme argument of see is a object in (3). The experiencer argument must be an object. Here, CAT refers to any object that we recognize as a member of the domestic feline species for which we have a common lexical item. There are other meanings for cat, which we will not represent at this time. For example, in colloquial English,

---

[1] http://www.sfu.ca/person/dearmond/322/322.event.class.htm

a cat may refer to a spiteful woman or to a play or devotee of jazz. Their different meanings will have to be handled in the lexical entry for CAT. We will put this problem aside for now.

Nouns must be marked for the features of Number, Count, Gender, Person, Case, and probably a few other features. We will concentrate on these five features ultimately, but let us consider Number and Count here.

2.1   Count

Some nouns can be counted and some can not:

(8)   a.   one dog

b.   one tooth

c.   one house

d.   one country

e.   one unicorn

f.   one idea

g.   one tendency.

(9)   a.   rice

b.   snow

c.   water

d.   beef

e.   mud

f.   wind

g.   gas

h.   impudence.

The nouns in (8), often called mass nouns, cannot be counted:

(10)   a.   *one rice

        b.   *one snow

        c.   *two waters

        d.   *five beefs

        e.   *128 muds

        f.   *one half air.

Occasionally, there are count nouns that have the same form as mass nouns. They should not be confused:

(11)   John had a beef with his boss.

Here, *beef* refers to a disagreement, not the edible meat of cows.

2.2   Number

Most nouns are inflected for number. The default (the predictable or expected form) for singular nouns is unmarked. The singular form of a noun is a single morpheme marking both the lexical meaning and the grammatical category [-Plural][2] if there is no overt ending: dog, snow, house, rice, snow, water, beef, mud. If the word contains more than one morpheme, the singular feature [-Plural] is incorporated into the morpheme of the word that determines that the word is a noun: uni+corn, pre+sup+pos+it+ion, sing+er. For example, in sing+er sing is a verb stem; the suffix '-er' makes it a noun stem. It is the nominal morpheme that is marked for number, not the verbal morpheme.

The default for the plural is the suffix '-s/-es'. The form `-es' is largely predictable: it follows nouns which end in `s', `z', `ch', `sh', `x'. If the noun ends in a consonant plus `y', `y' is replaced with `i' and the plural form is `es':

---

[2] Note that we leave the brackets unlabelled. Labelling is something that grammarians do for referential purpose. We believe it has no proper place in the grammar.

(12)   loss, loss+es;, church, church+es; dish, dish+es; fox, fox+es; spy, spi+es.

There are various kinds of irregular plurals of nouns. In the first class, the plural form is a single morpheme that is related to the singular morpheme by the change of a vowel:

(13)   tooth, teeth; foot, feet; goose, geese; louse, lice; mouse, mice; man, men; woman, women.

That is, tooth and teeth are each a distinct morpheme, but they are related by being connected to the same lexical entry for tooth: TOOTH.

Some nouns share the same form for the singular and the plural:

(14)   deer, sheep, elk, antelope.

We consider each form to represent two morphemes: one singular and the other plural. That is, the form deer is either a singular morpheme or it is a plural morpheme. The two morphemes share the same phonological shape, but they differ in terms of the grammatical features they each contain. In a number of nouns borrowed from Latin or Greek where the singular is marked by an affix, and the plural by another affix:

(15)   a.   radi+us, radi+i

        b.   agend+um, agend+a

        c.   dat+um, dat+a

        d.   octop+us, octop+i

        e.   octopu+s, octopod+i

        f.   thes+is, thes+es

        g.   pleur+a, pleur+ae

        h.   criter+ion, criteri+a

6

(14e) is a rare and rather unknown Greek variant of (14d). The word is a compound formed with "oct-" `8' plus "pod-" `foot.' The Neo-Latin variant treats the stem 'octop' as a single morpheme in place of the compound stem in the Greek variant (14e). A stem is the basic morpheme upon which a word is built.

However, a better analysis for this class of nouns (14) is to assume that the endings 'us', 'um', 'is', 'a', and 'ion' are stem extender morphemes.:

(16)   a.   radi+us = noun stem = noun root + stem extender

        b.   radi+i = noun (word) = noun root/stem [no extender].

These suffixes are required when the stem is marked as [+Pl]. In this way, [-Pl] is never phonetically marked in Standard English.

2.3   Nominal Features

Long prominent in phonology, features have played a less significant role in syntax, though in this decade they have become more significant. Nouns must be marked for the inherent feature [Ct] ([Count]). The category of the form must also be included. To illustrate, dog and water are marked as follows:

Table 1: Lexical Entry for DOG

DOG	Lexeme (basic morpheme
/dag/	phonemic form
N	category
+	Count

Table 2: Lexical Entry for WATER

WATER	Lexeme
/watr/	phonemic form
N	category
-	Count

All nouns must be marked for the feature [+Count].

The grammatical feature [Pl] ([Plural]) is not necessarily inherent in nouns, though all nouns must be marked for number. A few nouns are inherently marked for number. Words such as *cattle, police, scissors*, and *shears* are inherently plural. They have no singular form:

(17)   a.   Some cattle are grazing in the neighbor's corn field.

        b.   *Some cattle is grazing in the neighbor's corn field.

        c.   The police are on their way.

        d.   *The police is on their way.

        e.   *The police is on its way.

        f.   *The police are on its way.

Both cattle and police are non-count nouns. They have the following feature matrix:

Table 3: Lexical Entry for CATTLE

CATTLE	Lexeme
/kætl/	phonemic form
N	category
-	Count
+	Plural

Table 4: Lexical Entry for POLICE

POLICE	Lexeme
/pəlís/	phonemic form
N	category
-	Count
+	Plural

Mass (non-count) nouns are inherently singular. They have no plural form:

(18)   a.   *John drinks waters.

        b.   *Many Asians eat rices.

These nouns have the following feature matrix:

Table 5: Lexical Entry for WATER (2)

WATER	Lexeme
/watr/	phonemic form
N	category
-	Count
-	Plural

Table 6: Lexical Entry for RICE

RICE	Lexeme
/rajs/	phonemic form
N	category
-	Count
-	Plural

Most mass nouns have a countable counterpart. This counterpart means kinds of, types, species of:

(19)   a.   The rices grown in asia are quite varied.

          b.   The waters that flow into the rivers of B.C. are usually cold and clear.

Here, the rices means species of rice, the waters means the different kinds of water. These forms are considered different lexical items from the mass noun counterpart. They can be counted and they may occur in the singular:

(20)   a.   Only one rice grows in southern China.

          b.   Of the waters that flow into the rivers of B.C., only one (water) is not cold and clear.

We will put this problem of varying lexical items aside for now, noting that nouns of this type are marked [+Ct].

With the exception of the noun classes mentioned above and proper names, nouns do not carry inherent number. Yet they must be marked for number. Agreement is the best evidence for it. Suppose we leave the Number feature box empty in the lexicon as the default for nouns:

Table 7: Lexical Entry for BOOK (1)

BOOK	Lexeme
/bʊk/	phonemic form
N	category
+	count
	plural

Next, we propose that all blank features must be specified as plus or minus. If a blank feature fails to be specified, the noun crashes (i.e., the sentence containing it is rendered ungrammatical). How does the feature become specified? That is the topic of next section.

2.4   Inherent and Noninherent Features

The value of the feature in Table 7 is blank. This constitutes a three way or ternary split of the feature: plus, minus, and unspecified. There is good evidence that language is binary only or it is nonary (no specific values). All feature are thought to be binary. In order to achieve this we will create two subfeatures for certain features.

The first subfeature deals with inherentness. If a particular feature is always true for a given lexical item, it is said to be inherent. Let us start with nouns. Consider *book*. *Book* is always a count noun.[3] We introduce the subfeature [±Count_Inh(erent)]. Since *book* is

---

[3] *Book* can also be a verb as in 'to book a passage'. This constitutes a separate lexical entry from the noun. We will consider verbs later.

always a count noun, we will mark it as [+Count_Inh]. Since the value of Count is plus, we will mark it as [+Count]:

Table 8: Lexical Entry for BOOK (2)

BOOK	Lexeme
/bʊk/	phonemic form
book	orthographic form
N	category
+	Count_Inh
+	Count
	Plural

Count_Inh and Count are subfeature that always occur together in doublets. We mark this be enclosing them in the heavy box. We may change this format later. Snow is always [-Count. It has the following lexical entry:

Table 9: Lexical Entry for SNOW

SNOW	Lexeme
/sno/	phonemic form
+	Count_Inh
-	Count
	Plural

Similarly, plural must be reconfigured to be binary. Here, the feature is not inherent. We will mark as [-Plural_Inh]. The value for Plural is not determined. It is determined through agreement with the quantifier that modifies it. This we do below. Although Plural is valueless, it cannot remain so. The value for Plural will be determined by the agreement rule. The feature cannot remain valueless. The lexical entry for book is now amended to include Plural_Inh:

Table 10: Lexical Entry for BOOK (3)

BOOK	Lexeme
/bʊk/	phonemic form
N	category
+	Count_Inh
+	Count
-	Plural_Inh
	Plural

Police is Plural_Inh; it cannot be used in the singular:

(21)　　　　*The police is coming.

Table 11: Lexical Entry for POLICE

POLICE	phonemic form
/pəlís/	
N	category
+	Count_Inh
-	Count
+	Plural_Inh
+	Plural

Certain other features are also inherently marked. We will introduce them at the appropriate place.

2.5　Orthographic Form

For literate speakers of English we add another level in the feature matrix of the lexical entry—the orthographic level. It is spelled out as book in English and assigned the phono-

13

logical form /bʊk/. We represent this addition in the following feature matrix with normal lower case characters. We will continue to capitols where the standard rules of spelling require them:

Table 12 : Lexical Entry for BOOK (4)

BOOK	Lexeme
/bʊk/	phonemic form
book	orthographic form
N	category
+	Count_Inh
+	Count
-	Plural_Inh
	Plural

There is a set of rules connecting the phonemic form to the orthographic form and another set connecting the orthographic form to the phonemic forms. For example, /b/ is almost always spelled out as "b" or "bb" where another set of orthographic rules calls for doubled consonant. Exceptions must be marked in the lexical entry. Similarly, "b" and "bb" are connected to /b/ in the phonemic representation. Since these rules are not directly related to syntax, we will not be concerned with the rules very often. In some cases will be.

2.6   Noun classes

In conceptual (propositional) structure there are two basic forms—eventualities and non-eventualities which we will call 'thing'; this term is borrowed from Jackendoff (19) modifying it slightly. Things refer to the arguments of eventualities that are not themselves eventualities. For example, consider the following sentence:

(22)   John told his dog to quit biting at his fleas.

14

The verb *tell* takes three arguments: John (agent, thing), his dog (goal, thing), and to quit biting at his fleas (theme, eventuality). *Biting* is a verbal participle that takes two arguments, both of them things.

They refer to things in the real or imaginary world. In syntactic terms eventualities are realized mainly by verbs and secondarily adjectives. They also be realized as nominalized nouns 'the building of the palace'. objects are subdivided into [OBJECT], [CONTAINER], [RULER], [RELATION], [PART_OF] and other classes that we will not cover here:

[OBJECT] is define here as the class of objects which do not takes no arguments; for example:

(23)   tree, house, finger, book, table, dirt, sun, fork, shovel, car, unicorn, faun, fairy, wing, and so forth.

[CONTAINER] is defined here as the class of objects which take an argument and imply containment:

(24)   cup of tea, basket of fruit, bowl of cherries, glass of milk, box of chocolates, jar of beans, sack of potatoes, pot of gold, and so forth.

Most container nouns are also [OBJECT]s when they refer to the container as an object and not as a container:

(25)   a.   John broke a cup.

       b.   Mary likes woven baskets.

       c.   The bowl has a crack in it.

       d.   Some of those glasses are chipped.

[RULER]. is defined as an individual or a group of individual who rule or control some political group or a group in general:

15

(26)   a.   the Queen of England

            b.   the bald King of France

            c.   one of the presidents of the United States

            d.   all late prime ministers of Canada

            e.   the coach of the team

            f.   certain leaders of the boy scouts.

[RELATION] is defined as the relation that holds between members of a family in the broader sense of the term. [RELATION]s take one arguments; only one of them is a complement. For example:

(27)   a.   the mother of Susan.

            b.   the father of John and Mary.

            c.   two sisters of the guy next door.

            d.   one of the brothers-in-law of Harry.

'Of NP' is the complement. The subject of the following sentences is the noun that is identified as the relation:

(28)   a.   Judy is the mother of Susan.

            b.   Bill is the father of John and Mary.

            c.   He found Joan and Kathy to be two sisters of the guy next door.

            d.   I knew Horace as one of the brothers-in-law of Harry.

     [PART_OF] holds between a part of some object and the object itself:

(29)　a.　　the top of the table

　　　b.　　the side of the house

　　　c.　　the back of the chair

　　　d.　　the bottom of the pool.

It is extended to include less concrete relations:

(30)　a.　　the end of the road.

　　　b.　　the title of the song

　　　c.　　the form of the balloon

　　　d.　　the sound of music.

There are other things (noun classes) that take one or more than one argument. We won't list them here.

2.7　Other Inherent Features of the Noun

All nouns with the exception of pronouns are third person. This is an inherent feature of nouns. Formally, we call the feature [Personal]. The feature [+Personal] refers to first and second person pronominals. Nouns are [-Personal]. Most nouns do not make reference to gender, or natural sex. We will call this feature [-Gender]. Nouns marked as [+Gender] refer to natural or arbitrary gender. The default gender is masculine. The marked gender is [+Fem] (Feminine), and the unmarked masculine gender is [-Fem]. Arbitrary gender means that gender is selected for inanimate objects that are not distinguished by sex, such as the use of the pronominal she for boats, cars, and other objects commonly or sometimes used. A noun marked as [-Gender] is not expanded to include [±Fem].

The entry for BOOK is now expanded to include person and gender:

Table 13: Lexical Entry for BOOK (5)

BOOK	Lexeme
/bʊk/	phonemic form
book	orthographic form
N	category
+	Count_Inh
+	Count
-	Plural_Inh
	Plural
THING	argument type
-	Personal
-	Gender_Inh
+	Split

## 2.8   Subcategorization and Arguments in the Lexicon

We mentioned above that container nouns and other non-things take an argument. We must account for this property in the lexical entry for the noun. It must include the information whether it takes an argument, and what kind of argument it takes. We list the argument first: what kind of argument(s) does it take. If it takes an argument, then we must determine the category of the argument. This is called **subcategorization**. For example, the container CUP takes one argument; this argument is an internal argument. This argument must be a NP. Hence, *CUP* subcategorizes a noun phrase s in (61). These two features are related and are grouped together:

2.9   The Spelling Out of Plural Nouns

2.9.1 Regular Nouns.

The regular normal plural of nouns includes "splitting". The lexical entry must be split into a stem and an inflectional suffix containing the feature Plural. The normal plural is

18

formed with the suffix {S} which has the basic allomorph /z/. This formation is considered to be the default rule. It applies after the irregular rules fail to apply. Let us start with *book*. Its plural is *books*. Here, the ending `-s' is a separate morpheme. Before the phonological shape of the lexical item can be assigned, the default rule applies splitting N into N plus NSuf (Noun Suffix). Of the paired features, only the value feature is represented here (to avoid too much clutter):

(31)

N^0
BOOK
[+Count]
[+Plural]

NStem   NSuf
BOOK   [+Plural]
[+Count]
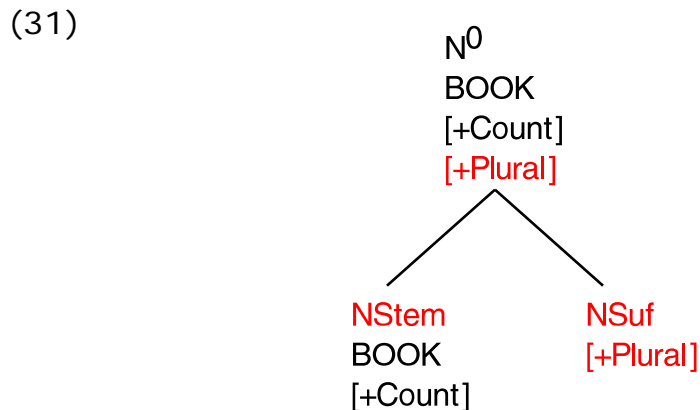
The stem carries its inherent feature value [+Count]; the non-inherent value [+Plural] is copied to the suffix. This process I call splitting.

This process may occur in the lexicon or in the "presyntax", which remains undefined here. It is uncertain where it takes place, but it is not considered to be a syntactic process. But it is part of the grammar and we include it here. It occurs after the irregular rules discussed below have taken place. Default rules are always applied last when a set of rules applying to a particular form apply. The rule of Plural Affix Formation:

(32)   Plural Affix Formation

              [N, +Pl] --> [NStem] + [NSuf, +Pl]

              [Default Rule],
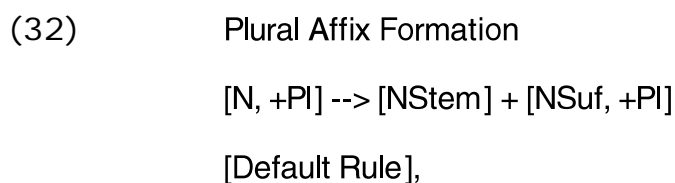
"N" is defined here to mean all the features that define the category commonly called a noun. The feature [+Pl] is selected since it is specifically copied and assigned to the newly created suffix ([NSuf]). Thus N in both halves of the rule refers to the features of N except [+Pl]. [+Pl] is a feature of N, but the rule applies specifically to it.

[Suf, +Pl] is linked to the morpheme {S} which occurs in the grammatical morphemes component of the lexicon. {S} is a morpheme which contains several allomorphs. The first allomorph is /^z/, the default. The phonological rules of English will derive the three variants of /z/: [z], [ɨz], and [s]. We presume that the result of plural affixation (PAF) forms of a word that is learned in the conscious part of the mind. The underlying process occurs in the sub-conscious mind. That is, book and books, or more formally, [book] and [[book]+[s]], we have instant recall to, but we cannot directly access what goes on in the subconscious mind, where the rules are developed for grammar.

2.9.2 Irregular affixation by Suffixation

In addition to the default ending {S}, there are irregular endings. These must apply before the default rule. The suffix `-en' occurs in up to three nouns in modern English. The examples are:[4]

> (33) a. ox, ox+en
>
> b. child, childr+en
>
> c. brother, brethr+en

The form *brethren* has limited usage: it is used mainly in congregations of certain churches. The form is a hold over from an earlier period when it was the normal plural of brother. Based on *brethren* we assume the analysis of the plural to be that in (42b). The `-r' at the end of *childr-* we analyze as a formative morpheme extending the stem (they are also called stem extenders). Such stem extensions are extremely rare in modern English nouns. The singular stem is pronounced differently from the plural, they are spelled the same. They form different allomorphs of the morpheme {CHILD}.

The lexical entry for *ox* must include information about the plural:

---

[4] There in obsolete plural for cow: kyne. `-ne' is a variant of `en'. However, as far as I know, this plural is not found in North American English.

Table 14: Lexical Entry for OX

OX	Lexeme
/aks/	phonemic form
ox	orthographic form
N	category
+	Count_Inh
+	Count
-	Plural_Inh
	Plural
THING	argument type
+	Split
[+Pl] -> en	Irregular formation

This produces two lexical words: *ox* and *oxen*.

2.10   Latinate and Greek affixes

Nouns of this class have a distinctive allomorph marking the singular as well as one marking the plural. We will not cover all the variants here. Consider the following pair of nouns:

(34)   radius, radii.

The former is singular, the latter is plural. The base form of the morpheme is {RADI}. The best evidence for this is found in derived adjectives where the suffix '-al' is adjoined directly to 'radi":

(35)   radi+al.

What about the suffix '-us'? Although it could be analyzed as a singular ending, a better analysis is to consider it a stem extender. If so, then there are two stems: RADI- and RADI-US. The evidence comes from the formation of compound nouns in English.The first art of the vast majority of compound nouns do not mark plurality:

(36)   a book shelf

book here does not mean just one book nor does it mean exclusively more than one book. Note the plural is impossible in the vast majority of these compounds:

(37)   a.   *a books shelf

        b.   *the books shelf.

The feature Count_Inh is absent.

Now consider a compound formed with the stem RADI:

(38)   A radius symposium

This means a symposium that deals radii. *Radius* cannot mean singular here, yet it is marked with the suffix '-us'. The suffix seems to occur where there is no overt ending. Thus we treat the suffix as a stem extender. The suffix is entered in the lexical entry and it is deleted before an over suffix such as the plural *radi+i* and the adjective *radi+al*:

Table 15: Lexical Entry for RADI

RADI+US	Lexeme (Basic Morpheme)
/rédiəs/	phonemic form
radius	orthographic form

Table 15: Lexical Entry for RADI

RADI+US	Lexeme (Basic Morpheme)
N	category
+	Count_Inh
+	Count
-	Plural_Inh
	Plural
???	argument type
+	Split
US -> Ø / __+ phonetic suffix	irregular forms
[+Pl] -> i	irregular orthographic plural

The percent sign (%) in the penultimate line indicates the position of the stem. The last line states that the stem extender 'us; is inserted after the stem when there is no overt suffix ([-Suffix]). Obviously, this rule must apply after all rules that create suffixes.

Other nouns that belong to this declension type include:

(39)   a.   memorandum, memoranda

        b.   plica, plicae (a fold or folded part, esp. of skin)

        c.   phenomenon, phenomena

        d.   plasmodesta, plasmodestata (cytoplasmic strands functioning as living links between cells)

        e.   crisis, crises

2.10.1 Identical Singular and Plural Forms

For the small class of nouns whose singular and plural form are identical:

(40)   sheep, deer, elk, antelope, and so forth,

we may simplify the lexical entry to:

Table 16: Lexical Entry for SHEEP

SHEEP	Lexeme
/šip/	phonemic form
sheep	orthographic form
N	category
+	Count_Inh
+	Count
-	Plural_Inh
	Plural
THING	argument type
-	Split

The feature [-Split] simply means that the form (the noun *sheep* here) does not split into a stem and a suffix. If there is no information that the plural is formed in an alternate way, there is no distinctive form for the plural here. Both the singular and the plural forms are identical.

3 Quantifiers

3.1 Introduction

Quantifiers, which include all numerals, indefinite quantifiers, and the null quantifier, are operators which modify nouns for quantity or lack thereof. Operators are modifiers that are required by the grammar. They cannot be omitted. The grammar may specify that a certain operator may or must be omitted in a given context, but a speaker of the language cannot drop them at his own will. Count quantifier includes all numerals and they can modify only count nouns:

(41)   one, two, three, 27, 3,929, 6 million, one half, one third, 6/7ths, -1, -19,
             the square root of 8, the third root of 27, pi, the imaginary number,
             and so forth.

Indefinite quantifiers have no fixed value, unlike the count quantifiers. They refer to a relatively large or smaller quantity depending on the context:

(42)   some, several, few, little, a few, a little, lots of, a lot of, many, much,
             and so forth.

The null quantifier does not imply any quantity. It is phonetically null:

(43)   a.   John reads books.

        b.   Nancy eats rice.

Here, *books* and *rice* are modified by the null quantifier. No quantity of either is implied.

Let us start with the following NP/QP (quantifier phrase);

(44)   five books

The quantifier takes one argument. The argument must be a count noun. As we have seen above, BOOK is a count noun. BOOK is an object in that takes no argument. The logical (or argument structure) representation of *five books* is the following:

(45)

FIVE $\longrightarrow$
BOOK internal (theme)

Level 1
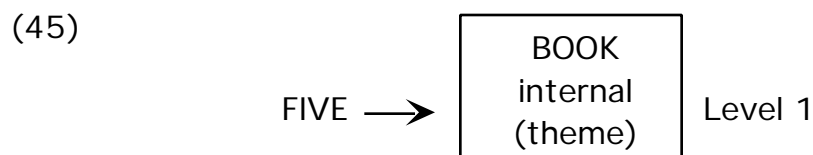
The lexical entry for Five is given in Table 17. All numerals are inherently count and inherently plural. All numerals are [+Count] and all numerals except for ONE is [+Plural]. Obviously, ONE is [Plural]:

25

Table 17:   Lexical Entry for FIVE

FIVE	Lexeme
/faɪv/	phonemic form
five	orthographic form
Q	category
+	Count_Inh
+	Count
+	Plural_Inh
+	Plural

The lexical entry for other numerals great than ONE are similar to that for FIVE. The lexical entry ONE is given in Table 18:

Table 18:   Lexical Entry for ONE

ONE	Grammeme (Lexeme)
/wʌn/	phonemic form
book	orthographic form
Q	category
+	Count_Inh
+	Count
+	Plural_Inh
-	Plural

3.2   Other Quantifier Features

The features Count and Plural are grammatical in that agreement rules make use to them. There are two semantic feature that differentiate one four classes of quantifiers: Quantified and Fixed Value. {NULL}[5] simply means that no quantity is implied:

----

[5] This form is enclosed in braces to distinguish it from *null* , a phonetically empty string.

26

(46)　　　　LeRoy reads books.

{NULL} normally occurs in generic (46) statements or in repetitive statements:

(47)　　　　LeRoy usually reads books, but sometimes he reads trashy maga-zines.

The feature Quantified differentiates all quantifiers from the null quantifier. [+Quant] indicates that a quantity is specified, whether fixed value or not. The feature [FV (Fixed Value)] differentiates quantifiers which refer to a specific number of items, no matter how abstract (such as the square root of minus 1). The minus value refers to quantifiers such as *some, several, many* which do not refer to a specific number, but a more or less vague quantity that is contextually dependent. Fixed value quantifiers are all count nouns. The lexical entry for ONE is amended to include these features:

Table 19: Lexical Entry for ONE

ONE	lexeme
/wʌn/	phonemic form
book	orthographic form
Q	category
+	Quant
+	FV
+	Count_Inh
+	Count
+	Plural_Inh
-	Plural

The lexical entries indefinite numerals and {NULL} are given below.

3.3　　Projecting from the Base

Now, let us look at the logical structure of one book:

(48)

$$Q^1 = QP / NP$$

$$Q^0 \qquad N^1 = NP$$

$$N^0$$

ONE $\longrightarrow$ | BOOK internal (theme) | Level 1
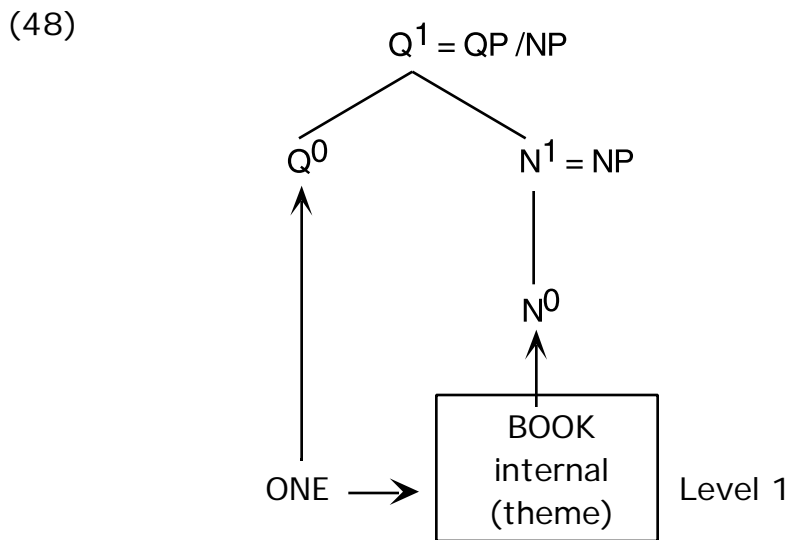
This structure is projected in the following way. We start with N^0. It takes no argument. We still have to project N^0 to the next level, N^1. This forms a noun phrase. If N^1 is maximal, that is nothing lexically modifies N^1 and there are no further arguments, we may write N^1 as NP, which represents a maximal noun phrase.

The rules of English syntax require that all NPs be modified by a quantifier operator. Operators are modifiers that are required by the grammar. Lexical modifiers are optional, although they may be required in certain idioms. We now look at Q^0 and see that it is ONE. ONE, like a quantifiers takes one argument; in this case BOOK. The maximal projection of BOOK is N P. In the syntax NP becomes a complement of Q^0. Q^0 is projected up to Q^1 which must dominate the head of the projection, Q^0 and its complement, NP. This process must be followed every time a structure is projected from its logical base (argument structure).

Note that Q^1 is the maximal projection. As far as is known, quantifiers take only one argument. We write here as QP/NP. This a bit of a conundrum. By convention, when a head is projected to a phrase bearing the same label; here QP. In beginning syntax you probably learned that NP dominates Q as well N in some configuration—perhaps it is conjoined to it. This is not contradictory. The extended NP represents the semantic range of NP. Consider the following sentence:

(49)   John bought two books.

It is clear that what John bought was some books--two of them to be exact. The semantic range of the complement of *buy* is *book*, or more precisely, *two books*. In purely syntactic view, *books* is the complement of *two*. In a semantic sense, *books* is the head of the complement of *buy*. In a syntactic sense, it is the complement of *two* only. Because of this dual nature, we give the forms a double label; the first for the syntactic projection, and the second for semantic projection.

The steps of projecting a tree structure are itemized:

(50)   a.   Start with a lexical head X^0;

       it should be the basic head of the structure.

       b.   Project to X^1.

       c. X^1 must include the direct object (the complement in level 1)

       d.   Look for any modifiers of X^1 and adjoin them to X^1.

       e.   Now look for the operator Y^0 which takes X^1 as its argument.

   f.   Repeat starting with the operator Y.

This is basic. Later we will add second arguments. Their projection will basically follow these steps.

3.4   Missing Feature Values and Links

As we stated above the empty feature must be filled. How is it going to be filled? *Book* can only be singular when in construction with ONE, and it must be plural when it is in construction with a numeral greater than ONE:

(51) a. *one books.

b. one book

c. *eight book

d. eight books.

Obviously, the feature [+ Plural] for ONE must match the missing feature for Plural in BOOK. Consider again figure (48). First, note that ONE c-commands its argument BOOK. Let us draw a link from ONE to BOOK. The link represents c-command:

(52)

$$Q^1 = QP /NP$$

$$Q^0$$
ONE

$$N^1 = NP$$

$$N^0$$
BOOK
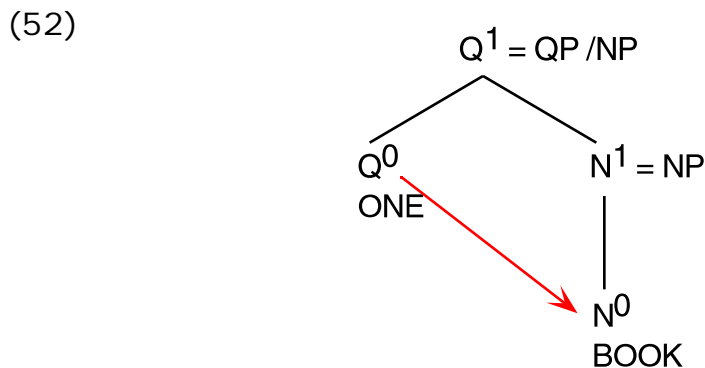
The argument structure is deleted as it is not necessary here. The arrow represents the link. The end with the arrow head is called the head of the link and the other end called the tail of the ink.

3.5   Feature Agreement in the Grammar

Agreement is a grammatical rule. It occurs in the syntax. Initially, we will say that it is bound by the c-command relation. Before we can elaborate on agreement, we must go to the lexicon to get the feature matrix. The feature matrix is part of the lexical item. Initially the lexical item differentiates between inherent and blank features. This distinction is a property of the lexical item. It is the lexical entry for police, cattle, scissors, pants, and so forth, that tells us that these words are plural. We cannot assume in general that mass nouns are necessarily singular in all languages. We have no way of telling that police is inherently plural without looking at its use n a sentence. We must obtain this information from the grammar of a given language. It holds for English.

This holds for count nouns, too. For example, pea is a count noun whereas corn is a mass noun. Both are similar food forms:
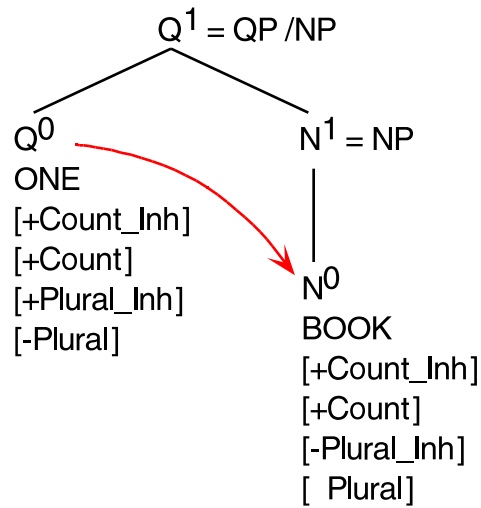
(53)   a.   John likes corn.

          b.   *John likes a corn.

          c.   John ate a pea.

          d.   *John ate pea for dinner.

We must look first at the lexical item and view the feature matrix. Certain syntactic rules depend on selected features in the feature matrix. However, the phonological and written form cannot be obtained at this point before certain rules have applied. The phonological and orthographic form depends on the features that have been filled in as we will show below in the following subsection.

Selecting a lexical item whose features will be copied into the syntax may not be as easy as that which we present below. In figure (27) BOOK is not marked for the feature plural. Number is determined by the quantity operator [QUANT][6] which modifies BOOK. The feature plural in BOOK must be specified as either plus or minus. To do this, the feature [+Plural] is copied from the operator onto the noun it modifies. Let us add to figure (52) the feature of Count and Plural:

---

[6] The operator is the predicate [QUANT]. Its lexical item is FIVE. Logically, FIVE is greater than ONE. Any numeral greater than ONE is assigned the feature [+Pl]. ONE is assigned [-Pl]. Numerals are used for counting. Obviously, they must be marked for [+Count]:

(54)

$$Q^1 = QP\,/NP$$

$$Q^0$$
ONE
[+Count_Inh]
[+Count]
[+Plural_Inh]
[-Plural]

$$N^1 = NP$$

$$N^0$$
BOOK
[+Count_Inh]
[+Count]
[-Plural_Inh]
[Plural]

3.6   Government

First note that the quantifier c-commands BOOK. Short C-command of this sort is called government. Government differs from c-command in that a node can be governed by only one governor, where as a node may be c-commanded by more than one node. If A governs B, then A is called a governor:

(55)   **Government**

X governs Y iff:

a.   X c-commands Y

b.   X is a head

c.   There is no governor W, such that X governs Y and Y governs X.

d.   Y is a complement (argument) of X.

Condition c) means that there can be no intervening governor. A governee can be governed by only one head at most; the closest potential governor is the actual and only governor.
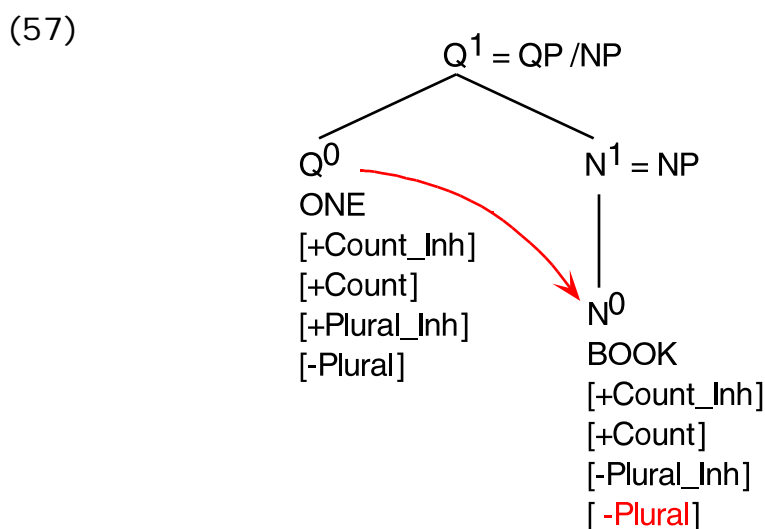
A governor must also be a head. B is called a governee, but this term is rarely used except in this text. The governee is a complement of the governor (head). The closest c-commanding node is the governing node. We may say that government blocks government of an internal node by an outside c-commanding node. This is called a barrier. In the above structure, ONE is an operator whose argument is NP BOOK. ONE functions as the head of the phrase and NP BOOK as its complement. ONE is the governor, and BOOK is the governee.

In Figure (54) note that ONE is a governor of BOOK in that ONE c-commands BOOK, ONE is a head, and there is no node that governs BOOK, such that ONE governs it--i.e., there is no intervening governor. In a sentence such as

(56)   John read one book.

Read governs the QP/NP *one book*, but it does not govern the NP *book* since *one* governs *book*. *One* is an intervening governor.

Next, we propose that features may be copied and transferred through the link visible in (54). The plus feature of [+Pl] is copied and transferred to the empty Plural slot in the feature matrix of BOOK. The rule inserted feature value and the feature are marked in red here to denote a non-inherent feature:

(57)
$$Q^1 = QP\,/NP$$

Q^0
ONE
[+Count_Inh]
[+Count]
[+Plural_Inh]
[-Plural]

$N^1 = NP$

N^0
BOOK
[+Count_Inh]
[+Count]
[-Plural_Inh]
[-Plural]

Now, BOOK is marked with a value for plural. The noun will not crash with respect to this feature.

Note that both forms are marked as [+Ct]. In this respect they agree. They agree now in both features. Suppose "*one water" is generated, where water is a non-count noun:

(58)

$$Q^1 = QP / NP$$

Q^0
ONE
[+Count_Inh]
[+Count]
[+Plural_Inh]
[-Plural]

$N^1 = NP$

N^0
WATER
[+Count_Inh]
[-Count]
[-Plural_Inh]
[-Plural]
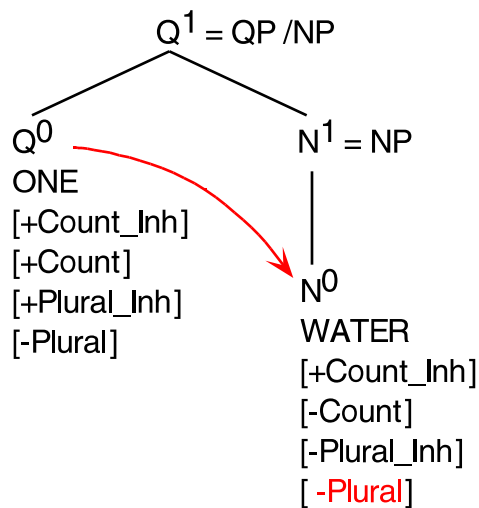
The features of Count do not match; one is plus, the other minus. Therefore, these features clash. When there is a clash, the construction is rendered ungrammatical. The goal of linking is to ensure that all duplicate features match.

Actually, we believe that it is the feature which governs a like feature; we call this Feature Government:

(59)   **Feature Government**

X feature-governs Y iff:

a.   X, Y, and W are each a feature of the same type

b.   X c-commands Y

c.   X is member of a head

d.   There is no governor W, such that X governs W and W governs Y.

e.   Y is a complement of X.

In Figure (58) the feature Count now governs the feature Count in the governee. The link is drawn from the governing feature to the governed feature:

(60)

$$Q^1 = QP/NP$$

Q^0
ONE
[+Count_Inh]
[+Count]•
[+Plural_Inh]
[-Plural]

$N^1 = NP$

N^0
WATER
[+Count_Inh]
•[-Count]
[+Plural_Inh]
[-Plural]
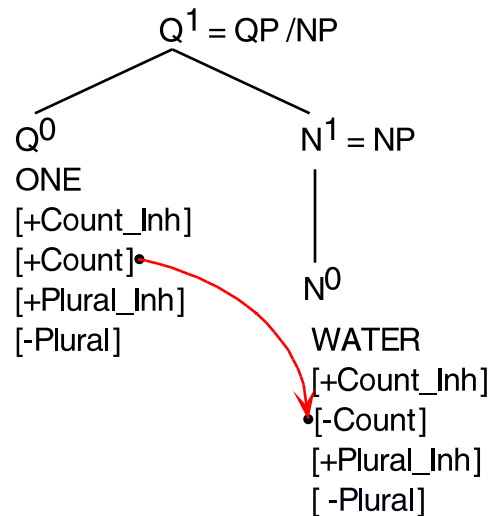
Water is inherently singular and is represented in black type. The feature-link connects two instances of the feature Count, but the values of the features do not match. The QP/NP fails.

3.7   Indefinite quantifiers

Next is the problem of the so-called indefinite quantifiers: some, few, many, much, more, less, a few, little, fewer, and so forth. These occur in contrast to the so-called definite numerals: one, two, five, one half, two thirds, 11/35ths, -8, -1.5, -234.82815,   (the circumference

of a circle divided by its radius), the square root of minus one, irrational numbers, irreal numbers, and so forth. These numerals are [+Count] ([+Ct]).

The indefinite quantifiers do not mark a specific value, but a relative value. For example *few* means not many, but exactly how many is not determined. Count nouns can be modified by certain indefinite quantifiers and non-count nouns can be too:

(61) a. four books

   b. some books

   c. *four waters

   d. some water.

We cannot use the features definite or specific since these are already conscripted for other uses. Let us use the feature "fixed value" [±FV] to differentiate the definite set of numeric quantifiers from the indefinite set.

Fix value has one interesting property. If a quantifier is [-Qf] (quantified), the feature FV is always negative. That is, if something is not quantified, it cannot have a fixed value. Hence the feature is NIL if [NULL]; otherwise it is marked.

The indefinite quantifier some as in *some books*, for example, contains at least the following features. Here include the information whether it takes an argument, and what kind of argument it takes. This is called **subcategorization**. *SOME subcategorizes* a noun phrase s in (61). These two features are related and are grouped together:

Table 20: Lexical Entry of SOME

SOME	Grammeme (Lexeme)
some	orthographic form
/sʌm/	phonological form
Q	category
+	Quant
-	FV
-	Count_Inh
	Count
-	Number_Inh
	Number
internal	argument
NP	subcategorization

The NIL features for Count and Plural are discussed below.

Certain indefinite quantifiers may modify non-count nouns:

(62)   a.   some water

          b.   five waters (in the normal sense of water)

          c.   much rice

          d.   lots of rice[7]

          e.   a little rain.

Some indefinite quantifiers can modify either mass nouns or count nouns:

---

[7] *Lots of* is functionally a quantifier. It is formally a compound form. We will not discuss its formal properties here.

(63)	a.	some books, fingers, no fingers, lots of students.

b.	some rice, no water, snow, some air, lots of smoke.

Note that when it is modifying count nouns, the count noun is always plural; when it is modifying mass nouns, the mass noun is always singular:

(64)		*some book; *some rices (in the intended meaning).

This is true for all the non-fixed quantifiers that can modify either mass or count nouns (lots of, a lot of). This leads to a generalization: if a quantifier may modify both count and mass nouns, the count noun is always plural and the mass nouns is always singular.

## 3.8	The Count-Plural Algorithm

The following quantifiers contain an interesting property (see (63):

(65)		some, no, {NULL}, lots of.

If the nouns they modify are count nouns, the noun is marked plural; it the nouns they modify are mass nouns, the nouns are marked singular:

(66)	a.	some books are, some rice is

b.	no stones are, no water is

c.	beds are, snow is ({NULL})

d.	lots of exams are, lots of beer is

e.	a lot of students are, a lot of snow

Rather than have two homophonous quantifiers for each of the five pairs in (66, e.g. some-1 and some-2, suppose *some* is not marked for either +Ct or -Ct, but is but is marked [-Count_Inh], which means that a value for [Count] will have to be determined. First, lets consider the P-marker for *some snow*. Links are included; note that Count and Plural occur in

38

pairs. The inherency property of linked feature are not required to match; the value of the feature itself is required to match:

(67)

$$NP \; (Q^1 = QP)$$

Q^0 $\qquad\qquad\qquad N^1 = NP$

S~OME~
[-Count_Inh]
[Count]•

N^0

[-Plural_Inh]
[Plural]•

SNOW
[+Count_Inh]
•[-Count]
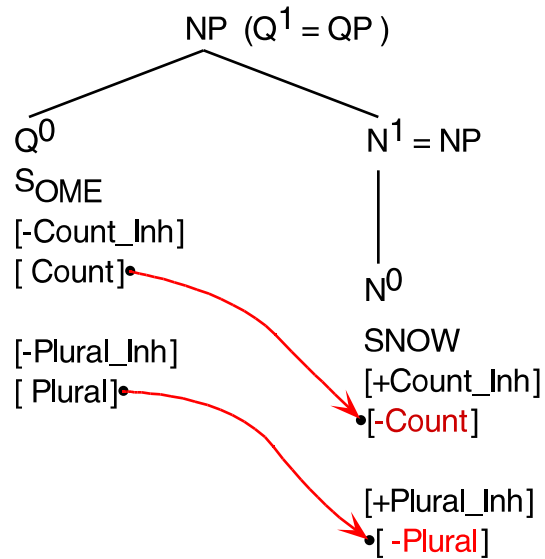
[+Plural_Inh]
•[-Plural]

The features with no marked values acquire the matching feature of the marked feature. Therefore, SOME acquires the negative value for both Count and Plural:

(68)

$$Q^1 = QP \,/NP$$

Q^0 $\qquad\qquad\qquad N^1 = NP$

S~OME~
[-Count_Inh]
[-Count]•

N^0

[-Plural_Inh]
[-Plural]•

SNOW
[+Count_Inh]
•[-Count]
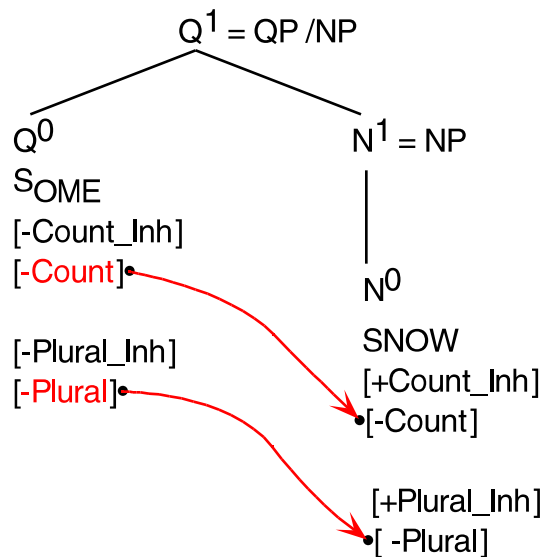
[+Plural_Inh]
•[-Plural]

Now consider *some rocks*. ROCK is marked as [-Pl_Inh] but is [+Ct_Inh]:

(69)

$$Q^1 = QP/NP$$

Q^0
SOME
[-Count_Inh]
[Count]•

[-Plural_Inh]
[Plural]•

$N^1 = NP$

N^0
ROCK

[+Count_Inh]
•[+Count]

[+Plural_Inh]
•[Plural]
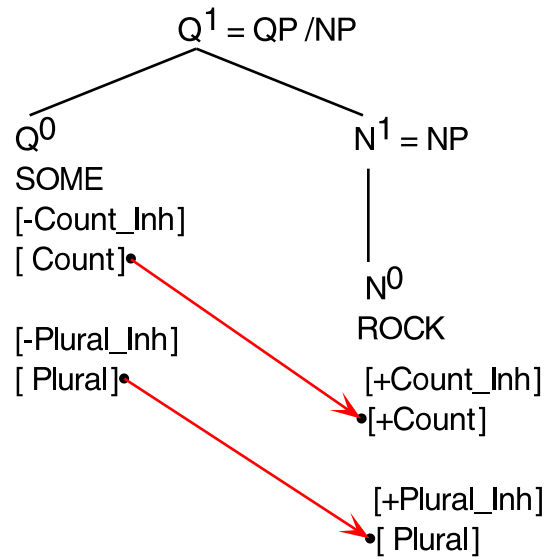
First note that the value for Plural cannot be determined, but the value for Count in the quantifier can be; it agrees with [+Count] in SNOW:

(70)

$$Q^1 = QP/NP$$

Q^0
SOME
[-Count_Inh]
[+Count]•

[-Plural_Inh]
[Plural]•

$N^1 = NP$

N^0
ROCK
[+Count_Inh]
•[+Count]

[+Plural_Inh]
•[Plural]
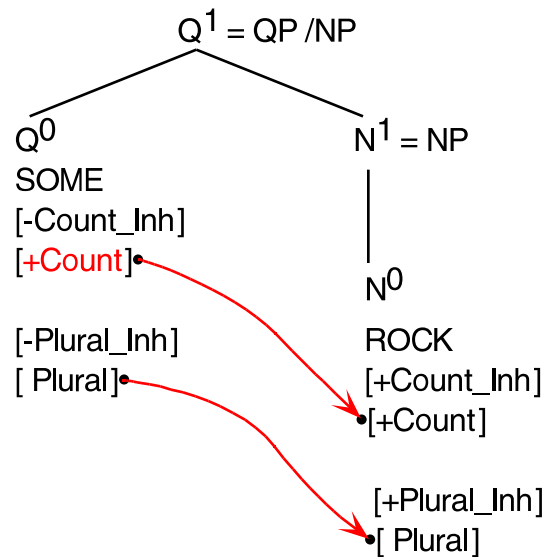
The question arises, "How is the value for Plural determined?" Note that when the noun is [-Count] it is [-Plural]. When it is [+Count], it is [+Plural]. Based on this we propose the Count-Plural Algorithm. When the feature [Plural] has no value in the quantifier, the feature takes on the feature value of [Count] in the quantifier:

(71)   **Count-Plural Algorithm**

$$[\text{ Plural}] \rightarrow [\text{ Plural}] / \underline{\hspace{2cm}}$$
$$[\text{ Count}]$$

The symbol " " (alpha) means that if the source value is +, then the goal value is '+', and if the source is '-', then the goal is '-'. This is not an agreement rule as we have defined it in this text. It is a matching rule that is not controlled by government. Applying rule (71) to the P-marker above, the value of Count is '+', hence this value is matched (or copied) to Plural in the same paradigm, and then by agreement, it is copied to Plural in the noun:

(72)

$$Q^1 = QP/NP$$

Q^0
SOME
[-Count_Inh]
[+Count]•

[-Plural_Inh]
[+Plural]•

$N^1 = NP$

N^0

ROCK
[+Count_Inh]
•[+Count]

[+Plural_Inh]
•[+Plural]
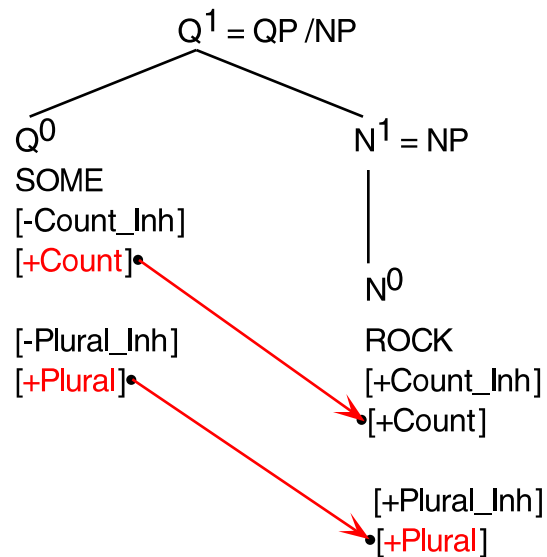
3.9   Indefinite Count Quantifiers

Several and similar quantifiers differs from some in that it is inherently [+Ct]:

(73)   a.   several books

        b.   *several rice.

We can now use the generalization that indefinite quantifiers which are marked at some point for the feature [+Ct] are [+Pl]. The lexical entry for *several* is now the following:

Table 21: Lexical Entry of SEVERAL

SEVERAL	Grammeme (lexeme)
several	orthographic form
/sɛvərəl/	phonological form
Q	category
+	Quant
-	FV
+	Count_Inh
+	Count
+	Plural_Inh
+	Plural
internal	argument
NP	subcategorization

The quantifier much is similar to the quantifier little except that is can only occur in questions and negative constructions:

(74)   a.   *much water

          b.   not much water

          c.   how much water?

          d.   *much books

This interesting property lies beyond the scope of our topic here. *Many* does not have this restriction:

(75)   a.   *many waters (in the normal sense of water)

        b.   many books.

        c.   not many books.

        d.   how many books?

The quantifier *much* contains the feature [-Ct], and *many* [+Ct]):

Table 22: Lexical Entry of MUCH

MUCH	Grammeme (Lexeme)
much	orthographic form
/mʌčl/	phonological form
Q	category
+	Quant
-	FV
+	Count_Inh
-	Count
+	Number_Inh
-	Plural
internal	argument
NP	subcategorization

Table 23: Lexical Entry of MANY

MANY	Grammeme (Lexeme)
many	orthographic form
/mɛni/	phonological form
Q	category
+	Quant
-	FV
+	Count_Inh
-	Count
+	Number_Inh
-	Plural
internal	argument
NP	subcategorization

One final point here. Some, as well as more, less are marked ±Ct, which means they can modify either count or mass noun. We have also marked them ±Pl. This is an oversimplification. When this class of quantifiers modifies count nouns, the noun is always plural; when it modifies mass nouns, the noun is always singular:

(76) a. more books are

  b. more water is

  c. *more book is

  d. *more waters are (in the normal sense of the term.)

3.10 Non-quantified quantifiers

Under certain conditions mass and plural count nouns occur unmodified by an overt quantifier. We will consider the quantifier feature here as "unquantified":

(77)   a.   Mary went to the store to buy potatoes for dinner.

        b.   Tomorrow John will buy the necessary parts for his car.

There is one or more constraints on this construction. Although all the conditions are not known, it apparently cannot occur in the subject position of an active voice verb:

(78)   a.   *Students went to the store to buy a few books.

        b.   Potatoes were bought for dinner (<- X bought potatoes for dinner),

        (where X is an unknown agent).

This quantifier contrast with quantified quantifiers (one, some, more) by failing to mark a quantity.

Since we do not consider the feature of plurality inherent in count nouns, but subject to agreement with that in the quantifier, we differentiate quantified quantifiers from unquantified quantifiers by the feature "Qf" (for [±Quantified]. Quantifiers marked [-Qf] are phonetically null. The null quantifier is like other indefinite quantifiers in that is may modify a count noun, which must be plural, and a mass noun, which must be singular:

(79)   books, *book, rice, *rices. (As in "John likes ____).

(55)#

This class should not be confused with generic quantifiers which are also null.

3.11   Determining the Phonological Form of the Lexical Item

Once all the features are in place, we may determine the phonological form of the lexical item. Here, the phonological and the orthographic forms of each lexical item are inserted. The singular of BOOK is spelled out as *book* in the orthography, and ONE is spelled out as *one* if is marked as emphatic; if it is not emphatic is spelled out as *a*. These are shown in the following two figures:

45

(80)

$$Q^1=QP/NP$$
<object>

$$Q^0$$
ONE
$$[+Ct\_Inh]$$
$$[+Ct]\bullet$$

$$[+Pl\_Inh]$$
$$[-Pl]\bullet$$

$$[+Emph$$

one

$$N^1=NP$$

$$N^0$$
<object>

[Thing]
BOOK
$$[+Ct\_Inh]$$
$$\bullet[+Ct]$$

$$[Pl\_Inh]$$
$$\bullet[-Pl]$$

book

(81)

$$Q^1=QP/NP$$
<object>

$$Q^0$$
ONE
$$[+Ct\_Inh]$$
$$[+Ct]\bullet$$

$$[+Pl\_Inh]$$
$$[-Pl]\bullet$$

$$[-Emph$$

a

$$N^1=NP$$

$$N^0$$
<object>

[Thing]
BOOK
$$[+Ct\_Inh]$$
$$\bullet[+Ct]$$

$$[Pl\_Inh]$$
$$\bullet[-Pl]$$
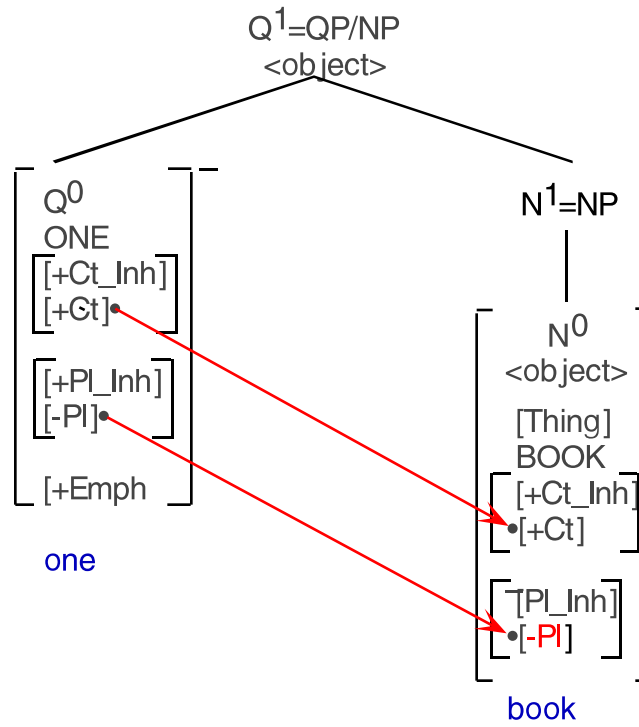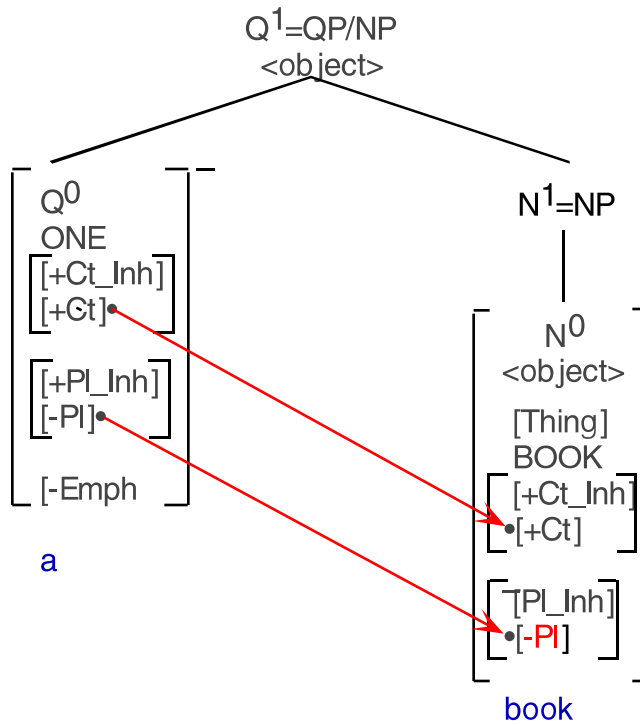
book

Now let us consider *five books*. The derived form following agreement (marked in red) before spell-out is the following:

(82)

$$Q^1 = QP/NP$$
<object>

$$Q^0$$
FIVE
[+Ct_Inh]
[+Ct]•

[+Pl_Inh]
[+Pl]•

$$N^1 = NP$$

$$N^0$$
<object>

[Thing]
BOOK
[+Ct_Inh]
•[+Ct]

[Pl_Inh]
•[+Pl]
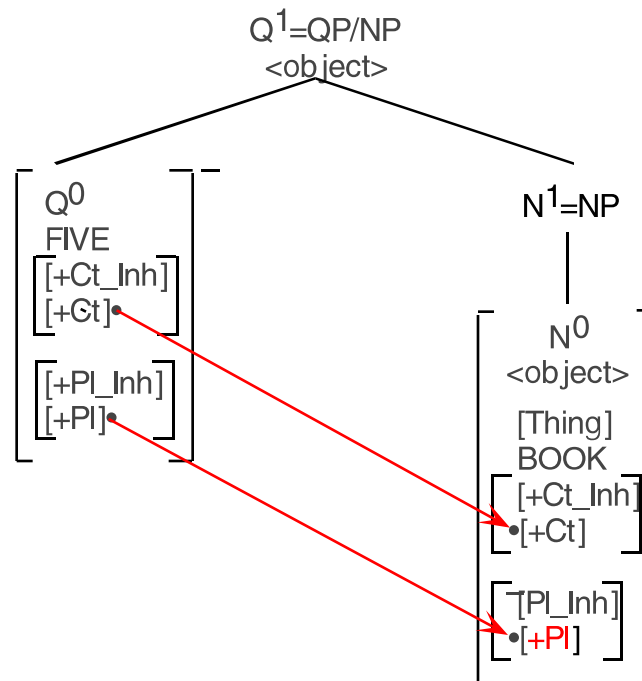
FIVE contains the feature [+Pl], differentiating it from ONE. Agreement inserted the plus value for Plural.

There is no problem in spelling out FIVE. The lexical entry for FIVE gives *five* (/fajv/). The spelling out of the plural form of BOOK is more interesting. This we shall do in the following subsection.

4   Determiners

4.1   Non-Demonstratives

Determiners are operators which take a single argument. In English, as in most Indo-European languages, determiners take a QP argument:

(83)   a.   the six books

b.   these eight bananas

c.   that (one) volcano.

All visible determiners are definite [+Def]. The base for the determiner is D; it projects to DP/NP:

(84)   **Projection of D**

         D projects to DP/NP

As in the case of quantifiers, DP is a semantic member of NP. All quantifiers take a QP argument. This included in the lexical entry of each determiner:

Table 24: Lexical Entry for THE

THE	Grammeme (Lexeme)
/ðə/	phonemic form
the	orthographic form
D	category
+	Def
-	Dem
internal	argument structure
QP	subcategorization

The feature [Dem] stands for demonstrative. We introduce these below. There are more kinds of arguments of quantifiers; we will not cover them here. Since QPs are operators, they are required in the NP. In the syntax of English the determiner takes a QP as its argument. This determines the order of the words at the surface level:

(85)   a.   D + QP =

       b.   D + Q + NP [ignoring internal bracketing].

Here the plus sign is merely a separator; it has no significance.

     The phrase marker for (83a) is given in (86):

(86)

$$D^1 = DP/NP$$

```
          D¹ = DP/NP
         /          \
     ┌─────┐      Q¹ = QP/NP
     │ D⁰  │      /        \
     │ THE │   ┌──────┐  ┌──────────┐
     │ +Def│   │ Q⁰   │  │ N⁰       │
     │ -Dem│   │ SIX  │  │ BOOK     │
     └─────┘   │ +Qf  │  │[+Ct_Inh] │
      the      │ +FV  │  │[+Count]  │
               │ +Ct  │  └──────────┘
               │ +Pl  │  ┌──────────┐
               │ -Du  │  │ [-Pl_Inh]│
               └──────┘  │ [+Plural]│
                 six     └──────────┘
                         /          \
                  ┌──────────┐  ┌──────────┐
                  │ NStem    │  │ NSuf     │
                  │ BOOK     │  │ [+Plural]│
                  │ [+Count] │  └──────────┘
                  └──────────┘
                     book         s
                        \        /
                         books
```
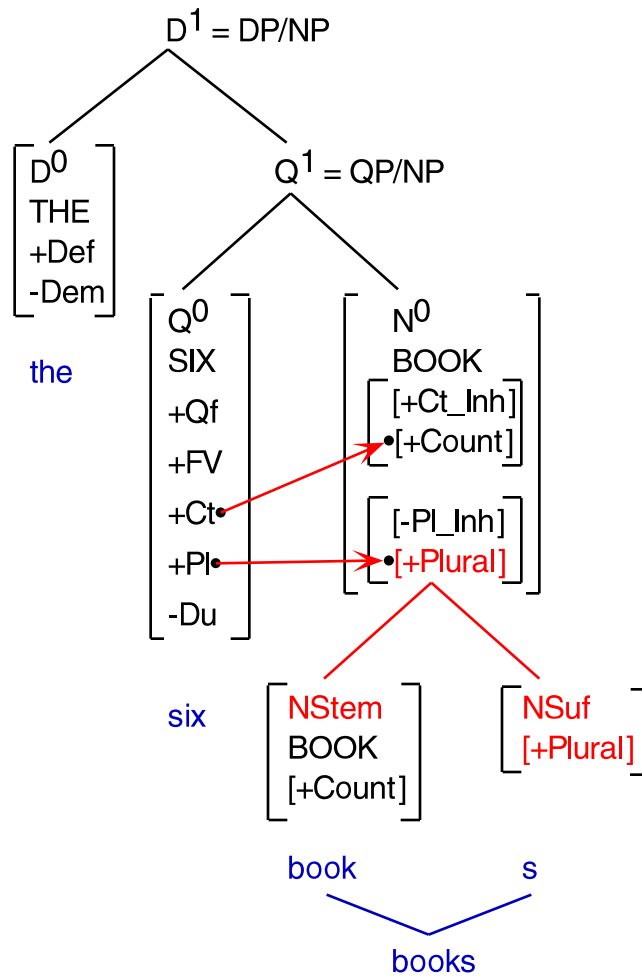
There is a null (not visible) determiner; it marks indefinite [-Def].

(87)   a.   six books

       b.   eight bananas

       c.   a/one volcano.

The null determiner is phonetically null--not pronounced. However, operators are required where ever stipulated in the syntax. The examples in (87) are not unmarked in regards to definiteness; they are indefinite: [-Def]. This is a binary opposition which characterizes all operators. The phrase marker for (87a) is shown in (88):

(88)

$D^1 = DP/NP$

$\begin{bmatrix} D^0 \\ \{NULL\} \\ -Def \end{bmatrix}$ [null]

$Q^1 = QP/NP$

$\begin{bmatrix} Q^0 \\ SIX \\ +Qf \\ +FV \\ +Ct\bullet \\ +Pl\bullet \\ -Du \end{bmatrix}$ six

$\begin{bmatrix} N^0 \\ BOOK \\ \begin{bmatrix} +Ct\_Inh \\ \bullet +Count \end{bmatrix} \\ \begin{bmatrix} -Pl\_Inh \\ \bullet +Plural \end{bmatrix} \end{bmatrix}$

$\begin{bmatrix} NStem \\ BOOK \\ [+Count] \end{bmatrix}$ book

$\begin{bmatrix} NSuf \\ [+Plural] \end{bmatrix}$ s

books
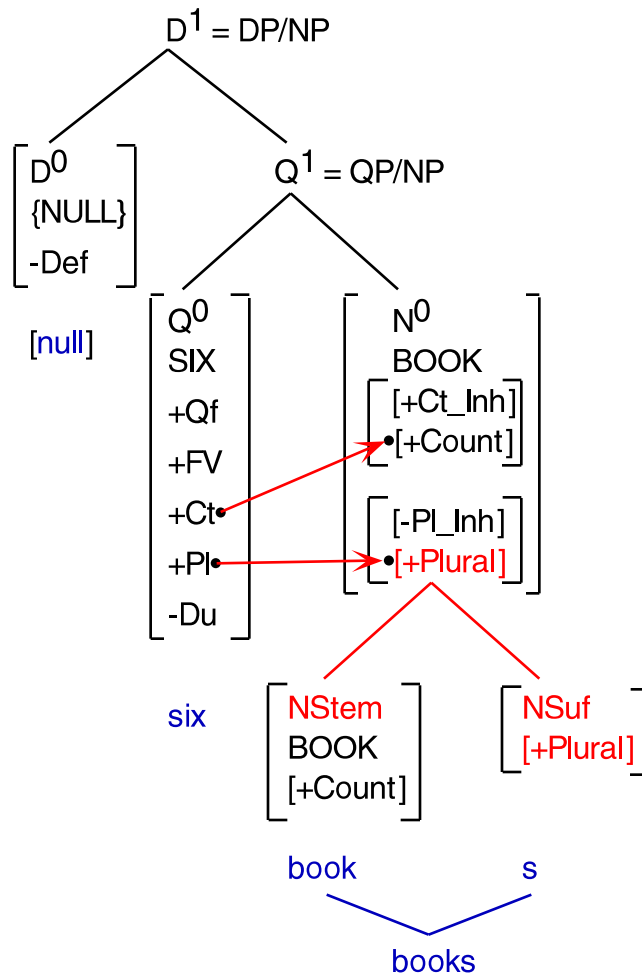
Today more and more linguists are treating 'a; and 'an' as an indefinite quantifier. We argue that it occurs if it is the first phonetic string in the NP. For example,

(89) a.   John bought a book.

      b.   John bought the book.

      c.   *John bough the a book.

      d.   John bought each book.

      e.   *John bought each a book.

In (89a) 'a' is the first phonetic word in the NP. (89c) is ungrammatical because *the* is the first phonetic word in the NP. The same holds true in (89e)--*each* is the first phonetic word. Note that there is a reading for (89e) in which case it is grammatical: John bought each person a book. Here, *each* occur in a different NP —the so-called indirect object and the direct object. In the direct object NP, *a* is the first phonetic word.

4.2   Demonstratives

The determiners *that* and *this* are called demonstratives and marked here as [+Dem]. Demonstratives indicate proximality; whether the object is close to the speaker or not close to the speaker. There are other uses of the demonstratives, but these are minor and we will not cover them here. Both demonstrative determiners show agreement for number:

(90)   a.   these six books

b.   this one book

c.   this book

d.   *this six books

e.   *one books.

f.   *a books.

Determiners govern QuP and its head Qu. Demonstratives are differentiated for proximity by the feature [Prox]. This is shown in the lexical entry for THIS in Table 25. Determiners must also be marked as [-Pl_Inh], since number is not an inherent feature of them, but they must agree with the noun. The lexical entry for THIS is shown in Table 25:

51

Table 25 : Lexical Entry for THIS

THIS	Grammeme (Lexeme)
/ðɪs/	phonemic form (singular)
this	orthographic form (singular)
D	category
+	Def
+	Dem
+	Prox
-	Pl_Inh
	Pl
internal	argument structure
QP	subcategorization
-	Split

These is [+Pl], but the form does not split into a stem and an affix. The form is irregular and is considered a single morpheme. There it is marked as [-Split] in the lexicon.

The determiner *the* is not inherently marked for number; hence number does not occur in the feature distribution of it. The same holds for the null indefinite determiner. Number agreement of determiners is sown in the following phrase marker for (90a):

(91)

$D^1 = DP/NP$

```
        D⁰
        THE
        +Def
        +Dem
        +Prox
        ⎡ -Pl_Inh ⎤
        ⎣ +Pl•   ⎦
        these
```

$Q^1 = QP/NP$

```
   Q⁰
   SIX
   +Qf
   +FV
   +Ct•
   •+Pl•
   -Du
   six
```

```
   N⁰
   BOOK
   ⎡ [+Ct_Inh]  ⎤
   ⎣ •[+Count]  ⎦
   ⎡ [-Pl_Inh]  ⎤
   ⎣ •[+Plural] ⎦
```

```
   NStem           NSuf
   BOOK            [+Plural]
   [+Count]

   book               s
         books
```
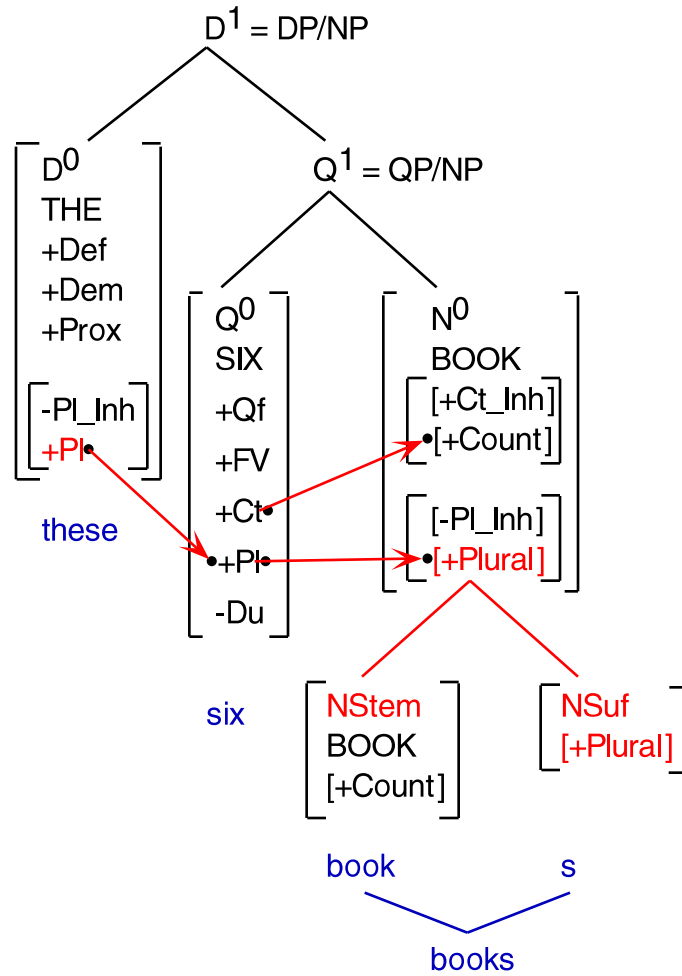
5   Universal Quantifiers.

Universal quantifiers are hard to define. We will not attempt to do so here. There are six undisputed universal quantifiers and one debatable one:

(92)   a.   all, both, each, every, any, no.

       b.   {NULL}.

Universal quantifiers precede determiners in English:

(93)   a.   all the books

          b.   all twelve scholars

          c.   all the eight students

          d.   both the days

          e.   both two men

          f.   both the two eggs.

(93c) and (93f) seem unacceptable out of context. These forms are emphatic emphasizing the quantifier. Emphatic stress must be placed on the quantifiers in these two constructions.

     No is a universal quantifier in such sentences as:

(94)   a.   No two persons are exactly alike.

          b.   No seven dances in Salome are ever expunged.

And the null universal quantifier exhibits the same property:

(95)   a.   Two students are thinking of buying a Mac.

          b.   The seven dances in Salome are Strauss's best.

The null universal quantifier is by far the most commonly used and is in effect a default. The question that arises is what are the features that constitute UQs and distinguish them from other operators? At this time, I do not know the answer. It is a technically complex question and is involved with the logical form of quantifiers. I shall introduce the feature [±UQf] without attempting to define it here. If the UQ is null, it has the feature [-UQf]. All UQs are marked positively for this feature:

Table 26: Lexical Entry for ALL

ALL	Grammeme (Lexeme)
/al/	phonemic form (singular)
all	orthographic form (singular)
UQ	category
+	UQ
-	Dual
-	Plural_Inh
-	Count_Inh
+	Qf
+	FV
internal	argument structure
DP	subcategorization
noun	selectional restriction
-	Split

Note that ALL is marked [-Dual] which means it cannot modify TWO. It is marked as [-Plural_Inh] and [-Count_Inh] which means that it can modify either a count noun or a mass noun, either a plural noun or a singular noun. As with quantifiers, it is subject to Rule (71), the count-plural algorithm:

(96)   a.   all books

        b.   *all book

        c.   all rice

        d.   *all rices (in the sense intended).

Each UQ has a unique set of features regarding the features Definite, Count, and Fixed Value. All can occur with both definite and indefinite complements and count and mass noun complements:

(97)   a.   all the men

           b.   all men

           c.   all the rice

           d.   all rice

           e.   *all several men

           f.   *all some rice.

Both, which means two, can only take dual count noun complement:

(98)   a.   both the men

           b.   both men

           c.   both two men

           d.   *both three men

           e.   *both rice

           f.   *both several men

           g.   *both few rice.

The lexical entry for *both* is:

Table 27: Lexical Entry for BOTH

BOTH	Grammeme (Lexeme)
/boθ/	phonemic form (singular)
both	orthographic form (singular)
UQ	category
+	UQf
+	Pl_Inh (probably not necessary)
+	Pl
+	Dual_Inh
+	Dual
+	Count_Inh
+	Count
+	FV
internal	argument structure
DP	subcategorization
count noun	selectional restriction
-	Split

BOTH must be marked for Plural and Dual or there would nothing to prevent it from occurring in construction with any number bearing the feature Plural other than TWO itself.

Note that the quantifier is missing in (98b). The quantifier must be understood to be TWO. When TWO is unemphatic and it is preceded by *both* in the same NP, it is null by default; otherwise it is *two* when it is emphatic. The lexical entry for TWO is shown in Table 28:

57

Table 28 : Lexical Entry for TWO

TWO	Grammeme (Lexeme)
/tu/, /tju/ [default]	phonemic form, two standard variations
[null]/ [NP BOTH … __ …] condition: TWO is [-Emph].	alternate phonemic form following BOTH and not marked as emphatic.
two	orthographic form
[NULL]	orthographic form if following a phonetic form in the NP and is unemphatic.
Q	category
+	Qf
+	FV
+	Pl_Inh (this feature probably not necessary)
+	Pl
+	Dual_Inh
+	Dual
internal	argument structure
NP	subcategorization
-	Split

Note that ONE has a similar distribution. Following a universal quantifiers it is null unless emphatic:

(99) a. any book

   b. any one book (emphatic)

   c. every book

   d. every one book (emphatic)

To complicate matters there is two senses of EVERY, compare (100b) with (100c):

(100)   a.   You may buy every book on the table.

        b.   *You may buy every one book on the table.

        c.   For every one book that you read, you will get a small prize.

The difference here probably is account for by a distributive meaning. We will not cover this here just noting the difference.

The UQ ANY is un marked for plural and count; it is subject to the count-number algorithm:

(101)   a.   any book

        b.   any one book

        c.   any books

        d.   any rice

        e.   *any rices.

The quantifier in (101a) and (101b) is ONE; in (101c) it is [-FV] and[-Qf]. ANY is marked [-Pl_Inh] and [-Ct_Inh]:

Table 29: Lexical Entry for ANY

ANY	Grammeme
UQ	category
/ɛni/	phonemic form, two standard variations
any	orthographic form
Q	category
+	UQf
-	Pl_Inh
-	Dual_Inh
+	Qf
-	FV
internal	argument structure
DP	subcategorization
noun	selectional restriction
-	Split

EACH does not share the same distribution of features as ANY:

(102)   a.   each book

          b.   *each books

          c.   *each rice

          d.   *each rices.

          e.   each two books

          f.   *each several books

Thus, EACH can only modify count nouns and it must be marked [+Count]. EVERY has a similar distribution:

(103)   a.   every book

          b.   *every books

          c.   *every rice

          d.   *every rices

          e.   every four books
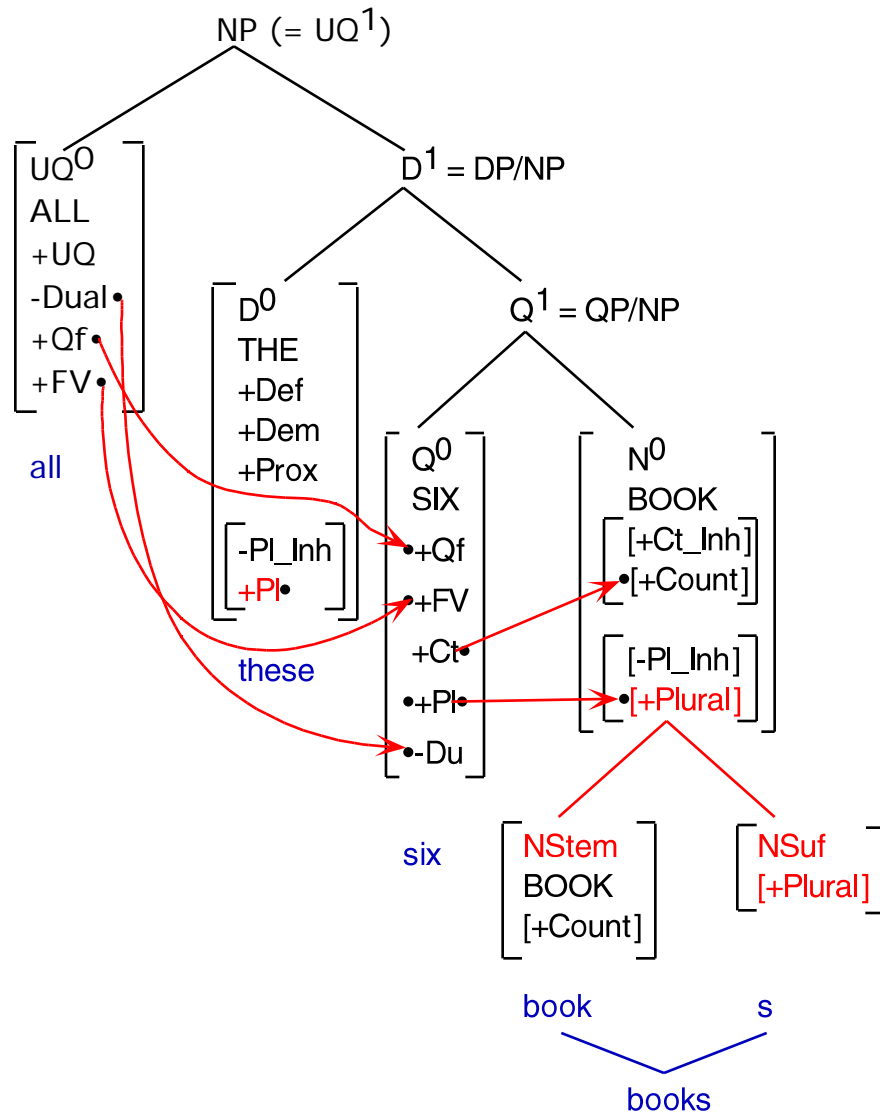
          f.   *every some books.

EVERY must also be marked [+Count]. The student is to determine the grammatical (lexical) entry for these last two universal quantifiers.

The phrase marker for

(104)   all these six books

is the following:

(105)

NP (= UQ^1)

UQ^0
ALL
+UQ
-Dual
+Qf
+FV

all

D^1 = DP/NP

D^0
THE
+Def
+Dem
+Prox

[-Pl_Inh]
[+Pl]

these

Q^1 = QP/NP

Q^0
SIX
+Qf
+FV
+Ct
+Pl
-Du

six

N^0
BOOK
[+Ct_Inh]
[+Count]

[-Pl_Inh]
[+Plural]

NStem
BOOK
[+Count]

NSuf
[+Plural]

book   s

books

6   Bibliography

Bach, Emmon. (1981). `On time, tense, and aspect: an essay in English Metaphysics.' Peter

Cole (ed.), *Radical Pragmatics*. 63-81. New York: Academic Press.

Contents: Proposition Structure | Noun Phrases | Count Nouns | Lexical Spell Out | Inherent
Features | Agreement | Irregular Affixation | Latinate and Greet Affixes |

This page last updated 8 FE 2003.