

Functional projections in the DP

The lower portion

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the EGG 2016, Lagodekhi

1 Preliminaries

Questions about UG:

- What sort of projections are there in the DP?
- What order are these projections merged in (i.e. what is the functional sequence)?

Questions about a specific language:

- Which projections does the language use from the pool provided by UG?
- How is the functional sequence lexicalized?
- How is the surface order derived?

Issues that will influence how you set up the functional sequence

- how the functional sequence is mapped onto the syntax-semantics interface
- how the functional sequence is mapped onto the syntax-phonology interface
 - how the functional sequence is linearized
 - how the functional sequence is lexicalized
- which morphemes represent agreement, what status agreement markers have in the functional sequence (if any)

2 NP: mass and count, predicates and arguments

2.1 Predicates and arguments

NPs are predicates, DPs are arguments: the traditional view, held e.g. in Longobardi (1994).

Languages vary as to what their NPs denote: Chierchia (1998), Nominal Mapping Parameter (a semantic parameter)

[\pm argumental], [\pm predicate]: constrain the default semantic interpretation of NP

- Type 1: [+arg, -pred], $\langle e \rangle$, e.g. Chinese, Japanese
 - NPs are argumental and denote entities; for common nouns this means they denote kinds
 - as NPs denote entities, there can be bare NP arguments
 - all nouns are mass nouns
 - no plural morphology
 - generalized classifier system
- Type 2: [-arg, +pred], $\langle e, t \rangle$, e.g. French, Romance
 - NPs are predicates and denote properties, so no bare nominals in argument position, only DPs can be arguments
 - count/mass distinction
 - morphological plural
 - if we see what appear to be bare NP arguments, they have a silent D
- Type 3: [+arg, +pred], e.g. English, Germanic
 - NPs denote either kinds or predicates (mass nouns are +arg and count nouns are +pred)
 - bare mass nouns and bare plurals in argument position
 - no bare singular count nouns
 - plural morphology

For criticism of the Chierchia account, see Cheng & Sybesma (1998; 1999), Borer (2005), among many others.

2.2 Mass and count

2.2.1 Some well-known facts

natural atomicity \neq count syntax

count but not naturally atomic: *fence, wall, lawn, line, twig*

naturally atomic but not count: *furniture, cutlery, jewellery*

Some minimal pairs (Ns on the right are called object mass nouns or collective mass nouns)

- (1)
- | | |
|---------|----------|
| shoes | footwear |
| letters | mail |
| coins | change |
| leaves | foliage |
| clothes | clothing |

Predominantly mass nouns may be made count (Universal Packager)

- (2)
- a wine, a love, a thread, a salt, a stone
 - wines, loves, threads, stones
 - all the wines / loves / threads / salts / stones
 - We store three bloods in this lab (adapted from Borer 2005: 102)

Predominantly count nouns may be made mass (Universal Grinder)

- (3)
- there is dog / stone / chicken on this floor
 - too much dog / chicken / stone / table / carpet
 - a lot of dog / chicken / stone / table / carpet (adapted from Borer 2005: 102)

2.2.2 Some theories

Mass vs count: via lexical specification

Ns are lexically marked as count or mass: traditional view, held e.g. in Cheng & Sybesma (1998)

Mass vs count: by a semantic operation (Rothstein 2010, Pires de Oliveira & Rothstein 2011)

- mass vs. count is a matter of a semantic operation
- both mass and count nouns are derived from an unmarked N_{root} which is a predicate and denotes sets
- MASS operation: derives mass nouns, the associated kind of N_{root}
- COUNT operation: yields the denotation of the singular count noun, which allows direct grammatical counting
- a specific root may have only one or both operations apply to it
- in English, the default is that only one operation applies; both operations apply in a few cases (eg. *stone, apple*)

- (4) a. John hates eating apples, but he likes apple in the salad.
 b. There were a lot of stones in the garden, although together they didn't amount to much stone. (Pires de Oliveira & Rothstein 2011: ex. 40 a, b)

- in Brazilian Portuguese MASS applies freely to root nouns, COUNT is restricted; both operations apply to many roots, so many nouns (those traditionally characterized as count) are ambiguous between count and mass
- the mass vs. count noun resulting from the MASS or COUNT operation is stored in the lexicon

Mass vs count: a matter of the amount of structure you have (Muromatsu 2003, Borer 2005)

See section 5.

3 The category (little) *n*

Parallel with *vP*:



What is it good for?

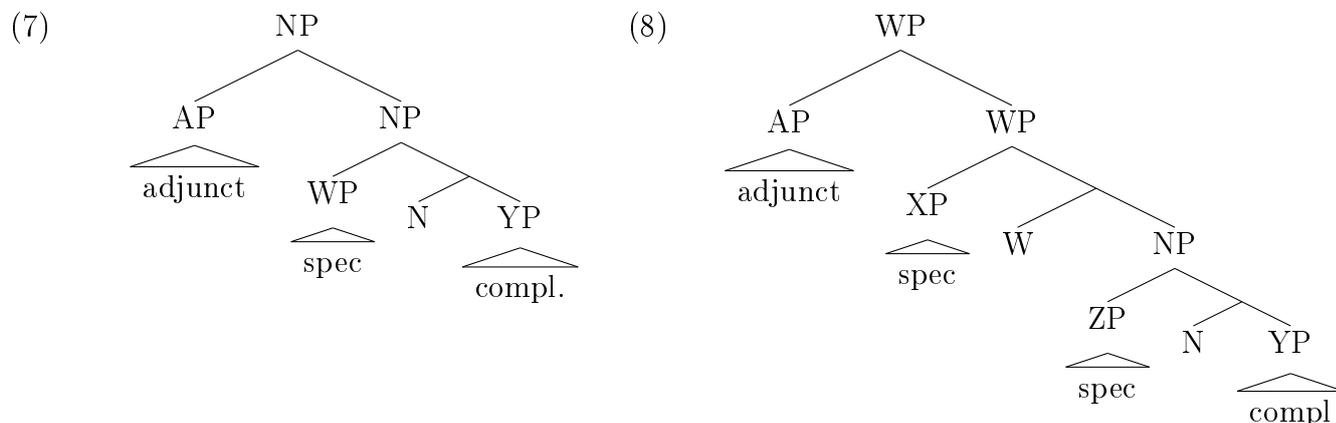
- Radford (2000): the external argument of transitive nominals is merged in spec, *nP* (cf. *the enemy's destruction of the city*, *the Israelis' withdrawal of troops*); the external argument moves to spec, DP where it gets structural genitive case ('s)
- Carstens (2000): like Radford, but suggests that there can be a second, higher *nP* which has possessors in its spec¹
- in DM, structure is built on acategorial roots; *n* categorizes the root as a nominal
- Svenonius (2008): its spec holds adjectives like colour, origin, material
- Roberts (2011): demonstratives are merged in spec, *nP*

¹Both Radford (2000) and Carstens (2000) refer to earlier work in Valois (1991) and Sportiche (1990). I haven't been able to locate the former. The latter explicitly talks about a shell structure in NP, modeled on Larson's *vP*-shells, but does not use the *n* notation.

4 Adjectives

4.1 The structural representation of adjectives

XP-adjunction: Bernstein (1991), Sproat & Shih (1991), Svenonius (1994), Valois (1996), Muromatsu (2003), Mikkelsen & Hankamer (2002), Carstens (2008), Schoorlemmer (2009)



Head, with N as complement: Abney (1987), Barbiers (1992), Embick & Noyer (2001), among others



explains: Danish data in which N-to-D is blocked by the adjective

- (10)
- | | | | | |
|----|-----------|--|----|---------------|
| a. | hest-en | | c. | den røde hest |
| | horse-the | | | the red horse |
| | the horse | | | the red horse |
| b. | *den hest | | d. | *røde hest-en |
| | the horse | | | red horse-the |
| | the horse | | | the red horse |
- (Mikkelsen & Hankamer 2002)

doesn't explain:

- adjective is not unique and not obligatory
- adjectives can have a complement (which is not the noun); they form a constituent with their complement

(11) *a [proud of his son] father

(12) a [fiá-ra büszke] apa
 the son.poss-onto proud father
 the father proud of his son

Hungarian

- modification: below *barely* modifies only *hot* → *barely hot* must be a phrase to the exclusion of *black coffee*

(13) some barely hot black coffee (Svenonius 1994)

The head analysis would predict that *barely* modifies *hot black coffee*

- coordination: below *alt-for* has scope over both *heit* and *sterk*; the conjunction forms a phrase with the conjuncts, the modifier is outside of this phrase → *hot and black* is a phrase

(14) alt-for heit og sterk kaffe
 all-too hot and strong coffee
 much too hot and strong coffee (Julien 2005) Norwegian

Head, with N as righthand spec: Delsing (1993a;b)



Specifier:

- dedicated functional projections: Cinque (1994; 2010), Laenzlinger (2004), Julien (2005)
- independently motivated functional projections: Svenonius (2008)



Often cited problems:

1. the ordering follows only if we stipulate the selectional requirements of the dedicated F heads. At the same time, the order might have a cognitive-semantic basis, in which case it is questionable whether we need all those F heads
2. the hypothesized F heads are (almost) systematically empty

Possible realizations of the F heads (Julien 2005)

- diminutives and augmentatives

(17) *Hungarian*
 asztal-ka
 table-DIM
 little table

(18) *Micmac* (Algic. N. Am.)
 kji-sipu
 AUG-RIVER
 big river
 (Körtvélyessy 2014)

- Northern Swedish and Norwegian indefinite articles

(19) ?eit stor-t eit styg-t eit hus
 a.neut.sg big-neut.sg a.neut.sg ugly-neut.sg a.neut.sg house.neut
 a big ugly house (Julien 2005: 9) Norwegian

Mixed:

- head or spec: Alexiadou (2001)
- adjunct or spec of NP: Demonte (2008)

4.2 Ordering restrictions among adjectives (AOR)

Object nouns:

- (20) poss > cardinal > ordinal > quality > size > shape > color > nationality (Cinque 1994)
- (21) value > dimensions > physical property > speed > human propensity > age > color (Dixon 1982)
- (22) ordinal > cardinal > size > length > height > speed > width > weight > temperature > wetness > age > shape > color > origin > material (Scott 2002)
- (23) [_{Quantif} Ordinal > Cardinal] > [_{Speaker-orient} Subjective Comment > Evidential] > [_{Scalar.Physical.Property} Size > Length > Height > Speed > Depth > Width] > [_{Measure} Weight > Temperature > ?Wetness > Age] > [_{Non.Scalar.Physical.Property} Shape > Color > Nationality/Origin > Material] (Laenzlinger 2004)
- (24) a. beautiful big red ball (Cinque 1994)
 b. numerous wonderful big American cars (Laenzlinger 2004)
 c. various round black Egyptian masks (Laenzlinger 2004)

See, however, Truswell (2009) for the claim that the order is not so rigid.

Event nouns:²

- (25) poss > cardinal > ordinal > speaker-oriented > subject-oriented > manner > thematic (Cinque 1994)
- (26) the probably clumsy immediate American reaction to the offense (Laenzlinger 2004)

²Note how this parallels the order of adverbs:

- (i) They probably have clumsily reacted immediatly to your letter. (Laenzlinger 2004)

4.3 AOR lifted

Discussed in Sproat & Shih (1991), Teodorescu (2006), Cinque (2010), among others

Focusing

- (27) a. big black car b. #black big car c. BLACK big car

Focused adjectives involve movement within DP.

Comma intonation

- (28) a. big black car b. #black big car c. black, big car

These are asyndetic coordination structures; conjuncts are freely ordered.

Reduced relative clauses

basic AOR in Mandarin (data from Sproat & Shih 1991)

- (29) a. xiǎo lǜ huāpíng b. *lǜ xiǎo huāpíng
small green vase green small vase
small green vase green small vase

RelCl and Poss.or introduced by *de*

- (30) a. wǒ mǎi-de huāpíng b. wǒ-de huāpíng
I buy-de vase I-de vase
the vase that I bought my vase

AOR lifted for *de*-adjectives

- (31) a. xiǎo-de lǜ -de huāpíng b. lǜ -de xiǎo-de huāpíng
small-de green-de vase green-de small-de vase
small green vase green small vase

These are relative clauses that have more structure than meets the eye; relative clauses are not As and so not subject to A-ordering restrictions.

Intensional adjectives

Data from Teodorescu (2006).

- (32) a. a famous former actor (*who is now forgotten)
b. a former famous actor (who is now forgotten)

- (33) a. a famous alleged actor b. an alleged famous actor

- (34) a. an alleged former thief b. a former alleged thief

These adjectives are not predicative so they can't be analyzed as relative clauses and they don't have special intonation either. Different orders correlate with different semantics.

Syntax "imposes ordering restrictions only on semantically equivalent structures" (Teodorescu 2006).

Non-definite superlatives

Data from Teodorescu (2006).

- (35) a. My class has a short Italian student.
b. #My class has an Italian short student.
- (36) My class has a shortest Italian student.
[Italian who is shorter than any other Italian in the class]
- (37) My class has an Italian shortest student.
[the shortest student in class happens to be Italian]

AOR is lifted due to the degree operator. Different orders correlate with different semantics. Syntax "imposes ordering restrictions only on semantically equivalent structures" (Teodorescu 2006).

5 Classifiers

5.1 Introduction

What is a classifier?

A "grammatical means for the linguistic categorization of nouns and nominals" (Aikhenvald 2000: 1)

- (38) Types of classifiers (Aikhenvald 2000)
- a. (noun class, gender)
 - b. noun classifier: categorizes a noun by itself
 - c. **numeral classifier**: only appear next to a numeral or a quantifier;³ may categorize N on the basis of animacy, shape, or other inherent property
 - d. possessed classifier: characterizes the possessed noun is a possessive construction
 - e. relational classifier: characterizes the way in which the referent of the possessed noun relates to the referent of the possessor
 - f. possessor classifier: categorizes the possessor based on inherent properties
 - g. verbal classifier: appears on the verb but categorizes the noun (typically the intransitive S or DO) on the basis of shape, consistency, or animacy
 - h. locative classifier: occurs on locative adpositions
 - i. deictic classifier: associated with deictics and articles

Different types of classifiers may co-occur in a single language.

³To be qualified below

5.2 Numeral classifiers: function and subtypes

Only appear next to a numeral or a quantifier.

- | | |
|---|--|
| (39) <i>Chinese</i>
san zhi bi
three Cl people
three persons
(Cheng & Sybesma 1998) | (40) <i>Hungarian</i>
három (szem) gyöngy
three Cl pearl
three pearls |
|---|--|

Exceptions exist, where a numeral classifier may occur in absence of a numeral or quantifier.

Demonstrative:

- | | |
|--|--|
| (41) <i>Thai</i>
mǎa tua nán
dog Cl that
that dog
(Allan 1977) | (42) <i>Hungarian</i>
ez a szem gyöngy
this the Cl pearl
this pearl |
|--|--|

Bare Cl+N:

- | | |
|---|---|
| (43) <i>Cantonese</i>
go louban maai zo ga ce
Cl boss buy pfv Cl car
the boss bought a/the car
(Li 2013: 234) | (44) <i>Mandarin</i>
wo mai le ben shu
I buy pfv Cl book
I bought a book
(Li 2013: 238) |
|---|---|

Cheng & Sybesma (1998) distinguish classifiers and massifier (or mass classifiers).

Count classifiers: *name* the unit in which the entitites come naturally, functional heads

Mass classifiers (massifiers): *create* a unit of measure, e.g. *bowl*, nouns that move to a functional head and take an NP complement

5.3 Numeral (count) classifiers: structural position

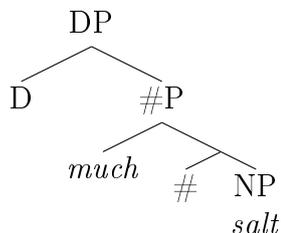
Numeral (count) classifiers (henceforth classifiers) are in a functional projection between NP and NumP called ClassifierP (Zhang 2013 calls it UnitP; Svenonius 2008 calls it SortP).

Borer (2005)

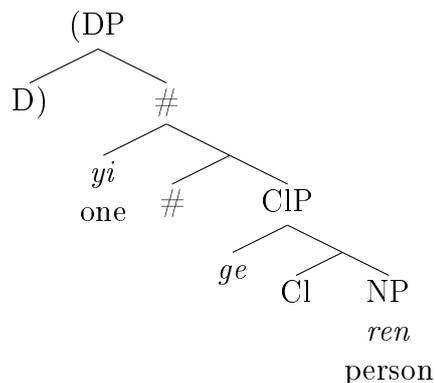
- mass vs count is a matter of the amount of structure you have
- nouns are, by themselves, ‘stuff’, have no grammatical specification as to mass vs. count
- NP has a mass denotation in all languages, NPs are always predicates
- the mass (‘stuff’) has to be portioned out before it can be counted
- this is done in a CIP in syntax

- stuff dividers: Chinese classifiers, English plural and indef. article (plural is a type of classifier)
- counting is performed by a higher projection, #P(NumP)⁴
- individuals are created at the level of #P

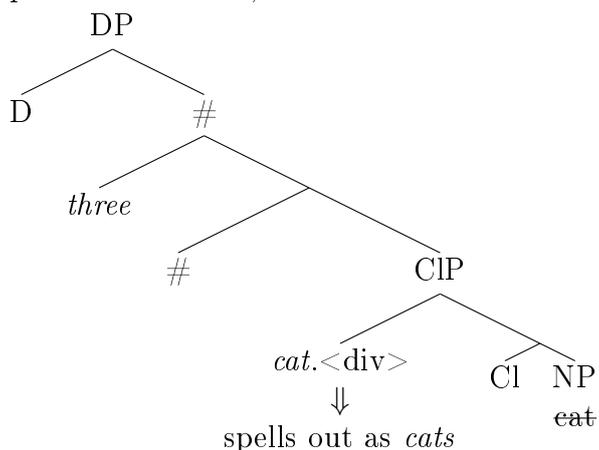
(45) mass structure: no CIP



(46) count structure with Chinese classifier



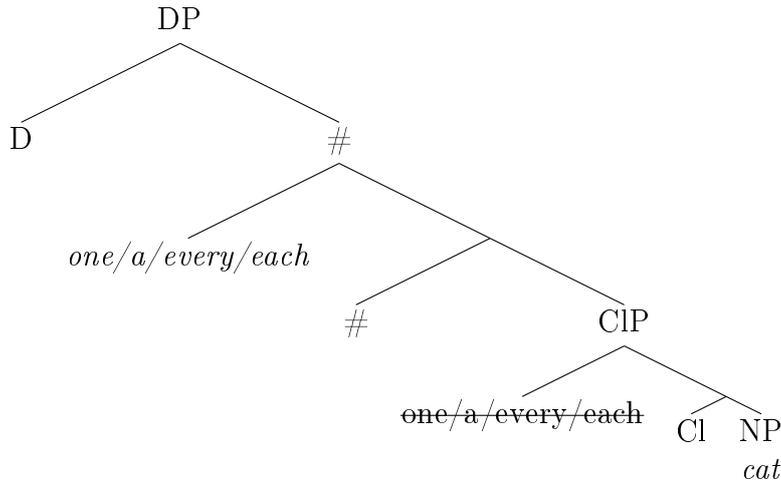
(47) English, count structure with plural:
plural is a divisor, numeral is a counter



The plural is not actually plural (cf. *three boys*, *one boy*, *zero boys*, *0.5 boys*, *1.5 boys*) and does not imply the existence of singulars. It just divides stuff.

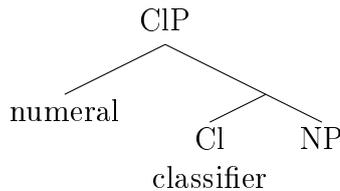
⁴Numerals and quantifiers are genuine counters, not multipliers. Multipliers operate on singulars; counters operate on partitioned out stuff. Note that Borer uses 'counter' to mean the numeral and the quantifier, while Cheng & Sybesma (1998) use it to mean the classifier. . .

- (48) English, count structure with indef. article or singular-taking quantifier: article/quantifier is both a divisor and a counter

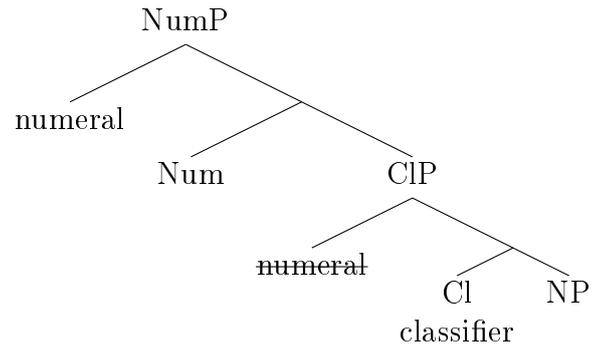


NB: in Borer's trees the classifier may look like a spec, but that's not the case (the way her trees are laid out follows from her special structural assumptions). Indeed, it is standard to assume that Cl is in the head position.

- (49) Cheng & Sybesma (1998)



- (50) Zhang (2013)



NB: Zhang calls CIP UnitP, and calls NumP QuantP; she has a NumP dominating NP (for the plural)

5.4 Classifiers and the plural

- (51) "The hypothesis can be stated as follows: if a language includes numeral classifiers as its dominant mode of forming quantification expressions, then it will also have facultative expression of the plural. In other words, it will not have obligatory marking of the plural on nouns" (Sanches & Slobin 1973: 4)⁵
- (52) The exceptions — those languages which have both numeral classifiers and obligatory plurals — are clearly in the minority, and, in most cases, their status with regard to one characteristic or the other is somewhat doubtful. (Sanches & Slobin 1973: p. 8.)

⁵The idea originates from an unpublished paper of Mary Sanches, first quoted in writing in Greenberg (1972).

This has developed into a claim that cross-linguistically, classifiers are in complementary distribution with the plural (T'sou 1976, Chierchia 1998, Borer 2005).

- (53) *Armenian*, adapted from Borer (2005)
- | | |
|--|---|
| <p>a. yergu hovanoc
two umbrella
two umbrellas</p> <p>b. yergu had hovanoc
two Cl umbrella
two umbrellas</p> | <p>c. yergu hovanoc-ner
two umbrella-pl
two umbrellas</p> <p>d. *yergu had hovanoc-ner
two Cl umbrella-pl
two umbrellas</p> |
|--|---|

But ...

Lebanese Arabic -AH is a Cl according to Borer & Ouwayda (2010), Ouwayda (2014)

- (54) tlat teffeH-aat
three apple-AH-pl
three apples (adapted from Ouwayda 2014: 52) Lebanese Arabic

Rothstein & Schvarcz (to appear) claim that CL and Pl co-occur in Hungarian

- (55) ez-ek a rúd szalámi-k
this-pl the Cl salami-pl
these rods of salami (Rothstein & Schvarcz to appear) Hungarian

Two approaches when Cl and plural co-occur:

- complementarity is basic (counter-examples involve a special plural or a special classifier or have been misanalyzed): Borer (2005), Borer & Ouwayda (2010), Wiltschko (2008), Svenonius (2008), Ott (2011), Ouwayda (2014)
- basic case is co-occurrence, Cl and plural are in different dedicated projections: De Belder (2011), Zhang (2011), Taraldsen (2009)

6 The order of classifiers and adjectives

6.1 Theoretical considerations

Some authors have noted that if classifiers partition stuff of individuate a mass, then certain adjectives, e.g. shape and size cannot possibly attach before classifiers do; see Muromatsu (2003), Truswell (2004), Svenonius (2008). (For other adjectives, e.g. colour or nationality, no prediction is made.)

Their predictions are not tested in classifier languages, though.

Csirmaz & Dékány (2014): both the kind of stuff that is divided up and the kind of division imposed on the stuff must be known before the semantic contribution of relative dimensional adjectives can be computed; dimensional adjectives modify the Cl+N unit

Argument 1:

- the Cl *szem* is associated with small spherical objects, while *fej* is used for big spherical objects
- but the size of the *szem* unit, for instance, is evaluated differently depending on whether the noun it combines with is *mustard seed* or *coconut*

(56) egy nagy szem mustár-mag (57) egy nagy szem kókuszdió
one big CL_{eye} mustard-seed one big CL_{eye} coconut
a big mustard seed a big coconut

Argument 2:

- some nouns can be partitioned in more than one way
- in order to evaluate whether our grape is *big*, we need to know how it is divided into units

(58) a. egy szem szőlő b. egy tő szőlő
one CL_{eye} grape one CL_{stem} grape
a grain of grape a grape plant

⇒ the standard of comparison is compositionally computed from the combination of the noun and the classifier

6.2 A case study: Hungarian specific classifiers

Dékány (2011), Csirmaz & Dékány (2014) check the position of classifiers in Scott's A-hierarchy

(59) ordinal > cardinal > size > length > height > speed > width > weight > temperature > wetness > age > shape > color > origin > material (Scott 2002)

Result:

(60) ordinal > cardinal > size > length > height > speed > width > weight > **classifiers** > temperature > wetness > age > shape > color > origin > material

size A > Cl

(61) két nagy szem alma (62) #két szem nagy alma
two big CL_{eye} apple two CL_{eye} big apple
two big apples two big apples

weight A > Cl

(63) két nehéz fej brokkoli (64) #két fej nehéz brokkoli
two heavy CL_{head} broccoli two CL_{head} heavy broccoli
two heavy broccolis two heavy broccolis

Examples with # get a type interpretation. If indeed units/individuals emerge at ClP, then this is expected; token interpretations will be out but type interpretations will be OK.⁶

Cl > temperature A

- | | | | |
|------|---|------|--|
| (65) | két karika hideg kolbász
two CL _{ring} cold sausage
two cold slices of sausage | (66) | *két hideg karika kolbász
two cold CL _{ring} sausage
two cold slices of sausage |
|------|---|------|--|

Cl > colour A

- | | | | |
|------|--|------|---|
| (67) | két szem sárga alma
two CL _{eye} yellow apple
two yellow apples | (68) | *két sárga szem alma
two yellow CL _{eye} apple
two yellow apples |
|------|--|------|---|

Examples with * are very hard if not impossible to get even with a change in interpretation; they get somewhat more acceptable with very strong, contrastive stress (which possibly indicates that A has moved into a Focus position).

Functional sequence so far:

- (69) Adj > Cl > Adj > n > N

Remaining puzzle: shape adjectives, which were expected to precede the classifier.

- | | | | |
|------|---|------|---|
| (70) | két szem kerek rizs
two CL _{eye} round rice
two round grains of rice | (71) | *két kerek szem rizs
two round CL _{eye} pearl
two round grains of rice |
|------|---|------|---|

6.3 A case study: the general Hungarian Cl

General Cl *darab* lit: '(whole) piece, specimen': compatible with any non-abstract count N. This Cl precedes all adjectives.⁷

⁶Interesting parallel from Thai: Piriyawiboon (2010) claims that a noun phrase with a type reading cannot contain a classifier.

- | | | |
|-----|--|------|
| (i) | a. sat yai
animal big
big animals (type of animal: elephants, buffaloes, rhinoceroses, etc.) | |
| | b. sat tua yai
animal Cl big
animals that happen to be big (e.g. a dog that is big for a dog)
(Cheng & Sybesma 2009, citing Kookiattikoon 2001) | Thai |

⁷An apparent counter-example is (i), where the adjective *nagy* 'big' precedes the general classifier.

- (i) egy nagy darab ember
one big Cl man
a beefy man (NOT a big man)

But: i) humans are generally not modified by the adjective *big*, ii) the interpretation is non-compositional, iii) *nagy* cannot be replaced by its antonym *kicsi* 'small', iv) *darab* can occur with any count noun, but

- (72) *egy nagy darab körte
 one big CL_{generic} pear
 a big pear
- (73) egy darab nagy körte
 one CL_{generic} big pear
 a big pear
- (74) *egy fehér darab toll
 one white CL_{generic} feather
 a white feather
- (75) egy darab fehér toll
 one CL_{generic} white feather
 a white feather

Functional sequence so far:

- (76) Num > Adj > Cl > Adj > n > N

But we have just said that size As must be inserted above Cls ...

This could be movement from Cl to Num, which would explain the following data.

- (77) egy **darab** hagyma
 one Cl onion
 an onion
- (78) egy **fej** hagyma
 one Cl onion
 an onion
- (79) *egy **darab fej** hagyma
 one Cl Cl onion
 an onion

At the same time, high adjectives intervening bw. the 2 Cls ameliorate the judgments:

- (80) ?egy **darab** nagy **fej** hagyma
 one Cl big Cl onion
 a big onion
- (81) *egy **darab fej** lila hagyma
 one Cl Cl purple onion
 a purple onion

→ *darab* is possibly a portmanteau for Num and Cl; the high adjective that intervenes bw. Num and Cl interferes with the merger of Cl and Num and marginally allows the 2 positions to be spelled out separately

Do we have a problem in Mandarin? Two orders, no difference in interpretation.

- (82) a. yi chang tiao xianglian = yi tiao chang xianglian
 one long CL necklace = one CL long necklace
 one long necklace
- b. yi hou ben jiaoke-shu = yi ben hou jiaoke-shu
 one thick CL text-book = one CL thick text-book
 one thick textbook

nagy darab can occur only with a handful nouns, v) *nagy darab* has a compound-like stress pattern, *darab* cannot have its own stress, and vi) the string *nagy darab* can co-occur with another *darab*.

- (ii) egy darab nagy darab ember
 one Cl big darab man
 one beefy man

The string *nagy darab* is therefore best analyzed as a compound The first *darab* in (ii) is the real classifier, while second *darab* is part of a compound adjective.

- c. yi suan ding maozi = yi ding yuan maozi
 one round CL hat = one CL round hat
 one round hat
- d. yi xiao fang zhang zhuanpian = yi zhang xiao fang zhuanpian
 one small square CL photo = one CL small square photo
 “one small square photo” (Zhang 2011: p. 45, ex. 117.) Mandarin

→ the dimensional adjective modifies units in both orders (no type interpretation), so the left hand side members of the pairs then show the base-generated order while the right hand side members of the pairs feature a classifier that ends up in Num on the surface.⁸

6.4 Could general Cls be systematically different?

Mandarin: Zhang (2009) suggests that while specific classifiers are merged in Cl, and move to Num, the general Cl *ge* is inserted directly into Num.

Persian: general and specific Cls can co-occur, the former must be higher (data from Gebhardt 2009: e. 273., ex. 110.)

- (83) a. do ta jeld ketab
 two Cl_{gen} Cl_{book} book
 two books
- b. *do jeld ta ketab
 two Cl_{book} Cl_{gen} book
 two books Persian

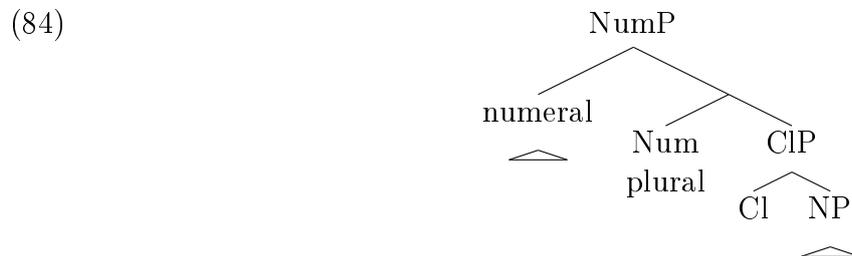
7 Cardinal numerals

7.1 Structural position

Cardinal numerals are ...

in spec, NumP (#P or QP or CardP):⁹ Franks (1994) Giusti (1997)¹⁰ Li (1999), Bartos (1999), Corver & Zwarts (2006), Cinque (2005),¹¹ among many others

In this approach the plural marker (and its \emptyset singular counterpart) is standardly taken to be in the head of this projection (but see Borer’s analysis).



⁸Zhang (2011) proposes deriving the flexibility in (82) by base-generating both orders.

⁹See previous sections that this might be a derived position.

¹⁰She calls the relevant projection AgrP.

¹¹Corver & Zwarts (2006) argue that numerals are merged in a postnominal position and move to spec, NumP

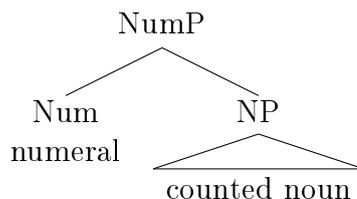
NB: numerals are in complementary distribution with the plural in some languages → complementary distribution does not necessarily mean competition for the same syntactic position!

- (85) három ház(*-ak)
 three house-PL
 three houses

Hungarian

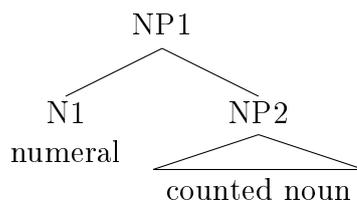
in Num (#P or Q or Card): Barbiers (1992), Zamparelli (2000: ch.6)¹²

(86)



N, taking the counted N(P) as a complement: Ionin & Matushansky (2004; 2006), partly Caha (2013) (he takes (Czech) numerals to be portmanteaus for N and Num)

(87)



In Ionin and Matushansky's approach the plural that appears on the counted Ns reflects concord with the semantic plurality of the extended NP. Languages in which there is no plural with numerals simply lack this concord.

Mixed analyses (spec or functional head): Bailyn (2004), Shlonsky (2004), Borer (2005), Danon (2012) (status depends on both the language and the construction involved)

Functional sequence so far:

- (88) Num > Adj > Cl > Adj > n > N

7.2 The modified cardinal construction

In some cases adjectives precede cardinals without being focused (see Jackendoff 1977, Ionin & Matushansky 2004, Cinque 2010, Maekawa 2013, Keenan 2013, Marušič & Žaucer under review, among others).

- (89) a. a beautiful two weeks (Maekawa 2013)
 b. we discussed the wrong two answers (Cinque 2010)
 c. a stunning one thousand books (Ionin & Matushansky 2006)

¹²For non-modified cardinals only, modified numerals like *exactly three* and vague numerals like *many*, *some* would be in a spec.

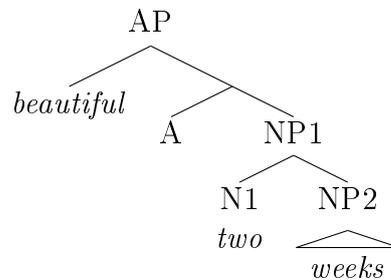
NB: the indef. article is obligatory, in spite of the semantic plurality of the counted N

Does this mean that we don't have a fixed functional sequence? No!

Possibility 1: these are reduced relative clauses (Cinque 2010)

Possibility 2: if cardinals are Ns, then this is not surprising; A > N.

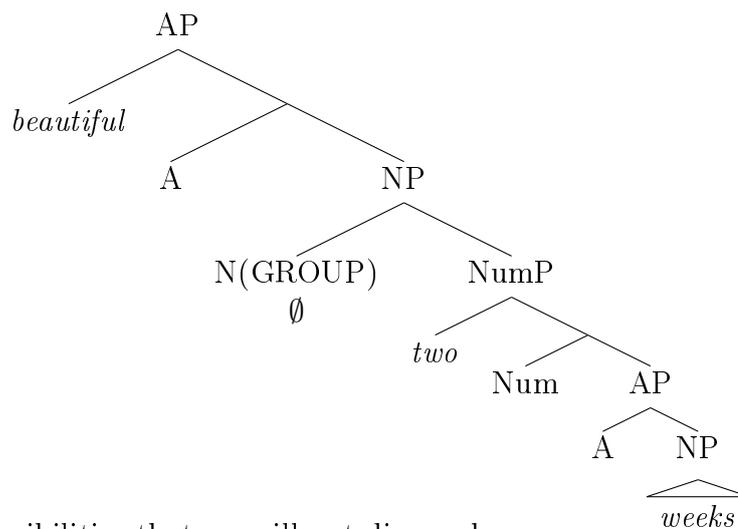
(90)



What we need to account for is why not all types of As can precede cardinals → this should be derived from semantics (Ionin & Matushansky 2004; 2006)

Possibility 3: these are binominal constructions with a silent GROUP noun

(91)



There are further possibilities that we will not discuss here.

7.3 Some related categories

We have so far talked only about cardinal numerals.

Ordinals:

(92) poss > cardinal > ordinal > quality > size > shape > color > nationality (Cinque 1994)

(93) ordinal > cardinal > ... > N (Shlonsky 2004)

Hungarian allows both orders, with different interpretations

- (94) az első három rab
 the first three prisoner
 the first three prisoners
 (one series/line/group of prisoners, of which we pick the highest ranked 3)
- (95) a három első rab
 the three first prisoner
 the three first prisoners
 (three series/line/group of prisoners; we pick the first from each series/line/group)

Quantifiers:

- *few, many*: might be taken to be vague cardinals
- *every, some, etc.*: genuine quantifiers

Bartos (1999) suggests that they are in a higher projection than cardinals (see also Borer & Ouwayda 2010 for a Q position above Num).

- (96) [_{QP} minden [_{NumP} három tanuló]] (kap egy közös szekrényt)
 every three student get one shared locker
 Every three students get a shared locker. (Bartos 1999: fn. 13.) Hungarian

If this is so, then

- (97) Q > Num > Adj > Cl > Adj > *n* > N

Note that *minden* ‘every’ also precedes ordinals

- (98) Minden harmadik tanuló hazamehet.
 every third student home.go.can
 Every third student can go home. Hungarian

So we have either (99-a) or (99-b).

- (99) a. Quant > Ord > Num > Adj > Cl > Adj > *n* > N
 b. Quant > Num > Ord > Adj > Cl > Adj > *n* > N

On quantifiers, see Szabolcsi (2010) for a recent summary.

All and its equivalents:

- (100) all the (*all) boys

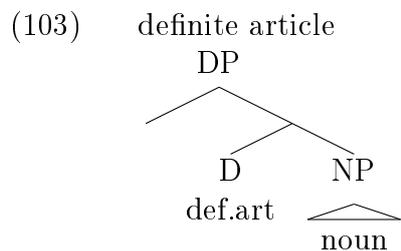
- (101) *Hungarian* b. mind a (*mind) három
 a. minden fiú all the three
 every boy fiú
 every boy boy
 all (the) three boys

- (102) all > D > Num > A > Cl > A > *n* > N

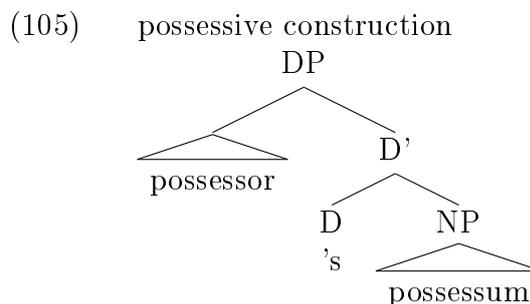
For expository purposes, for the rest of this course we will ignore ordinals and the possibility of a separate QP projection for quantifiers.

8 DP

Elements base-generated in D: definite article, Saxon genitive 's,¹³ personal pronouns



(104) **the** umbrella



(106) [the inspector over there]'s umbrella

Elements moving to D: proper names (depending on the language and construction), possessed N in the Construct State (CS), some personal pronouns (see the handout on possessives)

Proper names

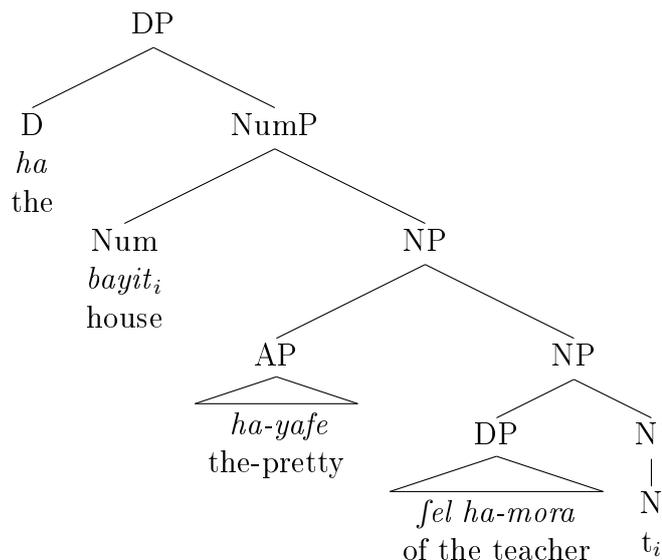
- (107) a. Il mio Gianni
 the my Gianni
 my Gianni
- b. Gianni_i mio t_i
 Gianni my
 my Gianni Italian
 (Longobardi 1994)

Construct state

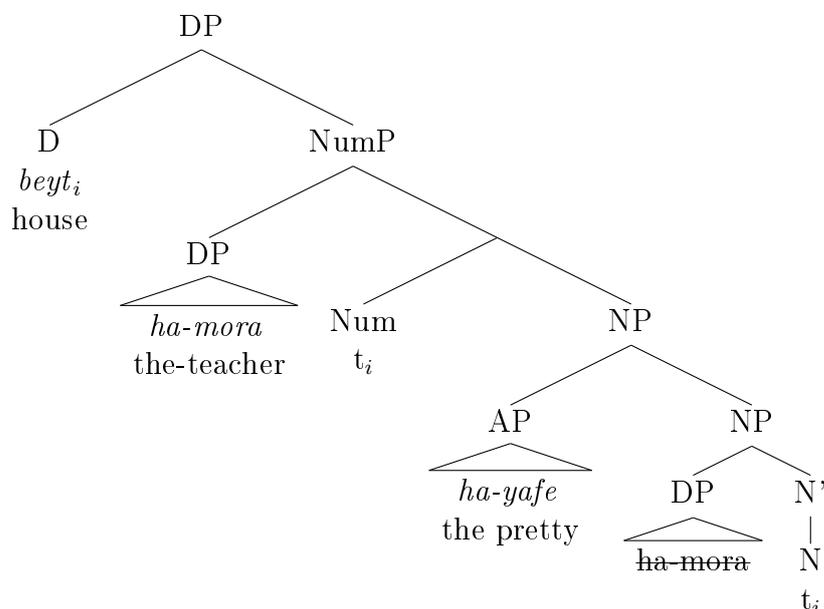
- (108) Hebrew
- a. ha-bayit ha-yafe fel ha-mora
 the-house the-pretty of the-teacher
 the teacher's pretty house free state
- b. beyt ha-mora ha-yafe
 house.m the-teacher.f the-pretty.m
 the teacher's pretty house (Ritter 1988) CS

¹³But see the handout on possessive constructions.

(109)



(110)



Functional sequence so far:

(111) D > Num > Adj > Cl > Adj > n > N

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