Functional projections in the DP

The lower portion

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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)

[± arguemental], [±predicate]: constrain the default semantic interpretation of NP

- Type 1: [+arg, -pred], <e>, 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], <e,t>, 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 ≠ 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. a wine, a love, a thread, a salt, a stone
    b. wines, loves, threads, stones
    c. all the wines / loves / threads / salts / stones
    d. We store three bloods in this lab (adapted from Borer 2005: 102)

Predominantly count nouns may be made mass (Universal Grinder)

(3) a. there is dog / stone / chicken on this floor
    b. too much dog / chicken / stone / table / carpet
    c. 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 \( N_{\text{root}} \) which is a predicate and denotes sets
- MASS operation: derives mass nouns, the associated kind of \( N_{\text{root}} \)
- 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 \( vP \):

(5) \[ vP \]
(6) \[ nP \]

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 spec\(^1\)
- 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, \( nP \)

\(^1\)Both 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


\[(7) \text{NP} \quad \text{AP} \quad \text{NP} \quad \text{adjunct} \quad \text{WP} \quad \text{spec} \quad \text{N} \quad \text{YP} \quad \text{compl.} \]

\[(8) \text{WP} \quad \text{AP} \quad \text{adjunct} \quad \text{XP} \quad \text{W} \quad \text{NP} \quad \text{ZP} \quad \text{spec} \quad \text{N} \quad \text{YP} \quad \text{compl} \]

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

\[(9) \text{DP} \quad \text{D} \quad \text{AP} \quad \text{A} \quad \text{adjective} \quad \text{NP} \quad \text{N} \]

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

\[(10) \begin{align*}
\text{a.} & \quad \text{hest-en} \\
& \quad \text{horse-the} \\
& \quad \text{the horse} \\
\text{b.} & \quad *\text{den hest} \\
& \quad \text{the horse} \\
& \quad \text{the horse} \\
\text{c.} & \quad \text{den røde hest} \\
& \quad \text{the red horse} \\
& \quad \text{the red horse} \\
\text{d.} & \quad *\text{røde hest-en} \\
& \quad \text{red horse-the} \\
& \quad \text{the red horse} \\
& \quad \text{(Mikkelsen & Hankamer 2002)}
\end{align*} \]

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

\[(11) *\text{a [proud of his son] father} \]

\[(12) \begin{align*}
\text{a [fiá-ra büszke] apa} \\
& \quad \text{the son.poss-onto proud father} \\
& \quad \text{the father proud of his son} \quad \text{Hungarian}
\end{align*} \]
• 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)

(15)\[ \begin{array}{c}
\text{AP} \\
A' \\
\text{NP} \\
A \\
\text{adjective}
\end{array} \]

**Specifier:**


• independently motivated functional projections: Svenonius (2008)

(16)\[ \begin{array}{c}
\text{FP} \\
\text{AP} \\
\text{F} \\
\text{NP} \\
\text{N}
\end{array} \]

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

\[
\begin{align*}
\text{a.} & \text{ neut.sg stor-t eit a.neut.sg big-neut.sg a.neut.sg ugly-neut.sg a.neut.sg house.neut} \\
\text{a big ugly house (Julien 2005: 9)} & \quad \text{Norwegian}
\end{align*}
\]

Mixed:

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

4.2 Ordering restrictions among adjectives (AOR)

Object nouns:

(20) \quad \text{poss > cardinal > ordinal > quality > size > shape > color > nationality (Cinque 1994)}

(21) \quad \text{value > dimensions > physical property > speed > human propensity > age > color (Dixon 1982)}

(22) \quad \text{ordinal > cardinal > size > length > height > speed > width > weight > temperature > wetness > age > shape > color > origin > material (Scott 2002)}

(23) \quad \text{[Quantif Ordinal > Cardinal] > [Speaker-oriented 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) \quad \text{poss > cardinal > ordinal > speaker-oriented > subject-oriented > manner > thematic (Cinque 1994)}

(26) \quad \text{the probably clumsy immediate American reaction to the offense (Laenzlinger 2004)}

\(^2\)Note how this parallels the order of adverbs:

(i) \quad \text{They probably have clumsily reacted immediately to your letter. (Laenzlinger 2004)}
4.3 AOR lifted

**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 lǐ huāpíng  
  small green vase  
  small green vase  

b. *lǐ xiǎo huāpíng  
  green small vase  
  green small vase

RelCl and Poss.or introduced by de

\[(30)\]

a. wǒ mǎi-de huāpíng  
  I buy-de vase  
  the vase that I bought  

b. wǒ-de huāpíng  
  I-de vase  
  my vase

AOR lifted for de-adjectives

\[(31)\]

a. xiǎo-de lǐ-de huāpíng  
  small-de green-de vase  
  small green vase  

b. lǐ-de xiǎo-de huāpíng  
  green-de small-de 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.

\(^3\)To be qualified below
5.2 Numeral classifiers: function and subtypes

Only appear next to a numeral or a quantifier.

(39)  **Chinese**
      san  zhi bi
      three CL people
      three persons
      (Cheng & Sybesma 1998)

(40)  **Hungarian**
      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)  **Thai**
      māa tua nán
      dog CL that
      that dog
      (Allan 1977)

(42)  **Hungarian**
      ez a szem gyöngy
      this the CL pearl
      this pearl

Bare CL+N:

(43)  **Cantonese**
      go louban maai zo ga ce
      CL boss buy pfv CL car
      the boss bought a/the car
      (Li 2013: 234)

(44)  **Mandarin**
      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 entities 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 ClassierP (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, \(^4\#P(\text{NumP})\)

• individuals are created at the level of \(#P\)

\[(45)\] mass structure: no CIP
\[
\begin{array}{c}
\text{DP} \\
D \quad \#P \\
\text{much} \quad \# \quad \text{NP} \\
\text{salt}
\end{array}
\]

\[(46)\] count structure with Chinese classifier
\[
\begin{array}{c}
\text{(DP)} \\
D \quad \# \\
\text{yi} \quad \# \quad \text{ClP} \\
\text{ge} \quad \text{Cl} \quad \text{NP} \\
\text{ren} \quad \text{person}
\end{array}
\]

\[(47)\] English, count structure with plural: plural is a divisor, numeral is a counter
\[
\begin{array}{c}
\text{DP} \\
D \quad \# \\
\text{three} \quad \# \\
\text{ClP} \\
\text{cat.<div>} \quad \text{Cl} \quad \text{NP} \\
\downarrow \\
\text{spells out as cats}
\end{array}
\]

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.

\[^4\text{Numerals and quantifiers are genuine counters, not multipliers. Multipliers operate on singulars; counters operate on partitioned out stuff. Note that Borer uses ‘counter’ to mean the numeral and the quantifier, while Cheng & Sybesma (1998) use it to mean the classifier…}\]
(48) English, count structure with indef. article or singular-taking quantifier: article/quantifier is both a divisor and a counter

\[
\text{DP} \\
\text{D} \\
\text{one/a/every/each} \\
\text{ClP} \\
\text{one/a/every/each} \quad \text{Cl} \quad \text{NP}
\]

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)

\[
\text{ClP} \\
\text{numeral} \\
\text{Cl} \quad \text{NP}
\]

NB: Zhang calls ClP 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.)

\(^5\)The 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

(53) **Armenian**, adapted from Borer (2005)
    a. yergu hovanoct	two umbrella	two umbrellas
    b. yergu had hovanoct	two Cl umbrella	two umbrellas
c. yergu hovanoct-ner	two umbrella-pl	two umbrellas
d. *yergu had hovanoct-ner	two Cl umbrella-pl	two umbrellas

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

(55) ez-ek a ruid szalami-k	this-pl the Cl salami-pl
two Cl and plural co-occur in Hungarian

Two approaches when Cl and plural co-occur:

• complementarity is basic (counter-examples involve a special plural or a special clas-
sifier or have been misanalyzed): Borer (2005), Borer & Ouwayda (2010), Wiltschko

• basic case is co-occurrence, Cl and plural are in different dedicated projections: De

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.

Csírmaz & 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
one big Cl_{eye} mustard-seed
a big mustard seed

(57) egy nagy szem kókuszdió
one big Cl_{eye} coconut
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
one Cl_{eye} grape
a grain of grape

b. egy tó szőlő
one Cl_{stem} 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
two big Cl_{eye} apple
two big apples

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

weight A > Cl

(63) két nehéz fej brokkoli
two heavy Cl_{head} broccoli
two heavy broccoli

(64) #két fej nehéz brokkoli
two Cl_{head} heavy broccoli
two heavy broccoli
Examples with # get a type interpretation. If indeed units/individuals emerge at CIP, then this is expected; token interpretations will be out but type interpretations will be OK.\(^6\)

\[ \text{Cl} > \text{temperature A} \]

\(65\) \[ \text{két karika hideg kolbász} \]
\[ \text{two } CL_{\text{ring}} \text{ cold sausage} \]
\[ \text{two cold } CL_{\text{ring}} \text{ slices of sausage} \]

\(66\) \[ \text{*két hideg karika kolbász} \]
\[ \text{two cold } CL_{\text{ring}} \text{ sausage} \]
\[ \text{two cold slices of sausage} \]

\[ \text{Cl} > \text{colour A} \]

\(67\) \[ \text{két szem sárga alma} \]
\[ \text{two } CL_{\text{eye}} \text{ yellow apple} \]
\[ \text{two yellow apples} \]

\(68\) \[ \text{*két sárga szem alma} \]
\[ \text{two yellow } CL_{\text{eye}} \text{ apple} \]
\[ \text{two yellow apples} \]

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:

\(69\) \[ \text{Adj} > [\text{Cl}] > \text{Adj} > n > N \]

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

\(70\) \[ \text{két szem kerek rizs} \]
\[ \text{two } CL_{\text{eye}} \text{ round rice} \]
\[ \text{two round grains of rice} \]

\(71\) \[ \text{*két kerek szem rizs} \]
\[ \text{two round } CL_{\text{eye}} \text{ pearl} \]
\[ \text{two round grains of rice} \]

6.3 A case study: the general Hungarian Cl

General Cl \textit{darab} lit: ‘(whole) piece, specimen’: compatible with any non-abstract count N. This Cl precedes all adjectives.\(^7\)

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

\(^7\)An apparent counter-example is (i), where the adjective \textit{nagy} ‘big’ precedes the general classifier.

\[ \text{(i)} \]
\[ \text{a. } \text{sat } yai \]
\[ \text{animal big} \]
\[ \text{big animals (type of animal: elephants, buffaloes, rhinoceroses, etc.)} \]
\[ \text{b. } \text{sat } tua yai \]
\[ \text{animal CL big} \]
\[ \text{animals that happen to be big (e.g. a dog that is big for a dog)} \]
\[ \text{(Cheng \\& Sybesma 2009, citing Kookiattikoon 2001) Thai} \]

But: i) humans are generally not modified by the adjective \textit{big}, ii) the interpretation is non-compositional, iii) \textit{nagy} cannot be replaced by its antonym \textit{kicsi} ‘small’, iv) \textit{darab} can occur with any count noun, but
*egy nagy darab körte
one big CLgeneric pear
a big pear

*egy fehér darab toll
one white CLgeneric feather
a white feather

*egy nagy darab fej hagyma
one CL big onion
a big onion

*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.

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

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

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

The string \textit{nagy darab} is therefore best analyzed as a compound The first \textit{darab} in (ii) is the real classifier, while second \textit{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 zhuangpian = yi zhang xiao fang zhuangpian
   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 jekl ketab
    two Clgen Clbook book
two books
b. *do jekl ta ketab
    two Clbook Clgen book
two books
Persian

7 Cardinal numerals

7.1 Structural position

Cardinal numerals are . . .

Bartos (1999), Corver & Zwarts (2006), Cinque (2005),11 among many others

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

(84) NumP
     \[ \text{numeral} \]
     \[ \text{Num} \rightarrow \text{CIP} \]
     \[ \text{plural} \rightarrow \text{Cl NP} \]

---

8 Zhang (2011) proposes deriving the flexibility in (82) by base-generating both orders.
9 See previous sections that this might be a derived position.
10 She calls the relevant projection AgrP.
11 Corver & 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)\textsuperscript{12}

\begin{center}
(86) \begin{tikzpicture}
  \node (NumP) {NumP};
  \node (Num) [below left] {Num \hspace{1cm} NP \hspace{1cm} counted noun};
  \node (numeral) [below left] {numeral};
  \node (NP) [below right] {counted noun};
  \draw (NumP) -- (Num);
  \draw (NumP) -- (numeral);
  \draw (Num) -- (NP);
\end{tikzpicture}
\end{center}

\textbf{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)

\begin{center}
(87) \begin{tikzpicture}
  \node (NP1) {NP1};
  \node (N1) [below left] {N1 \hspace{1cm} NP2 \hspace{1cm} counted noun};
  \node (numeral) [below left] {numeral};
  \draw (NP1) -- (N1);
  \draw (NP1) -- (numeral);
  \draw (N1) -- (NP2);
\end{tikzpicture}
\end{center}

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.

\textbf{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) \begin{align*}
  \text{Num} > \text{Adj} > \text{Cl} > \text{Adj} > n > N
\end{align*}

\textbf{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, Marušić & 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)

\textsuperscript{12}For non-modified cardinals only, modified numerals like \textit{exactly three} and vague numerals like \textit{many}, \textit{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.

![Diagram](image)

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

![Diagram](image)

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
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)

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).

\[
\{QP \text{ minden } [\text{NumP három tanuló }] \} \quad \text{(kap egy közös szekrényt)}
\]
Every three students get a shared locker

If this is so, then

\[
\text{Q > Num > Adj > Cl > Adj > n > N}
\]

Note that *minden*, 'every' also precedes ordinals

Mindennel harmadik tanuló hazahagy.

Every third student can go home.

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

\[
\begin{align*}
\text{a.} & \quad \text{Quant > Ord > Num > Adj > Cl > Adj > n > N} \\
\text{b.} & \quad \text{Quant > Num > Ord > Adj > Cl > Adj > n > N}
\end{align*}
\]

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

*All* and its equivalents:

\[
\text{all the (*all) boys}
\]

\[
\begin{align*}
\text{Hungarian} & \quad \text{mind a (*mind) három} \\
\text{a.} & \quad \text{minden fiú} \\
\text{every boy} & \quad \text{fiú}
\end{align*}
\]

\[
\begin{align*}
\text{b.} & \quad \text{all (the) three boys} \\
\text{boy} & \quad \text{három}
\end{align*}
\]

\[
\text{all > D > Num > A > Cl > A > n > N}
\]

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, personal pronouns

(103) definite article

\[
\text{DP} \\
\text{D} \quad \text{NP} \\
\text{def.art} \quad \text{noun}
\]

(105) possessive construction

\[
\text{DP} \\
\text{possessor} \\
\text{D'} \\
\text{D} \quad \text{NP} \\
\text{'} \quad \text{possessum}
\]

(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, mio ti
    Gianni my
    my Gianni

(108) Hebrew

a. ha-bayit ha-yafe jel ha-mora
   the-house the-pretty of the-teacher
   the teacher's pretty house

b. beyt ha-mora ha-yafe
   house.m the-teacher.f the-pretty.m
   the teacher's pretty house (Ritter 1988)

But see the handout on possessive constructions.
(109)

\[
\text{DP}
\]

\[
\text{D} \quad \text{NumP}
\]

\[
\text{ha} \quad \text{the}
\]

\[
\text{Num} \quad \text{beyt}_i \\
\text{house}
\]

\[
\text{AP} \quad \text{DP} \quad \text{Num} \quad \text{t}_i
\]

\[
\text{ha-yafe} \quad \text{the-prett}y
\]

\[
\text{el ha-mora} \\
\text{of the teacher}
\]

(110)

\[
\text{DP}
\]

\[
\text{D} \quad \text{NumP}
\]

\[
\text{beyt}_i \\
\text{house}
\]

\[
\text{Num} \quad \text{DP} \quad \text{NP}
\]

\[
\text{ha-mora} \\
\text{the-teacher}
\]

\[
\text{AP} \quad \text{DP} \quad \text{N'} \\
\text{ha-yafe} \quad \text{the-pretty}
\]

\[
\text{ha-mora} \\
\text{t}_i
\]

Functional sequence so far:

(111) \quad \text{D} > \text{Num} > \text{Adj} > \text{Cl} > \text{Adj} > n > \text{N}

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