A. Decide whether need is an auxiliary or lexical verb in the following sentences.

Reformulate the sentences, changing need to a lexical verb if it is an auxiliary, or to an auxiliary if it is lexical. (The reformulation may not be possible in all cases.)

a. You don’t need to go to the bank.  b. I don’t need any help.

c. Nobody need do that.  d. You need to go to the bank.

1.2. Auxiliaries as head of the sentence

Simplest analysis for the structure of an English sentence with an auxiliary:

(13) [NP Aux VP]

There are reasons to think that (13) should be replaced with a structure with the auxiliary is head of the whole sentence and the VP is its complement:

A. What we know about phrase structure tells us that phrases have heads. A sentence is also a type of phrase, so we expect it to have a head, unlike what (13) suggests. Since the head of a phrase is a single word, Aux is the best candidate for head of the sentence.

B. The next argument begins with the observation that auxiliaries determine the form that the verb in the VP takes:

(14) a. Modals go with verbs in the infinitive form (she must/might sing a song)
b. have goes with verbs in the perfect participle form (she has sung a song)
c. Progressive be goes with verbs in the –ing form (she is singing a song)
d. Passive be goes with verbs in the perfect participle form (the song was sung).

Normally, it is the head of a phrase which imposes restrictions on the type of complement it may take. We see this in the fact that verbs and prepositions require their NP complements to have accusative case (I saw her/*she; with her/*she)

E) Lexical verbs can take a complement VP introduced by to. Auxiliaries cannot.

(15) He wants/needs a drink vs. *He must a drink

C) Contrary to what (13) suggests, the application of the coordination test in (15) suggests that the auxiliary and the VP form a constituent which does not include the subject. It is typical of English that complements appear after heads, and this is what we find with the sequence Aux-VP. The fact that Aux and VP form a constituent (cf. (15)) and the assumption that VP is after the auxiliary, reflecting the typical head-complement order of English.

D) Complements headed by certain prepositions (rely on/*in them; trust in*on them). Moreover,

(16) [NP Aux VP]

Many linguists thus assume that sentences have the structure in (16). (See e.g. any of the textbooks by Adger, Carnie, Culicover, Haegeman, Ouhalla, Radford.)
Functional Categories

In (16)d) Here e stands for 'empty'. (You could alternatively write Ø under I or not put anything there.) We discuss the evidence for an empty I position in sentences without auxiliaries later.

What is I? The element I stands for Inflection. (Another abbreviation for 'inflection' is Infl.) The sentence is thus considered to be an Inflection Phrase or IP. The 'inflection' referred to in the term 'Inflection Phrase' is the type of inflection found on verbs, which expresses the following two pieces of information:

(17) **Tense**: the distinction between past (I talked) and non-past (I talk).
(18) **Agreement**: the relation between the subject and the verb (I talk vs. she talks).

If there is an auxiliary, it expresses the tense and agreement features. If there is no auxiliary, tense and agreement features of Infl are expressed on the verb in the VP. Simplifying an issue we discuss later, it is assumed that the features in Infl influence the choice of the morphological form of the verb, as the following diagramme is meant to express.

```
IP
   \   /
  \she \I'
   [3pers. sg.] [non-past]
    VP
  \   /
   \she \I'
   [3pers. sg.] [non-past]
    reads the paper
```

Note that on this analysis, the I position contains information about inflectional features, not morphemes. Some textbooks simplify the subject by putting inflectional morphemes like –s or –ed in the I position. This causes confusion, particularly when dealing with irregular verbs.

Why treat I as the head of the sentence? The idea that I is head of the sentence is supported by the fact that the tense and agreement features it contains are fundamental to the nature of the sentence. If there is no tense and agreement, there is no free-standing sentence: reading the book, to go home, known the answer are not full sentences. In these cases, there is also no assertion or proposition. A complete sentence is characterised by a specification of tense and linking a subject to a VP (Haegeman 2004:161-180), and these (tense and agreement) features are thus essential to the construction of a sentence, are thus legitimate candidates for being the head of the sentence.

The assumption that the auxiliary position is associated with the information expressed by verbal inflection may still seem surprising, since, when there is no auxiliary, the inflection appears on the verb inside the VP, not in the I position. We now look at more evidence in support of this position.

1.4. Evidence for the IP analysis: VP ellipsis

Some evidence for treating the sentence as an IP comes from the phenomenon in (20). The crossing out of the VPs indicates that they undergo ellipsis, i.e. are not pronounced. This (like the do so proform) is a way of avoiding the repetition of VPs.

(20) a. John will go to France and Mary may go to France.
   b. He said he would help me but I don't know if he will help me.
   c. Grandma likes Gothic music but I don't know if the neighbours do like Gothic music.
   d. Juan is seeing the film and Ann has seen the film already.
   e. They said they would get there before I do get there, but they never did get there.
   f. John reads novels and Mary said she does read novels. Do you read novels?

In (20), elements in I are in bold type. VP ellipsis is impossible without a pronounced element in I. If there is none, we need do support, cf. (20)e-g). The explanation for this:

A. Infl is associated with tense and agreement, as seen in the last section.

B. The tense and agreement features that Infl contains must be pronounced.

C. If the VP undergoes ellipsis, this information cannot be expressed by inflection on the lexical verb, since the verb is not pronounced.

D. Since inflectional affixes are bound morphemes, they cannot be pronounced alone in the Infl position. Hence: *Mary loaded the car faster than John [\(I'\) \[I \load(\text{ed})\]]

E. To reconcile B, C and D, English inserts the dummy auxiliary do in order to provide a stem capable of supporting the inflectional morphemes.

This explanation for do-support relies on assumption A. To the extent that the explanation is satisfying, it supports assumption A, which is one of the claims to be proved in this section.

In (20) we see that the elliptical VPs are identical to the pronounced ones, except that in (20)c,d,f,g) the pronounced and unpronounced verbs differ in inflection. If we assume that the inflectional information comes from the Infl position and not from the lexical verb itself, this is not a problem. The elliptical and underlined VPs are identical in all respects. It is only the features of Infl that differ between the two clauses.

1.5. Evidence for an empty I in sentences without auxiliaries

It was suggested above that I is present even in cases where there is no auxiliary (cf. the e (=‘empty’) symbol in (16)e). We now discuss some empirical evidence for this:

A. Evidence from cliticisation (Radford 1997a:137ff): Two uses of have:

(21) Perfect have: I had repaired the car; I have read the book
(22) Causative have: I had the car repaired; I have my hair cut every month.

Perfect have is an auxiliary, and causative have is lexical, as you can confirm using the tests for auxiliaries given earlier. (23) shows that perfect have, unlike causative have, can cliticise onto the subject (clitics are words that can’t be pronounced without attaching to other words).

(23) a. She'd repaired the car;  I'd cut my hair
   b. *She'd the car repaired;  *I'd my hair cut

There is a syntactic explanation for this. Consider the following structures:

(24) a. NP IP
    \   /
   \NP \I'\ VP
   \she
   [3pers. sg.]
   [non-past]
   \VP
   \ did
   \repair
   \the\ car
   \she
   [3pers. sg.]
   [non-past]
   \VP
   \ had
   \repair\ed
   \the\ car

If we assume that the sentences contain an empty INFL constituent, we can explain the impossibility of cliticising have onto the subject. Cliticisation is impossible because there is something, namely INFL, between the subject and verb.

B. Evidence from coordination: Assuming an empty Infl when there is no auxiliary makes sense of the fact that coordinated structures of the type in (25) are possible. If the lefthand conjunct were just a VP, we would not be able to conjoin it with the I’ which is the righthand conjunct.

(25) She \[\[I\ e\] \[VP read the book\]\] and \[\[I\ will\] \[VP see the film\]\].

1 In many recent writings on syntax, the term I((nfl)ection) is replaced by T(ense), though the basic idea of the analysis is the same.
Functional Categories

C. Other evidence. We later see that inflected lexical verbs move to Infl position in many languages (e.g. French and older forms of English). Adger (2003:165f) notes that in some Creole languages tense inflection is expressed only by auxiliaries in the Infl position.

1.6. The infinitive particle to is in the I position

The infinitive particle to in (26)/(27) is also an instance of I. It indicates the absence of tense and agreement features in the clause, and thus that the IP is not a freestanding sentence. (To read books like that is fun indicates neither the time of the reading, nor who reads.)

(26) I want to [NP them] [r. [s to] [VP go home]]
(27) I want to [NP he] [r. [s to] [VP go home]]

Given what we saw about VP ellipsis, we would not expect infinitival to disappear when VP ellipsis occurs. This is precisely what we find:

(28) a. He said he would help me but he may not be able to help me.
b. Juan is seeing the film. Ann has seen the film and Stan is going to see the film.

The infinitive particle is historically related to the preposition to, but synchronically is distinct from it. Proofs (see also Radford 2004:49ff): the proposition doesn’t allow ellipsis of its complement and allows only NP complements, in contrast to infinitival to:

(29) a. I need to go to the bank.
b. *I need to go to.

(30) a. I want to cancel my subscription.
b. *I want to the cancellation.

We return to the precise analysis of infinitives (e.g. the problem of the proposed empty subject in (27)) later in the course.

B. Draw the trees for the sentences below, using the new IP notation. Use triangle notation for NPs and VPs. Some of the sentences involve VP ellipsis. In these cases draw the VP as if it were pronounced, crossing out the elliptical (=unpronounced) material.

1. Fred has forgotten his book. 2. Jane has a dislike of spiders. 3. She helped me and I must thank her. 4. She will sing and dance. 5. I should go and will go. 6. You could get a job and earn some money. 7. I can go to the party and will. 8. She will go there but I don’t want to.

9. Quentin has gone to a counsellor, Gertrude will and Egbert should.

C. The use of do in (20)(e,f) is sometimes described as a proform for a VP. This implies that do in a sentence like (a) below (like do in (b)) replaces the underlined VP rather than being an instance of do support involving an unpronounced VP. Now consider (c) and (d) below. Many British speakers accept the sentences in (c), while most other speakers reject them (hence the sign *). In the light of these facts, assess, with regard to the two different types of speaker, the claim that do in (a) is a proform for VP.

(31) a. Wayne inquired of Sybil if she liked car racing.
b. Someone mentioned to me that Quentin has a social problem.
c. She couldn’t sleep because the problem was troubling her.

In (31)(a,b): subordinate clauses are complements of inquire and mention. (Proofs for complementhood: obligatoriness; parallels to NP complements: mentioned the truth to me)

In (31)c): subordinate clause is a VP modifier, parallel to PP in: She couldn’t sleep [PP because of the problem].

Some uses of CPs: (a) as a complement of a verb, (b) as a modifier of a VP, (c/d) as a complement to a noun or adjective.

(32) a. Mervyn thought (that) Georgiette was a good drummer.
b. Agatha said (that) Egbert should go home.

(33)

(34) a. He said he’d win the race and he
b. He said he’d win the race and he did

c. *He said he’d win the race and he has done; *He said he’d win the race and he could do

d. He said he’d win the race and he has done so; He said he’d win the race and he could do so

(35) a. It is important [CP FOR [IP the branch to be cut off before it falls on the car]]
b. It is important [CP THAT [a the branch should be cut off before it falls on the car]]

(36) a. It is important [CP FOR [a the branch to be cut off before it falls on the car]]
b. It is important [CP THAT [a the branch should be cut off before it falls on the car]]

(37) a. Is it necessary [CP FOR [a it to start raining when we film that scene]]?
b. Is it necessary [CP THAT [a it should start raining when we film that scene]]?

(38) a. [CP FOR [a Cuthbert to win her heart]], he would have to stop dribbling.
b. [CP IF [a Cuthbert is to win her heart]], he would have to stop dribbling.

(39) a. I’m going to Louisiana [CP FOR [a to see my Susyanna]] [archaic/dialectal]
b. I’m going to Louisiana [CP IN ORDER [a to see my Susyanna]]
Don’t confuse for complementiser with the beneficiary interpretation of for preposition (e.g. in she did that for me or a present for me). In (36)-(39), it seems clear that for does not form a PP with a following NP. For in (38a) might appear to have a beneficiary interpretation, but constituency tests show that for Cuthbert is no constituent:

(a) *It is for Cuthbert that, to win her heart, he would have to stop dribbling.
(b) *For whom would he have to stop dribbling to win her heart.

For preposition with a beneficiary interpretation can be modified by just (to indicate that the complement of for is the sole beneficiary of the action), unlike for complementiser:

(a) She did all that just for you.
(b) *Just for Cuthbert to win her heart, he would have to stop dribbling. (cf. (38a))

Two unusual properties of for complementiser: its complement IP must have to as its head and there must be an NP in the subject position (at least in standard English, cf. (39a)). The complementiser for also assigns case to the subject of its complement:

For [him/*he] to wear a torn t-shirt to the job interview was, um, unconventional.

2.3. Other uses of the C position and the overall function of C

Other uses of the position (some discussed later):

• Movement of auxiliaries into C position in questions: Should I go?
• Verb-second in languages like German and verb-first in Celtic languages involves movement of a verb to C.
• It is possible that even IPs in simple statements are part of CPs with an unpronounced complementiser (e.g. Carnie 2002:54f). We will ignore this point, however.
• Function of C: to show how the IP in the complement of C fits into a larger context (either a larger sentence or a larger discourse).

D. Draw trees for the following sentences (some of which don’t involve complementisers).

Use triangle notation for embedded IPs and for NPs in the main clause.

1. She said that cows can sing. 2. She said that cow can sing.
3. I asked a question. 4. I asked whether Egbert had arrived.
5. She ate dinner after work. 6. She ate dinner after she had finished her work.
7. They denied the allegation. 8. They denied that they had funded the terrorists.

E. Decide whether the following sentences involve the complementiser for or the preposition for. Evidence could include constituency tests or the possibility of replacing the string starting with for with another CP without changing the meaning, cf. the pairs in (36). Do not draw the trees, as some of the sentences involve constructions we not yet discussed.

1. Dwayne bought flowers for Cynthia to annoy Gertrude.
2. The general gave the order for the prisoners to be released.
3. For us to win, our opponents would have to play below their ability.
4. The detective asked for the suspects to be brought into his office.
5. He did all those things for us to try to win our support.

3. D and the DP hypothesis

Examples of determiners (abbreviation: D, Det)

a. Articles: the (definite) a, an (indefinite)
b. Demonstrative (deictic) determiners: this, that, these, those
c. Quantifiers: some, all, both, any, no, each, either, neither, a few, a little
d. Possessive determiners: my, your, its, her, his, our, their

These are grammatical items, not vocabulary items expressing entities, properties or situations in the real world, so D is another a functional category. We now say more about D and offer a different, and better, conception of the nature of the NP.

3.1. Pronouns as determiners

There is clear evidence that pronouns are a type of determiner, i.e. have the category D:

• Pronouns are often closely semantically related to particular determiners. Sometimes they are morphologically related or even formally identical.

(44)

a. I have NO water
b. Do you have ANY beer?
c. That is MY pen
d. I want THAT BOOK

(45)

a. You stupid idiots!
b. We earthlings and you Martians can learn a lot from each other.
c. them books [non-standard variant of those books]
d. Du bescheuerter, abartiger, hirnamputierter Loser!

• Some pronouns can be followed by nouns in the same way as other determiners can:

(46)

a. For {him/*he} to wear a torn t-shirt to the job interview was, um, unconventional.
b. Du bescheuerter, abartiger, hirnamputierter Loser!

c. *For whom would he have to stop dribbling to win her heart.

Children sometimes use pronouns where adults would use determiners, producing things like (46). Seeing children don’t hear it used as a determiner, these mistakes might reflect an innate assumption that pronouns and determiners are really the same animal.

Conclusions: determiners and pronouns belong to the same category, D.

F. Can you find examples from other languages making the same point as (44) and (45)?

3.2. The DP Hypothesis

We now discuss the DP hypothesis, the assumption found in many recent studies in syntax that what we have called NPs are really Determiner Phrases (DPs). (See Fundamentals sect. 6 for more details.) An example:

(47)

a. DP Hypothesis:

```
    D NP
   /  \
AP   
```

b. The old NP Hypothesis:

```
    D N'
   /  \
AP   
```

The analysis in (47a) entails that the head of (47) is the, not student. This may seem surprising. Given standard ideas about headship, one would normally treat student as the head of the phrase, as intuition tells us that all the other elements in the phrase, including the determiner, are giving us information about student. However, a different semantic analysis is possible. The determiner points to some specific individual (like pronouns like she or they
3.4. Empty determiners:

(52) a. [Syntax] is best explained with [example sentences].

b.  

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

\[ \text{N} \]

\[ \text{\Omega} \quad \text{syntax} \]

Arguments from Radford (1997:95ff) and others that apparently determinerless NPs contain a silent determiner and are thus DPs:

- The pronouns in (53) (subject pronouns in (a), reflexives in (b)) refer to an apparently determinerless noun. However, the pronominal elements must be third person. This does not have a semantic explanation. If (a) is uttered by someone talking to students, it should be possible to refer to students using the second person (you). If we assume that these nouns have an empty determiner which is specified for third person, we can explain these data. Remember, it is usually determiners, not nouns, which specify features such as person. (Compare: we students, these students).

(53) a. Students like reading, don’t they (*don’t you/*don’t we)
b. Syntacticians want to make themselves (*ourselves/*yourselves) clearly understood.

d. Determinerless structures in English correspond to structures with determiners in other languages. The nouns in (52) and (53) need determiners in French.

Similarly, proper names (which are inherently definite) have silent determiners, on analogy with languages pronouncing determiners overtly (also modern Greek, Italian).

(54) a. Susan, Mozart, Italy, Paris
b. Colloquial German: der Peter
c. French: la France

G. Indicate the structures of the following phrases (assuming the DP hypothesis).

a. that demented cow
b. a student of history
c. the student in the car
d. Sweden and the other Scandinavian countries
e. Ann and her secretary
f. religious people and their beliefs

3.5. Possessive ‘s

- Possessive ‘s expresses a relation between the DP in front of it and the NP after it. This relation is often a possessive relation, or some other relation that can be expressed by the verb have, but this doesn’t hold in all cases, cf. (d) below:

(55) a. the man’s hat
b. Mary’s partner
c. the book’s catalogue number
d. the city’s destruction

cf.

(48) a. [IP The artist’s [NP painting of the model]]
b. [IP The artist’s [VP painted the model]]

(49) a. [IP The enemy’s [NP complete destruction of the building]]
b. [IP The enemy [VP completely destroyed the building]]

(50) a. * [IP The building [VP completely destroyed the enemy]]
b. * [IP The building’s [VP completely destroyed the enemy]]

(51) a. [IP The building’s [VP complete destruction by the enemy]] (‘nominal passive’)
b. [IP The building was [VP completely destroyed by the enemy]]

(cf. the man has a hat)

cf. Mary has a partner
cf. the book has a catalogue number
cf. the building was completely destroyed by the enemy)

(57) a. [IP The building was [VP completely destroyed by the enemy]] (‘nominal passive’)

b. [IP The building was [VP completely destroyed by the enemy]]

cf. Mary has a partner
cf. the book has a catalogue number
cf. the building was completely destroyed by the enemy)
(58) illustrates the treatment of possessive 's if we assume the DP hypothesis. In all cases, DPs involving possessive 's will have a structure like that seen in (58)b).

(58) a. DP       b. DP
     D'       D'           D'       D'
Possessor             Possessor
D       D       [Possessed
NP      NP      entity] that woman 's books on physics

- Possessive 's is a type of determiner. Its presence excludes other determiners (*a the lady's book, *the lady's a book).

- A German colloquial/dialectal parallel to the structure in (58):
  (59) dem Mann sein Auto
  the man his car
  "the man's car"

- Possessor DPs are one of the few kinds of DPs that can’t be replaced by a normal pronoun: Ann’s car ≠ *she's car. This is because there are special possessive determiners which act as proforms for the D constituent in the tree (her car).

- Some English varieties allow movement to separate possessor and possessive 's, cf. (52).

- The specifier position of DP can also be occupied by certain adjective phrases:
  (61) so big a house; this long a road; too large an amount of coffee

4. General observations about functional categories
A category is ‘lexical’ if it has obvious descriptive content, and ‘functional’ if it has primarily grammatically relevant features. Lexical categories include N, V, P, A, Adv, and their respective projections (VP, NP etc.).

Examples of functional categories are I(P), C(P) and D(P). IP and CP are ‘extended projections’ of the verb, while DP is an extended projection of a noun. Syntacticians have also proposed other functional phases which are extended projections of adjectives and prepositions (not discussed here).

Other typical characteristics of functional elements:

- Functional elements may often be clitics or affixes, i.e. they must attach to some other word/phrase:
  - The possessive determiner attaches to a DP: [de the man over there]'s book
  - Pronouns can cliticise to verbs: he loves 'er/em, 'tisn't very good, das gibt's nicht
  - Auxiliaries often cliticise to the subject: he's gone, they've gone

Syntacticians sometimes assume that there are more functional categories than have been introduced here. For instance, what we call Infl is sometimes split into a number of different categories (e.g. Agreement, Tense, Mood, Perfect, Progressive), to cover cases like the patient will have been being treated). Research on AP suggests that adjectives are dominated by a functional head expressing degree, expressed e.g. by the comparative morphemes more. (The distinction between more intelligent and older is somewhat like the difference between do-support and the lowering of inflection onto the verb: if the adjective doesn’t have the right phonological properties to be inflection with –er, we need to insert more in the relevant functional position, just like we need to insert do when there is no verb capable of bearing inflection.) Adger (2003) is one textbook that introduces quite a lot of functional categories.

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