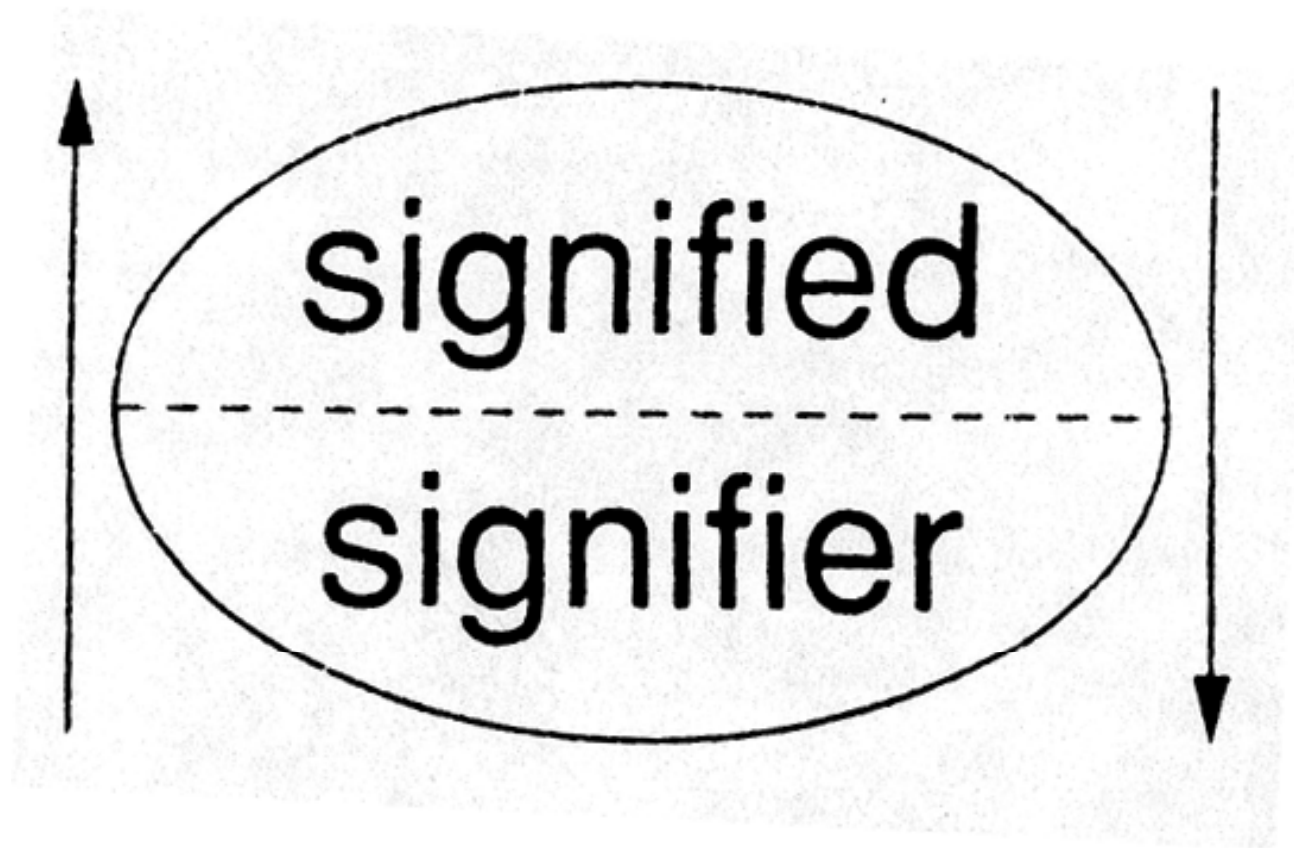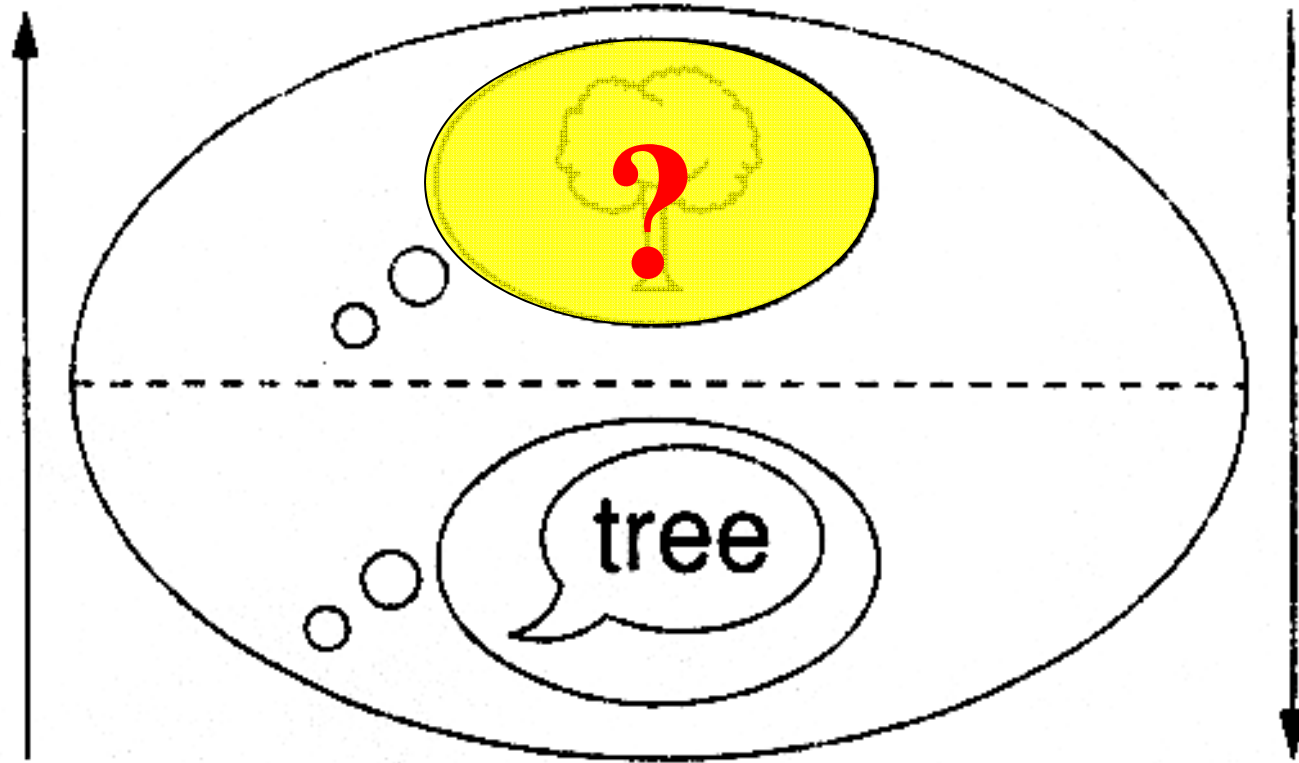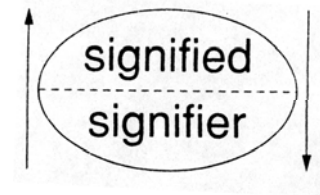# Introduction to Semantics

Ferdinand de Saussure
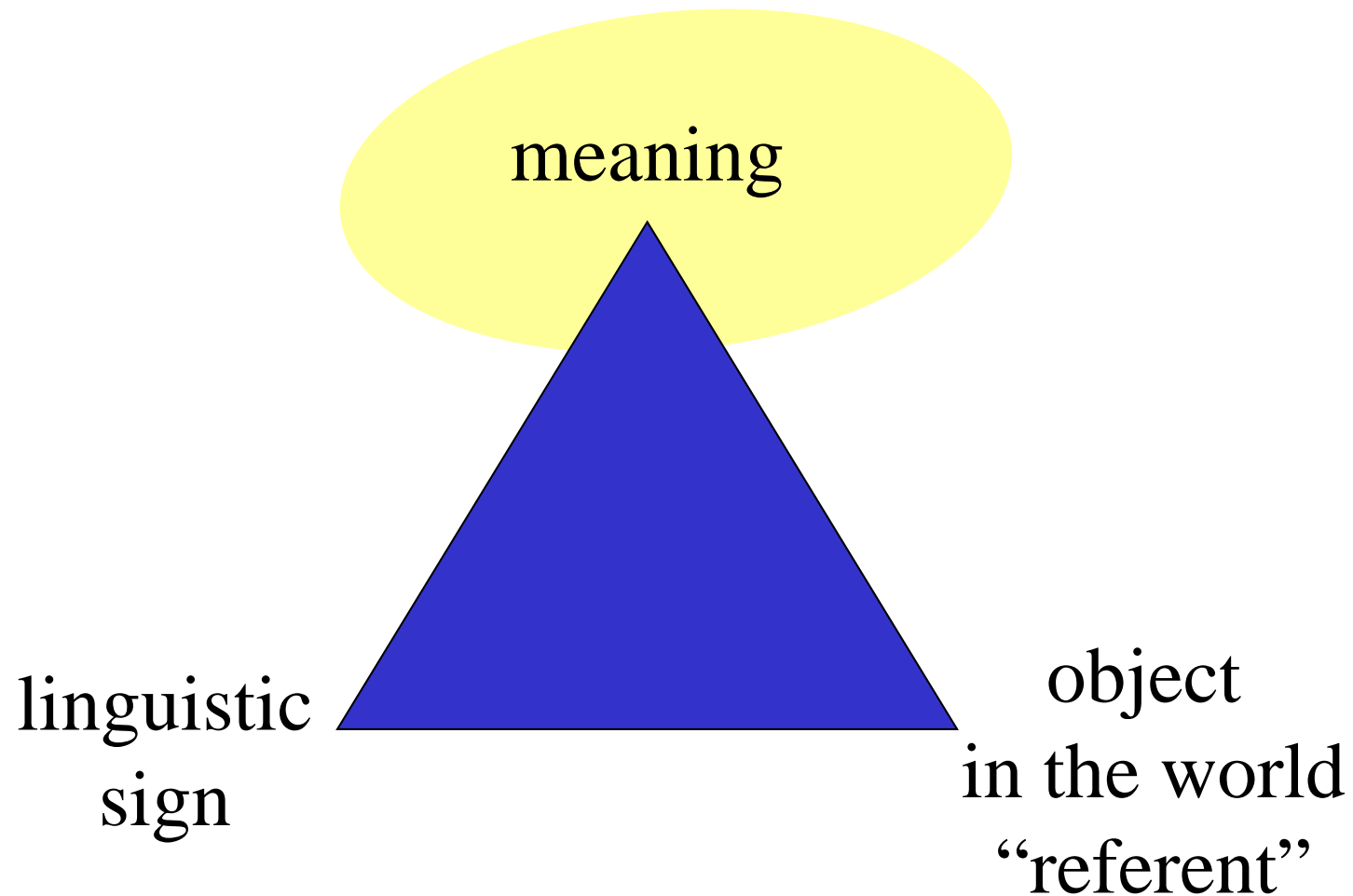## and the **sign**

1915

View of the Saussurian sign
(Chandler, 2002, p19)

1915

The semiotic triangle: C.S.Peirce

The semiotic triangle

4 legged mammal
with long ears that eats grass
and hops around a lot …

"rabbit"
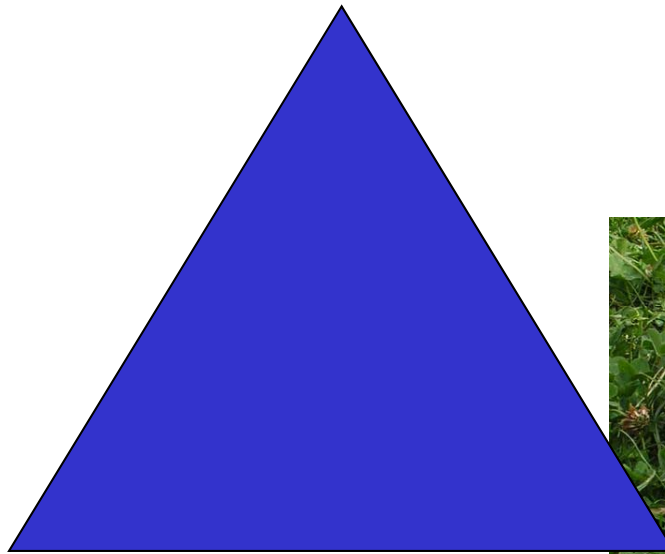
Semiotic Triangle: words
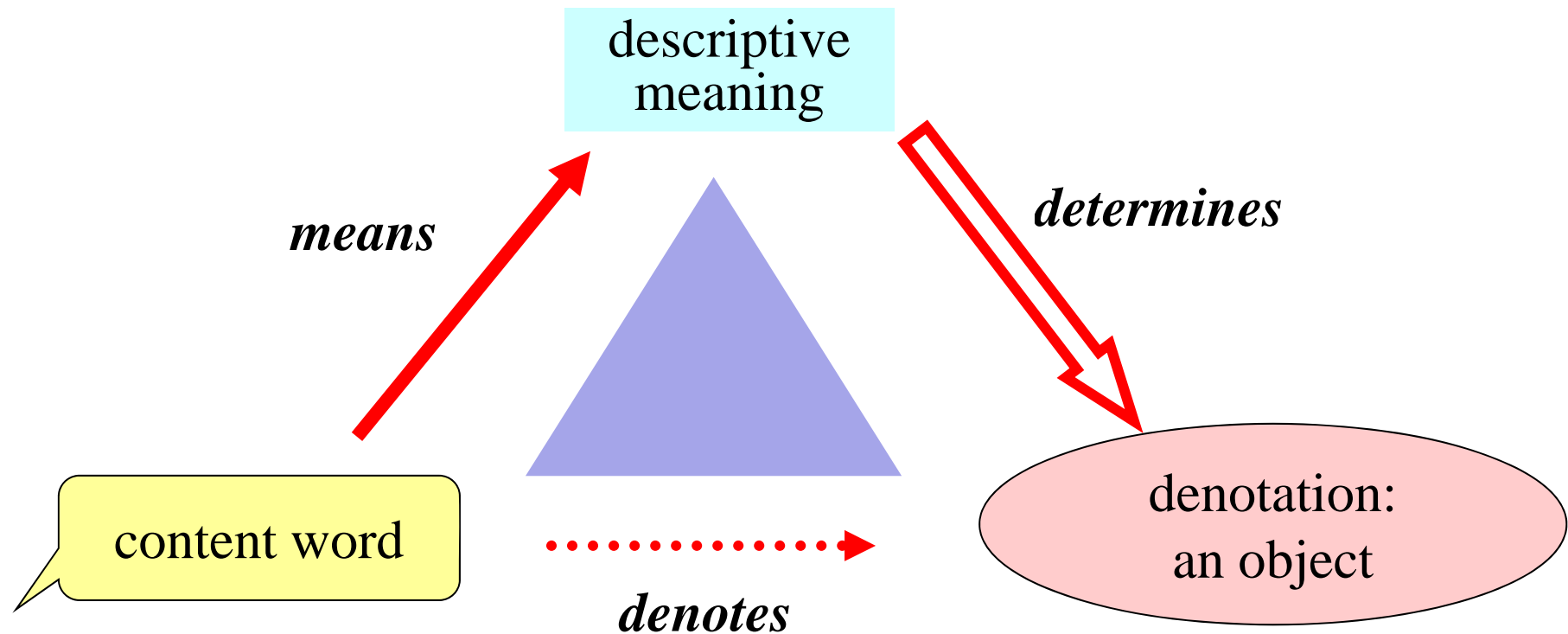
Semiotic Triangle: words
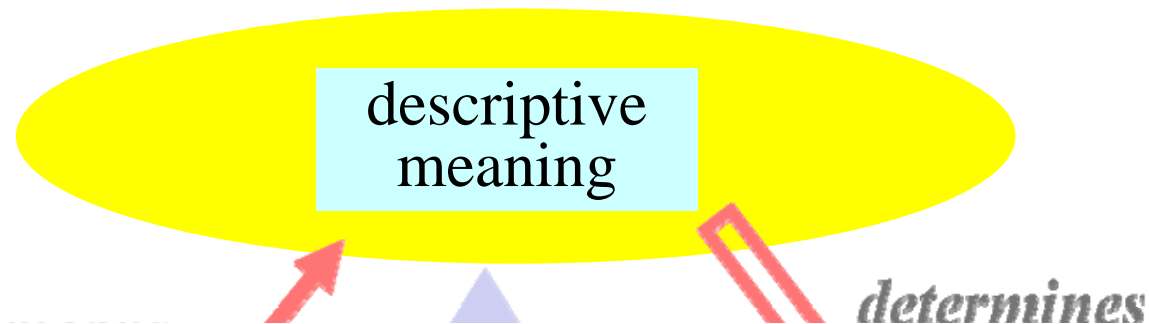
Basic questions:

- how can we find out about this 'meaning'?
- what is it?
- what properties does it have?

Semantics

Componential Analysis

Words

optimistic

bus

cow   van

sane

pessimistic

mad

horse   fish

schizophrenic

foal

motorcycle   psychopathic

paranoid

bicycle

Lexical fields

optimistic

sane

pessimistic

psychopathic

schizophrenic

paranoid

mad

cow fish

horse

foal

van

bus

motorcycle

bicycle

Semantics

- In fact, all languages face the same problem

- how to break up the continuous jumble of the world into categories that are

  - communicable,

  - learnable,

  - useful

Semantics

- All languages, i.e., human languages, do this in the same ways.

- A more or less **arbitrary** frame, or net, or scheme is placed over experience to organise experience into particular categories

- Each language has its own frame

- In this sense, language **(re-)constructs** 'reality'

The relation between **signifier** and **signified**
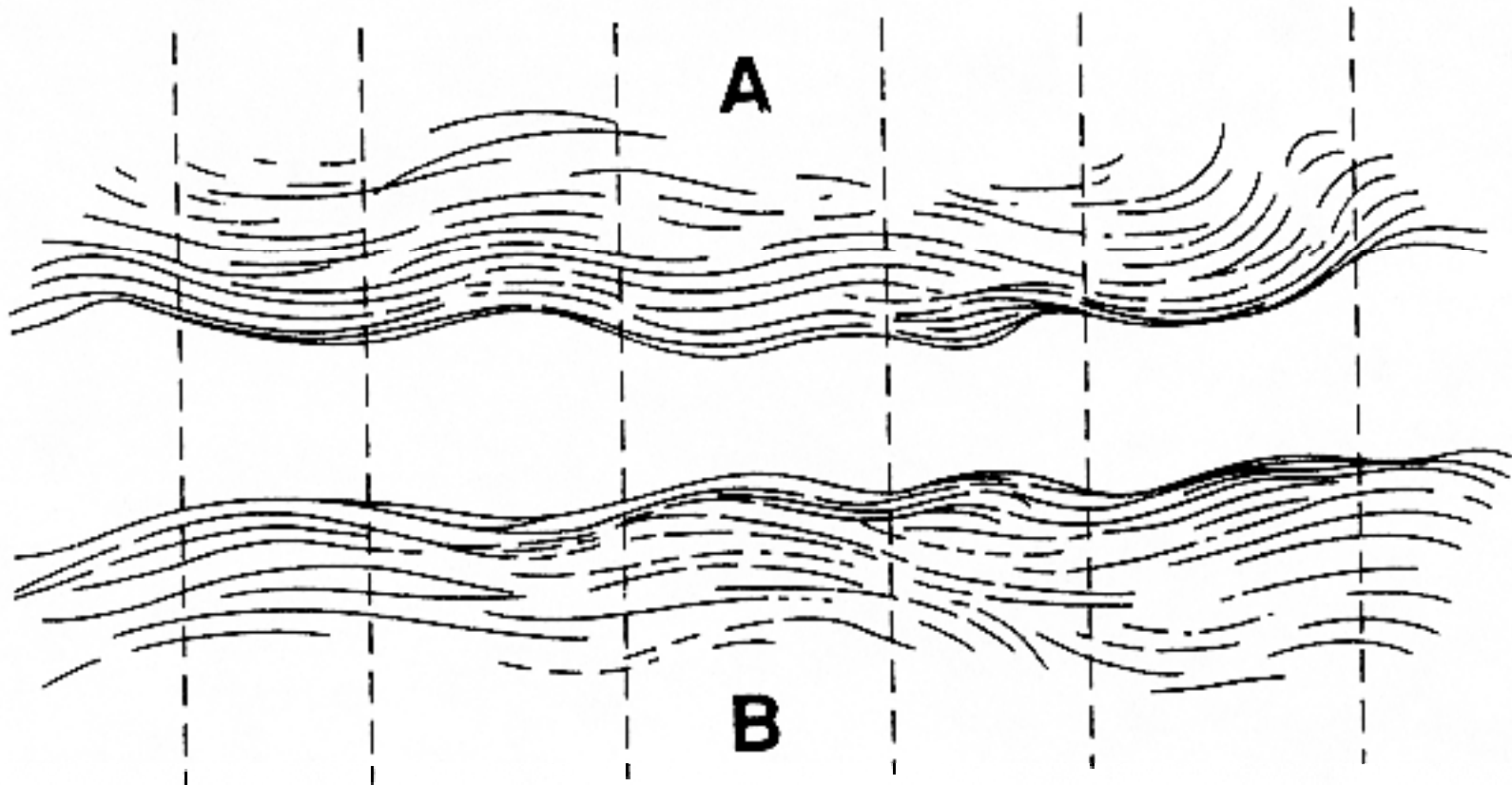
Planes of thought and sound -- "Two sides of a page"   Saussure 191

Lexical fields in different languages

English	German
cousin	Cousine
	Cousin / Vetter

Lexical fields in different languages

Lexical fields

- How do we organise the relations between different kinds of words and their meanings?

sense relations

relations between words
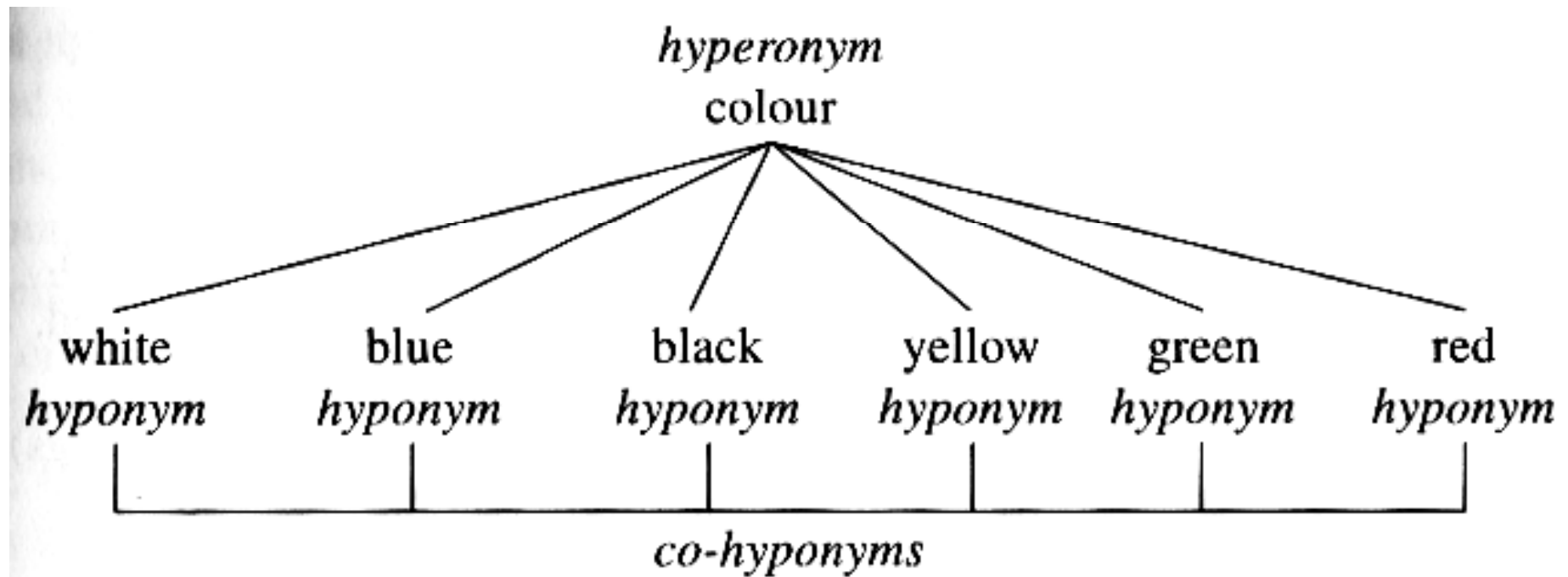
Hyponomy

hyperonym
colour

white   blue   black   yellow   green   red
hyponym   *hyponym*   *hyponym*   *hyponym*   *hyponym*   *hyponym*

co-hyponyms

'subtype' relationship {
sense relations:
relations between words

Hyponomy

mammal

cow   dog   cat   ape   human   whale

'subtype' relationship {

sense relations:
relations between words

Hyponomy
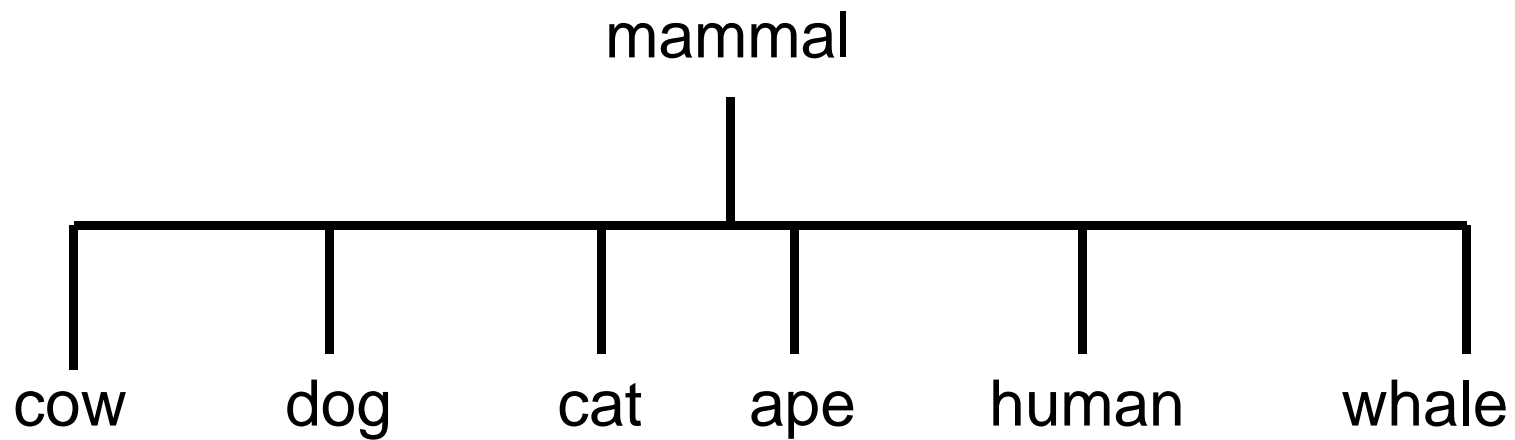
SUPERORDINATE TERM

parent

HYPONYM   **HYPONYM**

mother   *father*

co-hyponyms
of each other

SUBORDINATE

Hyponymy

cook

toast　　boil　　fry　　roast　　broil　　bake
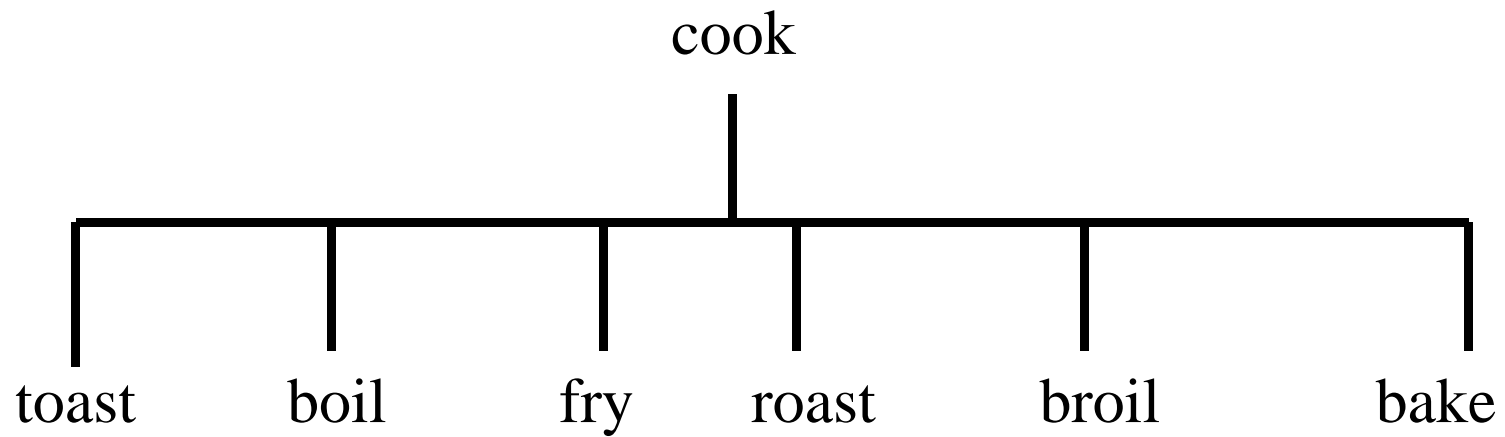
someone cooks something

logic　"cooks (x,y)"

Lexical fields

optimistic

sane

pessimistic

psychopathic

schizophrenic

paranoid

mad

cow   *fish*

horse

foal

van

bus

motorcycle

bicycle

Hyponomy

SUPERORDINATE TERM
mental states

HYPONYM   **HYPONYM**   **HYPONYM**   **HYPONYM**

optimistic   *pessimistic*   *not sane*   *sane*

SUPERORDINATE

co-hyponyms
of each other

HYPONYM   **HYPONYM**   **HYPONYM**

schizophrenic   *psychopathic*   *paranoid*
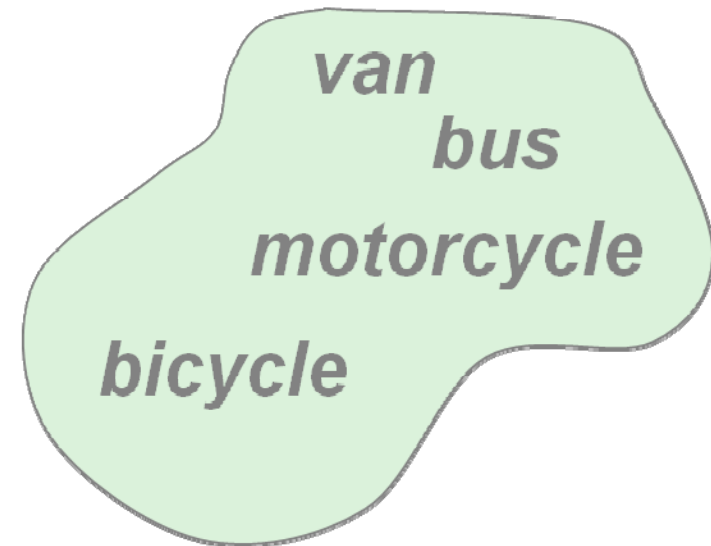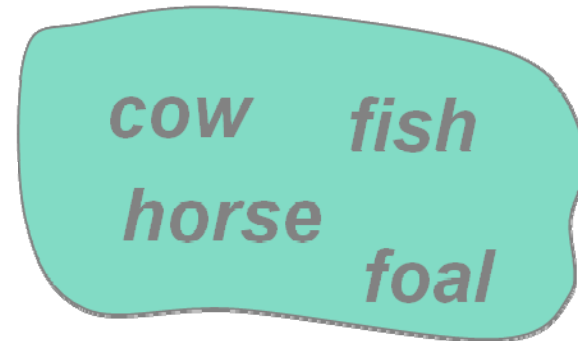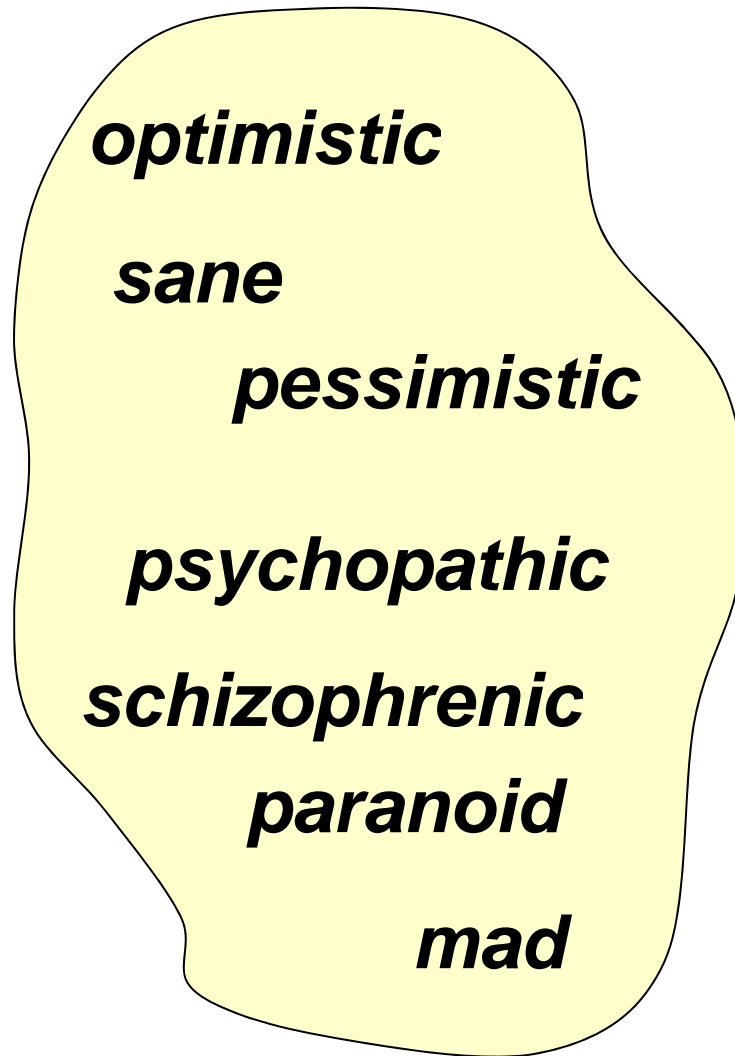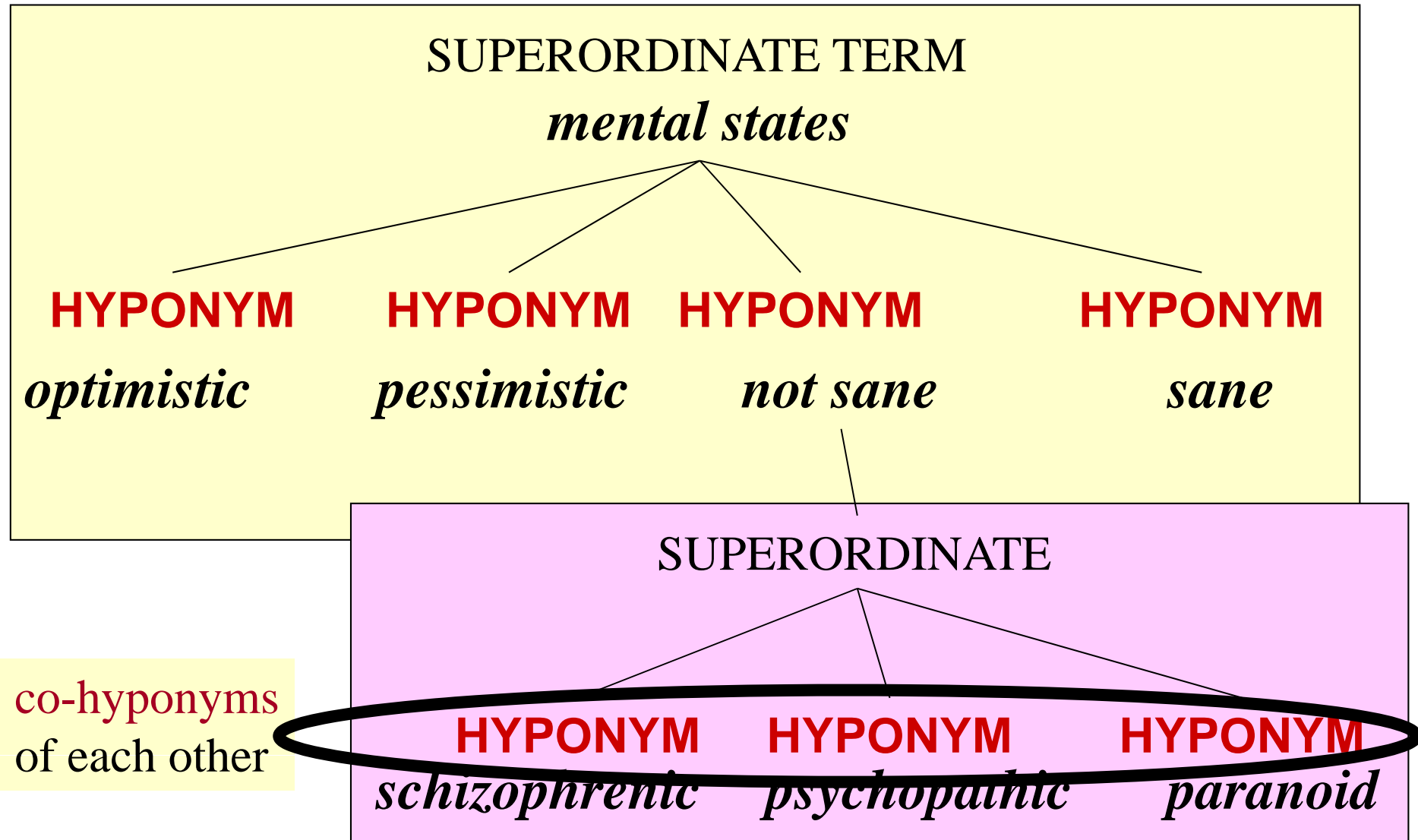
Hyponymy:
not the end of the story...

```
                        mammal
                           |
    _____
    |         |         |         |         |         |
   cow       dog       cat       ape      human      whale
```

```
                              mammal
          ┌───────┬───────┬───────┬───────┬───────┐
         cow     dog     cat     ape    human    whale

         cow     dog     tom-     ?      man       ?
         bull    bitch   she-           woman
```

```
                        mammal
           ┌──────┬──────┬──────┬──────┬──────┐
          cow    dog    cat    ape   human   whale
```

	cow	dog	cat	ape	human	whale
male-female	cow bull	dog bitch	tom- she-	?	man woman	?
adult-nonadult	cow calf	dog pup	cat kitten	ape ?	person child	whale pup
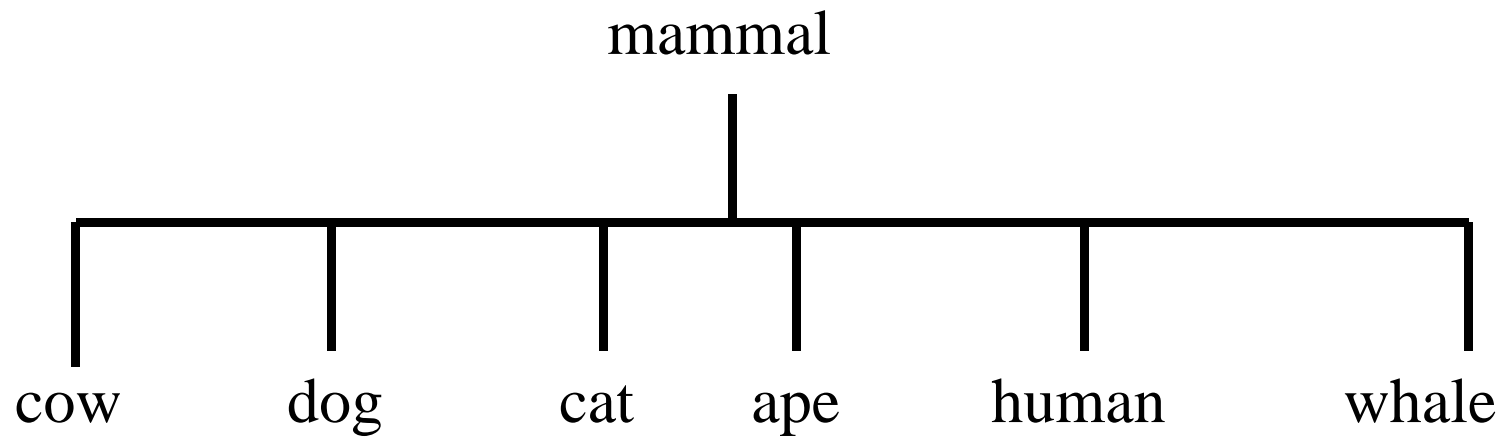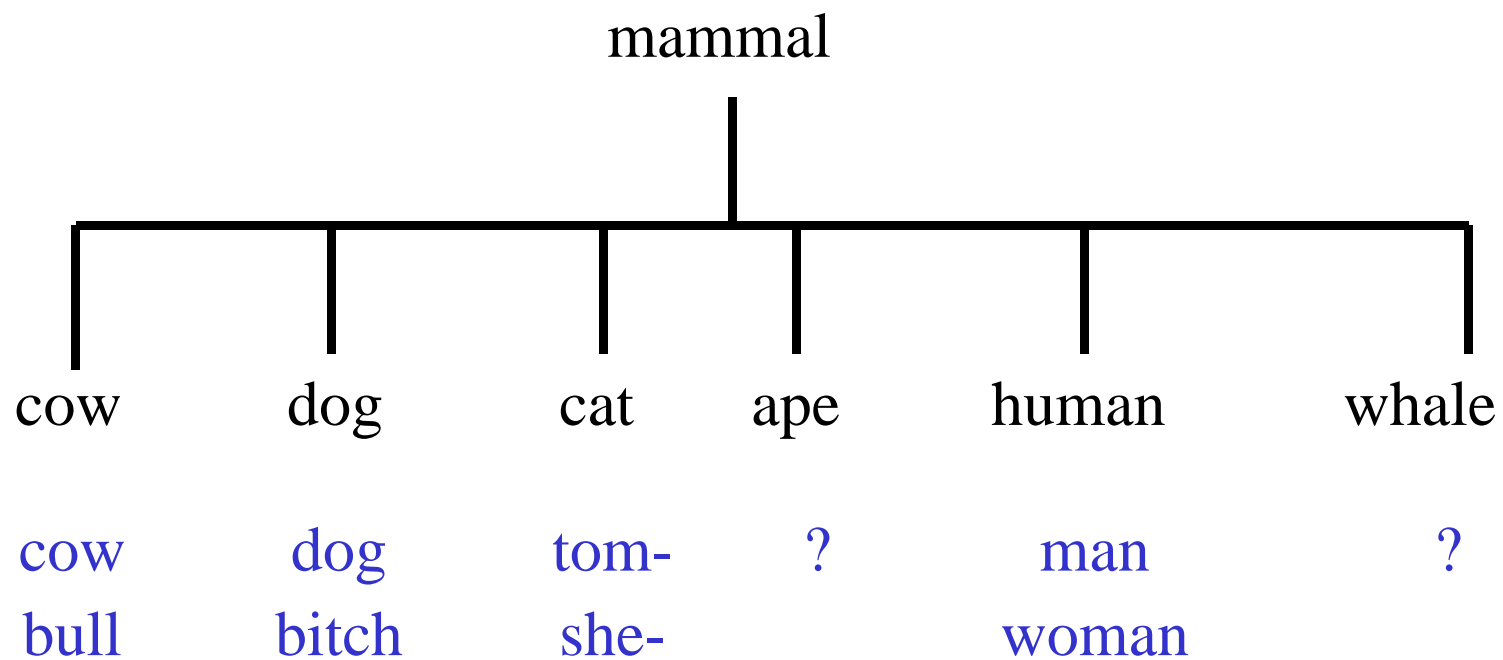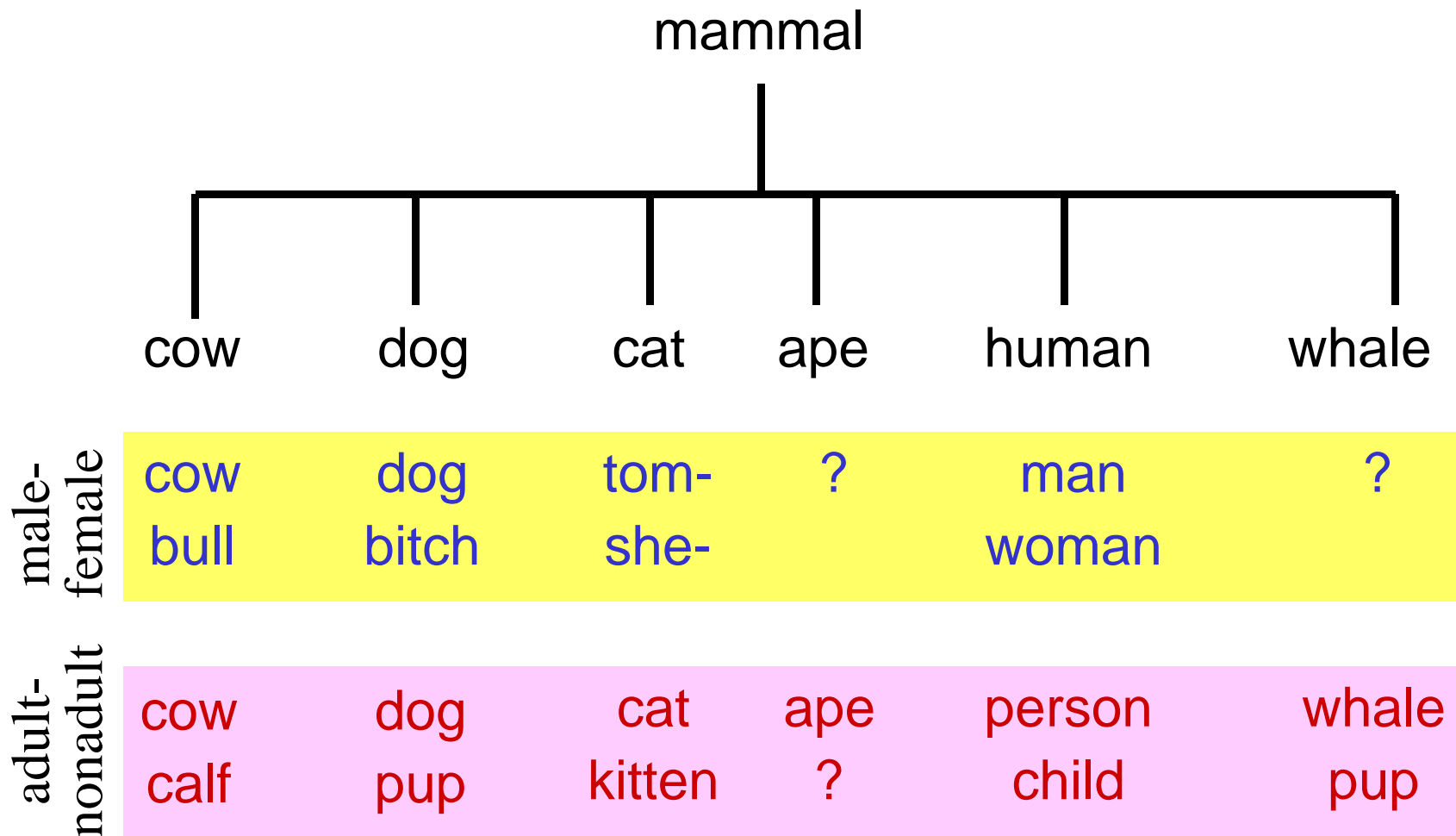
Use linguistic features   **± female**
± adult

Just as we saw ages ago with…
Phonetic Features

features	*voicing?*	*nasality?*	*place?*	*manner?*
<u>c</u>at	**-voiced**	**-nasal**	**+velar**	**+stop**

Semantic lexical **features**

± mammal
± adult
± female

animal

mammal   …   adult   child   male   female

human   …
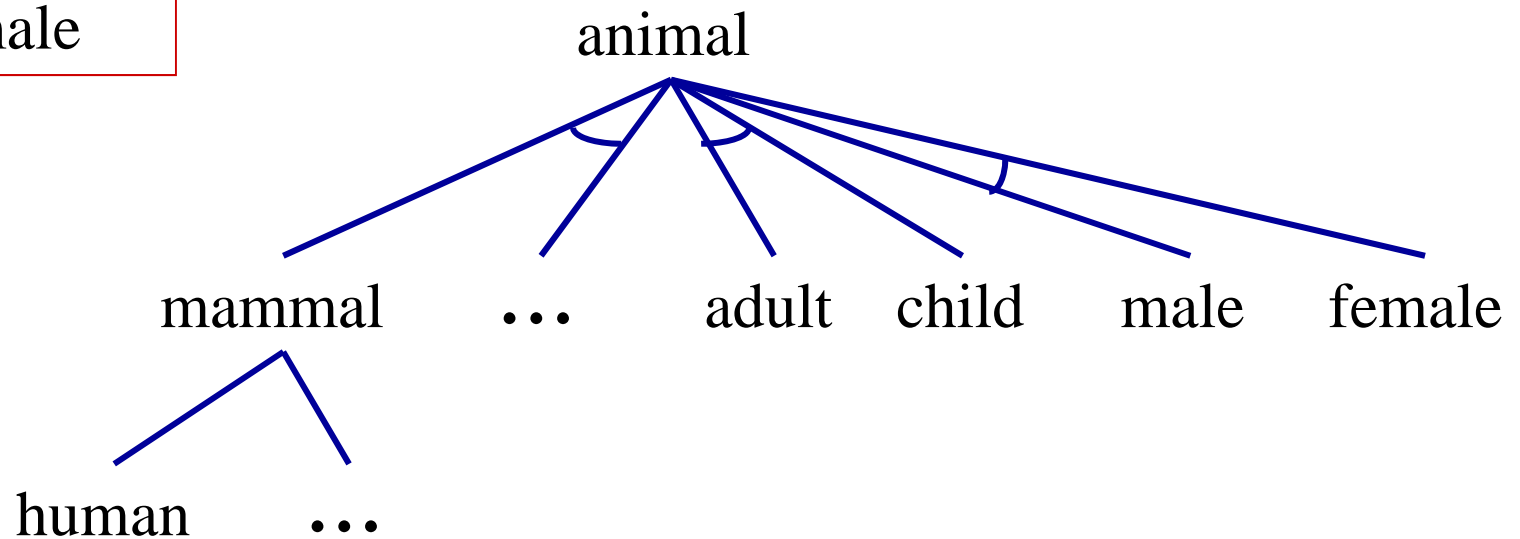
feature hierarchies

Componential Analysis

	Powered	Carries people	Four-wheeled
Bus	+	+	+
Car	+	+	+
Van	+	−	+
Bicycle	−	+	−
Motorcycle			

Language Change: semantics

Chaucer: (a)   *At **mete** wel ytaught was she with alle*
            She leet no morsel from hir lippes falle,
            *(b)   Full semely after hir **mete** she raughte*

Middle English → Modern English
mete   **meat**

A meal, occasionally dinner

a. Any kind of food:
the mete shall be mylk,
honey and wyne

b. Food in general,
opposite to drink:
it is mete and drinke

→ The flesh of animals used for food

Other sense (semantic) relations

- **hyponyms**

- **synonyms**
  - different words that mean the same

- **antonyms**
  - different words that mean the opposite of each other

- **meronyms**
  - words where one thing is a part of the other

Other sense (semantic) relations

- **hyponyms**
- **synonyms**
  - amble / stroll, lorry / truck, ...
- **antonyms**
  - hot / cold, black / white, up / down, on / off
- **meronyms**
  - toe / foot, finger / hand, door / house, prongs / fork

Types of 'difference' in meaning

- Incompatibility: complementarity

    - the switch is on   *entails*   the switch is not off
    - the switch is off   *entails*   the switch is not on
    - the switch is not on   <u>*does*</u> *entail*   the switch is off
    - the switch is not off   <u>*does*</u> *entail*   the switch is on

    - <u>Not</u> Gradable
        - * this switch is more on that that switch

Complementarity

(22) a. **complementaries**

temporary	permanent	*more temporary	*very temporary
		*more permanent	*very permanent
animate	inanimate	*more animate	*very animate
		*more inanimate	*very inanimate
dead	alive	*deader	*very dead
		*more alive	*very alive

Types of 'difference' in meaning

- Incompatibility: antonymy

      – the water is hot   *entails*   the water is not cold

      – the water is cold   *entails*   the water is not hot

      – the water is not hot   *does not entail* the water is cold

      – the water is not cold   *does not entail* the water is hot

      – Gradable
    - this water is hotter than that water
    - this water is neither hot nor cold

(22)

Antonymy

b. **antonyms**

old	young	older	very old
		younger	very young
hot	cold	hotter	very hot
		colder	very cold
high	low	higher	very high
		lower	very low

Types of 'difference' in meaning

- Incompatibility: converseness

  - Europe is north of Africa
    entails
    Africa is south of Europe

  - Fred is a parent of Wendy
    entails
    Wendy is a child of Fred

  - The Amazon is wider than the Thames
    entails
    The Thames is narrower than the Amazon

Representing these differences…

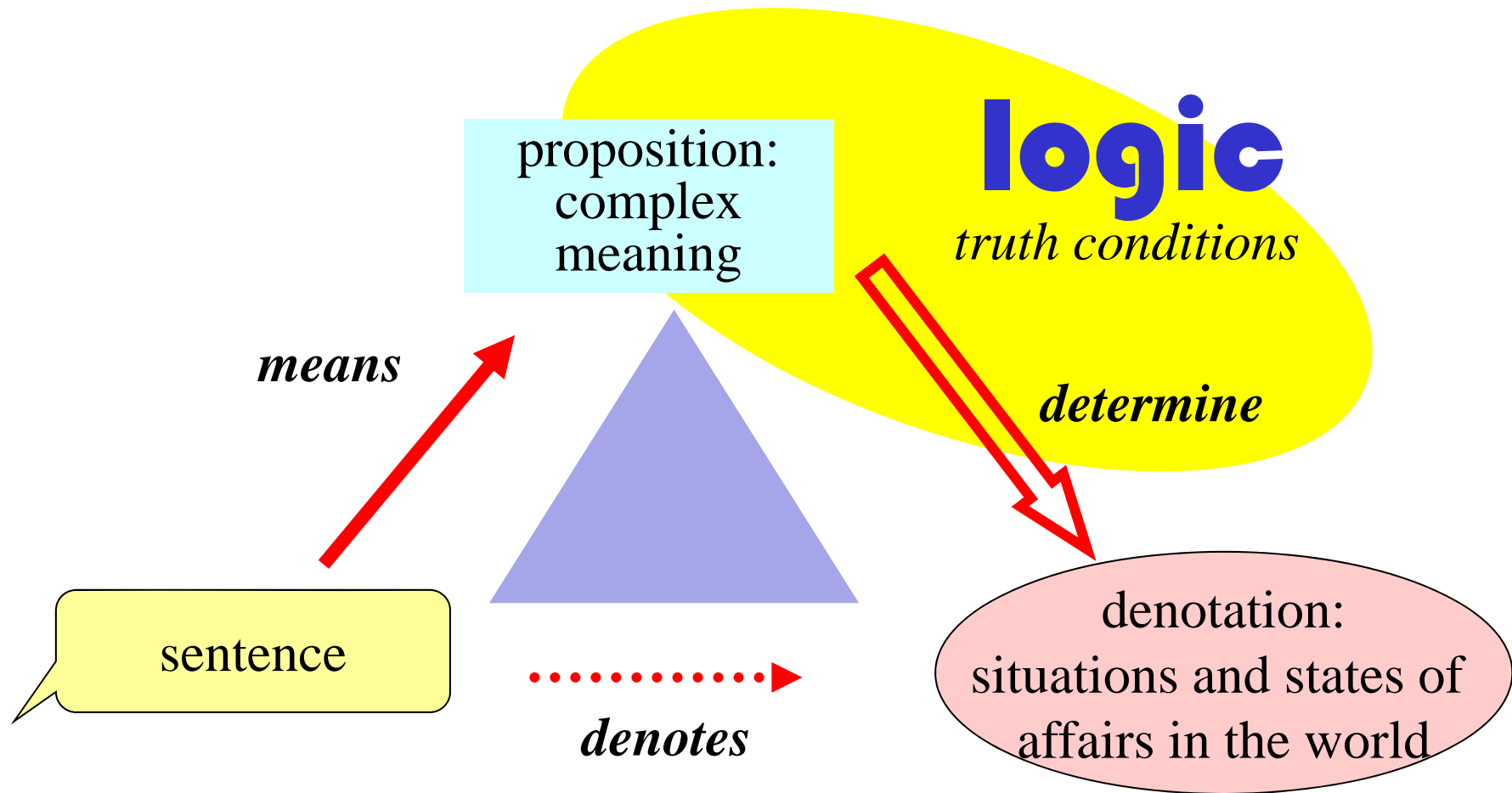- Again, we can make everything we need much more explicit if we use….

… logic …

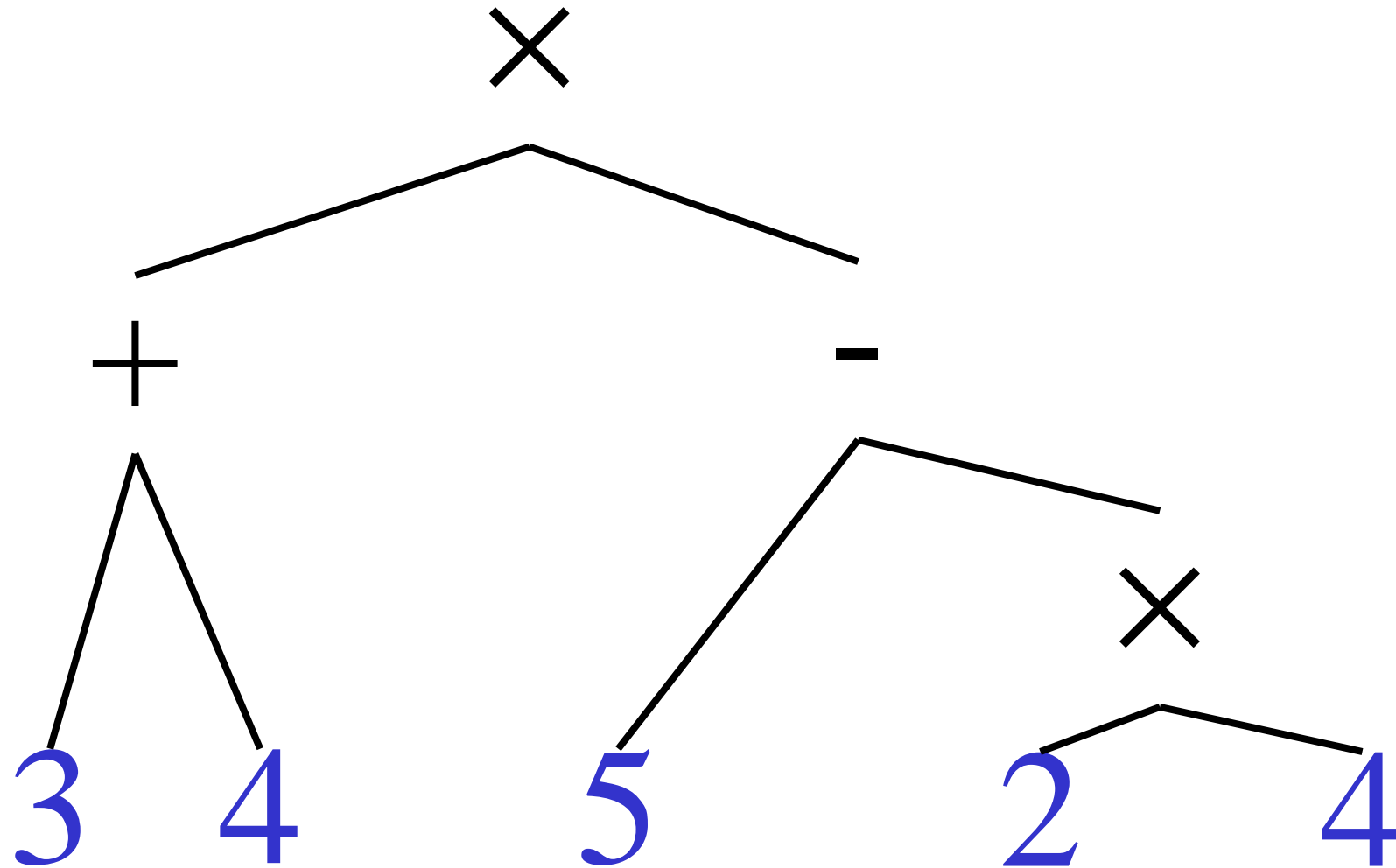!!!! SO WE WILL INTRODUCE THIS NEXT WEEK !!!

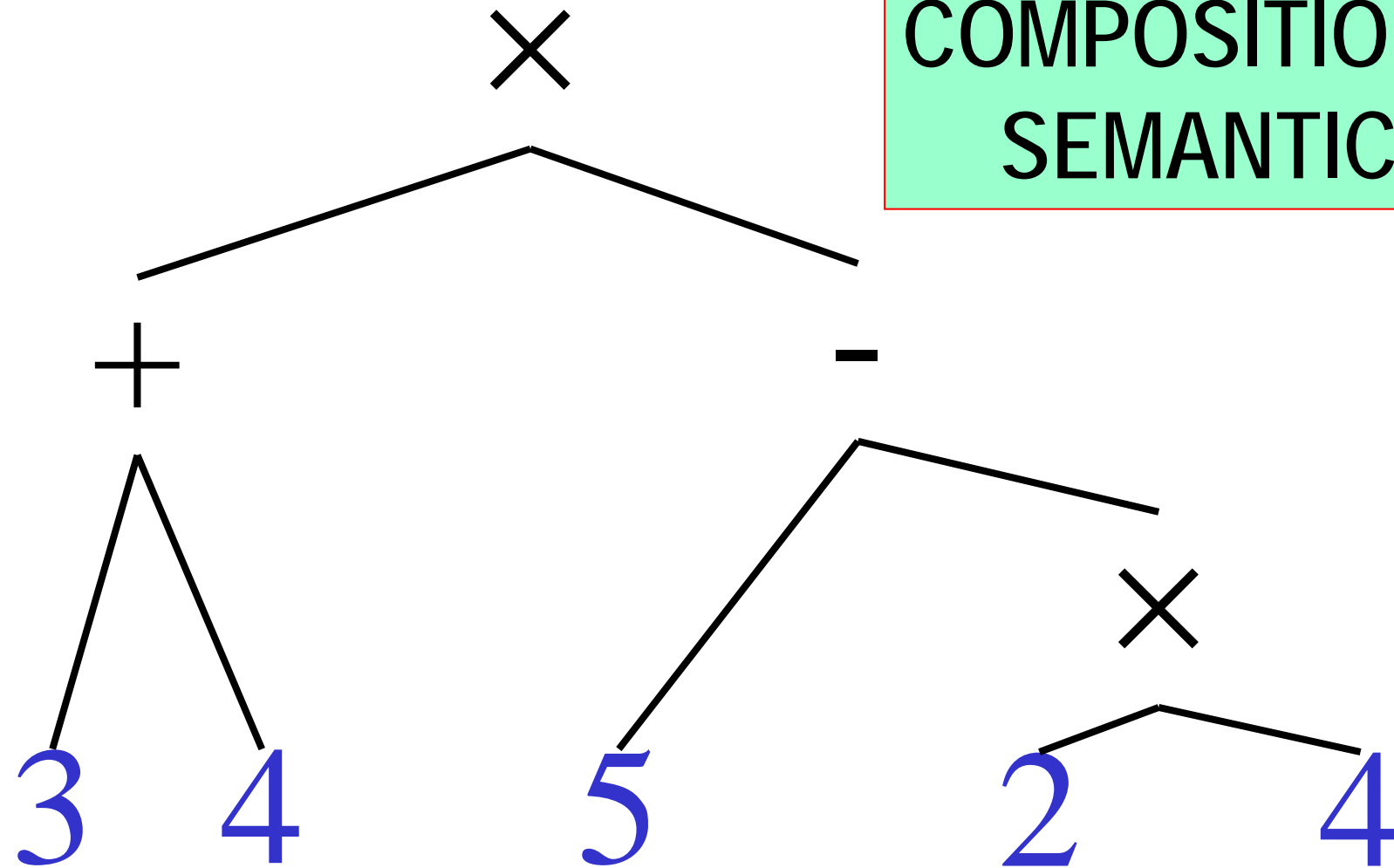# Semiotic Triangle: words

Compositional Semantics

How to put meanings together from the parts...

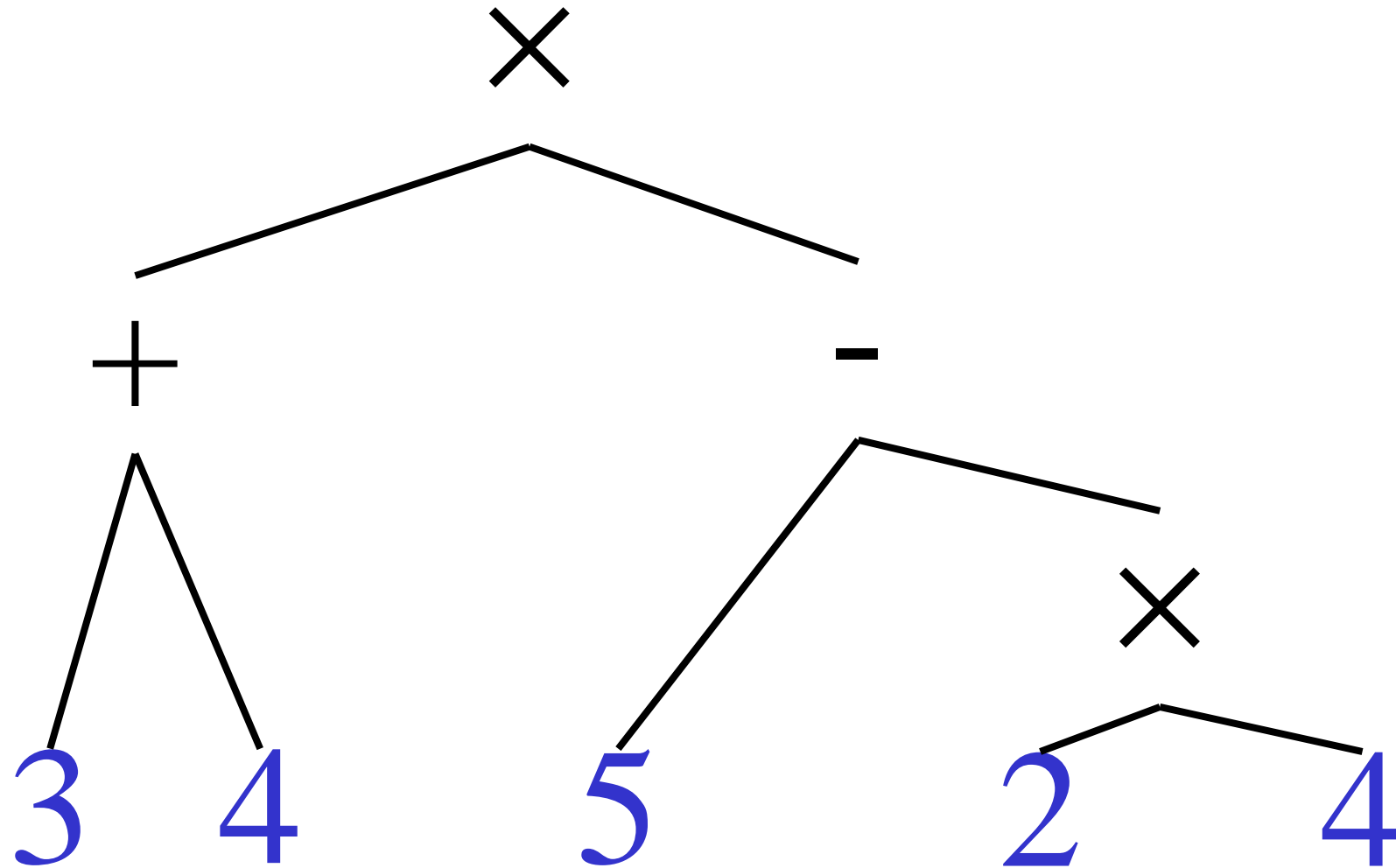$$(3 + 4) \times (5 - 2 \times 4) = \, ?$$
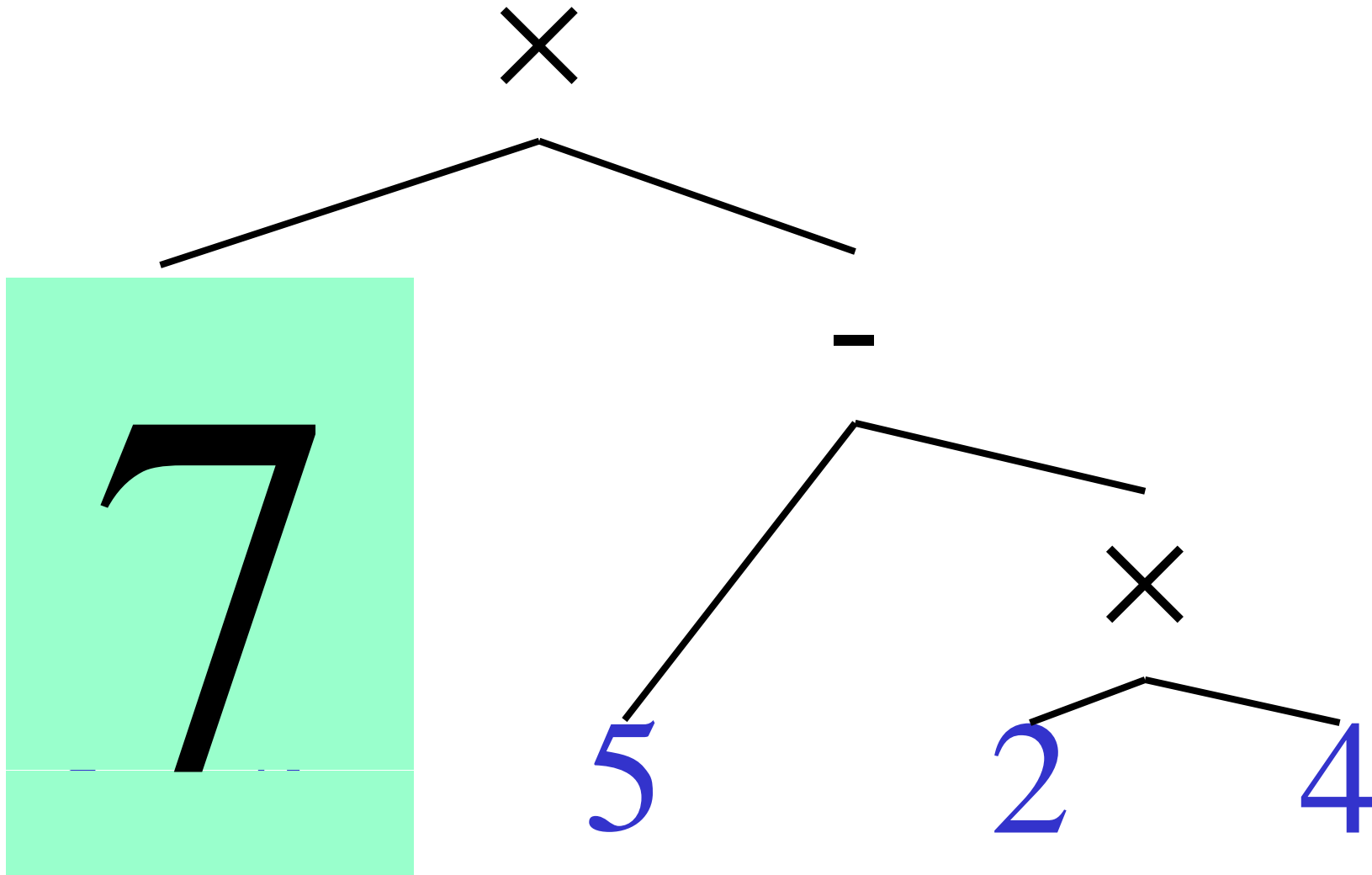
$$(3 + 4) \times (5 - 2 \times 4) = ?$$
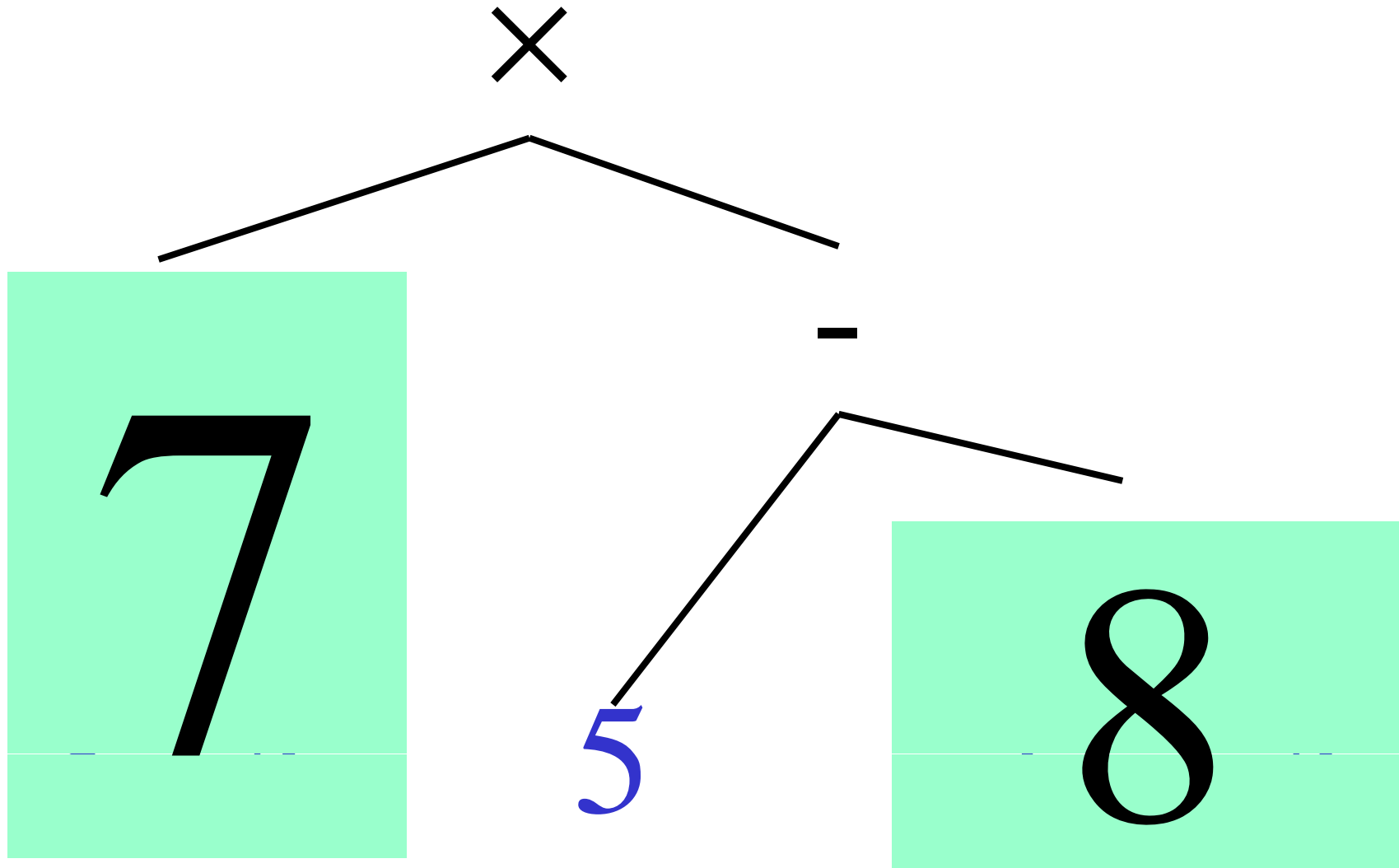
COMPOSITIONAL SEMANTICS

$$(3 + 4) \times (5 - 2 \times 4) = \ ?$$

$$(3 + 4) \times (5 - 2 \times 4) = ?$$

$$\times$$

$$7$$

$$-$$

$$5 \qquad \times$$

$$2 \qquad 4$$

$$(3 + 4) \times (5 - 2 \times 4) = ?$$

$$\times$$

7

−

5

8

$$(3 + 4) \times (5 - 2 \times 4) = \ ?$$
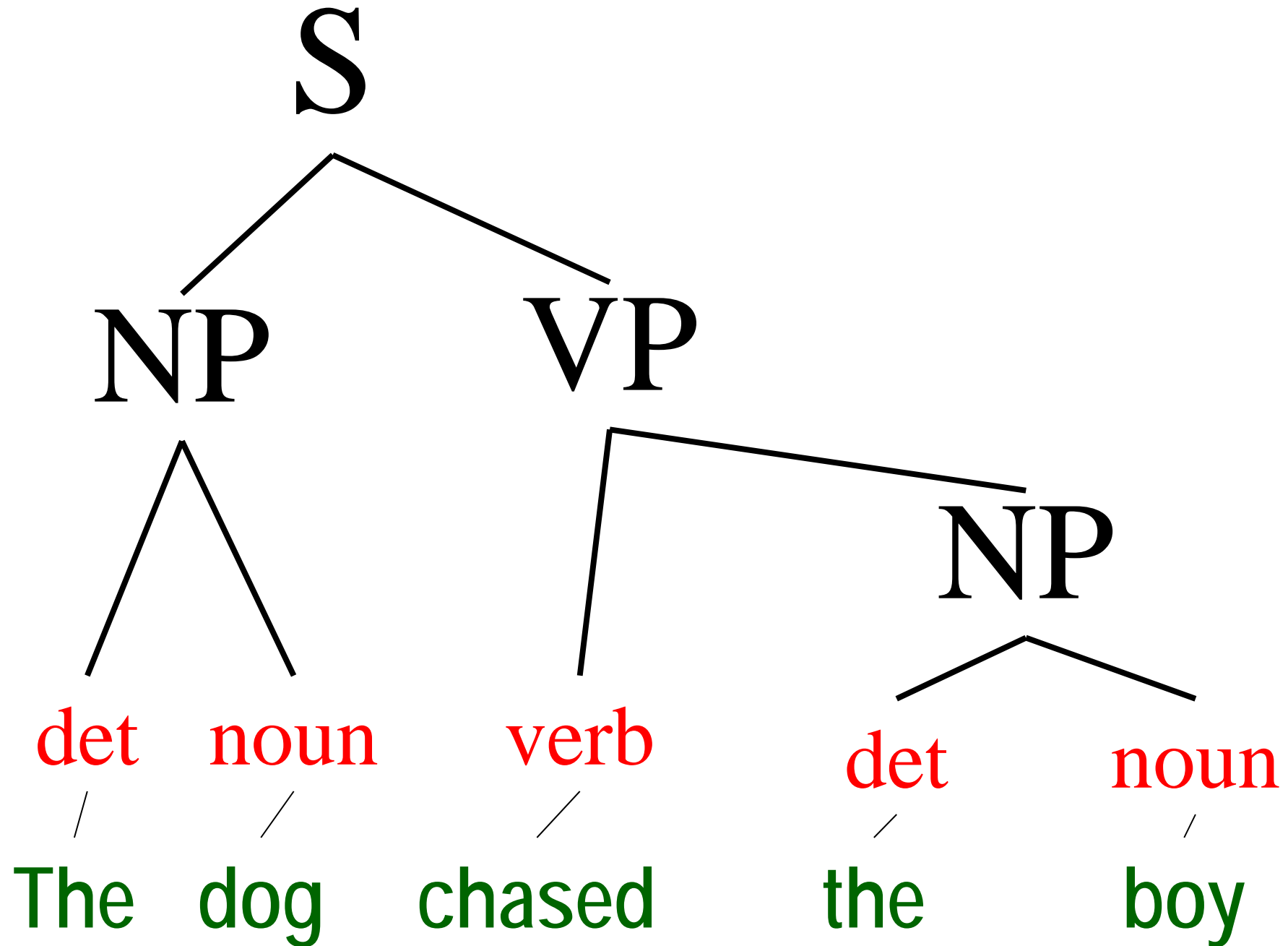
$$\times$$

| 7 | -3 |
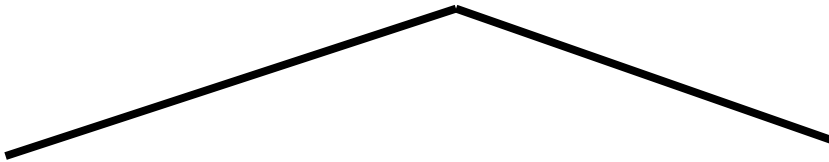
$$(3 + 4) \times (5 - 2 \text{ x } 4) = ?$$

-21

Semantics

Compositional Semantics

Syntax trees work in exactly the same way!!

```
            S
          /   \
        NP      VP
       /  \    /  \
     det  noun verb  NP
      |    |    |    /  \
     The  dog chased det noun
                      |    |
                     the  boy
```

NP

det   noun
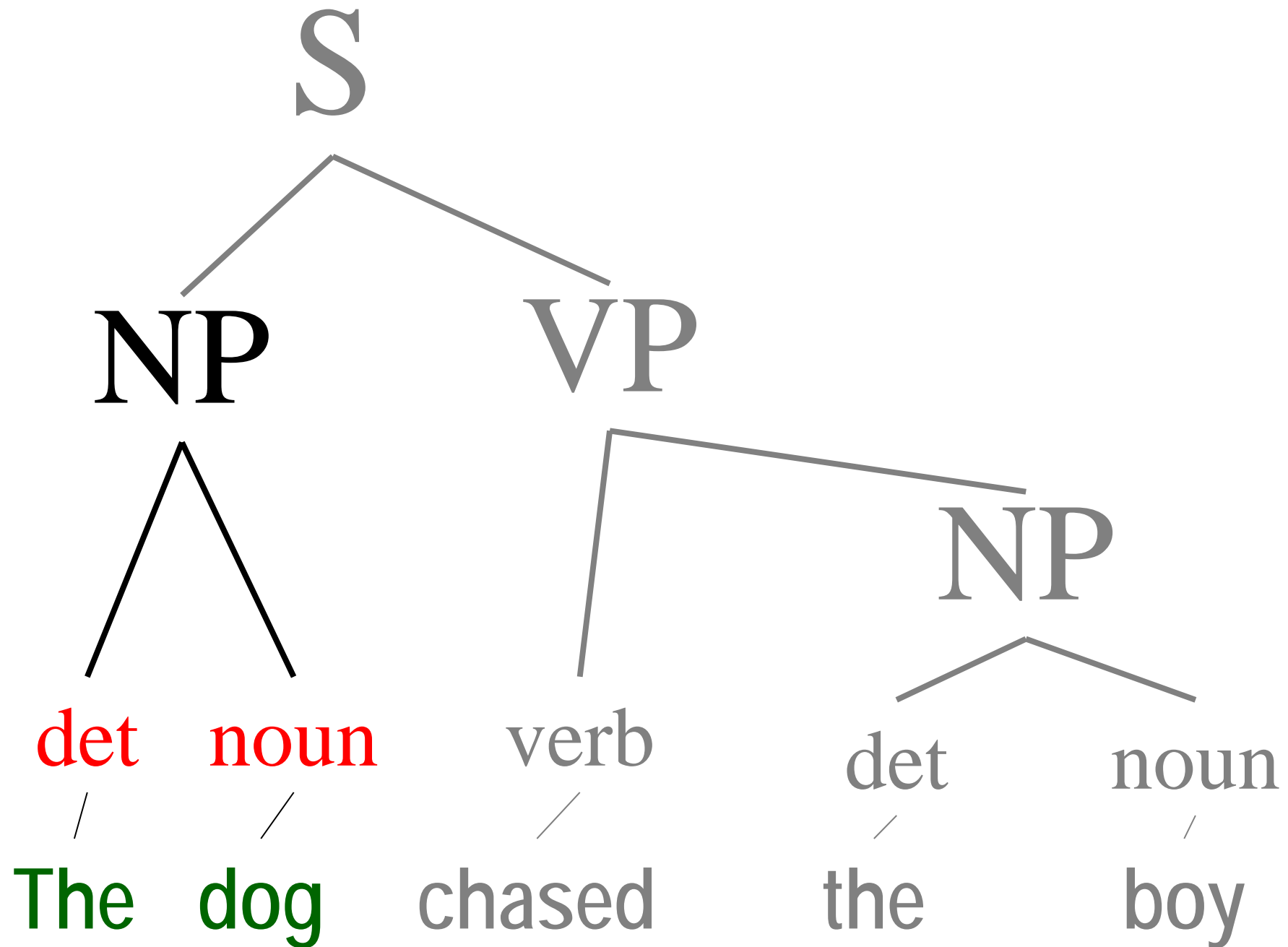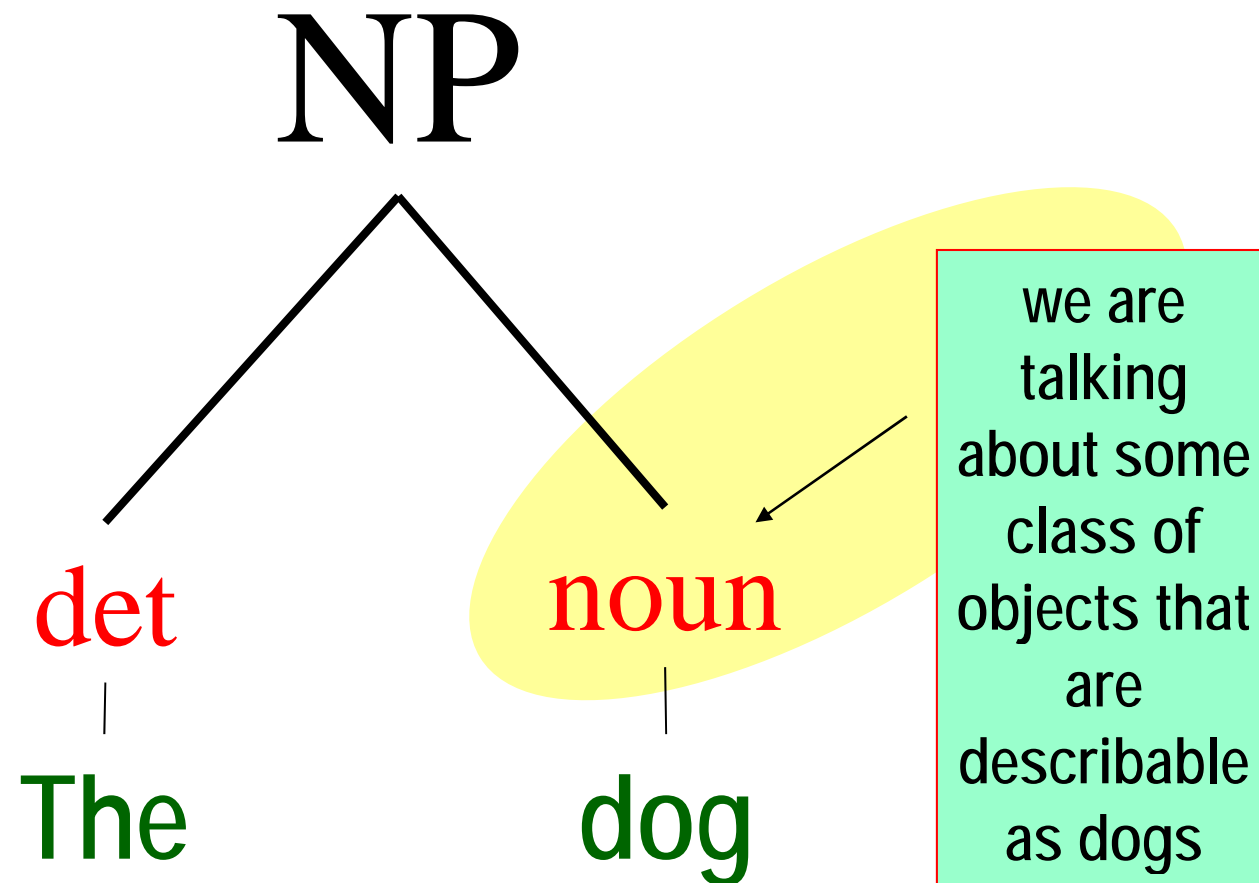
The   dog

we are talking about an object that I expect you to be able to identify

S

VP ⟶ ?

NP ⟶ 'the-boy'

NP

det   noun

verb

det   noun

The   dog   chased   the   boy

S

VP

NP

s.o. chased the-boy

NP

det   noun   verb   det   noun

The   dog   chased   the   boy

S → s.o. chased the-boy
s.o. = the-dog

s.o. chased the-boy

'the-dog'

S

VP

NP

NP

det   noun   verb   det   noun

The   dog   chased   the   boy

S

s.o. chased the-boy
s.o. = the-dog

VP

s.o. chased s.t.
s.t. = the-boy

NP

'the-dog'

NP

'the-boy'

det   noun   verb   det   noun

The   dog   chased   the   boy

S

s.o. chased the-boy
s.o. = the-dog

VP

s.o. chased s.t.
s.t. = the-boy

NP

'the-dog'

NP

'the-boy'

det	noun	verb	det	noun
The	dog	chased	the	boy

S

NP — VP

The dog

s.o. chased s.t.
s.t. = the-boy

the chasing was somewhere
somewhere = in-the-garden

VP → verb · NP · PP

NP

PP → prep · NP

det noun verb det noun prep det noun

The dog chased the boy in the garden

```
                    S
          ┌─────────┴─────────┐
         NP                   VP ──────────→  s.o. chased s.t.
      ┌───┴───┐          ┌─────┴─────┐          s.t. = the-boy-in-the-garden
      │       │          │           NP
      │       │          │      ┌─────┴─────┐
      │       │          │      │           PP ──────→  the boy was somewhere
      │       │          │      │      ┌─────┴─────┐       somewhere = in-the-garden
      │       │          │      │      │           NP
      │       │          │      │      │       ┌────┴────┐
     det    noun       verb   det    noun    prep  det    noun

     The    dog       chased  the    boy      in   the   garden
```
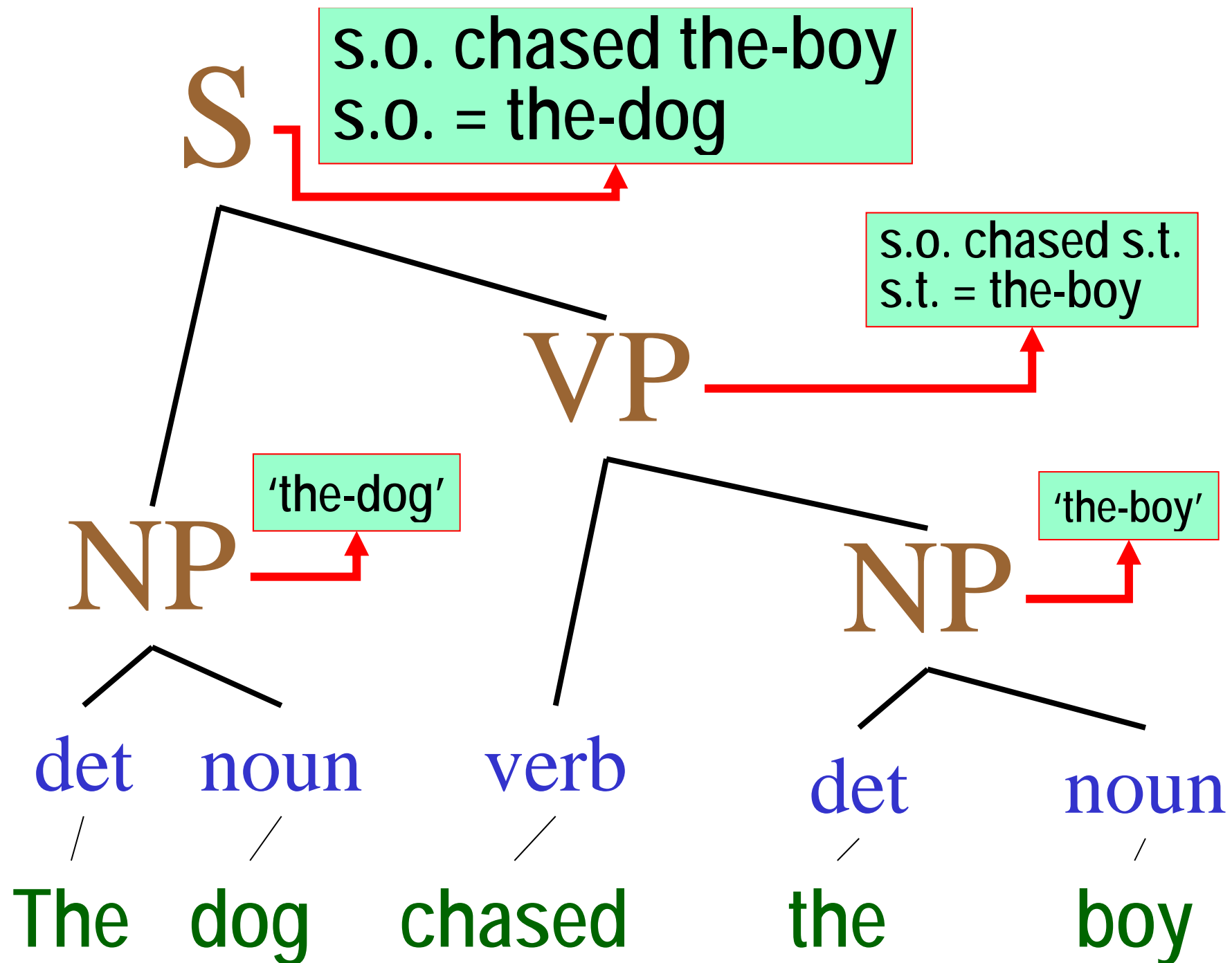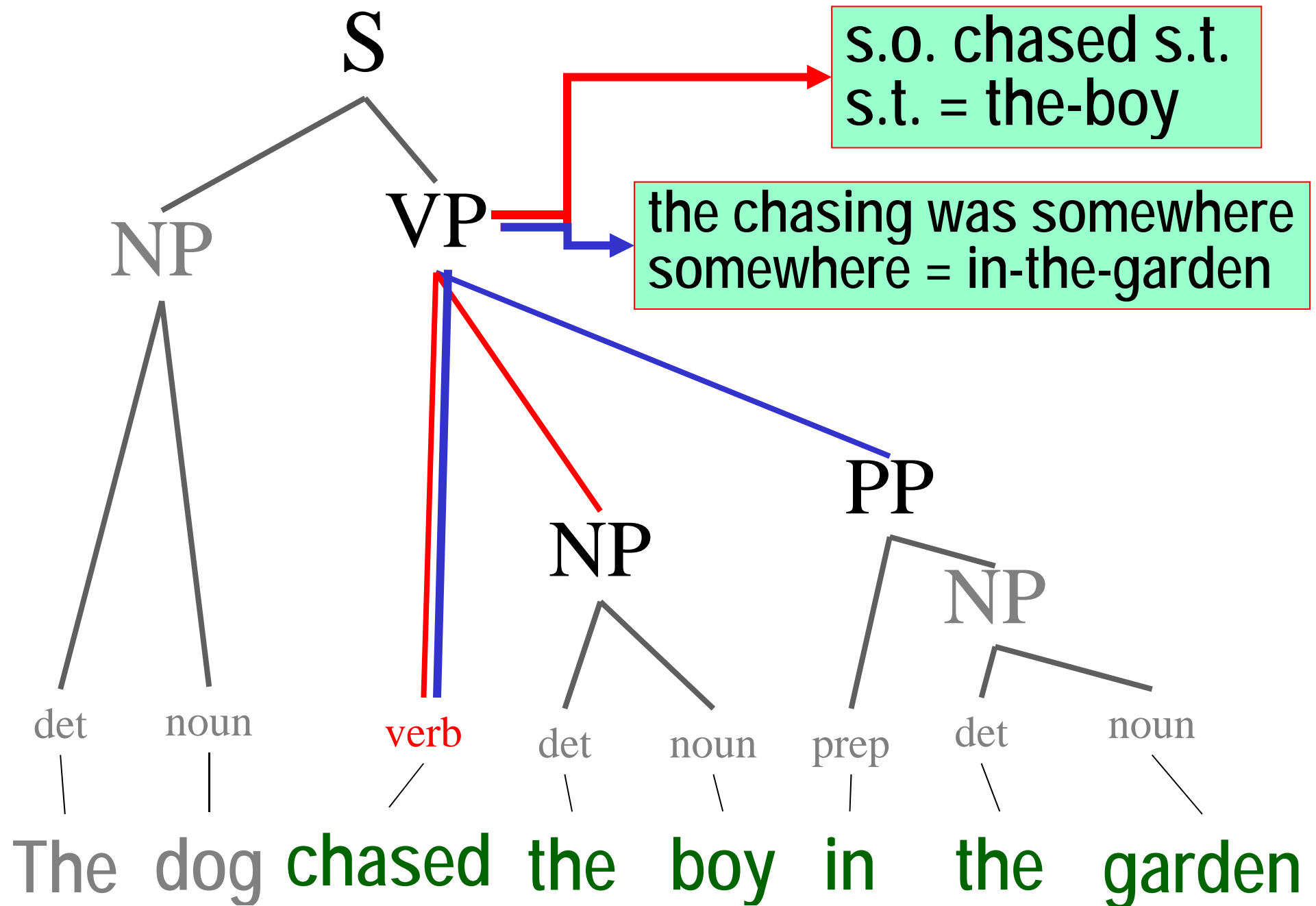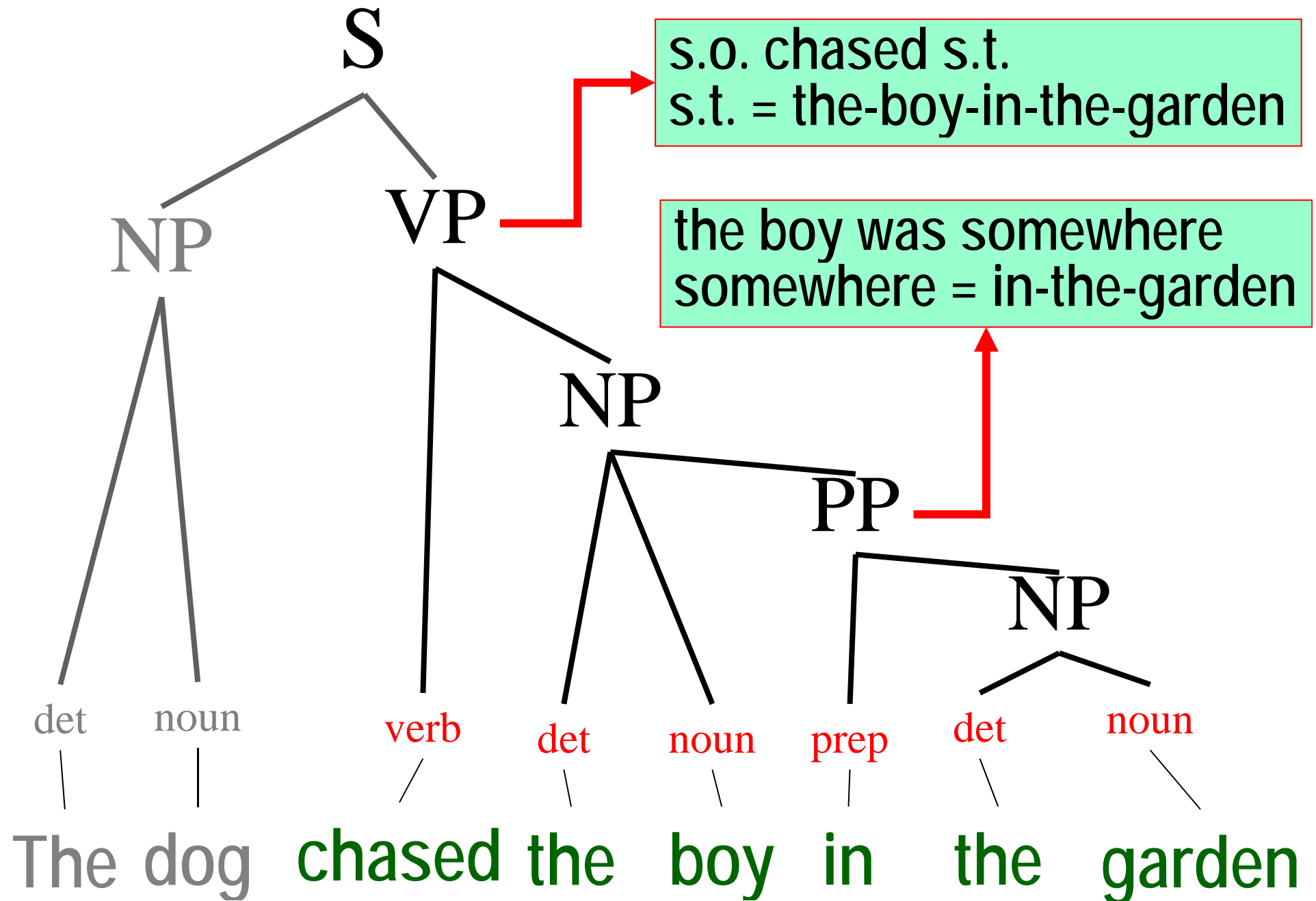
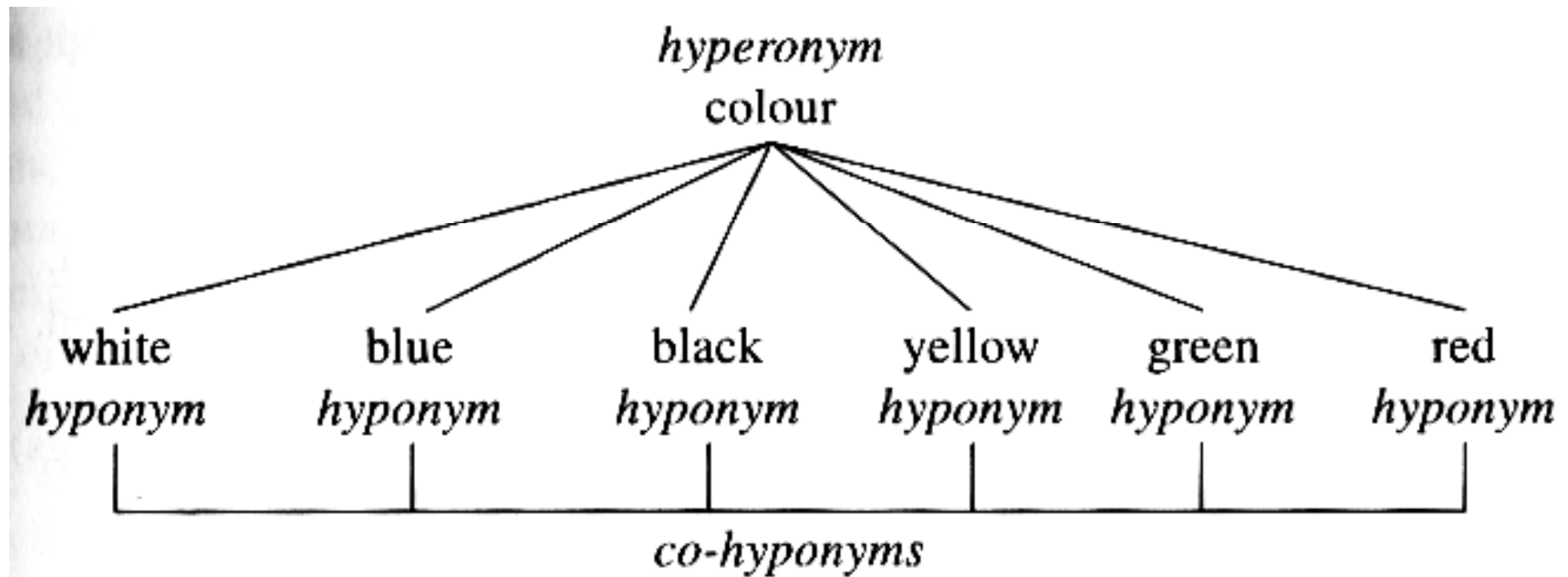# So: when designing grammars

- Need as little over-generation as possible
- Need as little under-generation as possible
- The individual constituents should 'make sense'
- The trees should give clear instructions as to how to put the meaning together out of the parts!

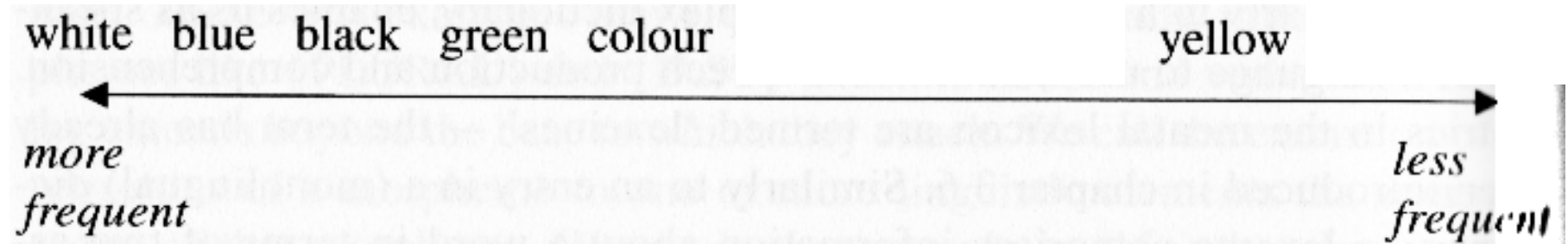# Other types of meaning

Hyponomy

'subtype' relationship { *sense relations:*
relations between words

Connotations

white   blue   black   green   colour   yellow

←——→

more   *less*
frequent   *frequent*

Connotations

white blue black green colour blood communist yellow flag bright

$\xleftarrow{\hspace{6cm}}\xrightarrow{}$

more frequent ⟵ ... ⟶ *less frequent*

Denotations
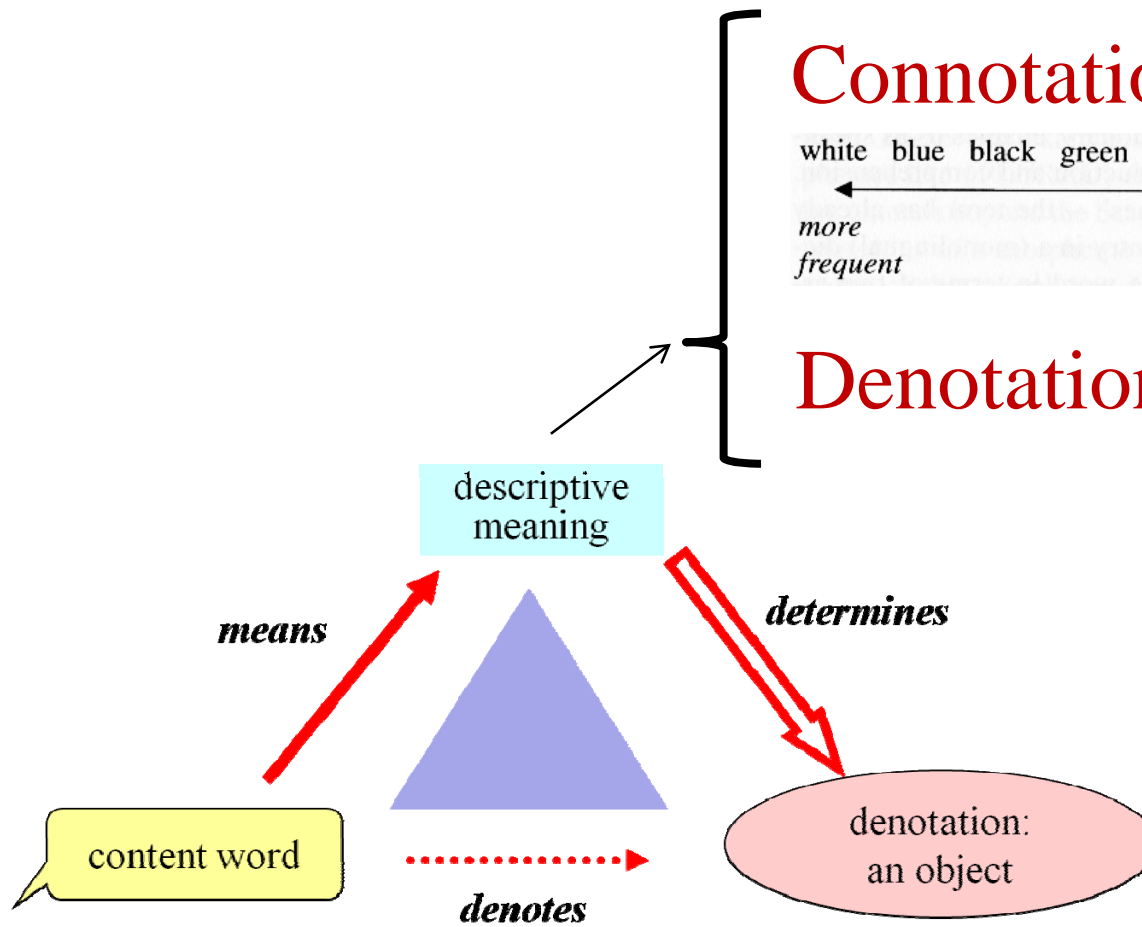
(6) Boxes?
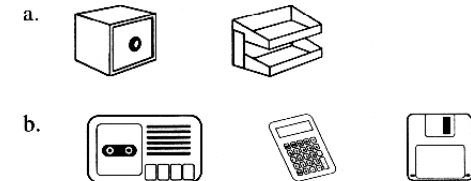
a.

b.

categorization

descriptive meaning

means

determines

content word

denotes

denotation: an object

phonology — articulatory phonetics → acoustic phonetics → auditory phonetics — phonology
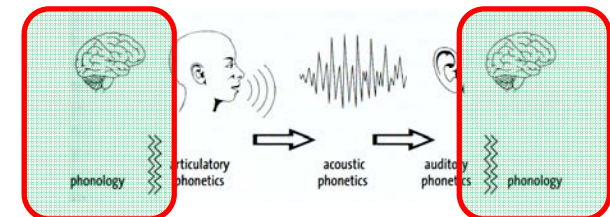
Semantic / Pragmatic Distinction

"We would like to apologise for any inconvenience caused."

a.   'An entity comprising the writer of this sentence and other people ('*we*')
     express their wish ('*would like*')
        to say that they are sorry ('*to apologise*')
           in case something has become the cause of ('*for … caused*')
              problems which annoy someone ('*any inconvenience*').'

Semantic / Pragmatic Distinction

"We would like to apologise for any inconvenience caused."

b. 'The construction company, who have set up this road sign,
       want to apologise
           to me, the reader of this sentence,
               for the delay,
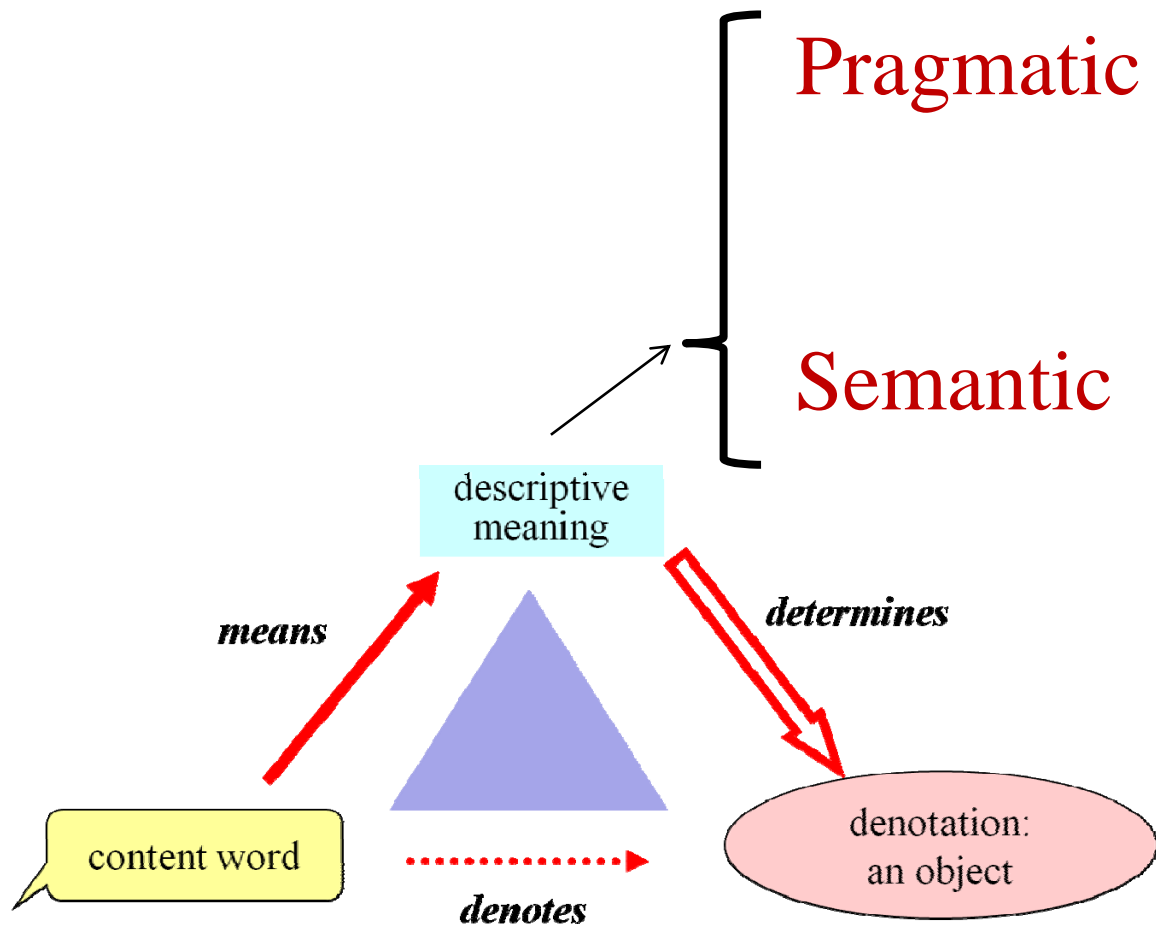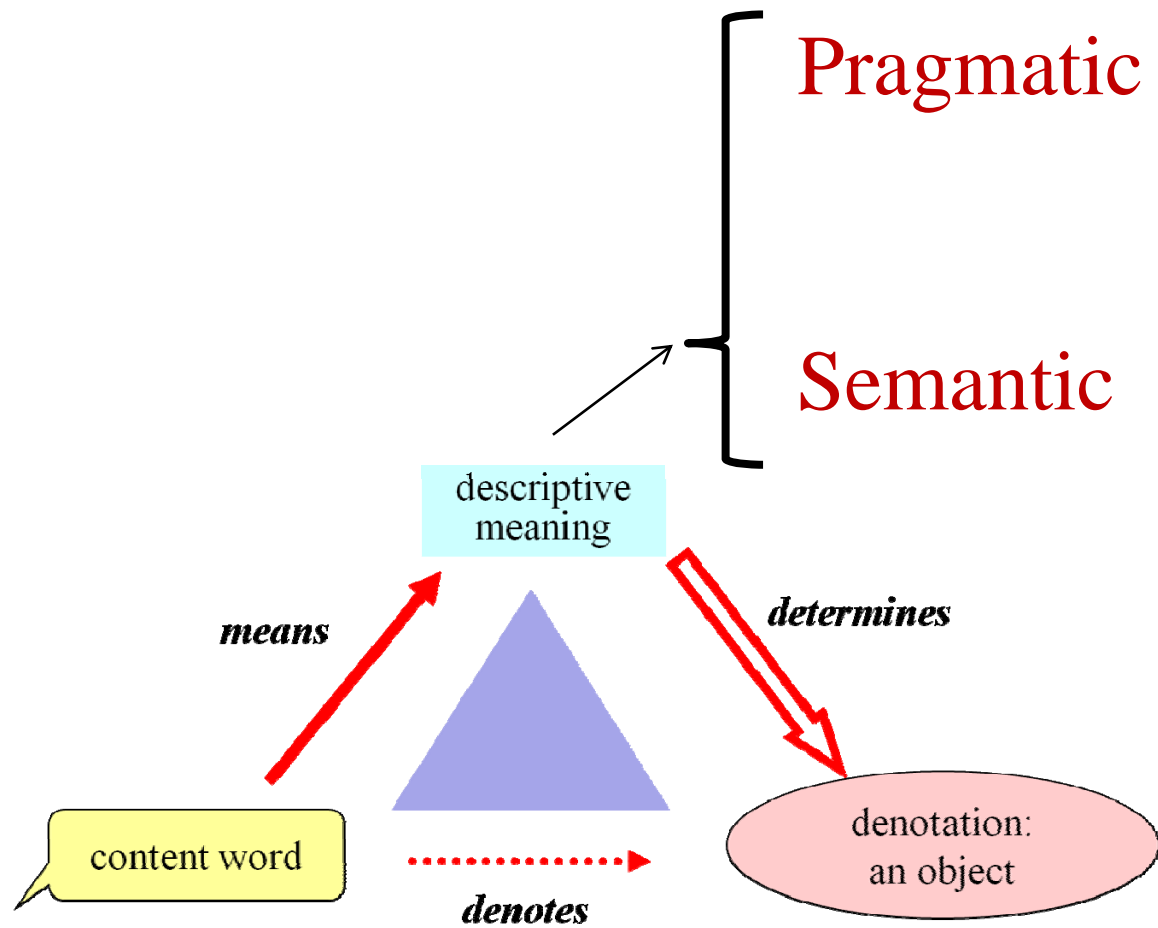   which they acknowledge to be their fault.'

Semantic / Pragmatic Distinction

(11) We would like to apologise for any inconvenience caused.

(12) a.   'An entity comprising the writer of this sentence and other people ('*we*')
   express their wish ('*would like*')
      to say that they are sorry ('*to apologise*')
         in case something has become the cause of ('*for ... caused*')
            problems which annoy someone ('*any inconvenience*').'
   b.   'The construction company, who have set up this road sign,
      want to apologise
         to me, the reader of this sentence,
            for the delay,
               which they acknowledge to be their fault.'

Events and Eventualities

SEMANTIC 'EVENTUALITIES'
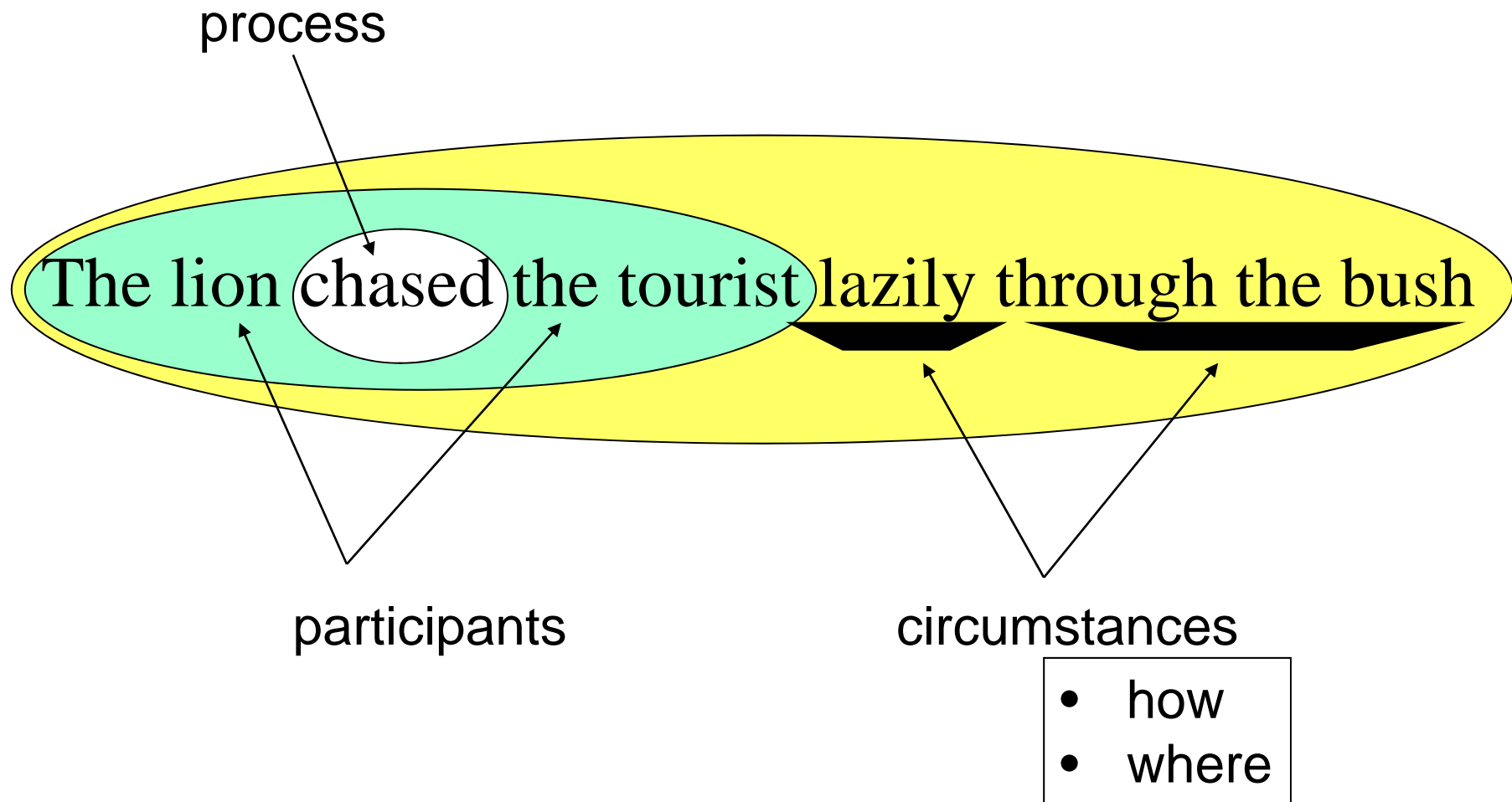
process

The lion chased the tourist lazily through the bush

participants

circumstances

- how
- where

Packing 'eventualities' into grammar

Mr Harvey, aged 25, was knifed to death in a savage attack after he and Tracie were pursued by another car in a 'cat and mouse' chase near Alvechurch, Worcestershire.

Packing 'eventualities' into grammar

Mr Harvey, aged 25, was knifed to death in a savage attack after he and Tracie were pursued by another car in a 'cat and mouse' chase near Alvechurch, Worcestershire.

someone
pursued
someone

someone
knifed
someone

Packing 'eventualities' into grammar

Mr Harvey, aged 25, was knifed to death in a savage attack after he and Tracie were pursued by another car in a 'cat and mouse' chase near Alvechurch, Worcestershire.

someone attacked someone (savagely)

someone chased someone 'cat and mouse-ly'

someone died

Metaphorical Structures
Lakoff and Johnson: "Metaphors we live by"

EMOTIONS:

HAPPY is **UP; SAD** is **DOWN**

I'm feeling *up*.	I'm feeling *down*.
That *boosted* my spirits	He *fell* into a depression
My spirits *rose*.	Her spirits *sank*.
You're in *high* spirits	He's feeling *low*.
The *height* of ecstasy.	The *depths* of misery.
That gave me a *lift*.	That *depressed* me.

Metaphorical Structures
Lakoff and Johnson: "Metaphors we live by"

PHYSICAL HEALTH:
HEALTH & LIFE is **UP;**
SICKNESS & DEATH is **DOWN**

He's at the *peak* of health.	He's *sinking* fast.
Lazarus *rose* from the dead.	He *fell* ill.
She's in *top* shape.	She came *down* with the flu.
	Her health is *declining*.
	He is feeling *under* the weather.

Prototypicality:
concepts and radial categories

An internal structure for the concept "bird"
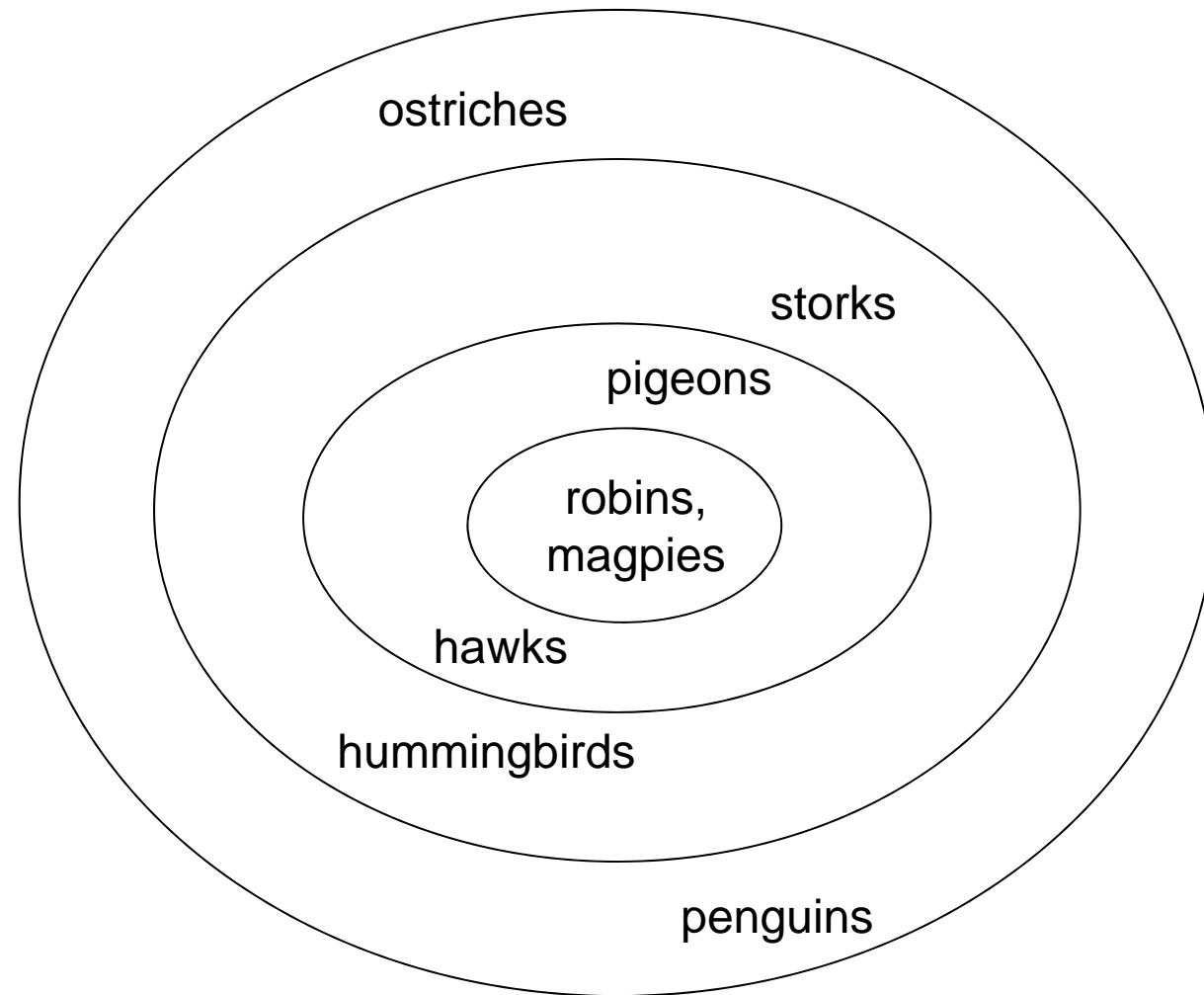
Some Important Distinctions

	Lexeme	Form	Meaning

polysemy — one lexeme   UNIVERSITY ——— <university> /juːnɪˈvɜːsitiː/

'institution for higher education'

'building which houses an institution for higher education'

homonymy — two lexemes   SWALLOW₁   SWALLOW₂   <swallow> /ˈswɒləʊ/

'a small black-and-white bird'

'to make food or drink go down the throat'

synonymy — two lexemes   JOB ——— <job> /ˈdʒɒb/   OCCUPATION ——— <occupation> /ɒkjʊˈpeɪʃən/

'professional employment'