Morphology: the structure of words

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Lecture #3

- The **morpheme** is the smallest linguistic sign: the smallest unit that has both a form and a meaning.
- Words, much like sentences, are formed by rules and have a **constituent structure**.
- Rules of **derivational** morphology and **compounding** create new words. Rules of **inflectional** morphology specify how grammatical information is encoded in words.
- Languages differ in how they make use of morphology. Their morphological devices do not vary randomly: they form **types**.

A word may consist of several morphemes:

re	use	able	s
prefix	root	suffix	suffix

Prefixes, infixes, suffixes, and circumfixes together are called **affixes**. They are **bound morphemes**.

reusables	stem = reusable, affix = s
reusable	stem = reuse, affix = able
reuse	stem = use, affix = re
use	root (smallest stem)

Roots/stems: open class morphemes, new instances can easily emerge or be invented: blick-ing

Affix			Rule		Output
-able	Verb	+	-able	=	Adjective
re-	re-	+	Verb	=	Verb
un_1-	un-	+	Adjective	=	Adjective
un_2-	un-	+	Verb	=	Verb

Table 1: Four derivational rules analyzing four derivational processes.

Affixes: closed class morphemes, new instances develop slowly: *book-lan

Content words: nouns, verbs, adjectives, adverbs
Function words: articles (“the”), prepositions (“about”), pronouns (“hers”), auxiliaries (“would”)

Derivational affixes create new concepts out of existing ones.
Inflectional affixes add grammatical information (e.g. number, person, tense)

English inflectional morphemes:

-s	He walks	(3rd person singular agreement)
-ed	She walked	(past)
-ing	They are walking	(present participle)
-en	We have eaten	(past participle)
-s	The students walk	(plural)
-’s	Kim’s book	(genitive)
-er	nicer	(comparative)
-est	nicest	(superlative)

An inflectional morpheme may accidentally have the same sound shape as some derivational morpheme. E.g. -er in “nicer” (comparative) and “mover” (agent-forming morpheme)

The universally attested word-structure is

$$\Big[\big[\ \text{[root] [derivational affixes]}\ \big]\ \text{[inflectional affixes]}\ \Big]$$

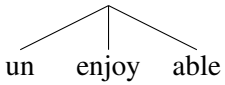
Particular grammars make certain **derivational processes** available, which we can describe by means of **rules**. Each rule specifies the **category of the input** and the **category of the output** (see Table 1 on page 1).

Affixes typically impose further restrictions on stems. Cf. paintable, movable, understandable, but *snorable, *goable, *puttable.

Given a **derivational analysis** of a word in terms of the **processes** that generated it (i.e. the rules that applied in its formation), we can trivially extract the word's **constituent structure**.

Which structure is right?

A.



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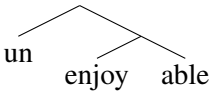

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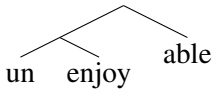
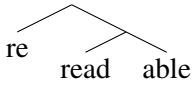


- Structure A. is excluded on analytical grounds because it describes two derivational processes in one fell swoop.
- Structure B. looks pretty good: the restrictions on the -able and un_1- rules are respected.
- Structure C. looks *prima facie* good: first un_2- would combine with the root/stem to produce a new verb, then -able would combine with that verb to produce an adjective. **But** un_2- can only combine with verbs whose meaning involves, roughly speaking, an action that changes the state of the thing it is directed at, and does so in a reversible way, e.g. tie/untie. "Enjoy" isn't such a verb (it neither changes the state of the enjoyed thing nor is it reversible), and indeed as a bonus prediction "unejoy" cannot be a word, barring of course some novel semantic interpretation for "enjoy" which does make it change the state of the enjoyed thing in a reversible fashion.

Which structure is right?

A.



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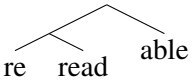
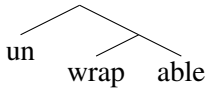


- We know of no prefix re- that attaches to adjectives to form a new adjective, cf. *repretty, *reinteresting, *reblue. So Structure A. can't be right.
- Structure B. uses well attested rules for re- and for -able.

Which structure is right?

A.



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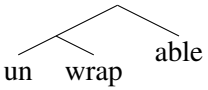

- Finally, an interesting one!
- **Both** structures are right, using the two homophonous prefixes un- we see in Table 1 (page 1).
- Structure A. uses un_1- to attach to an adjective producing a new adjective, meaning (roughly) the negation of the input adjective. If "wrappable" means something that can be wrapped, then this reading of "unwrappable" means something that cannot be wrapped.
- Structure B. uses un_2- to form a new verb "unwrap," meaning to undo the result of the action of wrapping, and then forms an adjective out of that with -able in the usual fashion. The word "unwrappable" in this analysis means something that can be unwrapped.
- **Crucially**, these two meanings are quite distinct, and **both are available** for the word. The string "unwrappable" is thus **structurally ambiguous**.

Compounding: Two or more **stems** whose combination takes on a novel meaning, with appreciable **lower predictability** than derivational processes.

A + A	=	A	bittersweet	A + N	=	N	hotdog
V + N	=	N	ceasefire, pickpocket	V + V	=	V	sleepwalk
N + N	=	N	rainbow				

Stress pattern: Typically, but not exclusively, on the first member of the compound: hótdog and blúebird, but thanksgíving.

Meaning in compounds:

hóuseboat = a boat which is a house	laughing hyéna = a hyena that laughs
hóusecat ≠ a cat which is a house	láughing gas ≠ a gas that laughs

What are "olive oil" and "baby oil"? What's "snake powder"?

Nevertheless, a housecat is a kind of cat, a laughing gas is a kind of gas, olive oil and baby oil are both kinds of oil, and snake powder is a kind of powder. English compounds are typically **headed** by their rightmost element. But there are compounds of uncertain headedness or altogether headless: ceasefire, pickpocket, kick-ass.

Cross-linguistic variation in the structure of words — morphological types

A given language may **predominantly** belong to one **type**, but still exhibit traces of another. In some cases, we can trace these mixed properties to language change.

Analytic (isolating) Each morpheme is a word on its own (e.g. English, Chinese)

Agglutinating Each bit of grammatical meaning is "glued" to the stem in the form of a separate affix (Japanese, Korean, Telugu, Hungarian, Quechua)

Fusional One affix or one change in the stem comprises several bits of grammatical meaning (Latin, Old English, German, Arabic, Hebrew)

Polysynthetic Affixes have extremely rich content (many native North American languages, e.g. Atsugewi)

Latin (fus.)	Hungarian (aggl.)	Case	Gramm. funct.
dom-us	ház	nominative singular	subject
dom-i	ház-ak	nominative plural	
dom-um	ház-at	accusative singular	object
dom-os	ház-ak-at	accusative plural	
dom-i	ház-nak	genitive singular	possessive
dom-orum	ház-ak-nak	genitive plural	
dom-o	ház-tól	ablative singular	...
dom-is	ház-ak-tól	ablative plural	

Table 2: Fusional vs. agglutinative in the verbal system. The ablative often case serves many grammatical functions, particularly in Latin.

Compare in Table 2: In the Latin verbal system, a single affix gives **both** number **and** case information; moreover, the affix varies with noun classes such as grammatical gender. In Hungarian however, there are **separate** affixes for number and case

Both **agglutinating** and **polysynthetic** languages pack a lot of information into a single word. The difference is that agglutinating languages have affixes for grammatical meaning only, while polysynthetic languages have affixes with very rich non-grammatical content.

Atsugewi (polysynthetic)		
verbal stem	st'aq'	to act on runny icky material
directional suffix	-cis	into fire
instrumental prefix	cu-	from a linear object, moving axially, acting on moving object
inflectional affix-set	s-'-w-⋯-a	1pers subj., 3pers obj., factual mood

/s + ' + w + cu + st'aq' + cis + a/ $\Longrightarrow$ [sc'ust'áq'c^{a}a]

Literal: I made it such that runny icky material moved into fire by acting upon it with a linear object moving axially.
Instantiated: I prodded the guts into the fire with a stick.