LING110

GOALS

Structure

- Structure of the English lexicon
- Structure of words

Morphemes and Morphology

Word derivation

Inflection and derivation

Introduction

- What is a word?
  - A word is a minimal free form.
    - 1.   A word is a linguistic unit (a form);
    - 2.   A word can be used by itself (it is free) as opposed to other units like the *-s* of *cats* which is a unit with a plural meaning but cannot be used by itself;
    - 3.   A word is the smallest unit (it is minimal) that can be used by itself, in contrast to phrases like *a large cat*.

Introduction con't

- It is easy to imagine situations in which a word like *dogs* occurs in isolation:
    - A: What are those over there?
    - B: Dogs.
- In this way, it contrasts with forms like the plural *-s* that was added to *dog* to form *dogs* which cannot be used by itself.
- However, English orthography is not a reliable criterion for determining the words in a sentence.
    - Consider Compounds

Compounds

- Consider the differences between *blackbird* and *black bird*.
  - The phrase that describes a bird that is black is stressed as *bla¹ck bi¹rd;* both words receive primary stress.
  - The name of the bird is stressed as *bla¹ckbi²rd;* the first syllable receives primary stress, and the second receives secondary stress.
- The compounds are distinguished from phrases by removing the space. However, this is not always the case.
- Consider *hot dog*.

  Examples of compounds that have a space are endless: consider *ha¹rd dri²ve* and *co¹p ca²r*

Inflection

- Take a look at COMPUTE

- Also have: *computes, computed, computing*

- They differ only by being different inflected forms of the lexeme COMPUTE.

  – They are members of the paradigm of the lexeme COMPUTE.

- A word is an inflected form of a lexeme.

  – This definition will work for lexemes that can be inflected.

  – The classes of lexemes that can be inflected in English are verbs (present & past tense, present & past participles), count nouns (singular vs. plural), adjectives (positive, comparative, superlative) , the auxiliaries *be* and *have*, and some adverbs.

Inflection con't

- There are other classes that do not inflect- such as prepositions, determiners, and conjunctions.
- This definition will not cover them.
- This analysis assumes that there is a set of rules that will build words.
- How do we generate words from lexemes?
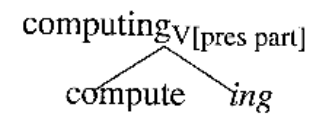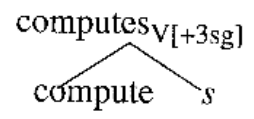- We need to write rules, as they do in computer programming.

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$$Word \Rightarrow Lex + infl$$

$$Word_{V[+3sg]} \Rightarrow Lex_V + s$$
$$Word_{V[pres\ part]} \Rightarrow Lex_V + ing$$

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computes$_{V[+3sg]}$
compute   *s*

computing$_{V[pres part]}$
compute   *ing*

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Rules

- What kind of rule generates the non 3rd singular *compute*?
- The rules given are binary rules; that is, they are equivalent to trees that have 2 branches. For words that do not have explicit inflectional endings, we propose unary rules.
- The non 3rd singular rule looks like this:
  - $\text{Word}_{V[-3sg]} \Rightarrow \text{Lex}_V$
- Once there are a set of rules they need to be run through the lexicon.
- Consider the rule:
  - $\text{Word}_{V[pres\ part]} \Rightarrow \text{Lex}_V + ing$

Rules con't

- Consider COMPUTE
- This rule would generate: COMPUTE + *ing*
- Result: *computeing*
- This is not right.
- We need an additional rule to fix the spelling.
- It must be a general rule because it must ensure that *concluding, providing* and many others are also correctly spelled.

Rules con't

- We need a rule to delete *e* before *ing*.
- The rule will be expressed as:
  - e + i --> I
- However, we don't want to delete every *e* when followed by *i* because there are lots of sequences of *ei* that are fine.
- First we apply the '⟹' rules to a lexeme to build a word, then we apply the '-->' rules.
- We need the '-->' rules to handle the problem with the *e* that appears at the end of so many English words.

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compute$_V$	compute$_V$	
	[compute + s]$_{V[+3sg]}$	Word$_{V[+3sg]}$ $\Rightarrow$ Lex$_V$ + s
[compute+*ing*]$_{V[\text{pres part}]}$		Word$_{V[\text{pres part}]}$ $\Rightarrow$ Lex$_V$ + *ing*
[comput+*ing*]$_{V[\text{pres part}]}$	"	e + i $\rightarrow$ i
[computing]$_{V[\text{pres part}]}$	[computes]$_{V[+3sg]}$	Remove '+'

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Relatedness of Words

- How are words related to each other?

- Consider the word: *antidisestablishmentarianism.*

- We can extract elements that we have seen before:

1. *-ism* Usually indicates a system of beliefs.

2. *anti-* which we recognize as meaning something like "opposed to".

3. *-arian* Creates adjectives that refer to occupations, ages, or sects.

4. *dis-* Means something like "the opposite or reverse of".

5. *-ment* Seems to create nouns from verbs.

Relatedness of Words con't

- In the end we are left with: *establish*

- Even here, we might suspect a connection with *stable* although it is not clear what the remaining *e-* and *-ish* mean.

- *antidisestablishmentarian* and *antidisestablishmentarian***ism***

  – Related by a rule that adds *-ism* to *antidisestablishmentarian*

- *advantage* and *disadvantage*

  – Related by a rule that adds *dis-* to *advantage*

- Note: These rules do not create different words from the same lexeme but create new lexemes.

2 kinds of Rules

- We have two kinds of rules.
1. Those which map lexemes onto words we call *inflectional rules*.
2. Those which create new lexemes we call *derivational rules*.
- This is an important distinction.
- Inflectional rules add information that the grammar of the language requires, such as marks for subject/verb agreement or the number of a noun.
  - These rules must apply if words are to be used correctly.
- Derivational rules are a mechanism by which the lexicon of a language can be enriched in response to the invention of new artifacts and ideas.

Derivational Rules

- Derivational rules have 2 possible consequences that are different from inflectional rules.

1. A derivational rule might, but not necessarily, create a word with a meaning different from that which the basic form had.
   - This contrasts with inflectional rules which only add grammatical information.
   - Compare: *table vs. tables* and *antibacterial* from *bacterial*.
   - The inflectional rule adds information about number to the original word.
   - The derivational rule creates a new lexeme with a very different meaning from the original *bacteria*.

Derivational Rules con't

2.   A derivational rule can change grammatical category.

•   Adjectives like *clear* and *quick* create

•   Adverbs *clearly* and *quickly* by adding *-ly*.

•   Inflectional rules, since they elaborate the paradigm of a lexeme, do not change grammatical category.

In addition to different functions, inflectional and derivational rules have different structural properties as well.

Derivational rules can apply to lexemes that have been created by previous derivational rules.

The same cannot be said of inflectional rules (in English).
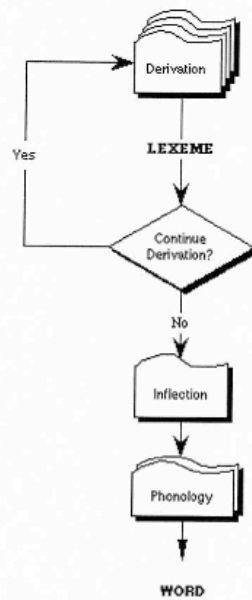
Derivational Rules con't

Note: the application of an inflectional rule also seems to block any further application of derivational rules.

Inflected words are morphologically inert; they cannot be subject to any further rule.

We will need to find a way to ensure that derivational rules apply inside inflectional rules.

Structure of rules:

1. Derivational morphology will apply inside inflectional morphology.

2. Derivational morphology creates lexemes and can be consulted as many times as we like.

3. Once we have inflected a word, we will apply phonological rules much as we saw in Table V.3 to create its phonetic form.

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Derivation

LEXEME

Continue
Derivation?

Yes

No

Inflection

Phonology

WORD

Terminology

- Finer distinctions and concepts that will be useful when analyzing words.

- Consider *unreadable*.

  - 2 derivational rules have applied: one has added *un-* and one has added *-able*.

  - The unit to which they have been added is *read*.

  - These units --- *read*, *un-* and *-able* --- are *morphemes*.

  The **morpheme** is the unit used to build lexemes and words.

  The morpheme is the smallest meaningful unit.

Terminology con't

- Morphemes are the building blocks of words and lexemes and if we try to break them down further, we will not find anything meaningful.
  - We can identify a meaning for each morpheme.

    un-   not

    read   interpret written form

    -able   capable of performing an action

Types of Meaning

- There are different types of meaning.

1. Lexical Meaning: the kind that the dictionary usually deals with. Perhaps we think of it as the definition.

- Morphemes that must normally attach to a lexeme and cannot appear in isolation such as *un-* and *-able* carry lexical meaning as well.

2. Grammatical Meaning: This kind of meaning is found in the plural *-s* in *trees*. These forms are inflectional and are required by the grammar.

3. Categorical Meaning: morphemes such as the *-ly* ending of *clearly* and *quickly* indicate that these words are adverbs. They signal the category of the lexeme.

Types of Meaning con't

- English has a large number of morphemes that carry *categorical* and *lexical* meaning.

- For example: *-ment* carries the grammatical meaning of *noun* when it is added to verbs.

- Notice that *enchantment* is created from the verb *enchant*.

- In addition, one of the meanings that it can contribute is that the state resulting from having had the action of the verb applied. Enchantment is the state of having been enchanted.
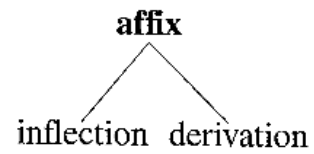
The Morphemes

- Consider *unreadable* again.
- Not all the morphemes are created equal.
- *read* seems to supply the core meaning.
- Distinction between the *root* of a lexeme or word and its *affixes*.
- The *root* is the fundamental component of the lexeme. Carrying the core meaning of the lexeme.
- An *affix* is a morpheme that is added to a lexeme.
- We can further distinguish between *prefix* and *suffix*.
- We know have the structural taxonomy of morphemes.

The Morphemes con't

- A structural taxonomy is a taxonomy based on the structural properties of the morphemes.

- We have also created a functional taxonomy of affixes.

- Affixes have 2 functions:

    1. They are derivational and create new lexemes. Or

    2. They are inflectional and create new words.

    See Figures V.3 and V. 4 in your coursebook.

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```
              morpheme
               /\
          root   affix
                  /\
             prefix  suffix



                 affix
                 / \
          inflection  derivation
```

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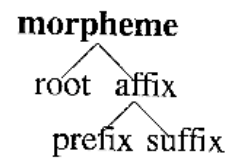
Derivational Rules

- To determine the grammatical category of a word - use it is a sentence and then determine how it is used.

    Sandy reads philosophical books.

- *read* here is a verb.

- How about *readable?*

    ¢Sandy readable philosophical books.

- Clearly it is not a verb.

- If it was a verb then it should be possible to substitute it for other verbs and obtain a plausible sentence.

- What is *readable?*

Derivational Rules con't

- To determine this we first use it in a grammatical and sensible sentence.

  Sandy enjoys readable books.

- Here it is used as an adjective to modify *books*.

- What happens if we substitute *big* for *readable?*

  Sandy enjoys big books.

- Thus- one of the properties of *-able* is that it is used to create adjectives.

- A second property is that it can only be added to *verbs*.

Derivational Rules con't

- To investigate: try to add it to words that are not verbs.
- For example:
  - Noun: **tableable*
  - Adjective: *beautifulable
- In conclusion, *-able* is a suffix that creates adjectives from verbs.
- The rule would look like:

  $$Lex_A \Rightarrow Lex_V + able$$

- When *-able* is added to a lexeme of category V, a new lexeme of category A (for Adjective) is created.

Derivational Rules con't

- Consider the prefix: *un-*
- What sorts of lexemes can it attach to?
- At first glance it looks like it can be added to both adjectives and verbs.
- The *un-* that means *not* can only be added to adjectives.
- The *un-* that means something like *reverse X* - where X is the verb to which it is added - can only be added to verbs.
- So, in fact we have two morphemes: *un-^{1}* and *un-^{2}*.
- We know that there are two morphemes because they don't mean the same thing.

	Root	Root Category
unclean	clean	Adjective
uncover	cover	Verb
unfold	fold	Verb
unfriendly	friendly	Adjective
unholy	holy	Adjective
unbind	bind	Verb

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Morphological Rule

- This establishes an important principle about morphemes:

A persisting property of a morpheme is its meaning. Each instance of a morpheme will be used with the same meaning.

- If two identical strings have the same meaning, then they are instances of the same morpheme.

- If two identical strings are not used with the same meaning, then they must be instances of different morphemes.

- *un-^{1}* is added to adjectives to create adjectives the meaning of which is the negation of the original adjective.

    Negative: $\text{Lex}_A \Rightarrow un + \text{Lex}_A$

Morphological Rule con't

- *un-2* is added to verbs to create new verbs that mean something like "reverse X" where "X" is the original verb.

- Reverse: $\text{Lex}_V \Rightarrow un + \text{Lex}_V$

- We now have the rules necessary to create *unreadable*.

    $$\text{Lex}_A \Rightarrow \text{Lex}_B + able$$

    Negative: $\text{Lex}_A \Rightarrow un + \text{Lex}_A$

- Can these rules apply in any order?

- There is only one order that will work.

- Remember, *un-1* can only be added to adjectives.

- What about *unfoldable?*

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```
        A
       / \
     un   A
         / \
        V   able
       read
```

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