Introduction to Lexical Morphology

GENERAL INFORMATION

General Information:

Course Material: pdf-files at http://ifla.uni-stuttgart/~jilka
   click on “The Phonology-Morphology Interface”

Course Demands:
   Analysis exercises
   Final exam: February 10

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Introduction to Lexical Morphology

THE LEXICAL PHONOLOGY AND MORPHOLOGY MODEL

- application in English derivational and inflectional morphology
- word is regarded as the key unit of morphological analysis
- symbiotic relationship between morphological and phonological rules
- common organization in hierarchically ordered strata/layers/levels
central principle of lexical morphology:

- the morphological component of the grammar is organized in a series of hierarchical strata

English affixes can be grouped in two broad classes on the basis of their phonological behavior: neutral and non-neutral

**neutral affix**: no phonological effect on the base to which it is attached

Examples: -ness, -less

‘abstract – ‘abstractness, ‘serious – ‘seriousness, a’lert – a’lertness

**non-neutral affix**: effect on segmental or suprasegmental structure of the base

Example for non-neutral affixes: -ic, -ee

em’ploy – emplo’yee, de’tain – detai’nee, ‘absent – absen’tee

-ic is a pre-accenting suffix (syllable immediately before it is stressed)
-ee is an auto-stressed suffix (attracts the stress itself)
Exercise:

(a) Transcribe the adjectives *wide*, *long* and *broad*

(b) What nouns are derived from them? Transcribe them.

(c) Derive adverbs from them and transcribe.

(d) Are the used suffixes neutral or non-neutral?

<table>
<thead>
<tr>
<th>Adjective</th>
<th>Noun</th>
<th>Adverb</th>
</tr>
</thead>
</table>

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the neutral/non-neutral distinction corresponds to the more traditional distinction between **primary** (= non-neutral) and **secondary** (= neutral) affixes and the classic distinction of weak boundary (‘#’) between neutral suffix and base vs. strong boundary (‘+’) between non-neutral suffix and base in SPE

secondary affixes can produce segment sequences that are disallowed in a single morpheme

example: no geminate consonants in morphemes:
miss [mɪs]
no geminate consonants with attached primary affix:
ad-duce [ədju:s]

geminate consonants with attached secondary affix:
thin-ness [θɪnɛs]

typically (there are exceptions) primary affixes are Greek or Latinate, secondary affixes are Germanic (affixes tend to combine with bases from the same source)
Basic principles of the Lexical Phonology/Morphology Model

- **level ordering**: affixes are added at different strata/levels
- each stratum/level has associated with it a set of morphological rules that do the word-building
- the morphological rules are linked to phonological rules that indicate how the structure built by morphology is supposed to be pronounced
- **underived lexical items** are listed in the lexicon
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**DERIVATION IN LEXICAL MORPHOLOGY**

- primary affixes are attached at level 1
- secondary affixes and compounding at level 2

\[
\begin{align*}
\text{root} \\
\text{level 1 affix} - \text{root} - \text{level 1 affix} \\
\text{level 2 affix} - \text{level 1 affix} - \text{root} - \text{level 1 affix} - \text{level 2 affix}
\end{align*}
\]

⇒ level 1 affixes are always closer to the root, level 2 (i.e. neutral) affixes are on the outside.

Exercise (Data from Kiparsky 1983):

<table>
<thead>
<tr>
<th></th>
<th>Mendel</th>
<th>Mendel-ian</th>
<th>Mendel-ian-ism</th>
<th>*Mendel-ism-ian</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mongol</td>
<td>Mongol-ian</td>
<td>Mongol-ian-ism</td>
<td>*Mongol-ism-ian</td>
</tr>
<tr>
<td></td>
<td>grammar</td>
<td>grammar-ian</td>
<td>grammar-ian-ism</td>
<td>*grammar-ism-ian</td>
</tr>
<tr>
<td></td>
<td>Shakespeare</td>
<td>Shakespear-ian</td>
<td>Shakespear-ian-ism</td>
<td>*Shakespear-ism-ian</td>
</tr>
</tbody>
</table>

(a) The suffix –ian is on level 1 because it is phonologically non-neutral. Explain in what way.
(b) Is –ism a neutral or non-neutral suffix and why?
(c) What can be predicted about the ordering of these suffixes if they co-occur?
What kinds of information should lexical entries of affixes contain?

- meaning
- to which bases (category and other criteria) can the affix attach?
- grammatical category of the created word
- at which level does affixation take place (affixes at the same level share traits, thus generalities are captured)?

Data:

<table>
<thead>
<tr>
<th>Suffix</th>
<th>Attach To</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>-ion&lt;sub&gt;N&lt;/sub&gt;</td>
<td>[[erode&lt;sub&gt;V&lt;/sub&gt;ion&lt;sub&gt;N&lt;/sub&gt;]]</td>
<td>[erosion]&lt;sub&gt;N&lt;/sub&gt;</td>
</tr>
<tr>
<td>-ive&lt;sub&gt;A&lt;/sub&gt;</td>
<td>[[compete(t)&lt;sub&gt;V&lt;/sub&gt;ive&lt;sub&gt;A&lt;/sub&gt;]]</td>
<td>[competitive]&lt;sub&gt;A&lt;/sub&gt;</td>
</tr>
<tr>
<td>-al&lt;sub&gt;A&lt;/sub&gt;</td>
<td>[[Pope&lt;sub&gt;N&lt;/sub&gt;al&lt;sub&gt;A&lt;/sub&gt;]]</td>
<td>[papal]&lt;sub&gt;A&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

all examples contain level 1 affixes that modify the base in some way

- **erode** – erosion: [d] → [ʒ]
- **compete** – competitive: necessity of stem extender –it--; vowel [i:] → [ɛ]
- **Pope** – papal: vowel change [ɔu] → [ɛi]
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**KIPARSKY’S MODEL OF THE ENGLISH LEXICON**

- the model is divided into two main spheres: *lexical* and *post-lexical*
- phonological lexical rules are activated by preceding word structure-building morphological rule
- postlexical rules apply when fully-formed words are put in syntactic phrases

Different models of the lexicon have different numbers of levels, e.g. Kiparsky 3, Katamba 2 (regular inflection also on level 2)
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LEVEL 1 AFFIXES

Example analysis –ity

Data: sanity, divinity, extremity, verbosity, productivity, profundity, serenity, vanity, morosity, morbidity, obscenity, bellicosity

a. State the base to which –ity is attached in each case
b. What are the changes in the phonology of the base caused by –ity?

More drastic changes can be observed when the adjectival base has already been created with an adjective-forming suffix, such as –(i)ous. This suffix is deleted from the base when –ity attaches.

a. audacious
   rapacious
   vivacious
   pugnacious

b. audacity
   rapacity
   vivacity
   pugnacity

c. *audaciousity
   *rapaciousity
   *vivaciousity
   *pugnaciousity
Example analysis –ory

Data: explain – explanatory; defame – defamatory; inflame – inflammatory

Ignoring consonantal changes, there is a change to the last base vowel $\varepsilon I \rightarrow a$

$\Rightarrow$ the similar behavior of –ory and –ity shows them belonging to the same level, allowing generalizations about shared properties (level 1 affixes affect stress and vowels in the base)

$\Rightarrow$ alternations conditioned by level 1 affixes are not phonologically motivated

The vowel alternations triggered by such affixes as –ity, -ory, -ify, -ize, -ous etc. are the result of **Trisyllabic Laxing**

- the underlying vowels that are assumed to retain the form from before the Great Vowel Shift are simply laxed.
- in the unaffixed form the vowels have undergone the Great Vowel Shift.

Trisyllabic Laxing occurs primarily with bases of Latinate origin.

```
  #diːn#
  divain  diviniti

  #ɛɾɛn#
  sɛɾi:n  sɛɾɛɾiniti

  #vi:l#
  váil  vílfai
```

Level 2 suffixes are phonology neutral and do not cause changes in the base to which they are attached:

Data: remote-ness, power-less, purpose-ful, severe-ly, money-wise, velvet-y, pretend-er

$\Rightarrow$ derivational word formation takes place on levels 1 and 2 – non-neutral processes are found at level 1 while neutral ones are found level 2
most level 1 inflectional morphology consists of either
- erratic morphemes whose behavior is largely unpredictable
- processes that were once extremely productive but are now frozen
- borrowed affixes which only co-occur with a few loanwords

Frozen historical relics:

ablaut

- change in a root vowel which indicates a change in grammatical function, e.g. /ət/ alternates with /əʊ/ to mark the change from present to past tense

Examples: ride – rode; drive – drove, write – wrote; rise – rose; strive - strove

- special class of verbs established at level 1 - any verb belonging to this class undergoes the vowel mutation
- more general process of adding suffix –ed happens on level 2 and is blocked by the more specific process that happened already on level 1 (*wrote)
- ablaut is not productive anymore – new verbs (“to rine”) would not use it to form the past tense (*rone vs. rined)
- affected verbs are so-called strong verbs (7 original classes):

<table>
<thead>
<tr>
<th>Class I:</th>
<th>rise</th>
<th>rose</th>
<th>risen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class III:</td>
<td>shrink</td>
<td>shrank</td>
<td>shrunk</td>
</tr>
<tr>
<td>Class V:</td>
<td>give</td>
<td>gave</td>
<td>given</td>
</tr>
<tr>
<td>Class VII:</td>
<td>stand</td>
<td>stood</td>
<td>stood</td>
</tr>
<tr>
<td>Class II:</td>
<td>freeze</td>
<td>froze</td>
<td>frozen</td>
</tr>
<tr>
<td>Class IV:</td>
<td>bear</td>
<td>bore</td>
<td>born</td>
</tr>
<tr>
<td>Class VI:</td>
<td>know</td>
<td>knew</td>
<td>known</td>
</tr>
</tbody>
</table>
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#### INFLECTION IN LEXICAL MORPHOLOGY II

**umlaut**

- Fronting of a vowel if the next syllable contains a front vowel, thus originally phonologically conditioned (regular phonological process in Germanic, now fossilized, i.e. not productive)

<table>
<thead>
<tr>
<th>Example</th>
<th>Noun Sg.</th>
<th>Noun Pl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>foːt (<code>foot</code>)</td>
<td>foː:tiz</td>
<td>(umlaut)</td>
</tr>
<tr>
<td>foː:tiz (umlaut)</td>
<td>feː:tiz</td>
<td>(loss of rounding)</td>
</tr>
<tr>
<td>foː:tiz (loss</td>
<td>feː:t</td>
<td>(loss of suffix)</td>
</tr>
<tr>
<td>rounding)</td>
<td>fiː:t</td>
<td>(GVS)</td>
</tr>
<tr>
<td>fTt</td>
<td>fiː:t</td>
<td>(GVS)</td>
</tr>
<tr>
<td>(shortening)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Other examples: goose – geese; tooth – teeth; louse – lice, mouse – mice

- With the loss of the plural suffix containing /i/ the phonological basis is lost and umlaut becomes a morphological device to mark plural in a small class of nouns (level 1 rule)

- **en-plural**

  - Historical remnant plural suffix found in very few words: oxen, brethren, children

- **irregular plural inflection in loanwords**

  - Examples: addendum – addenda; erratum – errata; stratum – strata; medium – media; datum – data

  - The suffixes are confined to the original borrowed words and thus assigned at level 1

  - Possibility of reanalysis as a singular noun
LEXICAL RULES I

- information necessary to specify morphological rules:
  a. the class of bases affected
  b. the affix that is attached
  c. where the affix is attached
  d. the class which the resulting word belongs to
  e. the level to which the affix belongs

- Form

At level/stratum n insert A in environment [Y _______ Z]x ⇒ Output: word
(i.e. insert A in the environment of a preceding Y and following Z, if a given morphological property or complex of properties symbolized as X is being represented)

- Example: Assignment of noun plural at level 1

  Level 1
  Either a. Insert /a/ in environment [dɛt_] Noun + Plural ⇒ Output: /dɛtə/
or b. Insert /ən/ in environment [dɔkʃ_] Noun + Plural ⇒ Output: /dɔkʃən/
or c. Insert 0 in environment [ʃiːp_] Noun + Plural ⇒ Output: /ʃiːp/
or d. Insert Replace /ə/ with /iː/ in nouns subject to umlaut [ʃiːp_] Noun + Plural ⇒ Output: /ʃiːt/

If the plural marking is received at level 1, the plural assignment is blocked at level 2.
If there is no plural assignment at level 1, then regular –s plural suffixation applies by default (on level 2 for Katamba, level 3 for Kiparsky)

Level 2

Insert /s/ in environment [Y ______] Noun + Plural  ⇒  Output: Y-/s/

Y stands for any count noun that wasn’t assigned plural at level 1 (bed, pet etc.)

- in the Lexical Phonology/Morphology Model phonological rules are coupled with morphological rules found at the same stratum in the lexicon

- a lexical phonological rule is always triggered by a preceding morphological rule

- the same rules can be triggered repeatedly by different preceding rules (typically a phonological rule triggered by various affixes) on the same level, thus lexical rules are termed cyclical.
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DIFFERENCES BETWEEN LEXICAL AND POST-LEXICAL RULES I

As the name suggests postlexical rules apply outside of the lexicon.

(i) *postlexical rules can apply in any context*

unlike lexical rules they can apply across word boundaries, taking the phrasal context into account – lexical rules only apply inside the word (phonological rules only in derived environments)

(ii) *lexical rules are cyclic*

at each level in the lexicon it is necessary to go through the morphological and phonological rules of that level, especially phonological rules may be triggered repeatedly - postlexical rules apply only once
(iii) lexical rules are structure-preserving

a lexical rule may not produce a form that could not be a phonologically well-formed word in the language (if a rule introduces or refers to a noncontrastive segment, then it can only apply outside of the lexicon, i.e. postlexically, as underlying representations within the lexicon may only be composed of elements drawn from the phonemic inventory

- lexical rules must not produce words with non-phonemes (e.g. */dasp/)
- lexical rules must not produce forms that violate phonotactic constraints (e.g. */larp/)
- lexical rules must not produce forms that do not have exactly one main stress (e.g. *’tunantá)
- postlexical rules may produce output that is at variance with the canonical patterns of the language (e.g. allophones: GA ‘atom’ as [æɾəm]; phonotactics: ‘it’s not’ [tsnat])
(iv) postlexical rules are automatic

whereas lexical rules may have many exceptions, postlexical are automatic and apply without exception to all forms with the requisite phonetic properties, morphology being irrelevant (no access to morphological structure)

- unpredictability of word formation processes: length, depth, width -
  *tallth, *shortth, *tickth
- level 2 Plural –s meaning not always plural: measles, mumps
- postlexical glottalization rule applies always (in certain varieties of British English) without taking words, wordtypes or boundaries into account
  t → ?
  in word-final position: ‘cat’ /kæʔ/; ‘it’ /ɪʔ/; ‘but’ /bʌʔ/
  before a consonant: ‘kettle’ /kɛʔl/; ‘settle’ /sɛʔl/; ‘catfish’ /kæʔfɪʃ/
  between vowels if /t/ is initial in an unstressed syllable:
    ‘bottom’ /bɒʔəm/; ‘a bit of butter’ /ə bɪʔən bʌʔə/
### EXERCISES I

1. Study the following data:

<table>
<thead>
<tr>
<th>suffix</th>
<th>attach to</th>
<th>output</th>
<th>-acy</th>
<th>democrat</th>
<th>democracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>-(i/u)al</td>
<td>autumn</td>
<td>autumnal</td>
<td>supreme</td>
<td>supreme</td>
<td>supremacy</td>
</tr>
<tr>
<td>-acy</td>
<td>medicina</td>
<td>medicinal</td>
<td>contractual</td>
<td>resident</td>
<td>residential</td>
</tr>
<tr>
<td>-er</td>
<td>reside</td>
<td>residential</td>
<td>province</td>
<td>provincial</td>
<td>sensual</td>
</tr>
<tr>
<td>-er</td>
<td>sense</td>
<td>sense</td>
<td>village</td>
<td>village</td>
<td></td>
</tr>
<tr>
<td>-er</td>
<td>hate</td>
<td>hater</td>
<td>hate</td>
<td>hater</td>
<td></td>
</tr>
<tr>
<td>-er</td>
<td>slate</td>
<td>slater</td>
<td>slate</td>
<td>slater</td>
<td></td>
</tr>
<tr>
<td>-er</td>
<td>run</td>
<td>runner</td>
<td>run</td>
<td>runner</td>
<td></td>
</tr>
<tr>
<td>-er</td>
<td>sing</td>
<td>singer</td>
<td>sing</td>
<td>singer</td>
<td></td>
</tr>
<tr>
<td>-er</td>
<td>quick</td>
<td>quicker</td>
<td>quick</td>
<td>quicker</td>
<td></td>
</tr>
<tr>
<td>-er</td>
<td>clean</td>
<td>cleaner</td>
<td>clean</td>
<td>cleaner</td>
<td></td>
</tr>
</tbody>
</table>

(a) For each example determine the word class of the bases that form the input to the suffixation process and the word class to which the resulting word belongs.

(b) At what stratum in the lexicon is each one of these suffixes found? Justify your answer.
2. (a) From which languages did English borrow the words in the two sets below?  
(b) Identify the number of suffixes in these words.  
(c) At what stratum in the lexicon is each plural suffix added? What is your evidence?

<table>
<thead>
<tr>
<th>Set A</th>
<th>Set B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singular</td>
<td>Plural</td>
</tr>
<tr>
<td>stimulus</td>
<td>stimuli</td>
</tr>
<tr>
<td>fungus</td>
<td>fungi</td>
</tr>
<tr>
<td>syllabus</td>
<td>syllabi</td>
</tr>
<tr>
<td>radius</td>
<td>radii</td>
</tr>
</tbody>
</table>

3. At what stratum are the nouns *cook*, *guide* and *cheat* derived from the corresponding verbs? On what basis does one decide?

4. Write formal morphological rules using the notation introduced in this chapter to account for the formation of the past tense of the verbs *moved*, *baked*, *ran* and *hit*
**EXERCISE IV**

**Level 2**


b. Insert /D/ in environment [bεIk_] Verb + Simple past ⇒ Output: [bεikt]

**Level 1**

c. Insert 0 in environment [hıt] Verb + Simple past ⇒ Output: /hıt/

d. Insert Replace /ʌ/ with /æ/ [räŋ] Verb + Simple Past

in verbs subject to ablaut [æ ] ⇒ Output: /räŋ/