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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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
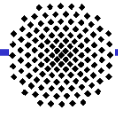
LEXICAL STRATA

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
>> 'home – 'homeless, 'power – 'powerless, 'paper – 'paperless

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

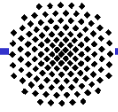> Example for non-neutral affixes: -ic, -ee
>> 'strategy – stra'tegic, 'morpheme – mor'phemic, 'photograph – photo'graphic
>> em'ploy – emplo'yee, de'tain – detai'nee, 'absent – absen'tee

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

LEXICAL STRATA - EXERCISE

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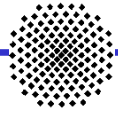
      (a) Transcribe the adjectives *wide*, *long* and *broad*

      (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?

              Adjective   Noun   Adverb

Introduction to Lexical Morphology
NEUTRAL AND NON-NEUTRAL AFFIXES

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]

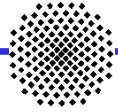no geminate consonants with attached primary affix:
ad-duce [ədjuːs]

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

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

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
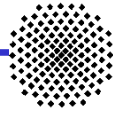
DERIVATION IN LEXICAL MORPHOLOGY

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

[*root*]
[level 1 affix – *root* – level 1 affix]
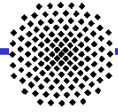[level 2 affix – level 1 affix – *root* – level 1 affix – level 2 affix]

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

Exercise (Data from Kiparsky 1983):

Mendel	Mendel-ian	Mendel-ian-ism	*Mendel-ism-ian
Mongol	Mongol-ian	Mongol-ian-ism	*Mongol-ism-ian
grammar	grammar-ian	grammar-ian-ism	*grammar-ism-ian
Shakespeare	Shakespear-ian	Shakespear-ian-ism	*Shakespear-ism-ian

(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?

LEXICAL ENTRIES OF AFFIXES

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:	suffix	attach to	output
	-ion$_N$	[[erode$_V$]ion$_N$]	[erosion]$_N$
	-ive$_A$	[[compete(t)$_V$]ive$_A$]	[competitive]$_A$
	-al$_A$	[[Pope$_N$]al$_A$]	[papal]$_A$

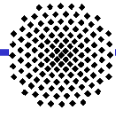all examples contain level 1 affixes that modify the base in some way

erode – erosion: [d] → [ʒ]
compete – competitive: necessity of stem extender –it-; vowel [i:] → [ɛ]
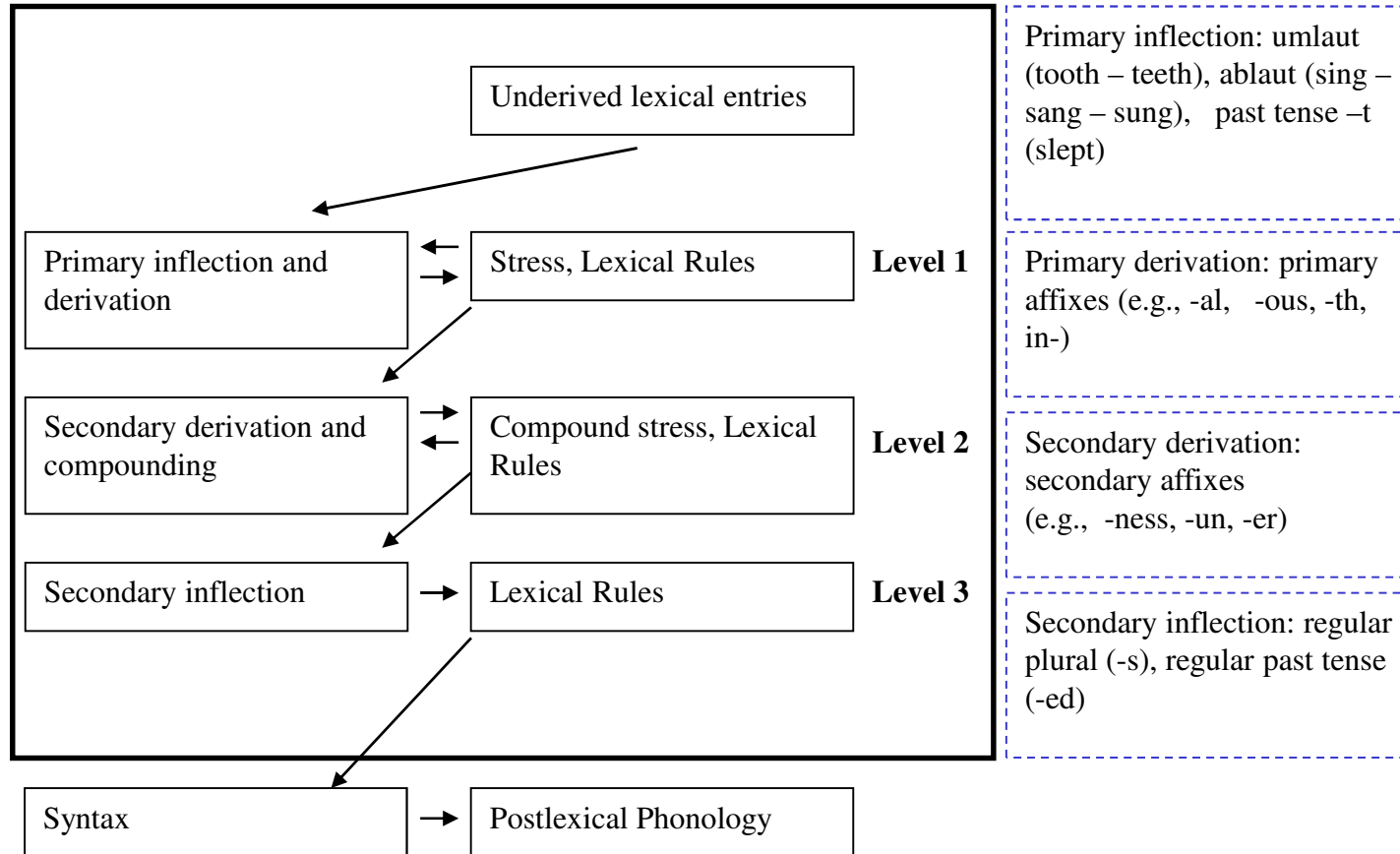Pope – papal: vowel change [əʊ] → [ɛɪ]

Introduction to Lexical Morphology

KIPARSKY'S MODEL OF THE ENGLISH LEXICON

	Underived lexical entries	
Primary inflection and derivation	**Stress, Lexical Rules**	**Level 1**
Secondary derivation and compounding	**Compound stress, Lexical Rules**	**Level 2**
Secondary inflection	**Lexical Rules**	**Level 3**
Syntax	**Postlexical Phonology**	

Primary inflection: umlaut (tooth – teeth), ablaut (sing – sang – sung),   past tense –t (slept)

Primary derivation: primary affixes (e.g., -al,   -ous, -th, in-)

Secondary derivation: secondary affixes (e.g., -ness, -un, -er)

Secondary inflection: regular plural (-s), regular past tense (-ed)

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

- 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
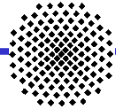
LEVEL 1 AFFIXES

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
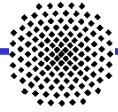b. What are the changes in the phonology of the base caused by –ity?

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	b. audacity	c. *audaciousity
rapacious	rapacity	*rapaciousity
vivacious	vivacity	*vivaciousity
pugnacious	pugnacity	*pugnaciousity

IDENTIFYING THE LEVELS OF AFFIXES

Example analysis –ory

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

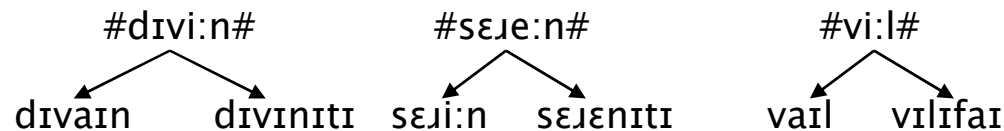Ignoring consonantal changes, there is a change to the last base vowel ɛɪ → a

⇨ 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)

⇨ 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.

<pre>
        #dɪviːn#   #sɛɹeːn#   #viːl#
         /   \   /   \   /   \
        /   \   /   \   /   \
   dɪvaɪn   dɪvɪnɪtɪ   sɛɹiːn   sɛɹɛnɪtɪ   vaɪl   vɪlɪfaɪ
</pre>

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

⇨ 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
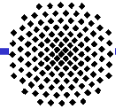
INFLECTION IN LEXICAL MORPHOLOGY I

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

<u>Frozen historical relics:</u>

ablaut

- change in a root vowel which indicates a change in grammatical function, e.g. /aɪ/ 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 (*wroted)
- 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):

Class I:	rise	rose	risen	Class II:	freeze	froze	frozen
Class III:	shrink	shrank	shrunk	Class IV:	bear	bore	born
Class V:	give	gave	given	Class VI:	know	knew	known
Class VII:	stand	stood	stood				
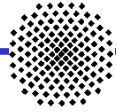
INFLECTION IN LEXICAL MORPHOLOGY II

umlaut

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

Example:	Noun Sg.	Noun Pl.
	foːt ('foot')	foːtiz ('feet')
		føːtiz (umlaut)
		feːtiz (loss of rounding)
		feːt (loss of suffix)
	fuːt (GVS)	fiːt (GVS)
	fʊt (shortening)	

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)
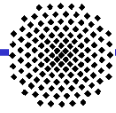
-en-plural

- 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 specifiy 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	/ə/ in environment	[dɛɪt_] Noun + Plural ⇨	Output: /dɛɪtə/
or	b. Insert	/ən/ in environment	[ɒks_] Noun + Plural ⇨	Output: /ɒksən/
or	c. Insert	0 in environment	[ʃiːp_] Noun + Plural ⇨	Output: /ʃiːp/
or	d. Insert	Replace /ʊ/ with /iː/	[fʊt_] Noun + Plural	
		in nouns subject to umlaut	[iː]	⇨ Output: /fiːt/

    If the plural marking is received at level 1, the plural assignment is blocked at level 2.
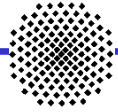
LEXICAL RULES II: PLURAL ASSIGNMENT

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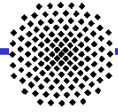(on level 2 for Katamba, level 3 for Kiparsky)

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**.

DIFFERENCES BETWEEN LEXICAL AND POST-LEXICAL RULES 1

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
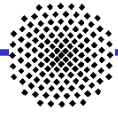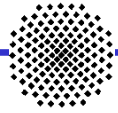
DIFFERENCES BETWEEN LEXICAL AND POST-LEXICAL RULES II

(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. */ɖasp/)
- lexical rules must not produce forms that violate phonotactic constraints (e.g. */ltarp/)
- lexical rules must not produce forms that do not have exactly one main stress (e.g. *'tunan'ta)
- postlexical rules may produce output that is at variance with the canonical patterns of the language (e.g. allophones: GA 'atom' as [ærəm]; phonotactics: 'it's not' [tsnɑt])

DIFFERENCES BETWEEN LEXICAL AND POST-LEXICAL RULES III

(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
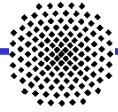
        t → ʔ

      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 bɪʔ əv bʌʔə/

EXERCISES I

1. Study the following data:

suffix	attach to	output
-(i/u)al	autumn	autumnal
	medicine	medicinal
	contract	contractual
	resident	residential
	province	provincial
	sense	sensual
-acy	democrat	democracy
	supreme	supremacy
-er	London	Londoner
	village	villager
-er	hate	hater
	slate	slater
	run	runner
	sing	singer
-er	quick	quicker
	clean	cleaner

(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.
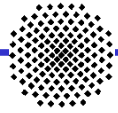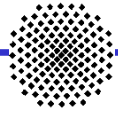
EXERCISES II

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?

Set A		*Set B*	
Singular	*Plural*	*Singular*	*Plural*
stimulus	*stimuli*	*phenomenon*	*phenomena*
fungus	*fungi*	*criterion*	*criteria*
syllabus	*syllabi*	*ganglion*	*ganglia*
radius	*radii*	*automaton*	*automata*

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

a. Insert   /D/ in environment   [muːv_] Verb + Simple past ⇨ Output: [muːvd]

b. Insert   /D/ in environment   [bɛɪk_] Verb + Simple past ⇨ Output: [bɛɪkt]

Level 1

c. Insert   0 in environment   [hɪt] Verb + Simple past ⇨ Output: /hɪt/

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

in verbs subject to ablaut   [æ̍]   ⇨ Output: /ræn/