Lecture 1: Morphologically conditioned phonology

(1) Morphologically conditioned phonology:
• the phenomenon in which a particular phonological pattern is imposed on a proper subset of morphological constructions (affix, reduplication, compounding) and thus is not fully general in the word-internal phonological patterning of the language.
• the inspiration for a number of influential theories of the phonology-morphology interface, including Lexical Morphology and Phonology, Stratal Optimality Theory, and Cophonology Theory.

(2) Today: survey
• the types of morphological information that can condition phonological patterns
• the types of phonological patterns that can be conditioned by morphology.

1. Illustrative examples

Mam Maya: a word may have at most one long vowel. Willard 2004, based on England 1983: ‘Dominant’ affixes cause long root vowels to shorten (3a); ‘Recessive’ suffixes preserve root vowel length (3b). Dominant vs. recessive status is lexical, not predictable.

(3) a. Dominant suffix: shortens long root vowel
   facilitative resultant  liich' - → lich'-ich'iin ‘break/breakable’
   locative               juus- → jus-b'een ‘burn/burned place’
   directional           jaaaw- → jaw-nax ‘go up/up’
   participial            nooj- → noj-na ‘fill/full’
   b. Recessive suffix: preserves root vowel length
   intransitive verbalizer muq- → muq-o0 ‘bury (n.)/bury (v.)’
   b’iitz- → b’iitz-o0 ‘song/sing’
      [b’iitzza]
   instrumental           luk- → luk-b’iil ‘pull up/instrument for pulling up’
   remainder              waa- → waa-b’an ‘eat/remains of food’

Malayalam (Southern Dravidian): consonant gemination applies at the internal juncture of subcompounds (noun-noun compounds with head-modifier semantics) (4b). Gemination does not apply to cocompounds (noun-noun compounds with coordinate semantics) (4c) (Mohanan 1995:49):

(4) a. meeša ‘table’
   petti ‘box’
   -kal (plural suffix)
   b. [meeša-ppetti]ₙ -kal ‘boxes made out of tables’
   c. [meeša-ppetti]ᵢ -kal ‘tables and boxes’
English: suffixes fall into two classes (e.g. Allen 1978, Siegel 1974, Chomsky & Halle 1968, Kiparsky 1982ab, Kiparsky 1985): those which shift stress (5a) and those which do not (5b):

(5) Base (a) Stress-shifting suffix (b) Non-stress-shifting suffix
párent parént-al párent-ing
président présidént-ial présidenc-y
áctive áctiv-ity áctiv-ist
démonstràte demonstrative démonstràtor

2. Phonological sensitivity to lexical class.

2.1 Part of speech

(6) Accented Unaccented [Japanese]
a. Nouns fu.ku.ro ‘bag’ hasira ‘pillar’
ta.ma.go ‘egg’ kusuri ‘medicine’
su.to.rai.ki ‘strike’ udoN ‘noodle dish’
b. Verbs ka.ke.ru ‘hang’ kakeru ‘be broken’
su.kuu ‘build a nest’ sukuu ‘rescue’
ue.ru ‘starve’ ueru ‘plant’

Polysyllabic words in Lenakel (Oceanic) have primary stress on the penultimate syllable; in verbs and adjectives, secondary stress falls on the first syllable and every other syllable thereafter, up to but not including the antepenultimate syllable (avoiding clash). In nouns, secondary stress is assigned to alternating syllables to the left of the primary penultimate stress. Data from Lynch 1978:18-20; see discussion in Smith 2011:

(7) a. Verbs (four or more syllables) [Lenakel]
/r-im-olkeikei/ [ɾi.mɔl.ɡeɟ.ɟey] ‘he liked it’
/n-im-r-olkeikei/ [ni.ma.ɾɔl.ɡeɟ.ɟey] ‘you (pl.) liked it’
/n-im-m-r-olkeikei/ [ni.ma.ma.ɾɔl.ɡeɟ.ɟey] ‘you (pl.) were liking it’
/t-n-k-m-r-olkeikei/ [ti.ɾa.gu.m(r).ɡeɟ.ɟey] ‘you (pl.) will be liking it’
~ [di.ɾa.gu.m(r).ɡeɟ.ɟey]
b. Nouns (four or more syllables)
/nimwakilaki/ [ni.mwɔ.ɡo.lu.ɡal] ‘beach’
/tupwalukaluk/ [tu.bu.ɡo.lu.ɡa.lɔk] ‘lungs’
~ [du.bu.ɡo.lu.ɡa.lɔk]

In Chuukese (Trukese; Micronesian), nouns must be minimally bimoraic, a condition which a monosyllabic noun can satisfy by possessing an initial (moraic) geminate (8a) or by undergoing
vowel lengthening (8b). (Coda consonants are not moraic in Chuukese.) By contrast, verbs are allowed to surface in monomoraic CVC form (8c). The data in (8a,b) exhibit vowel apocope (Smith 2011, citing Muller 1999:395 and Goodenough & Sugita 1980:xiv-xv):

(8) a. [kkej] ‘laugh’ (< /kkeji/)
   [fax] ‘starfish’ (< /faxara/)
   b. [fæːn] ‘building’ (< /fæːne/)
   c. [fan] ‘go aground’
   [mær] ‘move, be shifted’

Noun privilege: Smith’s (2011) survey finds overall that that nouns tend to exhibit more contrasts, while verbs are more prone to neutralization. This finding is clearly consistent with the Japanese example in (6), though it is not as clearly applicable to Lenakel or Chuukese.

2.2 IDEOPHONES

- a phonosemantic class of words whose meanings typically include color, smell, sound, intensity, or (often vivid) descriptions of unusual appearance or activity.
- can belong to various parts of speech, most often adjectives, adverbs or verbs.
- of interest to the present discussion because in many languages they constitute a class of words with distinctive phonology, often departing from prosodic or segmental norms.


- Ideophones are pronounced with exaggerated intonation
- Ideophones are usually consonant-final; the Hausa norm is to be vowel-final.
- Ideophones can end in obstruent consonants, including plosives, impossible in the other sectors of Hausa vocabulary (Newman 1995:776, Newman 2000:244,250):

(9)  fāt   fāriː fāt   ‘white IDEO = very white’  [Hausa]
    fār   kóreː fār   ‘green IDEO = very green’
    kūt   ɓóbökíː kūt   ‘friend IDEO = very close friend’
    ták   dâjá ták   ‘one IDEO = exactly one’
    fārât   táː tʃi fārât   ‘3SG.FEM get_up IDEO = she got up very fast’
    tūbūs   yáː gâjì tūbūs   ‘3SG.MASC become_tired IDEO = he became very tired’
    gārârâ   sùnàː jàːwòː gārârâ   ‘3PL walk IDEO = they roamed aimlessly’
2.3 **ETYMOLOGICAL CLASSES**

**Japanese** (Itô & Mester 1999:62): Sino-Japanese vocabulary distinguished by etymology and phonology No-DD bans voiced geminates; No-P bans singleton (onset) [p], and No-NT bans sequences consisting of a nasal consonant followed by a voiceless consonant:

(10)

<table>
<thead>
<tr>
<th></th>
<th>No-DD</th>
<th>No-P</th>
<th>No-NT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yamato</td>
<td></td>
<td></td>
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<tr>
<td>Sino-Japanese</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Assimilated foreign</td>
<td>violated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonassimilated foreign</td>
<td>violated</td>
<td>violated</td>
<td>violated</td>
</tr>
</tbody>
</table>

Itô and Mester (1999:70): the classification of lexical items into strata is not always technically etymologically accurate. For example, native (contracted) *anta* ‘you’ violates *NT.

2.4 **ARBITRARY LEXICAL CLASSES: PATTERNED EXCEPTIONS**

**Sacapultec** (Mayan, Guatemala): some nouns undergo final-syllable vowel lengthening in combination with possessive prefixes (11a), while others do not (11b) (DuBois 1985):

(11)                         | Plain         | Possessive         |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ak</td>
<td>‘chicken’</td>
<td>w:-k</td>
</tr>
<tr>
<td>ts'e'</td>
<td>‘dog’</td>
<td>ni-ts'i:</td>
</tr>
<tr>
<td>ab'ax</td>
<td>‘rock’</td>
<td>w-ub'a:x</td>
</tr>
<tr>
<td>mulol</td>
<td>‘gourd’</td>
<td>ni-mulu:</td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>otʧ'</td>
<td>‘possum’</td>
<td>w-otʧ'</td>
</tr>
<tr>
<td>am</td>
<td>‘spider’</td>
<td>w-m</td>
</tr>
<tr>
<td>weʔ</td>
<td>‘head hair’</td>
<td>ni-weʔ</td>
</tr>
</tbody>
</table>

DuBois: (11a) vs. (11b) is lexically conditioned, modulo a weak semantic or pragmatic skewing; many of the (b) stems ‘do not often occur in possessed constructions’ (p. 396).

**Tagalog**: *pay* - + C-initial stem creates environment for Nasal Substitution (*NCi → Ni*) (Zuraw 2000:19 ff.). NS is lexically conditioned:

(12)                         | Undergoer of NS | Non-undergoer of NS |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>a.</td>
<td>bugbóg</td>
<td>pa-mugbóg</td>
</tr>
<tr>
<td>‘wallo’</td>
<td>‘wooden club used to pound clothes during washing’</td>
<td>‘gift’ ‘gifts to be distributed’</td>
</tr>
<tr>
<td>b.</td>
<td>búlos</td>
<td>pa-múlos</td>
</tr>
<tr>
<td>‘harpoon’</td>
<td>‘harpoon’</td>
<td>buʔóʔ ‘whole’ ‘something used to produce a whole’</td>
</tr>
</tbody>
</table>

Zuraw: NS is statistically influenced by several factors (‘patterned exceptionality’):

- stems beginning with voiced consonants undergo Nasal Substitution in a much higher proportion than do stems beginning with voiceless consonants (Zuraw 2000:29).
- P(Labial-initial stems, NS) » P(Dental-initial stems, NS) » P(Velar-initial stems, NS)
Through overgeneralization and analogy, (arbitrarily) lexically conditioned patterns may become phonologically conditioned over time.

See also recent work by e.g., Becker & Gouskova (2016), Moore-Cantwell & Staubs (2014), Shih & Inkelas (2015), and others.

3. **The root-affix distinction**

(13) McCarthy & Prince 1995: roots are larger and more phonologically diverse than affixes

- Sanskrit roots may contain consonant clusters but affixes never do
- Arabic roots may contain pharyngeal consonants, but affixes cannot
- English suffixes favor (unmarked) coronal consonants (e.g. Yip 1991).
- roots are more resistant to undergoing alternations than affixes are.

3.1 **Root faithfulness**

(14) Root-affix Faithfulness Metaconstraint (RAFM; McCarthy and Prince 1995):

Root-Faith >> Affix-Faith

(15) **Ekuguusi** vowel harmony (Guusi, Bantoid; Cammenga 2002): mid vowels in affixes harmonize in [ATR] with mid stem vowels (o, e, ə, ɛ)

a. o-mo-te ‘tree’

b. ə-rɛɛnt-ir-e ‘he has brought’

c. e-ńuəm-ə ‘marriage’

d. tə-ʃɛɛnr-e ‘let us go’

3.2 **Counterexamples to the RAFM**

Casali 1997: survey of V-V hiatus in 87 languages revealed two strong preferences for deletion:

- V1 deletes…
- affix vowels delete…
- → stem-initial vowels should never delete to resolve VV hiatus across prefix-stem boundary

But: Karuk (Bright 1972); see discussion in Kenstowicz & Kisseberth 1979, Koutsoudas 1980

(16) | **gloss** | **No (or C-final) prefix** | **V-final prefix** | **gloss** |
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>‘cook’ (33)</td>
<td>imniš</td>
<td>ní-mniš</td>
<td>‘I cook’ (33)</td>
</tr>
<tr>
<td>‘to be cooking’ (62)</td>
<td>imništih</td>
<td>ʔú-mniš</td>
<td>‘he cooks’ (33)</td>
</tr>
<tr>
<td>‘they’re cooking’ (62)</td>
<td>kun-ímništih</td>
<td>ʔú-mnĩštih</td>
<td>‘he’s cooking’ (62)</td>
</tr>
<tr>
<td>‘head’ (50)</td>
<td>axvá h</td>
<td>mú-axvá h</td>
<td>‘his head’ (50)</td>
</tr>
<tr>
<td>‘money’ (44)</td>
<td>išpuka</td>
<td>mú-spuka</td>
<td>‘his money’ (44)</td>
</tr>
</tbody>
</table>
Cupeño (Alderete 2001a): When an accented root and accented affix co-occur in a word with culminating accent, root accent is expected to prevail (absent a directionality preference):

(17) **Accented root + accented affix(es):** accent surfaces on root

a. /på + ŋmíʔaw + lu/ \→ på-míʔaw-lu
   3SG + COME + MOTION ‘He came’

b. /ʔáyu + qá/ \→ ?áyu-qa
   WANT + PRES.SING ‘He wants’

**Unaccented root + accented affix(es):** accent surfaces on affix, not root

c. /på + ŋyax/ \→ på-yax
   3SG + SAY ‘He says’

d. /nòʔən + ŋyax + qá/ \→ nòʔən ya-qáʔ
   1SG + SAY + PRES.SING ‘I say’

But: in **Yakima Sahaptin** (Penutian; Hargus & Beavert 2006), accented affix wins over root (18c,d):

(18) **Accented root + unaccented affix(es):** affix surfaces on root

a. ?iʔatl’áwiʔa
   /ʔi + ?atl’áwi + ña/ \→ 2SG.NOM + beg + IMPRF
   ‘he’s begging him’

b. ‘he’s begging him’
   wánpanim
   /wánp + ani + m/
   sing medicine song + BENEFACTIVE + CISLOCATIVE
   ‘sing for me’

**Accented root + accented prefix(es):** accent surfaces on prefix

c. ?áʔatl’áwiʔa
   /på + ?atl’áwi + ña/ \→ INVERSE + beg + IMPRF
   ‘he’s begging him’

**Accented root + accented suffix(es):** accent surfaces on suffix

d. wanpáwaas
   /wánp + áwaas/
   sing medicine song + INSTRUMENTAL
   ‘sing medicine song’

**Summary**

- There are clear cases in which roots are immune to alternations that affixes undergo; perhaps this is the majority pattern (but unclear)
- There are certainly clear examples that go in the opposite direction.
- Is the correct dichotomy root morphemes vs. affix morpheme, or is it bases of affixation vs. the affixes that attach to those bases?
- Are the patterns obeying RAFM more general than the patterns violating it? Hard to know given current data
4. **BEYOND ROOTS: MORPHOLOGICAL CONSTRUCTION-SPECIFIC PHONOLOGY**

The bulk of morphologically conditioned phonology resides in the association of phonological patterns with the individual morphological constructions which derive and inflect words.

4.1 **AN EARLY OBSERVATION: ‘DERIVED-ENVIRONMENT EFFECTS’, OR NONDERIVED ENVIRONMENT BLOCKING (NDEB)**

(19) “Some phonological rules apply freely across morpheme boundaries, and morpheme internally where fed by some earlier phonological rule, but are blocked elsewhere, in what are referred to as ‘nonderived environments’. [Kiparsky 1993:277]

(20) **Finnish** Assibilation: t → s / _ i

a. /vete/ → vетi → vesi ‘water (nom.sg.)’
b. /vete-nä/ → vетенä ‘water (ess.sg.)’ (*vesenä)
c. /halut-i/ → halusi ‘want-3P.SG.PRET’
   /halut-a/ → haluta ‘want-INF’
d. /tilat + i/ → tilasi ‘order-3P.SG.PRET’ (*silasi)
   /tilat-a/ → tilata ‘order-INF’ (*silata)
e. /æiti/ → æiti ‘mother’ (*æisi)

(21) **Hausa** palatalization (Newman 2000)

a. ‘steal’ [saːt-aː] [Hausa]
   ‘steal (before noun object)’ [saːʧ-i]
   ‘steal (before pronoun object)’ [saːʧ-eː]
b. ‘street’ [tiːtiː]

*There are lots of palatalization examples like this! Polish…Korean….*

(22) Recurrence of this general pattern → attempts to capture it in the form of a single principle.

*But what principle?*

- What kinds of phonological patterns are affected?
- What environments count as ‘derived’?
- How general is the condition cross-linguistically, or for that matter within any given language?

(23) Morphologically derived environment effect: “a process that takes place only when its conditions are crucially met by virtue of material from two different morphemes.” (McCarthy 2003:21)
(24) Canonical case: trigger in stem, target in suffix (separated by morpheme boundary). But:
- Canonical nonderived environment blocking is related to...
- noncanonical cases of nonderived environment blocking, which are themselves part of...
- a larger landscape of phonological patterns restricted to particular morphological constructions (morphologically conditioned phonology)

4.2 **Noncanonical NDEB effects**

*Tohono O’odham* (Fitzgerald 2001)(Yu 2000)

(25) a. Nonderived words

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>kí:</td>
<td>‘house’</td>
</tr>
<tr>
<td>pí:ba</td>
<td>‘pipe’</td>
</tr>
<tr>
<td>?ásugal</td>
<td>‘sugar’</td>
</tr>
<tr>
<td>pákoʔòla</td>
<td>‘Pascola dancer’</td>
</tr>
</tbody>
</table>

b. Suffixation

<table>
<thead>
<tr>
<th>Suffix</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>?ásugâl-t</td>
<td>‘to make sugar’</td>
</tr>
<tr>
<td>hím-ad</td>
<td>‘will be walking’</td>
</tr>
<tr>
<td>číkpan-dâm</td>
<td>‘worker’</td>
</tr>
<tr>
<td>músigô-dag</td>
<td>‘to be good at being a musician’</td>
</tr>
<tr>
<td>pímiândo-màd</td>
<td>‘adding pepper’</td>
</tr>
</tbody>
</table>

c. Reduplication

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>tó-toñ</td>
<td>‘ants’</td>
</tr>
<tr>
<td>pí-pibà</td>
<td>‘pipes’</td>
</tr>
<tr>
<td>mú-msigò</td>
<td>‘musicians’ (cf. músigo ‘musician’)</td>
</tr>
<tr>
<td>si-sminjú</td>
<td>‘cemeteries’ (cf. sminjúr ‘cemetery’)</td>
</tr>
<tr>
<td>pá-pkoʔòla</td>
<td>‘Pascola dancers’</td>
</tr>
</tbody>
</table>

d. Suffixation and reduplication

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>hí-him-âd</td>
<td>‘will be walking, pl.’</td>
</tr>
<tr>
<td>hi-hidòd-a</td>
<td>‘the cooking, pl.’</td>
</tr>
<tr>
<td>há-haiwâñ-ga-kàm</td>
<td>‘ones having cattle’</td>
</tr>
</tbody>
</table>

*Differs from canonical cases:*
- Final stress placement in odd-parity forms is not attributable to a nearby morpheme boundary (e.g. in prefixed forms like *pí-pibâ*)
Turkish minimality (Itô & Hankamer 1989, Inkelas & Orgun 1995)

(26) a. do ‘note do’ \( \rightarrow \) ham ‘unripe’
    be ‘letter b’ \( \rightarrow \) yen ‘alight (!)’
    ye ‘eat (!)’ \( \rightarrow \) ok ‘arrow’
    de ‘say (!)’

b. *do-m ‘note do-1SG.POSS’ \( \rightarrow \) cf. arabam ‘car-1SG.POSS’
    *be-n ‘letter b-2SG.POSS’ \( \rightarrow \) cf. elman ‘apple-2SG.POSS’
    *de-n ‘say-PASS = be said (!)’ \( \rightarrow \) cf. anla-n ‘understand-PASS’
    *ye-n ‘eat-PASS = be eaten (!)’ \( \rightarrow \) cf. çine-n ‘chew-PASS’

diffs from canonical cases:
- There is not a clear phonological process involved
- There is not a clear sense in which the environment for the imposition of the minimal size constraint is crucially provided by two morphemes.

4.3 NDEB CASES ARE NOT ALWAYS AS NEAT AS THEY APPEAR

In Finnish, Anttila (2009), citing Karlsson 1983, notes that Assibilation applies before some /i/-initial suffixes and not before others:

(27) a. Suffixes triggering Assibilation
    Plural /-i/ \( \rightarrow \) vuote-i-nA \( \rightarrow \) vuosina ‘year-PL-ESS’
    Past tense /-i/ \( \rightarrow \) huuta-i-vAt-kO \( \rightarrow \) huusivatko ‘shout-PAST-3P.PL-QUE’
    Superlative /-impA/ \( \rightarrow \) uute-impA-nA \( \rightarrow \) uusimpana ‘new-SUP-ESS’

b. Suffixes not triggering Assibilation
    Instrument /-ime/ \( \rightarrow \) lentä-ime-n \( \rightarrow \) lentimen ‘fly-INST-GEN’
    Conditional /-isi/ \( \rightarrow \) tunte-isi \( \rightarrow \) tuntisi ‘feel-COND’

c. Suffix that optionally triggers Assibilation
    N→Adj /-inen/ \( \rightarrow \) vete+inen \( \rightarrow \) vesinen ∼ vetinen ‘water-ADJ = watery’

(28) In Turkish, disyllabic minimality is not imposed by the aorist suffix -r: de-r ‘say-AOR’, etc.

4.4 Reflection

What do we make of all this noncanonicity? Suggestion: understand ‘nonderived environment blocking’ as a special case of a more general phenomenon, namely that morphological constructions differ in whether or not they are associated with particular phonological patterns of alternation.
- Some constructions trigger patterns; others do not.
- Monomorphemic stems, by virtue of not entering into other constructions, are naturally exempt.
- Let’s take a tour of morphologically conditioned phonological effects of this kind…
- and then we’ll step back (next time) and try to make some sense of it all, in a theoretical context
4.5 **SEGMENT DELETION**

**Turkish:** vowel hiatus at stem-suffix boundaries is usually repaired by glide epenthesis, as illustrated below by /-Iver/. But vowel hiatus created by suffixation of the /-Ijor/ is resolved by vowel deletion:

\[(29)\]

<table>
<thead>
<tr>
<th>C-final root</th>
<th>V-final root</th>
</tr>
</thead>
<tbody>
<tr>
<td>jap ‘do’</td>
<td>gel ‘come’</td>
</tr>
</tbody>
</table>

Facilitative /-Iver/: epenthesis

<table>
<thead>
<tr>
<th>C-final root</th>
<th>V-final root</th>
</tr>
</thead>
<tbody>
<tr>
<td>jap-uiwer</td>
<td>gel-iver</td>
</tr>
</tbody>
</table>

Progressive /-Ijor/: deletion

<table>
<thead>
<tr>
<th>C-final root</th>
<th>V-final root</th>
</tr>
</thead>
<tbody>
<tr>
<td>jap-ijor</td>
<td>gel-ijor</td>
</tr>
</tbody>
</table>

**Nanti** (Kampan; Michael 2008): VV hiatus at prefix-stem boundary is usually resolved by deletion of the prefix vowel (30a-b), but if the prefix is 1\(^{st}\) person inclusive subject /a-/, the second vowel deletes (c-d):

\[(30)\]

a. /no=am-e/ → name [Nanti]

<table>
<thead>
<tr>
<th>S=bring-IRREAL.1</th>
<th>‘I’m going to bring’</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>S=te()l.story=PERF-REALIS.1</th>
<th>‘I told a story’</th>
</tr>
</thead>
</table>

c. /pi=ogi-rati\(n\)-e=ro/ → pogarati\(n\)kero

<table>
<thead>
<tr>
<th>2S=CAUS-stand.up-IRREAL.1=3NM(O)</th>
<th>[pogarati(n)kero] (*piogi(n)kero)</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘You will stand it up (e.g. a housepost)’</td>
<td>‘polite imperative’</td>
</tr>
</tbody>
</table>

d. /o=arateh-an-ak-i/ → aratehanake

<table>
<thead>
<tr>
<th>3NM(S)=wade-ABL-PERF-REAL.1</th>
<th>(*oratehanake)</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘She waded away’</td>
<td></td>
</tr>
</tbody>
</table>

e. /a=obiik-enpa/ → abi\(k\)enpa

<table>
<thead>
<tr>
<th>1PL.INC.S=drink-IRREAL.A</th>
<th>(*obi(k)enpa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘let’s drink!’</td>
<td></td>
</tr>
</tbody>
</table>

f. /a=N-obiik-enpa/ oburoki/ → abi\(k\)enpa oburoki

<table>
<thead>
<tr>
<th>1PL.INC.S=IRREAL-drink-IRREAL.A</th>
<th>manioc.beer (*obi(k)enpa oburoki)</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Let’s drink manioc beer!’</td>
<td></td>
</tr>
</tbody>
</table>

4.6 **GEMINATION**

**Hausa:** prefixing pluractional (31a) and intensive adjective (31b) CVC reduplication are associated with total assimilation (gemination); other prefixes are not (e.g., (31c)) (Newman 2000):

\[(31)\]

a. ‘beat’  
‘be well repaired’  
‘drink’  

<table>
<thead>
<tr>
<th>b()úg()a:</th>
<th>b()úb()úg()a:</th>
</tr>
</thead>
</table>

b. ‘brittle’  
‘strong’  
‘salty, brackish’  

<table>
<thead>
<tr>
<th>g()()ú()()r()ú</th>
<th>g()()gg()ú()r()ú</th>
</tr>
</thead>
<tbody>
<tr>
<td>f()á:</td>
<td>f()áf()á:</td>
</tr>
<tr>
<td>z()á()r()ts()i:</td>
<td>z()á()zz()á()r()ts()á:</td>
</tr>
</tbody>
</table>

c. ‘DIM-work’  
‘PROHIBITIVE-2M.SG = don’t you!’  

<table>
<thead>
<tr>
<th>d()á()n-tá()b()á</th>
<th>k()á:()r-k()á</th>
</tr>
</thead>
</table>
4.7 Vowel Lengthening

**Turkish:** place name-forming -ıye lengthens /a/ in stem-final open syllable; other suffixes do not

<table>
<thead>
<tr>
<th>Orthography</th>
<th>UR</th>
<th>Nominative</th>
<th>Accusative (-I/)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murad (name)</td>
<td>/murad/</td>
<td>[murat]</td>
<td>[muradıye]</td>
</tr>
<tr>
<td>refah ‘comfort’</td>
<td>/refah/</td>
<td>[refahı]</td>
<td>[refahıye]</td>
</tr>
<tr>
<td>Ümrان (name)</td>
<td>/yımran/</td>
<td>[yımranı]</td>
<td>[yımranıye]</td>
</tr>
</tbody>
</table>

4.8 Truncation to a Prosodic Constituent

**Swedish** nicknames: truncate to maximal syllable + suffix (Weeda 1992:121):

<table>
<thead>
<tr>
<th>Operation</th>
<th>Example</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>alkoholist</td>
<td>alk-is ‘alcoholic’</td>
</tr>
<tr>
<td>b.</td>
<td>mats</td>
<td>matt-e (proper name)</td>
</tr>
<tr>
<td>c.</td>
<td>fabian</td>
<td>fabb-e (proper name)</td>
</tr>
</tbody>
</table>

**Japanese** illustrates another: truncate (or lengthen) to two moras, + /-țan/ (Poser 1984, 1990; Itô 1990)

<table>
<thead>
<tr>
<th>Operation</th>
<th>Example</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>aki-tyan</td>
<td>(C)VCV</td>
</tr>
<tr>
<td>b.</td>
<td>syuu-tyan</td>
<td>(C)VV</td>
</tr>
<tr>
<td>c.</td>
<td>kin-tyan</td>
<td>(C)VC</td>
</tr>
<tr>
<td>d.</td>
<td>mii-tyan, mit-tyan, mido-tyan</td>
<td>(C)VV ~ (C)VC ~ (C)VCV</td>
</tr>
<tr>
<td>e.</td>
<td>kii-tyan, kit-tyan, kiyo-tyan</td>
<td></td>
</tr>
</tbody>
</table>

Affix-triggered truncation is most often found in hypocoristics and vocatives, constructions where ambiguity is relatively unproblematic. But: Rarámuri (Uto-Aztecan) denominal suffix -tá truncates trisyllabic stems to two syllables (Caballero 2008:125-26, 310) (a-b). Not all suffixes do this (cf. c-e):

<table>
<thead>
<tr>
<th>Operation</th>
<th>Example</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>sipu-tá-a čukú</td>
<td>(&lt; sipúča ‘skirt’)</td>
</tr>
<tr>
<td>b.</td>
<td>komá-ti-ma</td>
<td>(&lt; komáre ‘comadre’)</td>
</tr>
<tr>
<td>c.</td>
<td>tiyópi-če church-LOC</td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td>banisú-ki-ni-ma pull-APPL-DESID-FUT:SG ‘will want to pull for’</td>
<td></td>
</tr>
<tr>
<td>e.</td>
<td>wíkará-n-čane sing-DESID-EV ‘it sounds like they want to sing’</td>
<td></td>
</tr>
</tbody>
</table>
4.9 **ABLaut AND MUTATION**

Vowel ablaut or consonant mutation: morphologically indexed featural alternations that are too complex or opaquely conditioned to be treated as simple phonology (e.g. German *Buch* ‘book’ ~ *Bücher* ‘books’, *Koch* ‘cook’ ~ *Köche* ‘cooks’).

(36) **Hua** (Papuan; Haiman 1972, 1998): certain suffixes trigger the fronting of stem-final /o, u/ to /e, i/. Other phonologically similar suffixes do not. Data from Haiman 1972 (pp. 36-41)

<table>
<thead>
<tr>
<th>Basic stem</th>
<th>Suffixed stem</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘eat’</td>
<td>do-ra-‘e</td>
<td>‘2 DL. have eaten’</td>
</tr>
<tr>
<td></td>
<td>de-na</td>
<td>‘when I eat (in the future)’</td>
</tr>
<tr>
<td></td>
<td>cf. do-ga</td>
<td>‘when (non-1st, non-sg) eat (future)’</td>
</tr>
<tr>
<td></td>
<td>cf. do-bai-na</td>
<td>‘when I eat (in the future)’</td>
</tr>
<tr>
<td>‘do’</td>
<td>hi-s-u (&lt;hu-s-vu)</td>
<td>‘may do’</td>
</tr>
<tr>
<td></td>
<td>cf. hu-re-s-u (&lt;hu-ro-s-vu)</td>
<td>‘may do (perfective)’</td>
</tr>
<tr>
<td></td>
<td>cf. hu-bai-s-u (&lt; hu-bai-s-vu)</td>
<td>‘may do (progressive)’</td>
</tr>
</tbody>
</table>

4.10 **DISSIMILATION AND ‘EXCHANGE’ RULES**

Morphologically conditioned ‘exchange rules’, ‘toggles’, dissimilation: one segment surfaces with a value opposite either to its own input value or to the the output value of another segment in the same word (Weigel 1993, Kurisu 2001, Baerman 2007, DeLacy 2012).

(37) **Kɔnni** Class 1 nouns pluralize by means of a tonally polar suffix (-a~ -e) (Cahill 2004):

<table>
<thead>
<tr>
<th>gloss</th>
<th>stem tone</th>
<th>singular</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ‘fish’</td>
<td>H</td>
<td>sí-ŋ</td>
<td>sí-á</td>
</tr>
<tr>
<td>‘house’</td>
<td>H</td>
<td>tígi-ŋ</td>
<td>tíg-è</td>
</tr>
<tr>
<td>‘face mark’</td>
<td>H</td>
<td>wí-ŋ</td>
<td>wí-è</td>
</tr>
<tr>
<td>b. ‘breast’</td>
<td>L</td>
<td>biisí-ŋ</td>
<td>biis-á</td>
</tr>
<tr>
<td>‘stone’</td>
<td>L</td>
<td>tā-ŋ</td>
<td>tān-á</td>
</tr>
</tbody>
</table>

(38) **Dholuo**: plural -e suffix triggers voicing dissimilation in the stem (Tucker 1994, DeLacy 2012):

<table>
<thead>
<tr>
<th>gloss</th>
<th>singular</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ‘open space’</td>
<td>alap</td>
<td>ælæb-e</td>
</tr>
<tr>
<td>‘hill’</td>
<td>gɔt</td>
<td>gɔd-ɛ</td>
</tr>
<tr>
<td>‘chest’</td>
<td>agɔkɔ</td>
<td>agɔg-ɛ</td>
</tr>
<tr>
<td>b. ‘book’</td>
<td>kitæbu</td>
<td>kitep-e</td>
</tr>
<tr>
<td>‘twig’</td>
<td>kɛdɛ</td>
<td>kɛt-ɛ</td>
</tr>
<tr>
<td>‘year’</td>
<td>hɪغا</td>
<td>hɪk-ɛ</td>
</tr>
</tbody>
</table>

DeLacy 2012: it is hard to find convincing examples of morphophonological polarity. Most, including Dholuo, are ridden with lexical exceptions.
4.11 **Stress/Pitch-Accent (Re)Assignment**

In **Hausa**, some morphological constructions replace stem tone with a tonal melody, composed of H and L tones, which associates to the syllables of the base in a predictable manner (Newman 1986, 2000):

(39)  

- **a. Suffixation with tone replacement (various plural classes)** [Hausa]
  
  má:lám → má:lám-áí ‘teacher-PL’ -LH  
  rí:gá: → rí:g-ũná: ‘gown-PL’ -HL  
  támbáyá: → támbáy-óyí: ‘question-PL’ -H  

- **b. Suffixation without tone replacement (various)**
  
  dáfá: → dáfá:-wá ‘cook-PPL’ -LH  
  gájé: → gájé-ìyá: ‘short-FEM’ -LH  
  hù:lá: → hù:lá-ř ‘hat-DEF’ -L

In **Japanese**, ‘recessive’ morphological constructions preserve lexical stem accent; ‘dominant’ erase it (e.g., Poser 1984). If a recessive accented affix combines with an accented stem, ‘Leftmost Wins’ (b, c):

(40) **Recessive affixes** [Japanese]

- **a. Unaccented (p. 49)**
  
  yóm- → yóN-da ‘read’
  yób- → yoN-da ‘called’

- **b. Accented (p. 48)**
  
  yóm- → yóN-dara ‘if he reads’
  yób- → yoN-dára ‘if he calls’

- **c. Preaccenting (p. 54)**
  
  áNdoo → áNdoo-si ‘Mr. Ando’
  nísímura → nísímura-si ‘Mr. Nishimura’
  matumoto → matumotó-si ‘Mr. Matsumoto’

(41) **Dominant affixes**

- **a. Unaccented suffix (p. 72)**
  
  kóobe → koobe-kko ‘an indigené of Kobe’
  nágoya → nagoya-kko ‘an indigené of Nagoya’
  nyuuyóoku → nyuuyooku-kko ‘an indigené of New York’

- **b. Accented suffix (p. 49)**
  
  abura → abura-ppó-i ‘oil, fat/oily’
  yásu → yasu-ppó-i ‘cheap/cheap, tawdry’
  adá → ada-ppó-i ‘charming/coquettish’

- **c. Pre-accenting suffix (p. 55)**
  
  nísímura → nísilmurá-ke ‘the Nishimura family’
  ono → onó-ke ‘the Ono family’
  hára → hará-ke ‘the Hara family’

- **d. Post-accenting prefix (p. 57)**
  
  futatu → map-pútatu ‘two/exactly half’
  sáityuu → mas-sáityuu ‘amidst/in the very midst of’
  syoozíki → mas-syóoziki ‘honesty/downright honest’
5. **SUBSTANCE OF MORPHOLOGICALLY CONDITIONED PHONOLOGY**

What kind of phonology can be morphologically conditioned?
- Any kind of phonological pattern, other than the most low-level allophonic alternations
- Morphological conditioning is norm for unnatural phonology (Spencer 1998).
- Smith (2001, 2011): part-of-speech-sensitive phonology tends to be prosodic in nature. (see similar observations re phonologically optimizing suppletive allomorphy (Paster 2009) and conditions on infix placement (Yu 2007))

6. **CAN MORPHOLOGICALLY CONDITIONED PHONOLOGY REDUCE TO AUTOSEGMENTAL AFFIXATION?**

Goal of many autosegmental analyses in the 1970’s and 1980’s: account for apparent morphological conditioning by complicating phonological representations

(42) **Turkish:** certain roots, suffixes are exceptions to palatal and rounding harmony

Clements & Sezer 1982: ‘we examine various types of exceptions to the principles of vowel and consonant harmony … and show that these follow from the existence of "opaque" vowels and consonants in phonological representations.’ [p. 221]

a. **Norm: palatal and labial harmony in suffixes and epenthetic vowels**

i. al-du  ‘take-PAST’
   gel-di  ‘come-PAST’

ii. altu-da  ‘six-LOC’
   dort-te  ‘four-LOC’

iii. film-i  ‘film-ACC’
   filim  ‘film’

iv. kojn-u  ‘bosom-ACC’
   kojun  ‘bosom’

b. **Exceptionally disharmonic suffixes**

i. al-ujor  ‘take-PROG’ (progressive suffix with invariant [o])
   gel-ijor  ‘come-PROG’

ii. altu-gen  ‘six-GON’ (polygon former)
   dort-gen  ‘four-GON’

c. **Roots which trigger exceptional front harmony on suffixes**

   infilak-i  ‘explosion-ACC’  *infilak-uu
   harbi  ‘war-ACC’  *harb-uu
   saat-i  ‘watch/hour-ACC’  *saat-uu

d. **Diskarmonic epenthetic vowels (cf. aiv)**

   vakt  vakt-i  ‘time(-3poss)’
   kavim  kavm-i  ‘tribe(-3poss)’
(43) C&S’s solution: harmony accomplished by feature-filling association conventions, per Goldsmith 1976. Exceptional segments are prelinked to the features that they surface with; harmonic segments are lexically unspecified.

- Associate free (unspecified) P-features (“P” = [round], [back]) with free P-bearing segments in a 1-to-1, left-to-right fashion
- Associate remaining free P-bearing unit with leftmost available P-feature

<table>
<thead>
<tr>
<th>nom. singular:</th>
<th>nom. plural:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (-R)</td>
<td>(-R) (-R)</td>
</tr>
<tr>
<td>Ip In</td>
<td>Ip 1Er</td>
</tr>
<tr>
<td>(-B)</td>
<td>(-B)</td>
</tr>
<tr>
<td>b. (+R)</td>
<td>(+R) (-R)</td>
</tr>
<tr>
<td>sEn In</td>
<td>sEn 1Er</td>
</tr>
<tr>
<td>(+B)</td>
<td>(+B)</td>
</tr>
</tbody>
</table>

\(\text{ip-in, ip-ler, son-un, son-lar}\)

(a,b) Vowel disharmony in roots and suffixes: prelinking of [back], [round] values

- In the above example, floating and prespecified autosegmental features make it unnecessary to index the harmony rule to particular roots or suffixes.
- Can this approach work for all cases of morphologically conditioned phonology?
  - consonant gemination: affix a C?
  - vowel lengthening: affix (infix) a V?
  - ablaut, mutation: add a floating feature?
  - truncation: add a prosodic unit (bimoraic syllable)?
  - dissimilation, exchange: ?
  - stress deletion: ?
  - tone replacement: ?
  - segment deletion: ? (see Zimmerman 2013)
Next lecture: theories of morphologically conditioned phonology.

- How many types of morphologically conditioned phonological patterns can there be in a language?
- How diverse can the patterns be?
- If two affixes in the same word are associated with distinct phonological patterns, which prevails?

Some references


Siegel, Dorothy. 1974. Topics in English morphology. Massachusetts Institute of Technology.


