Readings: Hayes (APS reader) Chapter 5-6
Homework: Homework 3 is due today. Homework 4 is not due until May 10th.
Midterm: May 3rd (one week from Wed.): Bring blue books, open book/note, you have to solve problems (like homeworks)
Term Paper: Turn in one-paragraph description (with one reference source). Due before May 17th.

Week 4, Class 1:
Distinctive Feature Redundancy
Morphology

I. Feature Redundancy

1. *The idea of feature redundancy is that some features can be predicted on the basis of other features.*

- Spanish vowel system, some features can be predicted by others:
  i. e.g. [+back, +round], all [+back] vowels are also [+round].
  ii. [+front, - round], all [+front] are also [-round]
  iii. [+front, -back]. all [+front] are [-back]
  iv. there are no [-front, -back] vowels; you can just use [+-back]
  v. For a system like Spanish, you just need [high], [low] and [back]

	[-back]	+back]
[+high, -low]	i	u
[-high, -low]	e	o
[+ low]	a	

- English nasal sounds
  i. all [+nasal] consonants sounds are also [+voiced, + sonorant, -continuant]
  ii. [voice], [sonorant], [continuant] are redundant

- SPE view: Full Specification – all of the features [with +/- value] are part of the mental representation of sounds.
- Underspecification: Some phonologists think that redundancies should be extracted from the phonological representation (because the representation should only contain information that is not predictable)
- This is an ongoing controversy: There are also cases where features are not necessary in order to account for contrasts in the language, but are necessary for phonological rules
- Maasai vowel system: All [+low] vowels are also [-ATR]. [+low] predicts [-ATR] so therefore [ATR] is redundant for this vowel (predictable). Some phonologists may claim that [ATR] is not part of the lexical representation for this vowel (because it is redundant)

	[-back]	[+back]
[+high, -low, +ATR]	i	u
[+high, -low, -ATR]	ɪ	ʊ
[-high, -low, +ATR]	e	o
[-high, -low, -ATR]	ɛ	ɔ
[-high, +low, -ATR]		ɑ [also -round]

- ATR harmony requires [a] to have [-ATR] value, even though it is redundant
  i. Maasai ATR harmony: all vowels in a word have to be either [+ATR] or [-ATR]
  ii. All affixes have two forms: e.g. 2nd person singular morphemes for verbs (you): [i] or [ɪ]
  iii. If the root is [+ATR] then prefix is [i]: [rik] [+ATR] 'lead', therefore [irik] 'you lead'

iv. If the root is [-ATR] then prefix is [ɪ]: [rɪk] [-ATR] ‘to be nauseated’, therefore [ɪrɪk] ‘you are nauseated.
v. If the verb has [a], then prefix is [ɪ]. [nap] ‘carry’, therefore [ɪnap] [-ATR] ’you carry’
vi. You don’t need [ATR] to contrast low vowels, but the phonology considers low vowels [-ATR]

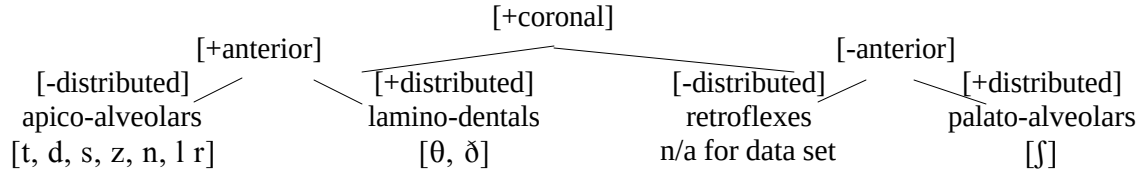
- What features are redundant (don’t need to be specified in the mental representation) and non-redundant is not an easy matter.
- For the purpose of writing phonological rules, you can leave out the redundant features.
- You need further phonological analysis in order to say whether or not they are part of the mental representation of sounds.

2. Arabic /al-/ assimilation and the feature [coronal]

1.	[albajt]	‘the house’	2.	[attaːdʒir]	‘the merchant’
3.	[alkitaːb]	‘the book’	4.	[addarsa]	‘the lesson’
5.	[alqalam]	‘the pen’	6.	[atˤtˤaːlib]	‘the student’
7.	[alʔumma]	‘the mother’	8.	[adˤdˤabaːb]	‘the fog’
9.	[alfaqiːr]	‘the poor person’	10.	[aθθawb]	‘the garment’
11.	[alxaːl]	‘the maternal uncle’	12.	[aððahab]	‘the gold’
13.	[alɣurfa]	‘the room’	14.	[assuːq]	‘the market’
15.	[alhaːl]	‘the situation’	16.	[azzawdʒ]	‘the husband’
17.	[alʕayn]	‘the eye’	18.	[asˤsˤabaːh]	‘the morning’
19.	[alhadijja]	‘the gift’	20.	[azˤzˤuhr]	‘the midday prayer’
21.	[almalik]	‘the king’	22.	[aʃʃajʔ]	‘the thing’
23.	[alwalad]	‘the boy’	24.	[annabiː]	‘the prophet’
25.			26.	[alluɣa]	‘the language’
27.			28.	[arradʒul]	‘the man’

3. Four basic types of [+coronal] sounds – three types in the Arabic data set

- Is the feature [coronal] redundant? Can we exclude it from the representation of the arabic segments?
  i. If a segment is [+anterior] it must also be [+coronal]
  ii. If a segment is [+distributed] it must also be [+coronal]
  iii. Why do we need [coronal] if it is predicted by [anterior] and [distributed]?
  iv. How else can we describe the segments targeted by the Arabic assimilation rule? The simplest way is to say [+coronal]
  v. There are many rules that target [+/- coronal] segments
  vi. We don’t need [coronal] to describe contrasts but it must be part of the representation in order to account for rules that target this feature.



II. Morphology

*4. Phoneme: the smallest linguistic unit that **can distinguish** a meaning*

- Minimal pairs: /pɪt/ 'pit' vs. /bɪt/ 'bit': /p/ and /b/ are phonemes because they can convey a meaning difference
- Allophone: a contextual variant of a phoneme: /p/ has allophones [p] and [p^h]

*5. Morpheme: the smallest linguistic unit that **has** meaning*

- /kæt/'cat'- the meaning is a four legged animal, related to lions and tigers
- /kæt-s/ 'cats' – more than one 'cat', can be divided into two morphemes (bimorphemic)
    i. /kæt/ 'cat' – four legged animal
    ii. /-s/'s' – plural
    iii. /kæt/ + /-s/ = [kæts]
    iv. '-' or '+' indicate a morpheme boundary

- Allomorph: contextual variant or a morpheme
    i. /dɔg/ - four legged animal related to a wolf
    ii. /dɔg/ + /-s/ = [dɔgz], more than one four legged animal related to a wolf
    iii. [dɔgz] vs. [kæts]
    iv. [-z] is the allomorph of the plural that occurs after a voiced consonant
    v. [-s] is the allomorph of the plural that occurs after a voiceless consonant

- Plural: /-s/ morpheme has allomorphs [-s] and [-z]

6. Morphology: studies the structure of words

- Goals of morphology
    i. isolate the units of meaning (component parts) of words
        1. e.g. /-s/ = plural
    ii. determine the rules for forming words
        1. e.g. /-s/ is a suffix //dɔg/ + /-s/ = [dɔgz]is grammatical: * /-s/ + /dɔg/ = /sdog/
        2. e.g. morphophonology: /-s/ realized as [z] after voiced consonant and [s] after voiceless

III. Types of morphemes

7. Root: central morpheme in a word: nominal root -'dogs'; verbal root 'walking'

    i. 'dog' = root, '-s' = affix
    ii. 'walk' = root, '-ing' = affix

8. Affix: always bound morphemes that attach to the root

    iii. prefix – attached before the root (un-)
    iv. Suffix – attached after the root (-s, -ing)
    v. infix – inserted into the word

- Bontoc (Philippines) /-um-/ infixation (inserted into the root) – meaning = 'is becoming'
    1. [fikas] 'strong' [f-um-ikas] 'he is becoming strong
    2. [kilad] 'red' [k-um-ilad] 'he is becoming red'

- Italian third conjugation /-isk-/ infix (inserted between root and a suffix)
    i. verbal roots ending in two consonant (dorm-ire) have suffixes for person and number: -o, -i, -e, -iamo, -ite, -ono
    ii. verbal roots ending in one consonant have –isk- infix:
        1. root + isk + suffix (-isk- had a meaning in Latin, lost in Italian)
        2. /-isk-/ has allomorphs [-isk-] before back vowels and [-iʃ-] before front vowels

	dorm-ire 'to sleep'		fin-ire 'to finish'	
	Sing.	Plur.	Sing.	Plur.
1st person	dorm-o	dorm-iamo	fin-isk-o	fin-iamo
2nd person	dorm-i	dorm-ite	fin-iʃ-i	fin-ite
3rd person	dorm-e	dorm-ono	fin-iʃ-e	fin-isk-ono

9. Free: Free root can stand alone: dog and walk

iii. English has a lot of free morphemes
iv. Italian, has gender/number for nouns, person for verbs: most roots are bound
    1. English: 'book' free root morpheme
    2. Italian: /libro/ 'book'+m.s.: /libr-/ 'book', /-o/ masculine and singular
    3. /libr/ never occurs alone (without an affix)

10. Bound: Bound roots can only occur with other morphemes.

v. –mit, as in 'permit', 'remit', 'commit', 'admit'
    1. but what does –mit mean (does the average speaker relate these words and assign –mit a consistent meaning)

free	**bound**
dog, cat, monkey, eat, fast, tomorrow	over**whelm**, dis**gruntle** , in**ept**. **ident**ify, **ident**ity, **ident**ifiable, un**ident**ifiable

11. Zero affixation or conversion: the use of a word as a different part of speech from its original form, without any affix or change.

- English allows zero affixation:
    i. *The **telephone** is in the kitchen* ('telephone' = noun)
    ii. *I must **telephone** my mother* ('telephone' = verb)
    iii. ***Google** is a search engine* ('google' is a noun)
    iv. *When I want information on infixes I **google** the word "infix"* ('google' is a verb)
- Italian doesn't allow zero affixation
    i. *Il **telefono** e' nella cucina* ('telefono' is a noun
    ii. *Devo **telefonare** a mia madre* (telefonare' is a verb)
        1. /–are/ is a verbal affix of Italian that can covert a noun to a verb.
        2. *Il mio **email** e'* kristie_mccrary@yahoo.com ('email' borrowed noun)
        3. *Devo **emailare** a mia madre* ('emailare' borrowed noun converted to verb)

12. Reduplication: all or part of a word is copied.

- Yidiɲ reduplication (aboriginal language of Australia) – reduplicate first two syllables of the word
  i. [mad^{j}indan] 'walk up', [mad^{j}inmad^{j}indan] 'keep walking up'
  ii. [d^{j}ad^{j}aman] 'jump', [d^{j}ad^{j}ad^{j}ad^{j}aman] 'keep jumping'

- Samoan: 3rd person plural of verb. reduplicate second to the last syllable of verb
  i. [matua] 'he is old', [ma**tu**tua] 'they are old'
  ii. [**pe**se] 'he signs', [**pe**pese] 'they sing'
  iii. [ata**ma**ʔi] 'he is wise', [ata**ma**maʔi] 'they are wise

- Maasai reduplication: 2nd person plural of present verb forms – reduplicate whole 2nd person verb form, and then the verbal root vowel.
  i. e.g. verbal root /nap/ 'to carry' /rik/ 'to lead'

	Singular		Plural	
1st person	a-nap	'I carry'	kɪ-nap	'we carry'
2nd person	ɪ-nap	'you carry'	ɪnap-ɪnap-a	'you (pl) carry'
3rd person	ɛ-nap	'he carries'	ɛ-nap	'they carry'

	Singular		Plural	
1st person	a-rik	'I lead'	ki-rik	'we lead'
2nd person	i-rik	'you lead'	irik-irik-i	'you (pl) lead'
3rd person	e-rik	'he leads'	e-rik	'they lead'

- Maasai also has another type of reduplication which means to do something repeatedly [keep doing it]
- Reduplication often used to indicate plurals, repeated action, or intensiveness.
  i. Tropean (Calabrian) reduplicates adjectives to create adverbs with intensive meaning: [bonu] 'good', [bonu bonu] to do something 'very well'

13. Notation: when you want to indicate morphological structure use hyphens

- hyphen tells you where to attach an affix
  i. prefix: *un-*
  ii. suffix: /-iŋ/
  iii. infix: /-um-/, /-isk-/
  iv. bound roots: *ident-*, /libr-/
  v. free roots: *monkey* (no hyphen)

14. Internal change: changes within a root that do not involve adding an affix

- English: sing, sang, sung; mouse mice
- Neapolitan (Southern Italian): /rósːə/ 'red' (feminine plural), /rúsːə/ 'red' (masculine plural)
  i. results from historical vowel harmony: mid back vowels raised to high vowels when followed by a high vowel: /rossi/ - [russi] but /rosse/ - [rosse] (subsequently the vowel that triggered harmony wash reduced to /ə/ - now internal vowel indicates gender instead of final vowel)

- *Arabic also has internal change: What is the root of these words?*

1.	kataba	'he wrote'
2.	kutiba	'it was written'
3.	katːaba	'he made someone write'
4.	kaːtaba	'he corresponded'
5.	ʔaktaba	'he dictated'
6.	kitaːb	'book'
7.	kaːtib	'writer'

15. Compounding: Formation of a word by combining two (or more) words –e.g. two roots

- Spelling is inconsistent – some have a space some don't

blackbird	*pancake*
intake	*bird bath*

- Linguistic arguments for compounds
  - i. genuine noun phrase allows insertion of an adjective
    1. large cake, large round cake
    2. bird bath, round bird bath, *bird round bath
  - ii. Syntax: Normally nouns can be modified by an adjective, nouns that are the second word of a compound cannot.
  - iii. Morphology: Localization: nouns can usually be plural: birds, bird baths, the first noun of a compound cannot be pluralized: *birds bath
  - iv. A compound is treated as a single unit by the syntax and morphology

IV. The Functions of Morphology

16. Derivations: forms new words from old words

- English: -able
  - i. identify: process of English derivations provides new word 'identifiable'
  - ii. –able affixation; can attach to a transitive verb

- Italian: -are
  - i. A noun can be made into a verb by adding *–are* or *-izzare*
  - *ii.* Borrowed word from English: *email, scanner*
  - *iii. emailare, scannerizzare*

- Italian: -abile
  - *i.* Noun for 'Pope' in Italian is *papa*
  - *ii.* –abile, like –able in English
  - *iii.* New word coined last yearItalian (and repeated on English speaking news channels): *papabile* 'Pope-able'; Someone who can be made into a Pope, a potential Pope.
  - *iv.* –abile suffixation is productive in Italian, new words are still being created

- Derivational morphemes can change grammatical category: Italian noun → verb (-are), noun → adjective (-abile)
- Can create new dictionary entry.

17. Inflectional morphology: makes words syntactically appropriate for their context.

- Choice of inflectional morphemes depends on other words in the sentence
  i. *We sing* vs. *She sings*; the final /-s/ is required because the subject is 3rd singular (she)
- English inflectional morphology
  i. tense on verbs: present *jump**s,*** past *jump**ed***
  ii. aspect on verbs: *sing**s.*** vs. is *sing**ing***, present indicative vs. present progressive
  iii. number on nouns: *dog* vs. *dog**s***
  iv. Person and number agreement: *I sing* vs. *she sing**s***, 3rd sing
  v. Case of pronouns: *I* (subject-nominative) vs. *me* (object- accusative)
- None of the above words would be independent dictionary entries

- Many other languages have much richer inflectional systems
  i. Gender: Italian has masculine and feminine; Modern Greek has masculine, feminine and neuter
  ii. Evidential status: events known vs. hearsay
  iii. Degree of respect: formal vs. informal: Spanish verb forms for *tu* vs. *usted: tu habla**s*** *vs. usted habla*

- Other languages have more possibilities within categories
  i. dual or trial number, in addition to singular and plural
  ii. remote vs. recent past in a tense system: Italian *ho parlato* 'I spoke' recent past vs. *parlai* 'I spoke' remote past
  iii. inclusive vs. exclusive forms of the first person plural, to distinguish whether or not the hearer is included.

18. Categories that are often inflectional

- Verbs: tense, aspect, mood, agreement (subject or object), evidential
- nouns: numbers, gender, case
- Adjectives: agreement with features of nouns they modify: Spanish: *una buena madre (all words are fem. sing.)*

19. Inflectional morphology as obligatory choice

- book is always singular, books is always plural (there is no form without number)
- Gender: *She* is always feminine, *he* is always masculine *(it* cannot be a person); people who advocate Gender-free language need to invent invent weird ways around making this choice (because it is obligatory for these words).

From website, **Avoiding Gender Bias in Pronouns**

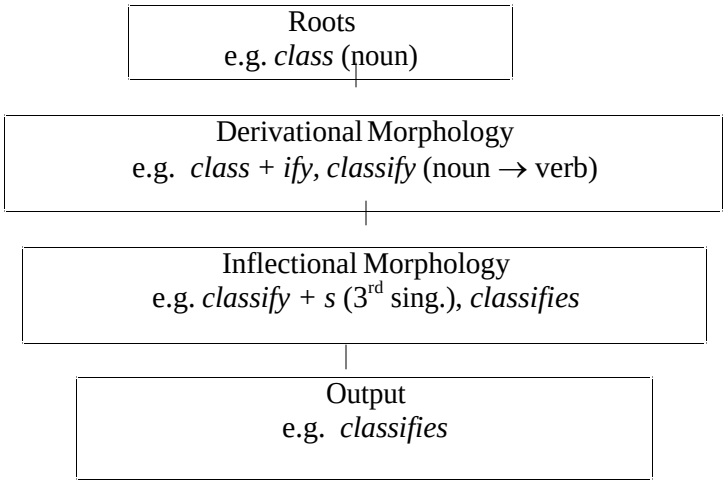
Biased Language
Studying the techniques by which a celebrated **writer** achieved **his** success can stimulate any writer faced with similar problems.
Gender-free Language
Studying the techniques by which celebrated **writers** achieved **their** success can stimulate any writer faced with similar problems.
Biased Language
If you must use a technical term **he** may not understand, explain it..

Gender-free Language
If you must use a technical term **he or she** may not understand, explain it. If you must use a technical term **he/she** may not understand, explain it.
Biased Language
Gradually, Toddler will see the resemblance between block creations and objects in **his** world, and **he** will begin to name some structures, like "house," "choo choo," and "chimney."
Gender-free Language
Gradually, Toddler will see the resemblance between block creations and objects in **her** world, and **she** will begin to name some structures, like "house," "choo choo," and "chimney."

- What would "gender-free" Spanish, French, Italian, Maasai, Modern Greek be like? (all nouns/adjectives (not just 3rd person sg. pronouns) have gender, mostly completely unrelated to biological gender)

20. Writing morphological rules

- Boxology: Crosslinguistic tendency for derivational morphology to precede inflectional morphology



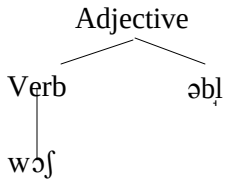
- If I send the root to the Inflection box before the Derivation box I get *class + s + ify = *classesify

21. Rules for derivation

- English: -able: *washable, lovable, thinkable, growable, doable*
- What can –able attach itself to? *wash, love, think, grow, do*
- What about *sleep, die, exist?*

- Word formation rule: requires three kinds of information
  i. change in the form: X → X + əbl̩
  ii. change in meaning: Xable means "able to do X" (we don't have a formal way of representing meaning)
  iii. change in part of speech: verb (trans.) + əbl̩ → adjective

- Output of word formation rule: tree diagram



- Bracket notation: $[[wɔʃ]_{Verb}\ əbl̩]_{Adj}$
- Look at pages 109-112 of Hayes reader for more examples of word formation rules

22. Morphological analysis

- paradigms: common way for phonologists to present and analyze morphological data
  i. a collection of words that are all morphologically derived words from the same root (usually used for inflectional morphology).
  ii. a collection of words that are all derived by the same morphological process(e.g. derived by the –able word formation rule)

- Analysis of inflectional paradigm (collection of morphologically derived words from the same root)
  1. what meaning do all of the words have in common? 'sleep'
  2. What is shared by all of the forms? /dorm/
  3. A reasonable hypothesis is that /dorm/ means sleep (verbal root)
  4. In this case, the residual is the person/number morpheme, which is a suffix
     a. /-o/ has two meanings: 1st person and singular (common for one morpheme to have more than one meaning)

- Italian verbal paradigm (inflectional)

dormire	'to sleep'
dormo	'I sleep'
dormi	'you sleep'
dorme	's/he sleeps'
dormiamo	'we sleep'
dormite	'you all sleep'
dormono	'they sleep'

- Maasai verbal paradigm
  i. What is the word for 'lead'?
  ii. What is the word for 'carry'
  iii. How is person/number of verbs rendered in Maasai?

arik	'I lead'	anap	'I carry'
irik	'you lead'	ɪnap	'you carry'
erik	'he leads'	ɛnap	'he carries'
kirik	'we lead'	kɪnap	'we carry'
irikiriki	'you (pl) lead'	ɪnapɪnapa	'you (pl) carry'
erik	'they lead'	ɛnap	'they carry'

- These are simple cases, but Maasai is 'highly agglutinative' [lots of affixation]
  i. e.g. /ilaatalepokitio/ 'the ones (masc.) that milked them for me
  ii. it's all one word (we know because ATR harmony applies at the word level)

il-	l-	aa-	ta-	-lep-	-o	-ki	-tio
plural masc. det.	relative masc.	it-me	past	milk	past	applied	plural

- Derivational paradigms
  i. All derived forms of one root: e.g. *believe*

believe
believable
un**believ**able
un**believ**ably

  ii. All derived by the same word formation rule: $[[X]_{Verb}\ \text{əbl}]_{Adj}$

believ**able**
wash**able**
do**able**
read**able**

23. Analysis of Russian verbal inflection paradigm: read

		Imperfective Aspect		**Perfective Aspect**	
		Present	**Past**	**Past**	**Future**
I (m/f)	ja	tʃitáju	tʃitál/-a	protʃitál/-a	protʃitáju
You-sg. (m/f)	ti	tʃitájeʃʲ	tʃitál/-a	protʃitál/-a	protʃitájeʃʲ
he	on	tʃitájet	tʃitál	protʃitál	protʃitájet
she	ona	tʃitájet	tʃitála	protʃitála	protʃitájet
it	oní	tʃitájet	tʃitálo	protʃitálo	protʃitájet
we	mi	tʃitájem	tʃitáli	protʃitáli	protʃitájem
you-pl.	vɨ	tʃitájetʲe	tʃitáli	protʃitáli	protʃitájetʲe
they	oní	tʃitájut	tʃitáli	protʃitáli	protʃitájut

A Maasai Morphology Puzzle
From Doris Payne's Maasai website: http://darkwing.uoregon.edu/~dlpayne/maasai/gender.htm

Maasai Noun Morphology:

Here are some Maasai words. The square brackets […] indicate that these are phonetic representations. In each word there is a prefix and a stem (or root). The questions below presume knowledge of technical linguistic concepts -- but even if you don't have that kind of background (yet!), you might enjoy thinking about how Maasai expresses these concepts.

A		B	
[ɛmbéné]	'pocket'	[ɔlbéné]	'bag'
[ɛndíà]	'puppy, female dog'	[ɔldíà]	'dog (general), male dog'
[ɛŋtʃatá]	'twig'	[ɔltʃatá]	'tree'
[ɛŋ kɛjó]	'leg'	[ɔlkɛjó]	'river'
[ɛŋ kíné]	'goat (general), female goat'	[ɔlkíné]	'male goat, large goat'
[ɛmpíjátá]	'point'	[ɔlpíjátá]	'corner'
[ɛŋjɪpét]	'wedge'	[ɔljɪpét]	'stake, skewer, spit (for roasting meat)'
[ɛntásàt]	'old woman'	[ɔltásàt]	'old man'
[ɛnagúétànì]	'female or small carpenter'	[ɔlagúétànì]	'carpenter'
[ɛsiaŋ áù]	'broken calabash piece'	[ɔsiaŋ áù]	'calabash with wide opening & leather handle'
[ɛlókònkò]	'chicken'	[ɔlókònkò]	'rooster'

1. What does the prefix in column A mean?

2. What does the prefix in column B mean?

3. List all the allomorphs (variant phonetic forms) of the prefix in Column A.

4. Of the forms listed in (3), which would be the best choice for the underlying (basic) form of the morpheme? Justify your answer.

5. Based on the above data, would you call the prefixes in A and B derivational, or inflectional? Why?