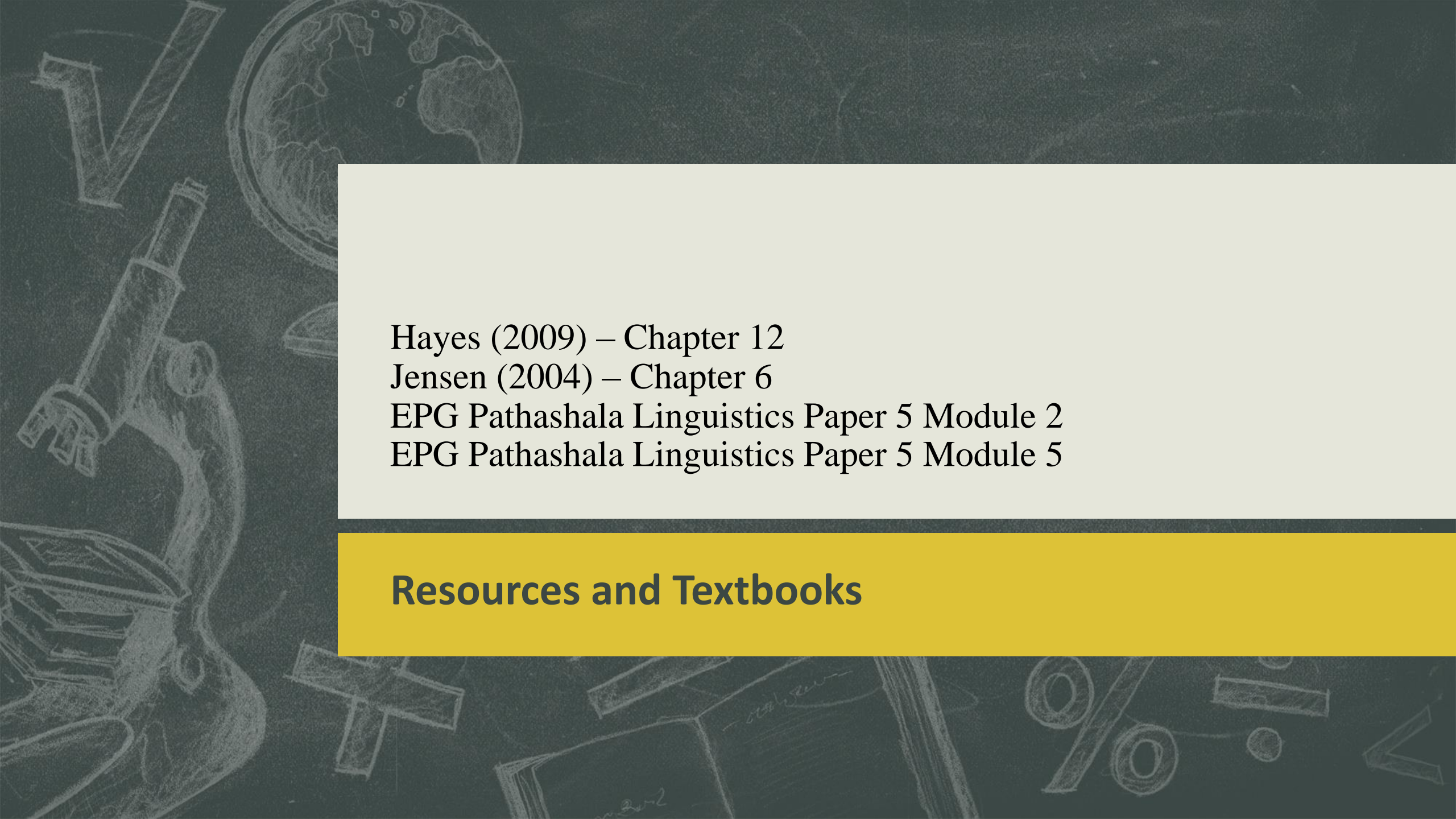


The background is a dark grey chalkboard with various white chalk sketches. In the top left, there's a large 'V' and a globe. Below the globe is a microscope. In the bottom left, there's a stack of books. In the bottom center, there's an open book with some handwritten text. In the bottom right, there are mathematical symbols like a percentage sign, a plus sign, and a less-than sign.

Unit 4 Constraints on phonological rules

-- Yangchen Roy



Hayes (2009) – Chapter 12
Jensen (2004) – Chapter 6
EPG Pathashala Linguistics Paper 5 Module 2
EPG Pathashala Linguistics Paper 5 Module 5

Resources and Textbooks

The background is a dark, textured surface resembling a chalkboard. It is covered with faint, light-colored chalk drawings of various scientific and mathematical symbols and objects. These include a large letter 'V' in the top left, a globe showing continents in the top center, a telescope on the left side, a stack of books at the bottom left, a cross symbol at the bottom center, an open book with handwritten text at the bottom center, a percentage sign and an exclamation mark at the bottom right, and a less-than sign at the far bottom right.

Kiparsky (1968) – “How abstract is phonology?”

Seminal pieces

Subtheories of Generative phonology

- Derivational Phonology

- Standard Generative Phonology (The SPE model)

- Natural Generative phonology

- Metrical Phonology

- Lexical Phonology

- Optimality Theory

The simplicity criterion

The general metric of evaluation for choosing between generative grammars (say two derivations), is simplicity of derivation and representation. See Halle (1962) for more on this.

The Simplicity Criterion:

The optimal grammar of a language is one in which the total number of phonological features required to state all the underlying representations and rules is reduced to the minimum.”

Phonological rules stated in terms of distinctive features and formal devices and rule ordering could satisfy the Simplicity Criterion.

The Naturalness condition

A phonological grammar that satisfied the simplicity criterion could be far from giving an account of the phonological knowledge of the language. In addition to satisfying the simplicity criterion, it was proposed that phonological grammars should also be natural.

Naturalness Condition

The requirement for naturalness was stated as the Natural Condition. The underlying representation of a morpheme is identical to its phonetic representation, unless there is evidence for a more abstract representation.

From the EPG Pathashala Paper 5, Module 2

In interpreting the naturalness condition, the conditional clause should be kept in mind. Ideally, the underlying representation should be identical with the phonetic representation. If not so, there should be evidence that the underlying representation must be posited as more abstract and related to the phonetic representation by means of phonological rule(s). Abstractness is permitted, provided it is well motivated. The danger lurked here. In order to account for phonological alternations, an abstract representation could be proposed, which could be shown to be related to the surface representation by means of a phonological rule. The rule would be formulated specifically to account for the abstract representation. In such a situation, the rule would not be motivated by the general facts of phonological alternation in the language, but by the specific facts. As we will see below, that indeed was how many phonological analyses came to be proposed, which would satisfy both the simplicity criterion and the naturalness condition, but appeared to be 'ad hoc' rather than well motivated.

Limitations of Standard Generative Phonology

- The SPE model of generative phonology is a linear one – phonological units are arranged in a linear fashion, having vowels, consonants and boundary symbols.
- There was an excessive emphasis on phonological rules in the SPE model. This led to three problems:
 - There were often proposals of abstract representations (of underlying forms) that were far removed from surface generalisations. See Kiparsky (1968) for constraints on abstract representations within the SPE model. **Alternative: Natural Phonology (Stampe 1974) and Natural Generative Phonology (Hooper 1976)**
 - The study of suprasegmental features like stress and tone was forced upon the system. These made the rules over-complicated and unnatural. **Alternative: Metrical Phonology (Hayes 1981), Autosegmental Phonology (Goldsmith 1981)**
 - The role of constraints in relation to phonological rules were not explored. **Alternative: Optimality Theory (McCarthy and Prince 1993)**

The issue of Abstractness

- Too much emphasis on phonological rules, such that you ignore the restrictions of the nature of representations. i.e. because the theory does not impose any constraints on the choice of underlying forms, phonologists would often propose analyses in which the underlying representation departs radically from the surface forms.

Example:

The derivation of [nait] 'night' in the SPE from Anglo-Saxon (Old English) /ni:t/

Vowel lengthening rule: /ɪ/ → [i:]

/i:/ → [ai]

Do speakers psychologically relate to this historical abstraction?

The issue of Abstractness, continued ... (suprasegmental features)

- Phenomenon like the stress pattern of a language, say English, when described using phonological rules, turns out to be immensely complex.
- If a language does not entertain consonant clusters with three consonants, it will break the cluster:

(1) $\phi \rightarrow V / CC_C$

(2) $C \rightarrow \phi / _ CC$

The issue of abstractness, continued ... (Hayes, 2009, p. 235)

Polish Vowel – Zero Alternation

- In Polish nouns come in three genders (masculine, feminine, neuter). They inflect for number (singular vs plural) as well as case (nominative, accusative, genitive, instrumental, locative, vocative).
- Nouns normally occur in at least one *unsuffixed* allomorph (either the nominative singular or the accusative singular), as well as a variety of *suffixed* allomorphs.

Paradigm of the word 'sweater'

	<i>Singular</i>	<i>Plural</i>
<i>Nominative</i>	[sveter]	[svetr-ɨ]
<i>Accusative</i>	[sveter]	[svetr-ɨ]
<i>Dative</i>	[svetr-ovi]	[svetr-om]
<i>Instrumental</i>	[svetr-em]	[svetr-ami]
<i>Genitive</i>	[svetr-a]	[svetr-uf]

	<i>Singular</i>	<i>Plural</i>
<i>Nominative</i>	[sveter]	[svetr-ɨ]
<i>Accusative</i>	[sveter]	[svetr-ɨ]
<i>Dative</i>	[svetr-ovi]	[svetr-om]
<i>Instrumental</i>	[svetr-em]	[svetr-ami]
<i>Genitive</i>	[svetr-a]	[svetr-uf]

In the two unsuffixed forms, the nominative and accusative singular, the stem shows up with an extra [e] vowel which is missing in the suffixed forms.

We will analyse the data using what we have learnt so far, and determine the underlying and surface forms of ‘sweater’ in Polish.

Hypothesis I: [e] ~ ϕ (environment to be determined), where /e/ is the underlying form

Hypothesis II: : ϕ ~ [e] (environment to be determined), where ϕ is the underlying form

Non-alternating Polish stems with [e]

a. Longer stems

[krater]	‘crater-nom. sg.’	[krater-ɨ]	‘crater-nom. pl.’
[order]	‘order-nom. sg.’	[order-u]	‘order-gen. sg.’
[pap ^h ier]	‘paper-nom. sg.’	[pap ^h ier-u]	‘paper-gen. sg.’
[numer]	‘number-nom. sg.’	[numer-u]	‘number-gen. sg.’
[skalpel]	‘scalpel-nom. sg.’	[skalpel-a]	‘scalpel-gen. sg.’
[karmel]	‘caramel-nom. sg.’	[karmel-u]	‘caramel-gen. sg.’
[basen]	‘basin-nom. sg.’	[basen-u]	‘basin-gen. sg.’
[omen]	‘omen-nom. sg.’	[omen-u]	‘omen-gen. sg.’

Hypothesis I is untenable, because the vowel in /krater-i/ would get deleted, yielding *[kratri]. This would happen for all Longer stems.

Hypothesis II seems more promising i.e. the underlying forms are what we see in the second column of the data sets. These underlying forms show a fundamental contrast (final / . . . CeC/ vs. final / . . . CC/), which is neutralized by the insertion of [e] into certain final clusters. This Epenthesis rule would convert underlying /svetr/ to [sveter], thus neutralizing it in the crucial respects with underlying /krater/.

- Further research suggests that there are actually two Epenthesis rules in Polish.
- The first rule splits up final consonant clusters when the second consonant is a sonorant.

Sonorant Cluster Epenthesis

$$\emptyset \rightarrow e / C \text{ --- } \left[\begin{array}{c} -\text{syllabic} \\ +\text{sonorant} \end{array} \right]]_{\text{word}}$$
Split up an underlying word-final C + sonorant cluster with an epenthetic [e].

- The other rule needed applies to vowelless underlying forms.

Monosyllabic Epenthesis

$$\emptyset \rightarrow e / [C_0 \text{ --- } C]_{\text{word}}$$
If a word would otherwise have no vowels at all, place [e] before its final consonant.

To sum up the analysis, here are the two rules applying in sample derivations. In each case, a form with epenthesis is compared with an analogous form with underlying /e/.

<i>‘sweater</i> <i>nom. sg.’</i>	<i>‘sweater</i> <i>nom. pl.’</i>	<i>‘crater</i> <i>nom. sg.’</i>	<i>‘crater</i> <i>nom. pl.’</i>	
/svetr/	/svetr-i/	/krater/	/krater-i/	underlying forms
sveter	—	—	—	Sonorant Cluster Epenthesis
—	—	—	—	Monosyllabic Epenthesis
[sveter]	[svetri]	[krater]	[krateri]	surface forms
<i>‘bottom- gen. pl.’</i>	<i>‘bottom- nom. sg.’</i>	<i>‘reindeer- nom. sg.’</i>	<i>‘reindeer- gen. sg.’</i>	
/dn/	/dn-o/	/ren/	/ren-a/	underlying forms
—	—	—	—	Sonorant Cluster Epenthesis
den	—	—	—	Monosyllabic Epenthesis
[den]	[dno]	[ren]	[rena]	surface forms

It is quite common for languages to avoid *consonant* + *sonorant* clusters at the ends of words; as noted above in §4.4.1, languages tend to arrange the consonants of syllables so that the more sonorous segments are adjacent to the vowel, and epenthesis rules that add vowels so that sonorant consonants will be vowel-adjacent can be found in, for instance, Turkish and Modern Hebrew. It is

- The epenthesis analysis of Polish looks feasible.
- However, the Sonorant Cluster Epenthesis rule, turns out to have many exceptions (Hayes' own data)

Exceptions to Sonorant Cluster Epenthesis

[katedr]	'cathedral-gen. pl.'	[katedr-a]	'cathedral-nom. sg.'
[zebr]	'zebra-gen. pl.'	[zebr-a]	'zebra-nom. sg.'
[algebr]	'algebra-gen. pl.'	[algebr-a]	'algebra-nom. sg.'
[filtr]	'filter-nom. sg.'	[filtr-a]	'filter-gen. sg.'
[miɕl]	'thought-nom. sg.'	[miɕl-ax]	'thought-loc. pl.'
[konstabl]	'constable-nom. sg.'	[konstabl-a]	'constable-gen. sg.'
[tɕ'vikw]	'red beet sauce-gen. pl.'	[tɕ'vikw-a]	'red beet sauce-nom. sg.'
[blizn]	'scar-gen. pl.'	[blizn-a]	'scar-nom. sg.'
[hɨmn]	'hymn-nom. sg.'	[hɨmn-u]	'hymn-gen. sg.'
[kombajn]	'combine-nom. sg.'	[kombajn-a]	'combine-gen. sg.'

“If the rule of Sonorant Cluster Epenthesis is to be considered valid, every one of these words must be marked with the rule feature (§9.6) [–Sonorant Cluster Epenthesis]. At least at first blush, this seems a rather high price to pay.”

“This, then, is the dilemma. If we assume that the [CC] ~ [CeC] alternations of Polish are underlain by /CC/, then the Sonorant Cluster Epenthesis rule that is needed will have many exceptions. On the other hand, if we assume that these alternations are underlain by /CeC/, then the Syncope rule that would be needed would likewise have many exceptions. Neither alternative offers a clean analysis.”

Go to Hayes (2009) and read up on how the Polish data is ultimately explained



Degrees of Abstractness (read Jenson, 2004, and EPG Pathashala P-05 M2)

Non-alternating morphemes, Regular alternating morphemes, Alternating morphemes with an abstract form, The underlying representation with non-occurring segments in the language

Non-alternating morphemes

- Non alternating morphemes (or concrete underlying representations) are ones where the underlying forms and surface forms are identical/near-identical i.e. Non-alternating morphemes have non-abstract representations (of high or low degree)
- Complete identity is rare though.

Example (English): /fɔ:l/ → [fɔ:l]

- The unmarked case, for non-alternating morphemes is that the phonetic form differs from the underlying form.

Example (English) : /bæk/ → [bæk̚]

- low degree of abstraction

- final /k/ unrealised)

- the short vowel /æ/ is shorter than the one in bæd, since vowels are shortened before voiceless consonants

Regular alternating morphemes

- Regular alternating morphemes have more than one surface alternant. Therefore, we have to posit an underlying prerepresentation that is **abstract for one of the alternants**.
- The alternant that differs from the underlying form is **derived** by a phonological rule.

Example (from Halle and Clements 1993, as cited in EPG Pathashala P05 M2) on Ganda Liquids:

(2/4) Ganda liquids

[kola] 'do' [wulira] 'hear' [be:ra] 'help' [lu:la] 'sit'

- [l] and [r] are allophones. The underlying representation is /l/, that changes to [r] following front vowels:

(2/5) Ganda Liquid rule

/l/ → [r] / [+syll, -cons, -back] ____

/lu:la/ 'sit'

DNA

[lu:la]

/be:la/ 'help'

r

[be:ra]

Underlying Representation

Ganda Liquid rule

Surface Representation

Regular alternating morphemes, continued ... (Russian)

Three rules

(2/8) Obstruent Devoicing Rule (ODR) ✓

$[-\text{sonorant}] \rightarrow [-\text{voice}] / __\#$

(2/9) Obstruent Voicing Rule (OVR)

$[-\text{sonorant}] \rightarrow [+ \text{voice}] / [+ \text{syll}, -\text{cons}] __\ [+ \text{syll}, -\text{cons}]$

(2/10) /i/- Lowering:

$[+ \text{syll}, + \text{high}, -\text{low}] \rightarrow [+ \text{syll}, -\text{high}, -\text{low}] / __\text{C}\#$

(2/11) /e/- Raising ✓

$[+ \text{syll}, -\text{high}, -\text{low}] \rightarrow [+ \text{syll}, + \text{high}, -\text{low}] / __\sigma$

Singular	Plural	Gloss
a) 'glas	gla'za	'eye'
b) u'cit'il'i	ucit'i'l'a	'teacher'
c) 'l'es	l'i'sa	'fores'
d) 'sn'ek	sn'i'ga	'snow'

Rule of stress shift: stress is assigned on the final syllable with the plural /a/

/glaz/ /glaz-a/	/sn ^ɨ eg//sn ^ɨ eg-a/	UR
'za	'ga	Stress rule
s ---	k ---	ODR
	i	/e/- Raising
['glas] [gla'za]	[sn ^ɨ ek] [sn ^ɨ i'ga]	SR
/glaz/ /glaz-a/	/sn ^ɨ eg//sn ^ɨ eg-a/	UR
'za	'ga	Stress rule
	i	/e/- Raising
s ---	k ---	ODR
['glas] [gla'za]	[sn ^ɨ ek] [sn ^ɨ i'ga]	SR
/glaz/ /glaz-a/	/sn ^ɨ eg//sn ^ɨ eg-a/	UR
'za	'ga	Stress rule
s	k i	/e/- Raising; ODR
['glas] [gla'za]	[sn ^ɨ ek] [sn ^ɨ i'ga]	SR

Alternating morpheme with an abstract form

- The morpheme is assigned an underlying form with a segment that does not occur in any of the surface forms of the morpheme.
- A general phonological process derives the surface forms from this underlying form.

Example: Deletion of voiced bilabial and velar obstruents word-finally following a homorganic nasal, in Standard English.

(2/13)					
bɒm	bomb	bɒmɪŋ	bombing	bɒmba:d	bombard
lɒŋ	'long'	lɒŋɪŋ	longing	lɒŋgə	longer

Alternating morpheme with an abstract form, continued ...

There are, however, cases where the word final voiced obstruent does not occur in any of the alternants forms of the morpheme.

sɪŋ	sing	sɪŋɪŋ	singing	sɪŋə	singer
-----	------	-------	---------	------	--------

The underlying form posited is /sɪnɡ/, keeping in mind the general rule of g-deletion in English. The morpheme undergoes nasal assimilation and g-deletion.

a. Nasal Assimilation (English)

[+cons, +nasal] → [α anterior, β coronal] / __[-syll, α anterior, β coronal]

b. g- Deletion (English)

g → Ø / [+cons, +nasal] __#

Look up an example from German in the EPG Pathashala Paper 05 Module 2

The underlying representation is a non-occurring segment in the language

- This is an extreme form of abstraction where, in order to keep the generalization in the grammar affecting a set of alternations, underlying forms are posited with segments that never surface in the language. The SPE is full of such examples.
- The attestations usually come from documented historical change.
- Chomsky and Halle account for the diphthong-short vowel alternations [ai] ~ [i], [au] ~ [u]/[ə] and [əʊ] ~ [ʊ] using two rules
 - Diphthongization: diphthongizes long vowels /i:/ → [ai], /u:/ → [au] and /ɔ:/ → [ou] / [əʊ]
 - Trisyllabic laxing: shortens the vowels, which are considered lax, in the context of being followed by two syllables, the first of which is unstressed

(a)		(b)	
[dɪvaɪn]	divine	[dɪvɪnɪti]	divinity
[vəbəʊs]	verbose	[vəbɔːsɪti]	verbosity
[təʊn]	tone	[təʊnəsɪti]	tonacity

The underlying representation is a non-occurring segment in the language

- While this analysis is well-motivated for a lot of cases, there are morphemes that have diphthongs, [aɪ], [aʊ], etc., but no corresponding short vowels, e.g. [raɪt] ‘right’, raɪtʃəs] ‘righteous’
- Since all diphthongs in SPE are derived from long vowels, even those instances of diphthongs as in ‘right’/‘righteous’, which do not have monophthongs in alternant forms, are derived from corresponding underlying long vowels.
- In the case of ‘right’ / ‘righteous’, SPE posits an underlying segment /x/ in the words, before which short vowels diphthongize.
- Evidence for the presence of /x/ in these forms is motivated by historical facts; present-day German, for instance, which belongs to the same sub-family, West-Germanic, has the segment in the cognate forms- ‘richt’ [rix̥t] ‘richtig’ [rix̥tɪç].

/rixɪt/ 'right' /rixɪt+i+ɔs/ 'righteous'

UR

i: (i)

i: (i)

Vowel lengthening

j (i / __x)

a:j (i:)

a:j (i:)

Diphthongization

ʃ (t)

∅(x)

∅(x)

x-Deletion

∅ (i)

i-Deletion

ə (ɔ)

Vowel Reduction

[rāyt] or [ra:jɪt]

[ra:jʃəs] or [rāyɪcəs]

SR

About (c) and (d)

- (c) and (d) are extreme cases of abstractness.
- The connection between the underlying form and the surface form is too unnatural.
- They encourage “anything goes”

Insightful abstract analysis: Hungarian vowel harmony (Carr & Montreuil, 1999, p. 122)

[+syll] → [+back] / [+syll, +back] C₀ ([+syll, -back, -round] C₀) __

- The default feature value with regards to backness of the suffix is [-back].
- The suffix vowel is [+back] when the vowel in the root form is [+back]
- The presence of the neutral intervening vowel with the feature [-back, -round] is of no consequence.

1)	(a) [kert]	‘garden’	(b) [kertnek]	(c) [kerttø:l]
2)	(b) [ʃi:n]	‘colour’	(b) [ʃi:nnek]	(c) [ʃi:ntø:l]
3)	(a) [ʃege:ɲ]	‘poor’	(b) [ʃege:ɲnek]	(c) [ʃege:ɲtø:l]

1)	(a) [ɲi:l]	‘arrow’	(b) [ɲi:lnɔk]	(c) [ɲi:lto:l]
2)	(a) [fɪŋ]	‘fart’	(b) [fɪŋnɔk]	(c) [fɪŋkto:l]
3)	(a) [hi:d]	‘bridge’	(b) [hi:dnɔk]	(c) [hi:dto:l]

There are a large set of roots (about 60) with [-back] vowels that take [+back] suffixes.

How do we treat these 60?

- (1) Treat them as exceptions (like the English plural forms *men*, *nuclei* etc)
- (2) Find a systematic way to account for them

(1) Is less favourable since their behaviour is systematic: The roots that undergo vowel harmony always do, and those that are always exceptions to vowel harmony are exceptions. (2) is more favourable, since the exceptions are consistent.

We take the path of abstraction

The path of abstraction

- The roots are explained to be systematically irregular because they behave as if the root vowel in them is [+back].
- The roots in the exceptional cases are posited as consisting of [+high, +back, -round] vowels. Hungarian then has the following underlying vowels:

Short vowels

	[-back]		[+back]	
	[-round]	[+round]	[-round]	[+round]
[+hi]	i	ɥ	ɨ	u
[-hi, -low]	e	ø		o
[+low]				ɑ

Long vowels

	[-back]		[+back]	
	[-round]	[+round]	[-round]	[+round]
[+hi]	i:	ɥ:	ɨ:	u:
[-hi, -low]	e:	ø:		o:
[+low]				ɑ:

1)	(a) [ɲi:l]	‘arrow’	(b) [ɲi:lnɒk]	(c) [ɲi:lto:l]
2)	(a) [fiŋg]	‘fart’	(b) [fiŋgnɒk]	(c) [fiŋkto:l]
3)	(a) [hi:d]	‘bridge’	(b) [hi:dnɒk]	(c) [hi:dto:l]

The suffixes in the exceptions above take [+back] vowels in the words with the roots having [+high, +back, -round] vowels.

This is an abstract analysis, because it needs a rule of absolute neutralization that changes across the board the [+high, +back, -round] vowels /i i:/ to [-back] [i i:] :

This means there is external rule ordering imposed in the grammar: The neutralization rule follows the vowel harmony rule in Hungarian

$[+syll] \rightarrow [+back] / [+syll, +back] C_0 ([+syll, -back, -round] C_0) ___$

$[+syll, +high, +back, -round] \rightarrow [-back]$

A dark, textured background featuring a collage of white line drawings of school supplies. Visible items include a globe, a stack of books, a pair of compasses, a ruler, and a microscope.

Kiparsky's alternation condition

See Kiparsky, 1968

- Kiparsky showed that the SPE model allowed for analyses that yielded counterintuitive results i.e. they involved distanced relation between surface forms and underlying forms.
- Two main types of cases that Kiparsky considered counterintuitive abstractness.
 - The phonological use of diacritic features
 - The diacritic use of phonological features

The phonological use of diacritic features

- Rules which have the form of phonological rules but operate on diacritic features.

(Kiparsky 1968: 11). A case in point is the proposal by some to account for the difference in two classes of words that undergo different vowel harmony changes. Thus, Finnish has two classes of words, those that show backness harmony, and those that show frontness harmony, as exemplified in the words [pouta] and [pöjtä]. The difference could be shown to be dependent on the feature $[\pm B]$ (for $[\pm \text{Back}]$). Both the words could be represented as *pOUtA* underlyingly and classified with the label $[+B]$ for *pouta* and $[-B]$ for *pöjtä*. $[\pm B]$ is a diacritic being used as a phonological feature.

The diacritic use of phonological rules

The SPE analysis of the English words *right/ righteous*, briefly presented in Module 2 of this paper, can be said to belong to the latter type. The consonant /x/ in these words is posited to show that they are different from words such as *decide/ decision*, in not having alternating diphthongs and monophthong vowels. As can be seen from the derivation reproduced in (6) from (19) in the preceding module, the diphthong in the words *right/ righteous* is explained as owing to the presence of /x/ in these words, which provides the context for the lengthening of the preceding vowel /i/. The long vowel /i:/ then is diphthongized to /ai/ after the general rule of diphthongization. Eventually /x/ is deleted.

(6)

/rix/ 'right'	/rix+i+0s/ 'righteous'	UR
i: (i)	i: (i)	Vowel lengthening
-----	j (i / __x)	
a:j (i:)	a:j (i:)	Diphthongization
-----	tʃ (t)	
Ø(x)	Ø(x)	x-Deletion
-----	Ø (i)	i-Deletion
-----	ə (ɒ)	Vowel Reduction
[rāyt] or [ra:jt]	[ra:jʃəs] or [rāyjcəs]	SR

The cases of non-alternating forms with the diphthong /ai/ are thus differentiated from alternating forms with [ai] and [i] vowels.

The alternation condition

- Both types of extreme cases of abstractness could have simpler analyses if it could be shown that these forms are exceptions that require the use of phonological feature as a diacritic or a diacritic as a phonological feature.
- To choose such analyses there must be some sort of constraint prohibiting the two types of cases leading to counterintuitive results.
- This constraint was named the **alternation condition**.
- The condition states that underlying segments could be postulated only if they corresponded to surface segments. Such a condition would ensure prevention of ad hoc analyses and counterintuitive relation between phonological representations and phonetic forms.

The revised alternation condition

In a revised proposal, Kiparsky (1973) proposed to restrict abstract representations on account of neutralization rules on the basis of rule applications. The revised alternation condition required that 'absolute neutralization rules only apply to derived forms'. Derived forms were forms that resulted (a) either from the application of a morphological rule, e.g. historic from history, or (b) from the application of one or more phonological rule, e.g. [jeŋ] from /jeŋg/ 'young', on account of a generalization common to forms such as youn[g]er, han[g]er, etc.

Absolute Neutralisation - "suppression of all contexts of an underlying difference between elements"

Strength Hierarchy

Principles of Markedness