A note on architecture

Phonology
/s/ => h if not an onset (before v)

/s/

[s] _V

[h] elsewhere

(Argentinian)
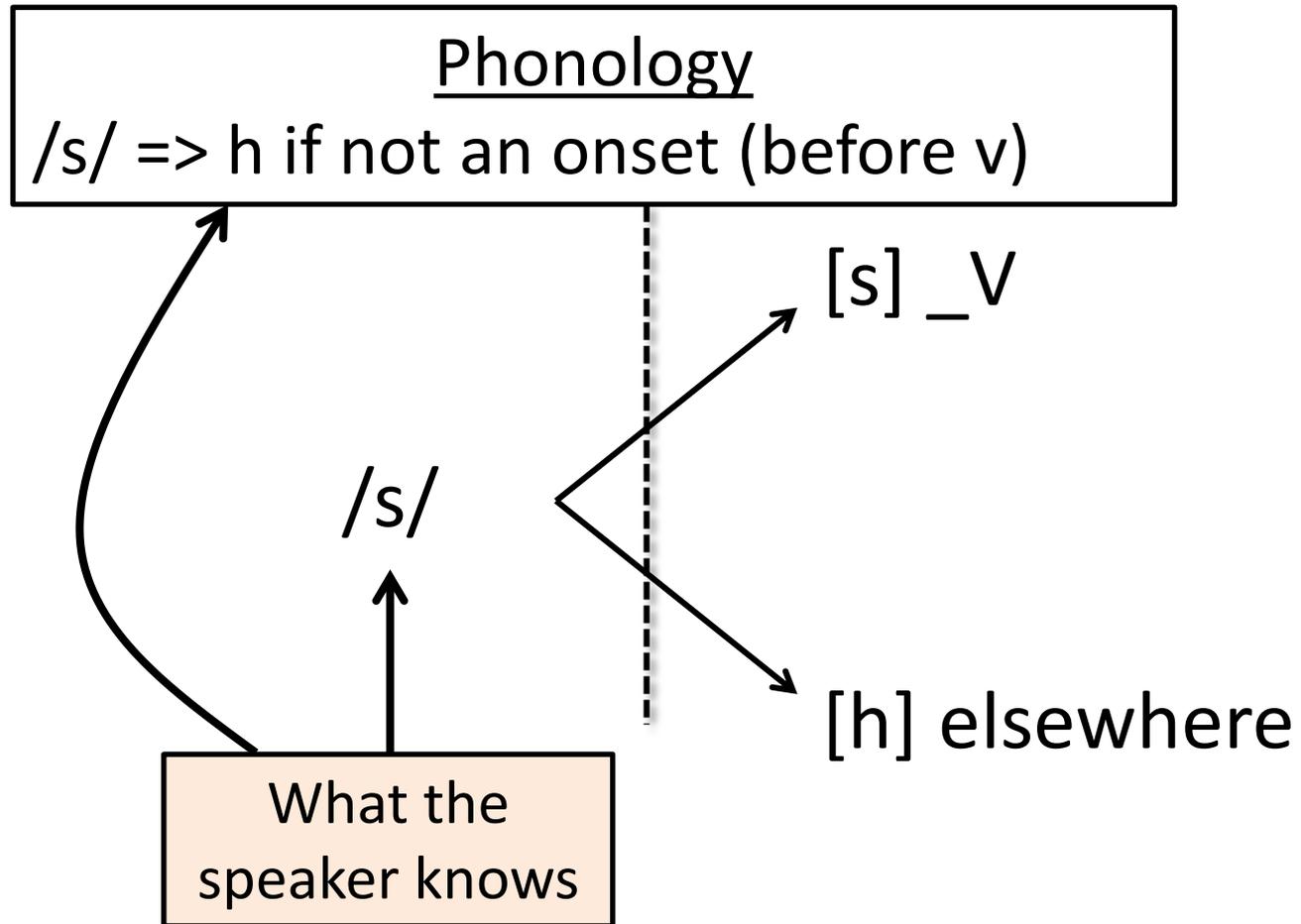
A note on architecture

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Abstract knowledge, not a pronunciation.

A note on architecture

Phonology
/s/ => h if not an onset (before v)

[s] _V

/ 🕷 /

[h] elsewhere

Abstract knowledge, not a pronunciation.

A note on architecture

/ 🕷 / => [s] _V

/ 🕷 / => [h]
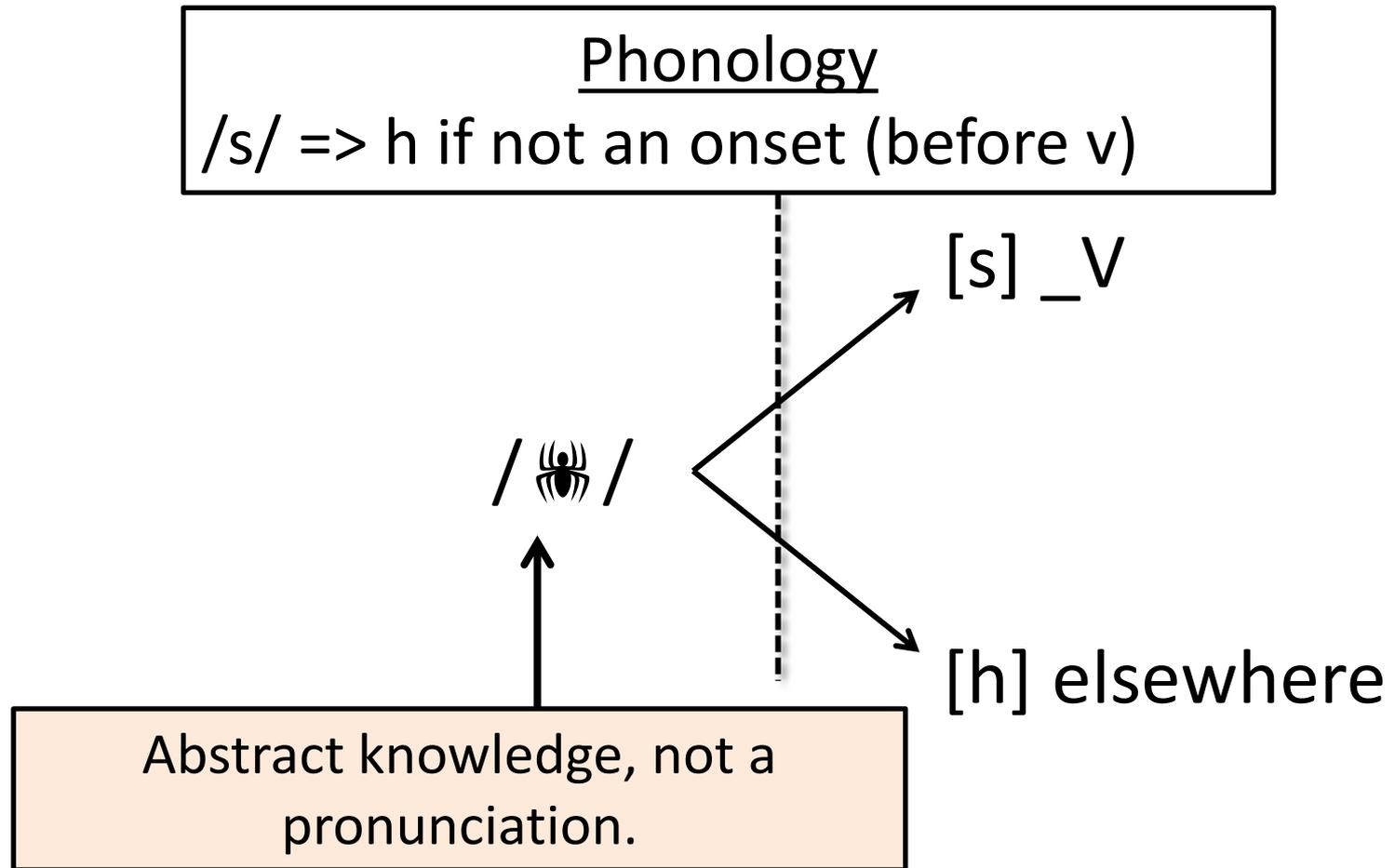
"Phonology maps abstract units to articulation"

A note on architecture

/ 🕷 / => [s] _V

/ 🕷 / => [h]

"Phonology maps abstract units to articulation"

("substance-free phonology")

AND THAT'S ALL!

A note on architecture

/ 🕷 / => [s] _V

/ 🕷 / => [h]

"Phonology maps abstract units to articulation"

("substance-free phonology")

↓ ↓

In principle, any mapping is possible…

A note on architecture

… and indeed, there are some pretty crazy regularities in different languages, e.g. Brazilian orthographic /r/

/🕷/ => [h] in singleton onsets, e.g. [hiu] 'Rio'

/🕷/ => [r] in branching onsets, e.g. [braziw] 'Brasil'

/🕷/ => [ɹ] in codas [veɹdʒi] 'green' (in some regions)

A note on architecture

… but it never gets really crazy

/ 🕷 / => [h] _V

/ 🕷 / => [kχ] elsewhere

▪ The model we've adopted actually predicts such cases.

A note on architecture

▪ proponents of "substance-free" phonology attempt to show that human beings *can* learn such "crazy" patterns.

▪ They try to check what patterns human-beings cannot learn, through experiments in artificial language learning.

▪ The reason that the patterns are not found they attribute to diachrony: such alternations never get a chance to be "born".

Allomorphy

an introduction to the phonology-morphology interface

2nd class: formalizations and representations

Through the prism of allomorphy, we saw two possibly incompatible views of phonology:

1) Phonology as blind filter

2) Phonology also as a UR selector
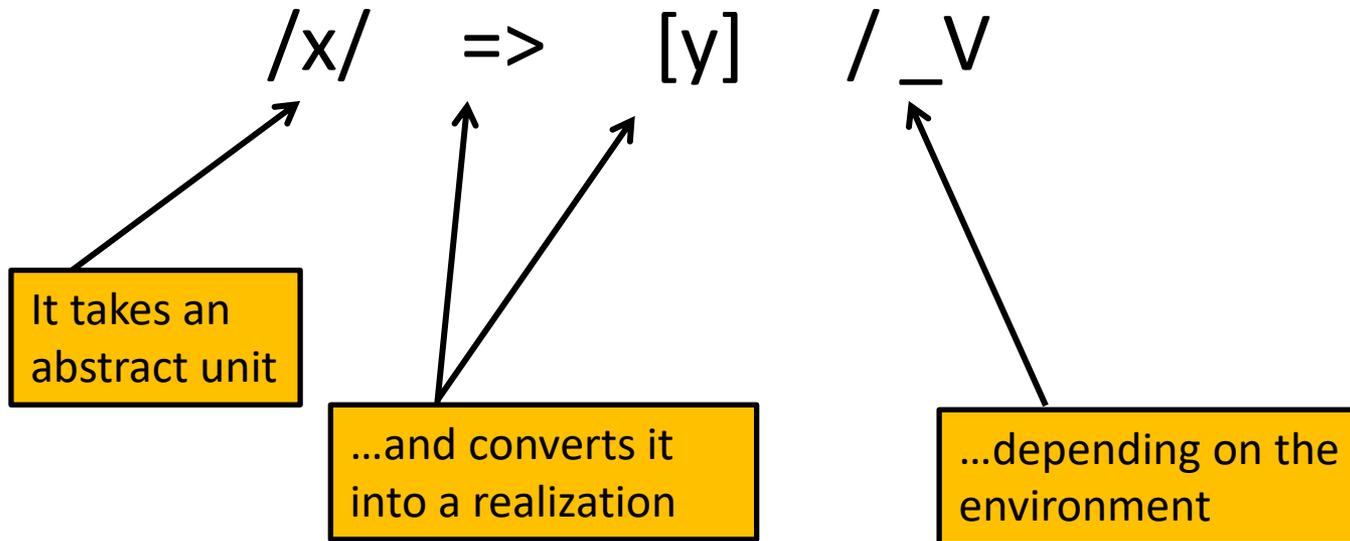
2nd class: formalizations and representations

Today we will see:

1) Formalizations of optimization

2) Richer representations

3) Should one always go for allomorphy?

The classic model of phonology

So far, our model does the following:

/x/   =>   [y]   / _V

It takes an abstract unit

…and converts it into a realization

…depending on the environment

The classic model of phonology

So far, our model does the following:

$$/s/ \quad => \quad [h] \quad / \text{ \_}]_{syll}$$

It takes an abstract unit

…and converts it into a realization

…depending on the environment
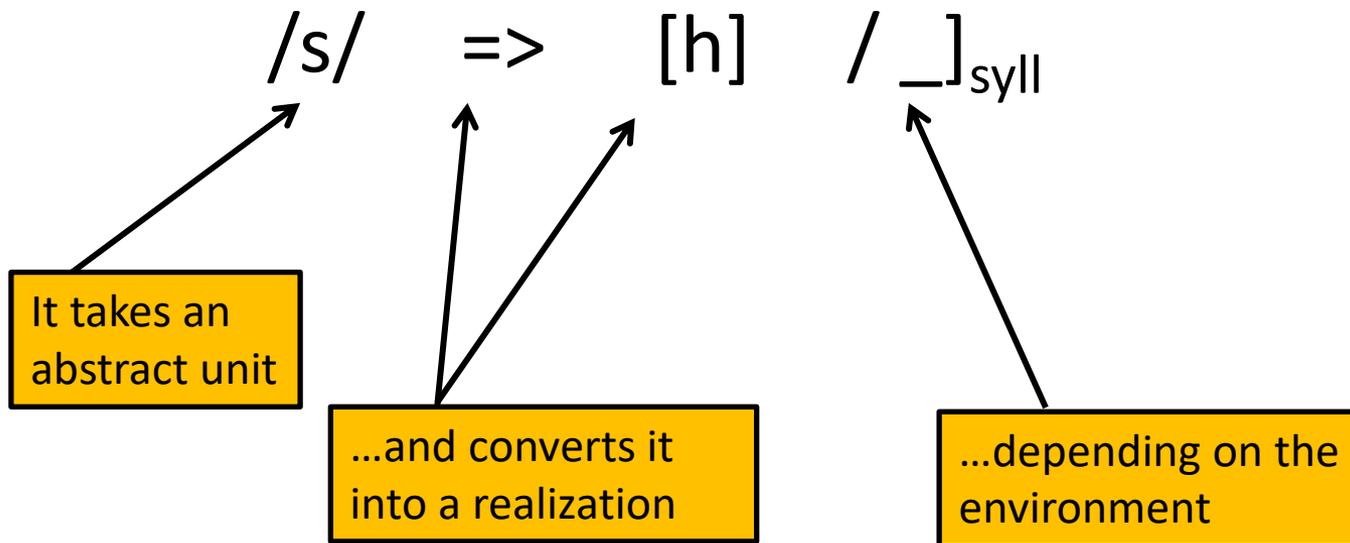
The classic model of phonology

This amounts to saying: there is a problem

$$/s/ \quad => \quad [h] \quad / \_]_{syll}$$
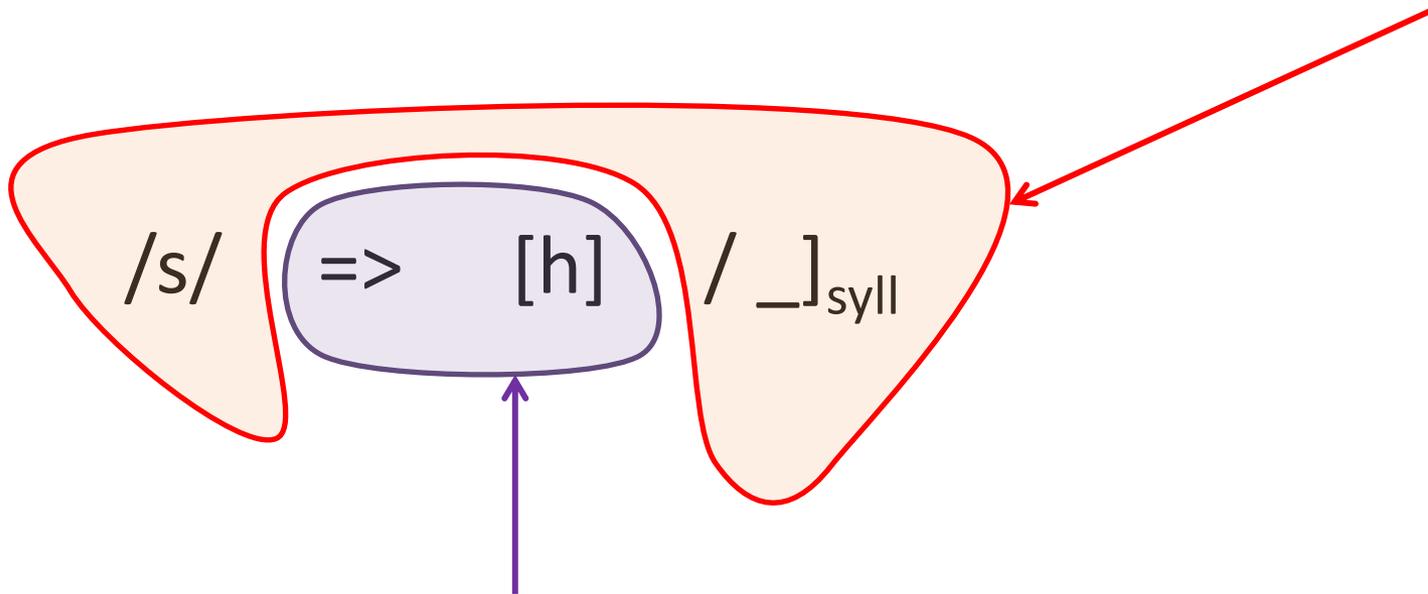
...And there's a solution.

The classic model of phonology

▪ However, it became increasingly clear that in many languages, the same problem is solved differently depending on the environment.

Catalan

/Vnt/=> [Vn]   /Vkt/ => [Vkt]

/Vln/ => [len]   etc.

The classic model of phonology

▪ This was one of the reasons that linguists wanted to separate the problem from the solution.

Catalan

/Vnt/ => [Vn]   /Vkt/ => [Vkt]

/Vln/ => [len]   etc.

Optimality Theory (Prince & Smolesky 1993)

For a given UR, the grammar evaluates several outputs by means of a constraint hierarchy:

/górad/	*C$_{[+voice]}$]#	*postonic [a]	FaithC
☞ a. górət			*
b. górat		*!	
c. górad	*!		

Optimality Theory (Prince & Smolesky 1993)

The candidate that violates the lowest ranking constraint is the « last man standing »; it is the optimal candidate.

/górad/	*C$_{[+voice]}$]#	*postonic [a]	FaithVoice
☞ a. [górət]			*
b. [górat]		*!	
c. [górad]	*!		

Lethal violation: the candidate exits the competition because it violates a constraint that other competing candidates do not violate

Non-lethal violation: the candidate violates a constraint, but there is no other candidate to compete with it

Optimality Theory (Prince & Smolesky 1993)

Phonology in this case is two things: 1) a SR generator, and 2) an evaluator of UR-SR relations

/górad/	*C$_{[+voice]}$]#	*postonic [a]	FaithC
☞ a. górət			*
b. górat		*!	
c. górad	*!		

Formalization of UR selection

Recall the simple case of allomorphy from French

[de-buʃe]   but   [dez-okype]

vs.

[pχe-buʃe]   but   [pχe-okype]

*[pχez-okype]

Allomorph selection in OT

For allomorphy, we have seen that there are two URs.
One may assume that they are both in the input:

$\left\{\begin{array}{l} \text{/de/} \\ \text{/dez/} \end{array}\right\}$ + /buʃe/	No epenthesis	*Hiatus	*CCV (*Coda)
☞ a. debuʃe			
b. dezbuʃe			*!

Allomorph selection in OT

For allomorphy, we have seen that there are two URs. One may assume that they are both in the input:

{/de/ /dez/} + /oky/	No epenthesis	*Hiatus	*CCV (*Coda)
a. deokupe		*!	
☞ b. dezokype			

Allomorph selection in OT

Cases with no allomorphy simply will not have the option of avoiding hiatus (Dep punishes candidates with segments that aren't there in the input)

/pʁe/ + /okype/	No epenthesis	*Hiatus	*CCV (*Coda)
☞ a. [pχeokupe]		*	
b. [pχe**z**okupe]	*!		

Allomorph selection in OT

Cases with no allomorphy simply will not have the option of avoiding hiatus (Dep punishes candidates with segments that aren't there in the input)

/ʒeoloʒi/	No epenth.	*Hiatus	*CCV (*Coda)
☞ a. [ʒeoloʒi]		*	
b. [ʒe**z**oloʒi]	*!		

Allomorph selection in OT

/de/ /dez/ + /okype/	No epenth	*Hiatus	*CCV (*Coda)
a. [deokype]		*!	
☞ b. [dezokype]			

/pʁe/ + /okype/	No epenth	*Hiatus	*CCV (*Coda)
☞ a. [pχeokupe]		*	
b. [pχezokupe]	*!		

Allomorph selection in OT

/de/ /dez/ + /okype/	Dep	*Hiatus	*CCV (*Coda)
a. [deokype]		*!	
☞ b. [dezokype]			

/pʁe/ + /okype/	Dep	*Hiatus	*CCV (*Coda)
☞ a. [pχeokupe]		*	
b. [pχezokupe]	*!		

Allomorph selection in OT

/de/ /dez/ + /okype/	Dep	*Hiatus	*CCV (*Coda)
a. [deokype]		*!	
☞ b. [dezokype]			

The trick: unlike *[pχez], [dez] does not violate Dep, because it is a lexically-stored option

/pʁe/ + /okype/	Dep	*Hiatus	*CCV (*Coda)
☞ a. [pχeokupe]		*	
b. [pχe**z**okupe]	*!		

Allomorph selection in OT

/de/ /dez/ + /okype/	Dep	*Hiatus	*CCV (*Coda)
a. [deokype]		*!	

This formalizes the fact that there is **phonological optimization** in the choice of [dez] or [de]. In essence, the analysis **hard-wires solutions to well-formedness constraints into the lexical knowledge**, in this case in the form of two underlying representations.

☞ a. [pχeokupe]		*	
b. [pχe**z**okupe]	*!		

Allomorph selection in OT

/de/ /dez/ + /okype/	Dep	*Hiatus	*CCV (*Coda)
a. [deokype]		*!	

The price for this trick is to complicate the role of phonology and abandon the idea of phonology as a "blind" interpretive module

☞ a. [pχeokupe]		*	
b. [pχe**z**okupe]	*!		

Representations: an alternative

Maybe there is a way around this complication of the role of phonology.

In the first class, we assumed that URs contained sequences of basic sound units (phonemes):

/m æ n/

Representations

But nowadays most phonologists would agree that this view is too simplistic.
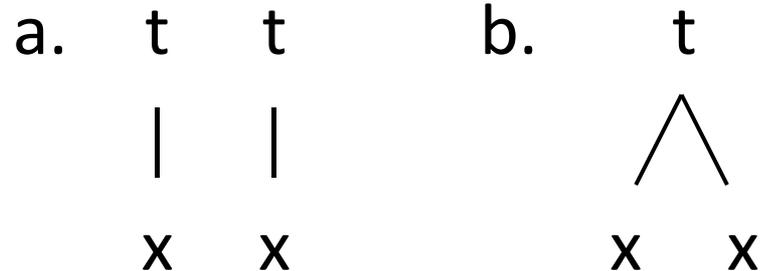
Rather, representations involve at least two tiers:

|			
Segmental	m	æ	n
	|	|	|
Skeletal	x	x	x

Representations

Such representations are especially helpful in the understanding of long segments, e.g. Italian [fatːo] 'done'.

Rather than just two identical consecutive segments (a), they are the same segment attached to two positions (b)

```
a.   t   t        b.      t
     |   |                /\
     x   x              x   x
```

Representations

Once the segmental and skeletal tiers are separated, one must recognize several possible deficient scenarios

a.   b. t   c. t   c. t

                                  |

x   x   x
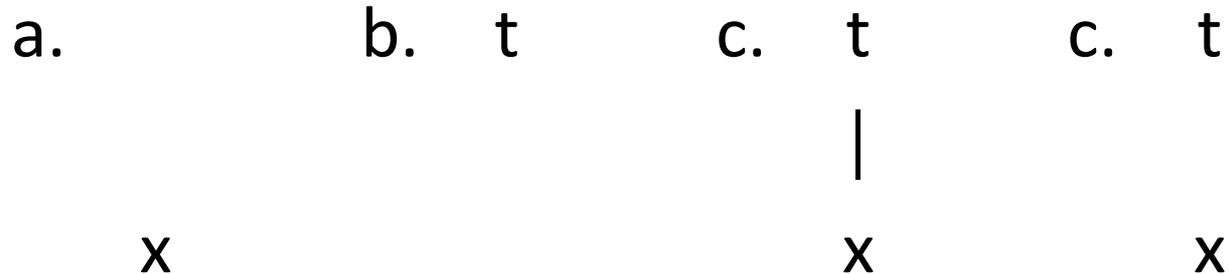
CVCV Phonology (Lowenstamm 1996, Scheer 2004)

A phonological theory in whose representations the skeletal tier is composed of CV units (strictly alternating Cs and Vs):

a. m æ n
    | | |
    C V C V

    [mæn]

b. m æ n   l i
    | | | | |
    C V C V C V

    [mænli]

CVCV Phonology (Lowenstamm 1996, Scheer 2004)

Thus, phonetically V-initial words in this theory begin with an empty V slot:

```
   o   k   y   p   e
   |   |   |   |   |
C  V   C   V   C   V
```
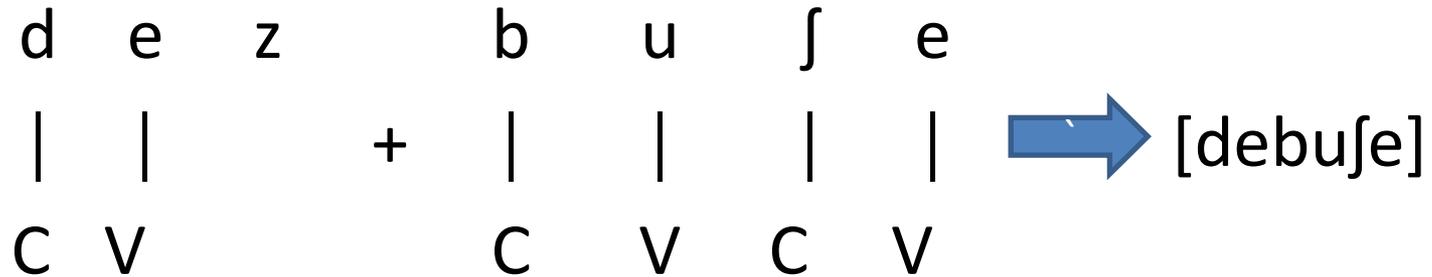
[okype]

CVCV Phonology: floating consonants

Back to [dez] ~ [de], within this framework, we can assume that the lexical representation of this morpheme involves a floating segment, with no C-slot:

```
d  e   z
|  |
C  V
```

CVCV Phonology: floating consonants

Before a C-initial base, there is no position for the floating segment to dock onto, and it cannot be realized

```
d   e   z       b   u   ʃ   e
|   |       +   |   |   |   |      ➡   [debuʃe]
C   V           C   V   C   V
```
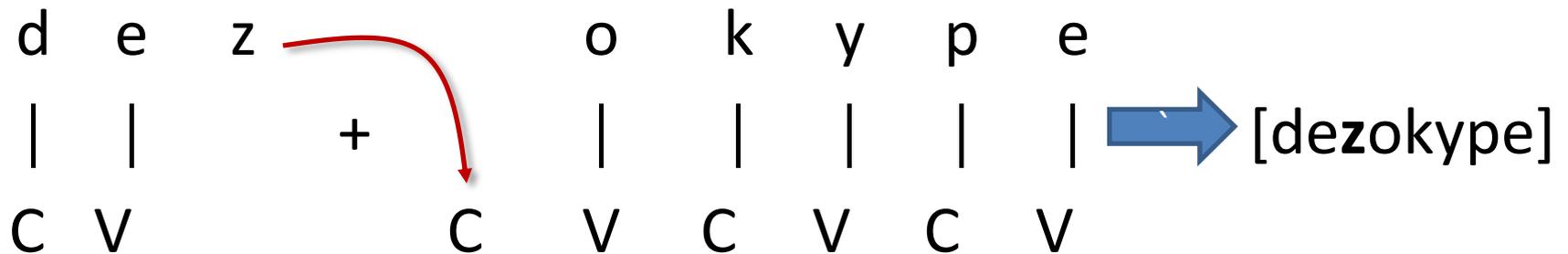
CVCV Phonology: floating consonants

But before a V-initial base, there is such a position

```
d   e   z           o   k   y   p   e
|   |       +       |   |   |   |   |
C   V           C   V   C   V   C   V
```

CVCV Phonology: floating consonants

But before a V-initial base, there is such a position

```
d   e   z              o   k   y   p   e
|   |       +          |   |   |   |   |      ⇨   [dezokype]
C   V          C   V   C   V   C   V
```

CVCV Phonology: floating consonants

But before a V-initial base, there is such a position

d e z → o k y p e

| | | + | | | | | → [de**z**okype]
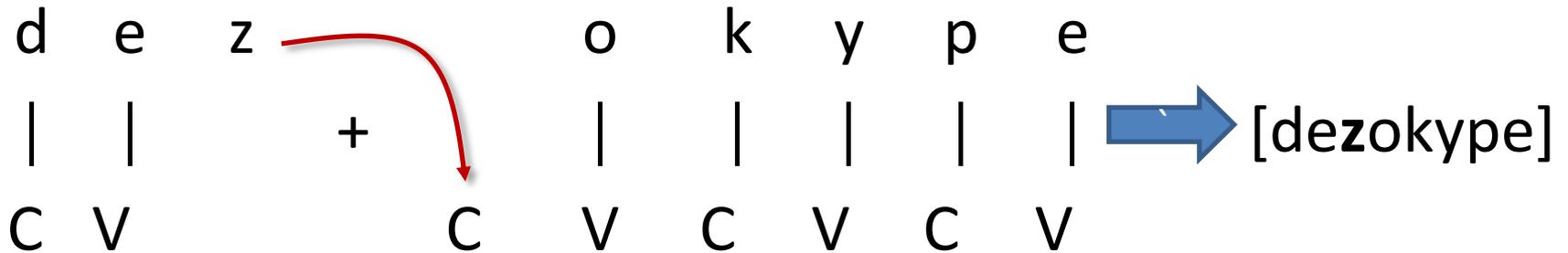
C V C V C V C V

(The CVCV skeleton is indepenedently motivated – it was not invented to solve this problem)

CVCV Phonology: floating consonants

This analysis assumes

     1) Segments seek to dock (be realized)

     2) Segments may remain unrealized

As the OT analysis, it conveys the optimization in the realization

CVCV Phonology: floating consonants

The analysis has the advantages that

      1) Phonology remains interpetative

      2) There is only one UR

It has the disadvatage that

      1) it integrates another tier into the UR

CVCV Phonology: floating consonants

The analysis has the advantages that

> 1) Phonology remains interpetative

> 2) There is only one UR

This is NOT allomorphy!!

It has the disadvatage that

> 1) it integrates another tier into the UR

Comparing the analyses

/de/ /dez/ + /okype/	Dep	*Hiatus	*CCV (*Coda)
a. [deokype]		*!	
☞ b. [de**z**okype]			

d   e   z   o   k   y   p   e

| | + | | | | | ➡ [de**z**okype]

C   V   C   V   C   V   C   V

Comparing the analyses: How different are they really?

/de/ /dez/ + /okype/	Dep	*Hiatus	*CCV (*Coda)
a. [deokype]		*!	
☞ b. [de**z**okype]			

d   e   z   ⟶   o   k   y   p   e

| | + | | | | | ⟹   [de**z**okype]

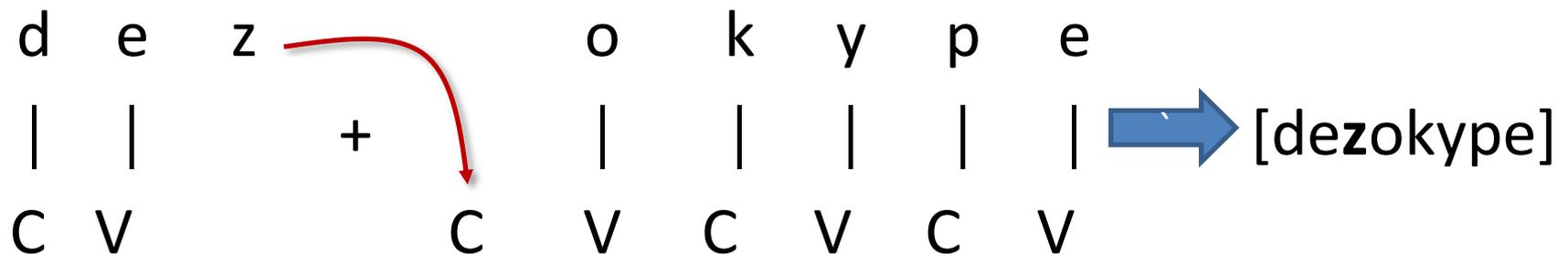C   V   C   V   C   V   C   V

Comparing the analyses: How different are they really?

Both assume an idiosyncracy in the representation

/de/ /dez/ Two URS	Dep	*Hiatus	*CCV (*Coda)
a. [deokype]		*!	
☞ b. [de**z**okype]			

Floating C

d   e   z   o   k   y   p   e

| | + | | | | | ➡️ [de**z**okype]

C   V   C   V   C   V   C   V

Comparing the analyses: How different are they really?

/de/ /dez/ + /okype/	Dep	*Hiatus	*CCV (*Coda)
a. [deokype]		*!	
☞ b. [de**z**okype]			

But the two-UR analysis is less economic/elegant, because

1) Since /de.../ is common to both URs, the analysis does not encode the fact that the locus of variation is only the /z/.

2) it does not relate the possibility of this [z] to any independently-available option in the theory.

Comparing the analyses: How different are they really?

Note that there is nothing about OT that forces one to have two URs in such cases. One can integrate representations into OT and have the same analysis as in CVCV

/de z/ + /okype/ CV CVCVCV	Dep	No floating
☞a. [dezok ype] CVCVCVCV		
b. [dez okype] CV CVCVCV		*!

Comparing the analyses: How different are they really?

Note that there is nothing about OT that forces one to have two URs in such cases. One can integrate representations into OT and have the same analysis as in CVCV

/de z/ + /buʃe/ CV CVCV	Dep	No floating
a. [dez b u ʃe] CVCVCVCV	*!	
☞ b. [dez bu ʃe] CV CVCV		*

Note on the cost of allomorphy

The assumption here:

- allomorphy is costly
- and if a single UR solution works, it's better

Note on the cost of allomorphy

The assumption here:

- allomorphy is costly

- and if a single UR solution works, it's better

However, if allomorphy is costly, why does it exist at all... The optimization in [dez],[de] can justify its existence; but as we will see, not all phon-con allomorphy is optimizing

Summary

- Any analysis of phonologically-optimizing allomorphy must encode the possibility to optimize in the representation.

- Autosegmental analyses with floating, optional segments are less ad-hoc and – when the two allomorphs are similar, which is nearly always – more economic.

Problems

- How abstract can you be?

- When the loser is not problematic

- When the phon-con allomorphy is not optimizing

- Is all allomorphy epiphenomenal?

How abstract can you get?

- From Scheer (2016):

a. -s

kap-sz	'you get'
dob-sz	'you throw'
lök-sz	'you push'
vág-sz	'you cut'
nyom-sz	'you press'
lő-sz	'you shoot'
ró-sz	'you scold'

b. -El

mos-ol	'you wash'
néz-el	'you look'
tesz-el	'you put'
ráz-ol	'you shake'
vonz-ol	'you attract'
főz-öl	'you cook'

How abstract can you get?

- From Scheer (2016):

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a. lexical identity

```
O  N
|
s  l
```
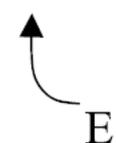
b. after regular stems

```
O  N  O  N  -  O  N
|  |  |        |
C  V  C        s  l
```

c. after sibilant-final stems

```
O  N  O  N  -  O  N
|  |  |        |
C  V  S        s  l
          E
```

How abstract can you get

Problems:

1) The floating /l/ is lost forever – circular?
2) A mechanism of optimization seems to be assumed that would rule out the association of /s/.
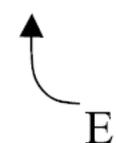3) Is this really so different from assuming two allomorphs?

a. lexical identity

```
O   N
|
s   l
```

b. after regular stems

```
O  N  O  N  -  O  N
|  |  |        |
C  V  C        s  l
```

c. after sibilant-final stems

```
O  N  O  N  -  O  N
|  |  |        |
C  V  S        s  l
            E
```

When the loser is not problematic

Catalan theme vowel allomorphy (Bonet *et al.* 2007)

a. gɔt   'glass'   gɔt-s   'glasses'
b. awt-u   'car'   awt-u-s   'cars'
c. mos-u   'lad'   mos-u-s   'lads'
d. gos   'dog'   gos-u-s   'dogs'

- For C-final masculines, there are two allomorphs : ø and /u/

- /u/ surfaces only to prevent a sibilant sequence. But why? What's so wrong with *[gɔtus]?

When the loser is not problematic

Catalan theme vowel allomorphy (Bonet *et al.* 2007)

a.	gɔt	'glass'	gɔt-s	'glasses'
b.	awt-u	'car'	awt-u-s	'cars'
c.	mos-u	'lad'	mos-u-s	'lads'
d.	gos	'dog'	gos-u-s	'dogs'

Bonet *et al* propose that **allomorphs are ordered**: one allomorph – ø in this case – is **default**, and will be used unless it raises a problem

When the loser is not problematic

An autosegmental analysis again provides an alternative:

g ɔ s u s
| | | ↓ |
C V C V C

g ɔ t u s
| | | |
C V C V C

The vowel floats above its position, and will only associate if required to

Non-optimizing phon-con allomorphy?

An example that is often brought up:

Haitian definite article allomorphy (Klein 2003)

liv-la   'book-the'
papa-a   'father-the'

Non-optimizing phon-con allomorphy?

An example that is often brought up:

Haitian definite article allomorphy (Klein 2003)

liv-la   'book-the'
papa-a   'father-the'

The opposite of what one would expect based on phonology!

Non-optimizing phon-con allomorphy?

An example that is often brought up:

Haitian definite article allomorphy (Klein 2003)

liv-la   'book-the'
papa-a   'father-the'

Alternative: in this language, there is an **alignment** force that militates in favor of syllabifying the base and suffix separately. *li.v-a

Non-optimizing phon-con allomorphy?

An example that is often brought up:

Haitian definite article allomorphy (Klein 2003)

liv-la   'book-the'
papa-a   'father-the'

Alternative: in this language, there is an **alignment** force

Problem no 1: [papa.la] is still better than [papa.a].
Solution: default status to /a/. One will use /la/ only if /a/ is not good.

Non-optimizing phon-con allomorphy?

An example that is often brought up:

Haitian definite article allomorphy (Klein 2003)

liv-la   'book-the'
papa-a   'father-the'

This is a baaaad soltion. It only means that we push the part of the problem that bothers us to the realm of the arbitrary. One must ask **why** [a] has default status…

Solution: default status to /a/. One will use /la/ only if /a/ is not good.

Non-optimizing phon-con allomorphy?

An example that is often brought up:

Haitian definite article allomorphy (Klein 2003)

liv-la   'book-the'
papa-a   'father-the'

Problem no 2: the allomorphe for [ʃɛk] 'cheque' is also [la]: [ʃɛk-la]. But then the usual syllabification of [vklv] is [ʃɛ.kla], which violates alignment...
Solution: To say that despite this, the syllabification in [ʃɛk.la]. Requires proof.

Non-optimizing phon-con allomorphy?

Many other such examples can be solved by the notion of alignment.

However, if one accepts them, then phonology does
        1) well-formedness

        2) allomorph selection

        3) priority-sensitivity

        4) syllabification is variable

Non-optimizing phon-con allomorphy?

Many other such examples can be solved by the notion of alignment.

However, if one accepts the ~~then~~ phonology does   1) well-form~~edness~~
          2) allo~~morph~~ selection
          3) ~~sonori~~ty-sensitivity
          ~~4)~~ syllabification is variable

Very different from the blind filter approach!

Non-optimizing phon-con allomorphy?

There are nevertheless many cases that cannot be accounted for even assuming phonology does all that:

Modern Hebrew

	base]#	base-V	
a.	ʦav	ʦab-**im**	'turtle-turtles'
	daf	dap-**im**	'sheet-sheets'
	ʁaχ	ʁak-ut	'soft-softness'
b.	luaχ	luχ-ot	'board-boards'
c.	kaχ**o**l	kχ**u**l-im	'blue (sg-pl)'

Non-optimizing phon-con allomorphy?

There are nevertheless many cases that cannot be accounted for even assuming phonology does all that:

French (regular plurals)

base]#	base-V
fɔʁm-ɛl	fɔʁm-**al**-ite
ʁepɛʁt-**waʁ**	ʁepɛʁt-**ɔʁj**-e

Palestinian Arabic

3pl	1pl	
ʔ**aː**l-u	ʔ**ul**-**na**	'say'
(cf. katab-u	katab-na	'write')

Phon-con allomorphy is not epiphenomenal

Indeed, it seems that in such cases one *must* admit that allomorph-selection can be sensitive to phonology without there being any optimization in it.

~~Phon-con~~ allomorphy is not epiphenomenal

Indeed, it seems that in such cases one *must* admit that allomorph-selection can be sensitive to phonology without there being any optimization in it.

And of course, there are many cases of **non-**phonologically-conditioned allomorphy that are not epiphenomenal…

Summary

Any approach must acknowledge non-optimizing phon-con allomorphy.

Summary

We've seen two approaches to *optimizing* phon-con allomorphy

1_ two lexical allomorphs, phonology selects the better allomorph

2_ A single representation - optimizing phon-con **allomorphy is epiphenomenal**.

Summary

The latter approach **cannot accommodate lexical allomorph selection in the phonology.**

What can support or refute this approach?

In the next class

We will further examine the locus of phon-con allomorph selection in the grammar.

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And we will look at a case study from Surmarian (Romantsch), which is arguably problematic for an approach that denies phonological allomorph selection.