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Exploring the Syntax-Phonology Interface: An Experimental Study on Czech Pronominal Clitics

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Outline

- How to define clitics?
- Syntactic properties of clitics
- Phonological properties of clitics
- Experiments
- Conclusion

Wackernagel´s clitics

– after the 1st syntactic constituent

1st constituent	CLITIC	the rest of the sentence	
Kous	***ho***	*dnes*	*pes.*
bit.PRET	**him.ACC**	today	dog.NOM
Pes	***ho***	*dnes*	*kous.*
dog.NOM	**him.ACC**	today	bit.PRET
Dnes	***ho***	*pes*	*kous.*
today	**him.ACC**	dog.NOM	bit.PRET

‘A dog bit him.’

Enclitics

– integrated into the preceding prosodic word (= host)

host	CLITIC	clitic integration
[kous]$_{\omega}$	**ho**	[kous ho]$_{\omega}$
bit.PRET	**him.ACC**	
[pes]$_{\omega}$	**ho**	[pes ho]$_{\omega}$
dog.NOM	**him.ACC**	
[dnes]$_{\omega}$	**ho**	[dnes ho]$_{\omega}$
today	**him.ACC**	

Syntax + phonology

Question to be answered experimentally:

Is the degree of phonological integration influenced by syntactic properties of the prosodic host?

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Syntax + phonology

Question to be answered experimentally:

Is the degree of phonological integration influenced by syntactic properties of the host?

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Question to be answered experimentally:

Is the degree of phonological integration influenced by syntactic properties of the prosodic host?

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Syntax

– ordering is a result of *MOVEMENT*

movement-type 1	movement-type 2	
verbal constituent	**non-verbal constituent**	
[Kous]$_V$ ho dnes pes.	*[Pes]$_N$ ho dnes kous.*	*[Dnes]$_{Adv}$ ho kous pes*.

Matushansky (2006)

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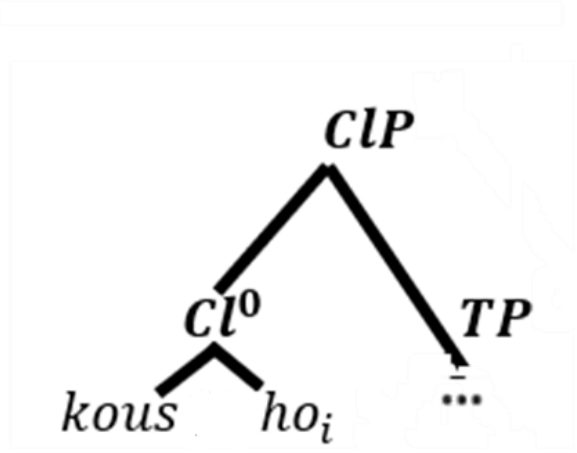
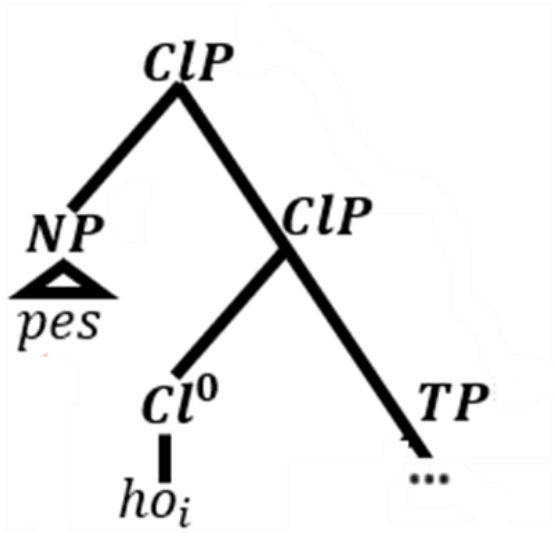
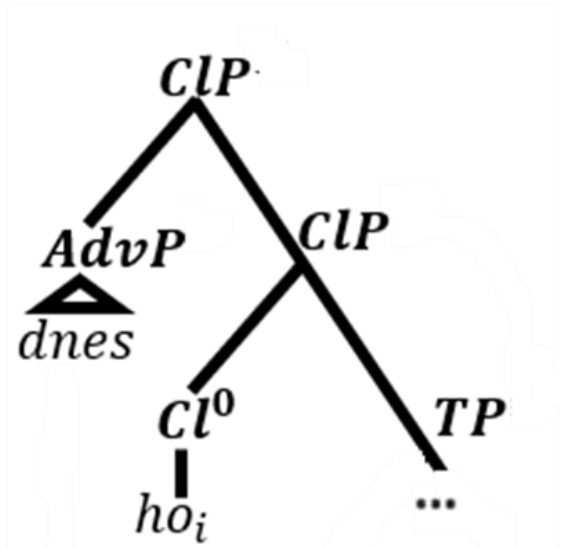
Syntax

movement-type 1	movement-type 2	
verbal constituent	**non-verbal constituent**	
[Kous]$_V$ ho dnes pes.	*[Pes]$_N$ ho dnes kous.*	*[Dnes]$_{Adv}$ ho kous pes.*



vs





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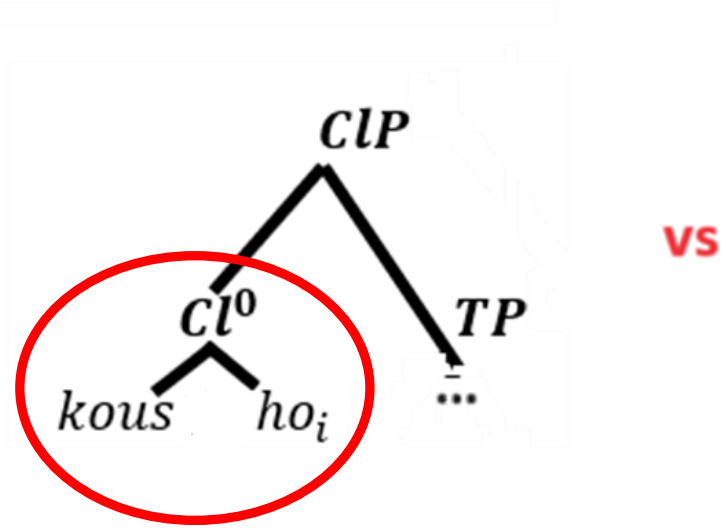
Syntax

movement-type 1	movement-type 2	
verbal constituent	**non-verbal constituent**	
[Kous]$_V$ ho dnes pes.	*[Pes]$_N$ ho dnes kous.*	*[Dnes]$_{Adv}$ ho kous pes.*



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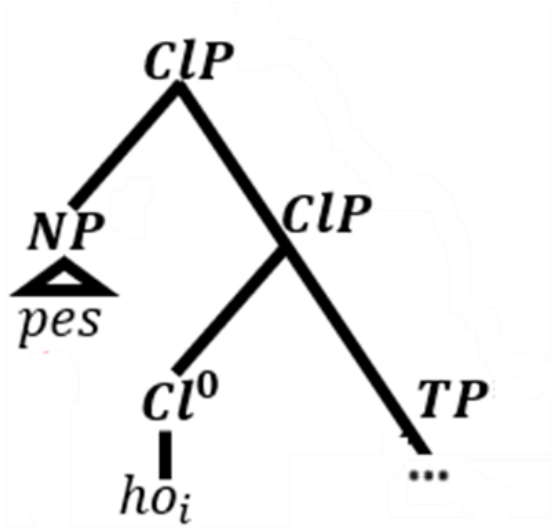

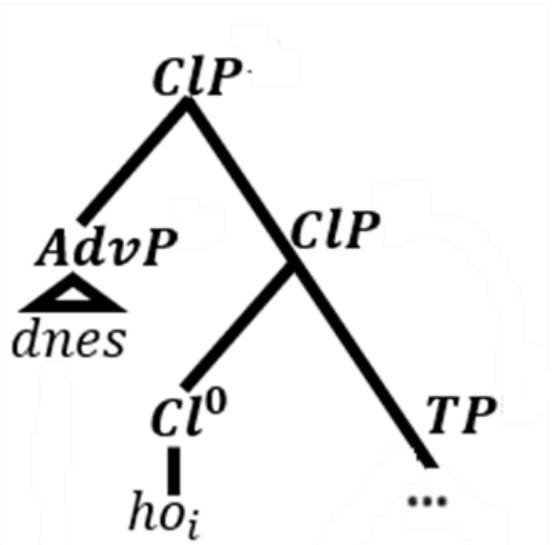

verb and clitic form one constituent

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Phonology

– how to evaluate the degree of phonological integration?

= how to measure the degree of *enclisis*?

→ let´s consider phonological processes
and their domain of application in phonology

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Phonology

– some processes apply only **within** the prosodic word

– in Czech: regressive voicing assimilation in obstruent clusters

*pro***[s]***it* ~ *pro***[zb]***a* ‘to ask’ ‘a request’

suffix is fully integrated

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Phonology

- some processes apply only **within** the prosodic word

- in Czech: regressive voicing assimilation in obstruent clusters

*pro**[s]**it* ~ *pro**[zb]**a*	‘to ask’	‘a request’
*pe**[s]* ~ *pe**[zɦ]**o kous*	‘a dog’	‘a dog bit him’

the clitic is fully integrated

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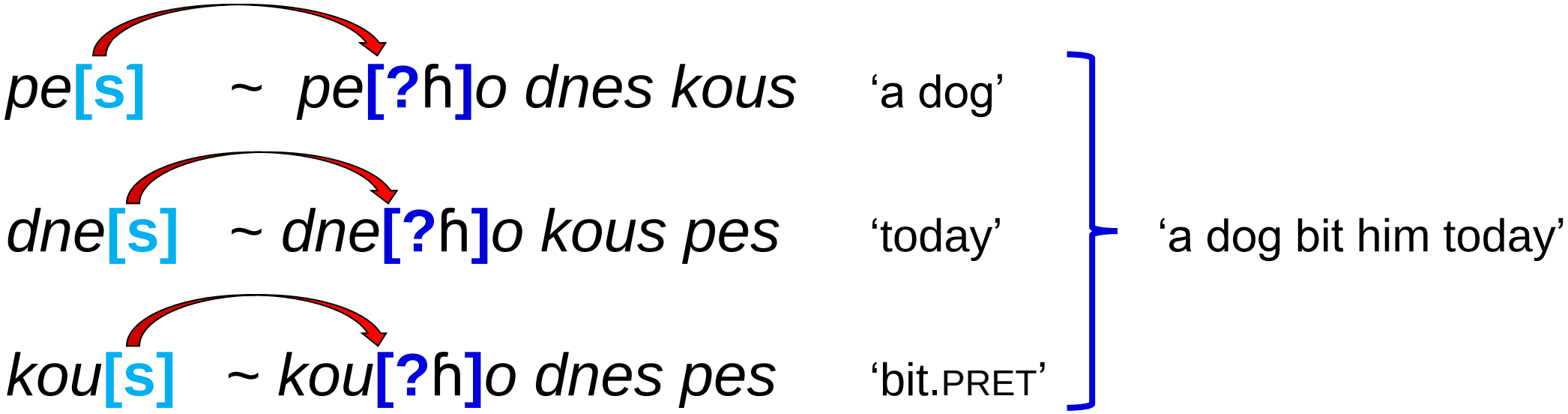
Experiment 1

– we measured the **degree of voicing** of the obstruent before the clitic



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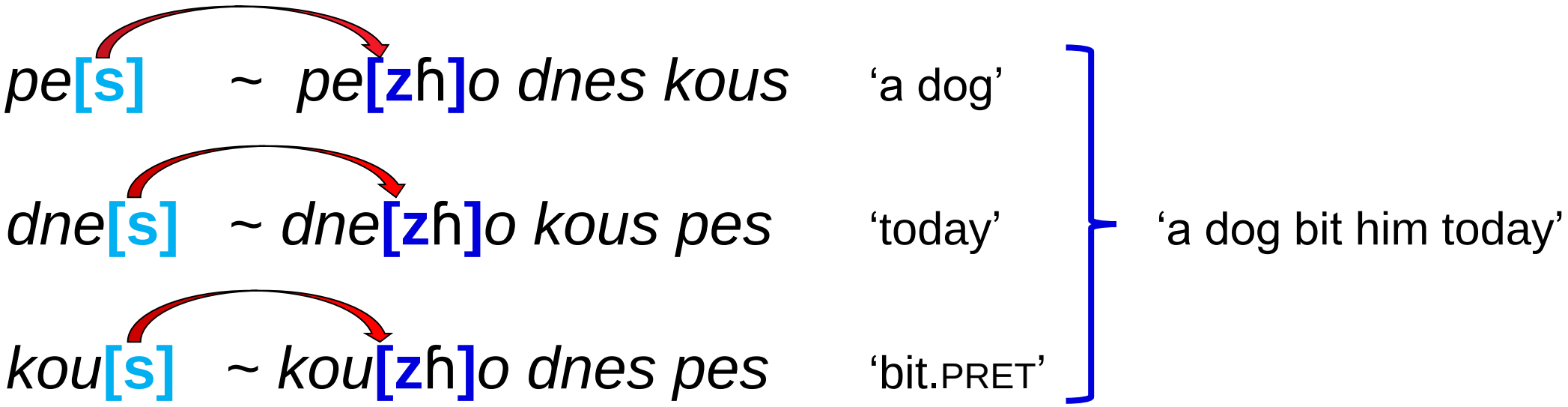
Experiment 1

– **degree of voicing** corresponds to **degree of integration**



voiceless [s] changes fully into voiced [z]: **full integration**

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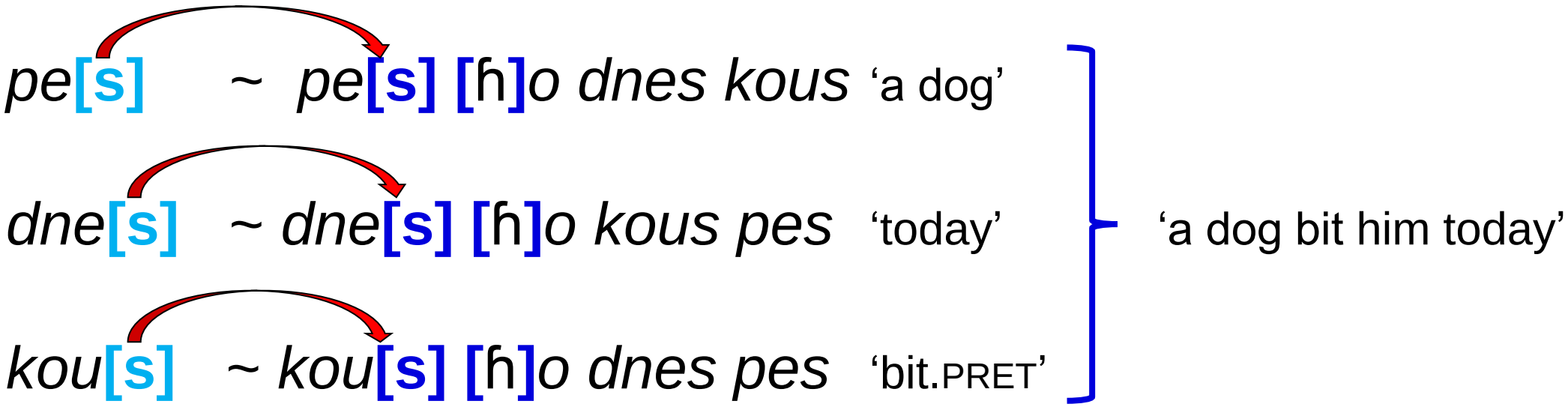
Experiment 1

– **degree of voicing** corresponds to **degree of integration**



voiceless [s] stays voiceless [s]: **no integration**

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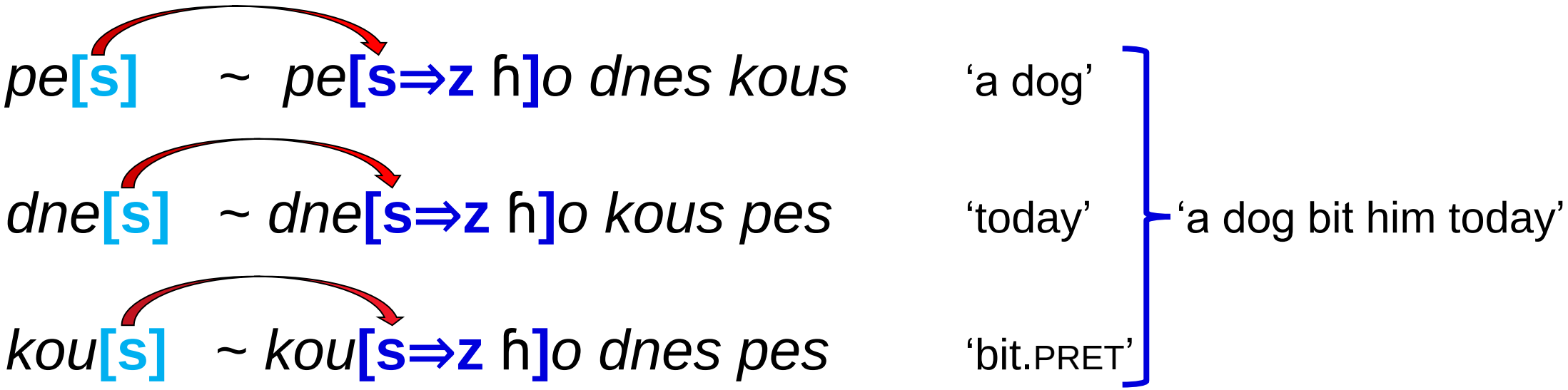
Experiment 1

– **degree of voicing** corresponds to **degree of integration**



voiceless [s] changes into partially voiced [s⇒z]: **partial integration**

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Design of Exp1

– **20** Czech native speakers read **14** sentences → **280** utterances

type	V (verb)	N (obj)	N (subj)	Adv (adv)	control items
number of sentences	**2**	**2**	**3**	**3**	**2**

– pronominal clitic ***ho*** „him/it.ACC“

control items: [word]ω + [word]ω

[stem + suffix]ω

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Design of Exp1

- what is measured

  → **degree of voicing** (word_ending_with_***C*** + *ho*)

- how it is measured

  → program ***Praat****:* fraction of voiced frames

  (based on Pitch values)

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Results of Exp1

-C ho	degree of **voicing** in front of the clitic *ho*
[V-head]ω + clitic	**91%**
[non-V-phrase]ω + clitic	**83%**

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Results of Exp1:

Clitics between words and suffixes – VOICING ASSIMILATION

-C-ba	degree of **voicing**
[stem + suffix]ω	**95%**

-C ho	degree of **voicing**
[V-head]ω + clitic	**91%**
[non-V-phrase]ω + clitic	**83%**

-C h-	degree of **voicing**
[word]ω + [word]ω	**76%**

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Phonology

– some processes indicate the **boundary** of the prosodic word

– in Czech: obstruent devoicing

mra[z]*it* ~ *mrá*[s] ‘to freeze’ ‘frost’

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Phonology

- some processes indicate the **boundary** of the prosodic word

- in Czech: obstruent devoicing

*mra**[z]**it* ~ *mrá**[s]***	‘to freeze’	‘frost’
*mra**[z]**it* ~ *mrá**[s]** **[ɦ]**o spálil***	‘to freeze’	‘frost burnt him’

the clitic is NOT integrated

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Experiment 2

– we measured the **degree of devoicing** of the obstruent before the clitic

‘to freeze’ ‘frost burnt him’

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Experiment 2

– **degree of devoicing** corresponds to **degree of integration**

*mra**[z]**it*	~ *mrá**[s]** **[**ɦ**]**o spálil*	no integration
*mra**[z]**it*	~ *mrá**[z**ɦ**]**o spálil*	full integration
*mra**[z]**it*	~ *mrá**[z⇒s** ɦ**]**o spálil*	partial integration
‘to freeze’	‘frost burnt him’	

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Design of Exp2

– **20** Czech native speakers read **11** sentences → **220** utterances

type	V (verb)	N (obj)	N (subj)	Adv (adv)	control items
number of sentences	**2**	**2**	**2**	**3**	**2**

– pronominal clitic ***ho*** „him/it.ACC“

control items: [word]ω + [word]ω

[stem + suffix]ω

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Design of Exp2

- what is measured

  → **degree of devoicing** (word_ending_with_***C*** + *ho*)

- how it is measured

  → program ***Praat****:* fraction of unvoiced frames

  (based on Pitch values)

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Results of Exp2

-C ho	degree of **devoicing** in front of the clitic *ho*
[V-head]ω + clitic	**8%**
[non-V-phrase]ω + clitic	**20%**

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Results of Exp2:

Clitics between words and suffixes – OBSTRUENT DEVOICING

-C-ba	degree of **devoicing**
[stem + suffix]ω	**5%**

-C ho	degree of **devoicing**
[V-head]ω + clitic	**8%**
[non-V-phrase]ω + clitic	**20%**

-C h-	degree of **devoicing**
[word]ω + [word]ω	**24%**

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Correlation of the two processes

Exp1	degree of **voicing**
[V-head]ω + clitic	**91%**
[non-V-phrase]ω + clitic	**83%**

Exp2	degree of **devoicing**
[V-head]ω + clitic	**8%**
[non-V-phrase]ω + clitic	**20%**

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Conclusion

- phonology mirrors syntax

- prosodic integration hierarchy:

stem+suffix > **verbal-head**+clitic > **non-verbal phrase**+clitic

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Future research

main goal: MORE DATA

- other pronominal clitics
- verbal clitics (auxiliaries)
- other phonological processes (e. g. degemination)

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