

Subphonemic differences between different types of /s/ in English:

Evidence from pseudowords

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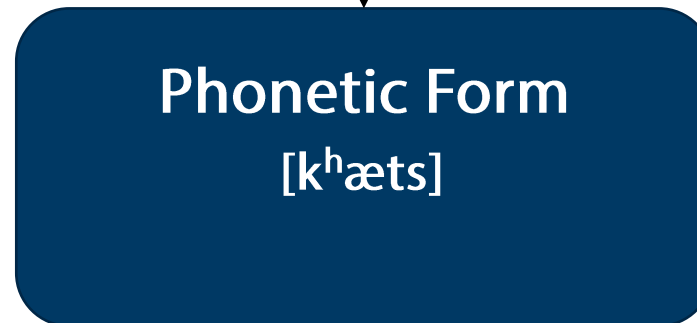
Disclaimer

In theory...

Lexical
Phonology

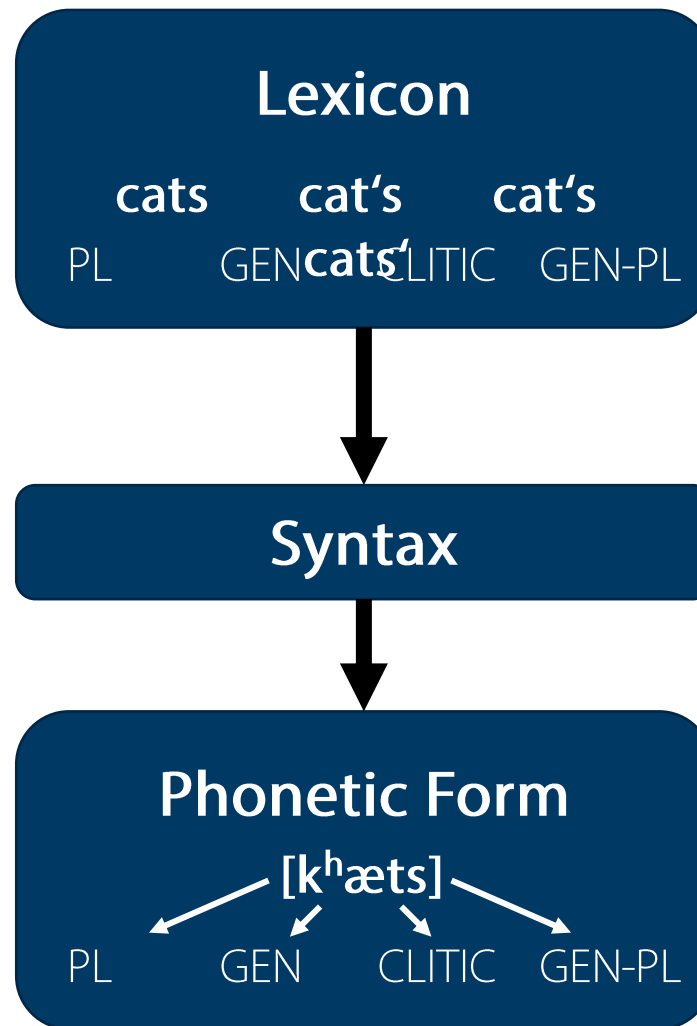


Post-Lexical
Phonology



In data...

Lexical
Phonology

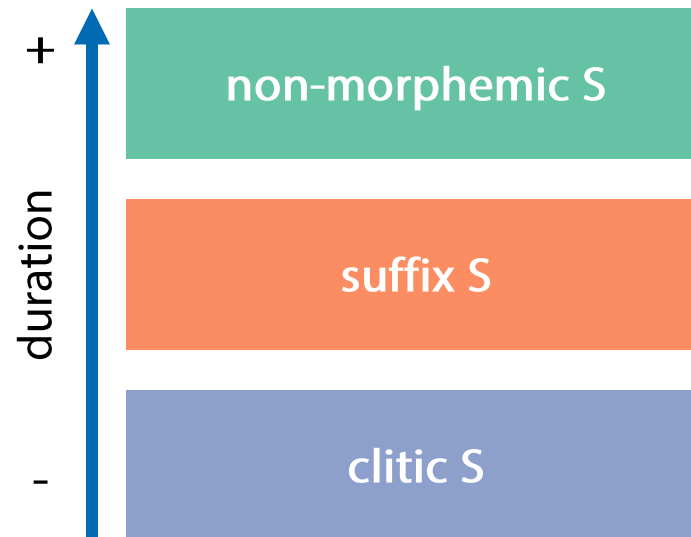


Post-Lexical
Phonology

Corpus findings

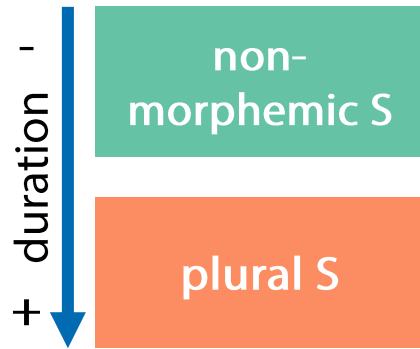
Zimmermann (2016), Plag et al. (2017), Tomaschek et al. (2019)

/s/ duration is longest in **non-morphemic** > **suffixes** > **clitics**



Experimental findings

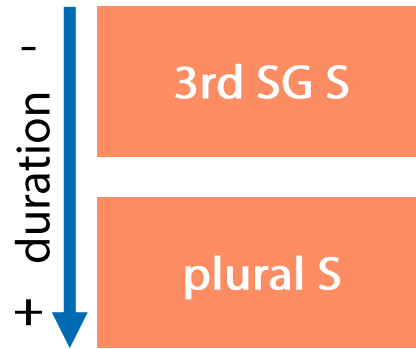
Walsh & Parker
(1983)



- ▶ Very small data set, n=361
- ▶ Lack of inferential statistic analysis
- ▶ No integration of phonetic covariates

Experimental findings

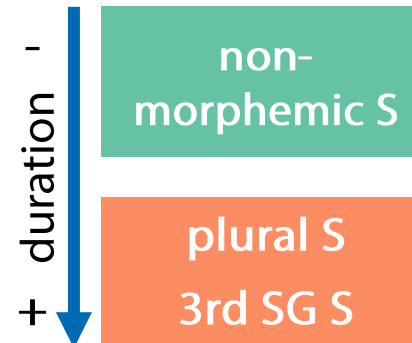
Li et al.
(1999)



- ▶ Rather small data set, n=823
- ▶ Imbalance of sentence-medial and -final occurrences of word-final /s/

Experimental findings

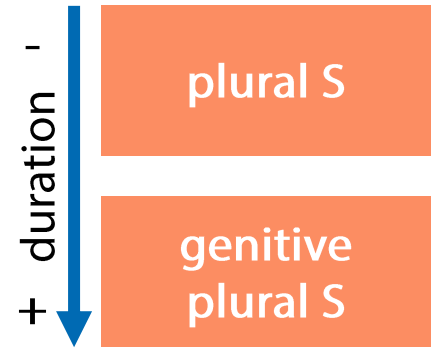
Seyfarth et al.
(2017)



- ▶ No differentiation of /s/ and /z/ with a clear majority of /z/ items
- ▶ No reliable evidence for duration of /s/ due to lack of data

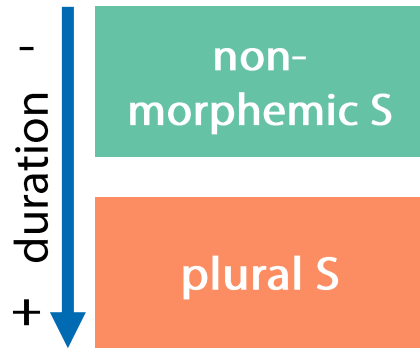
Experimental findings

Plag et al.
(2019)

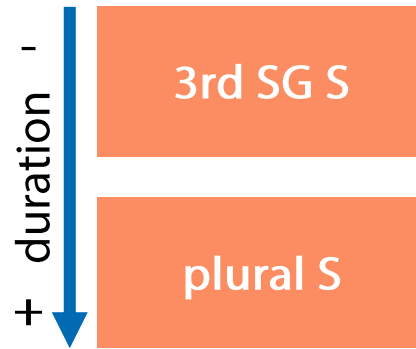


Experimental findings

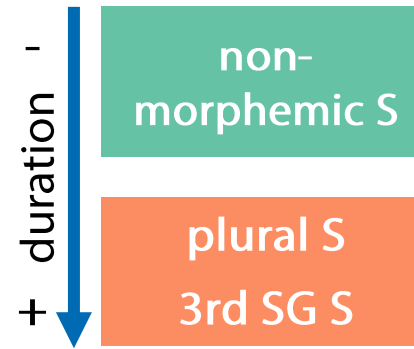
Walsh & Parker
(1983)



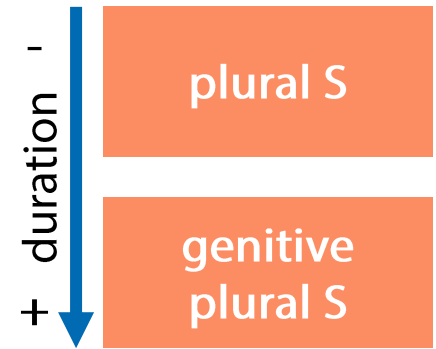
Li et al.
(1999)



Seyfarth et al.
(2017)



Plag et al.
(2019)



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Previous findings



Question

- ▶ How real are acoustic differences between different types of final /s/ in English?

non-
morphemic S

plural S

clitic S

Production study

- ▶ Balanced data
- ▶ Control of potentially intervening variables
- ▶ Data without potentially confounding effects of lexical and contextual properties, e.g. storage effects (Caselli et al. 2016)

Production study

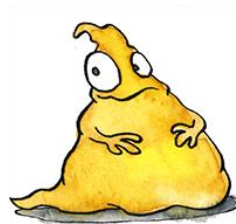
- ▶ Adaption of Berko-Gleason's (1958) classic pseudoword ('wug') paradigm
- ▶ Stimuli corresponding to alien lifeforms represented by little images → pseudowords



a glip



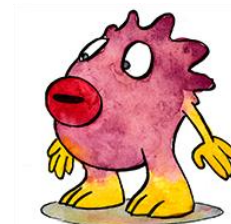
a pleets



a clook



a prufs



a bloup



a glait

Pseudowords

CC

|

Stop

+

Approximant

V

|

/ɪ i: u: ʌ aʊ eɪ/

C(C)

|

/p, t, k/ & /f/
/ps, ts, ks/ & /fs/

ɪ	i:	u:	ʌ	aʊ	eɪ
glip	pleep	cloop	prup	bloup	glaip
glit	pleet	cloot	prut	blout	glait
glik	pleek	clook	pruk	blouk	glaik
glif	pleef	cloof	pruf	blouf	glaif

glips	pleeps	cloops	prups	bloups	glai ps
glits	pleets	cloots	pruts	blouts	glait s
gliks	pleeks	clooks	pruks	blouks	glaik s
glifs	pleefs	cloofs	prufs	bloufs	glaif s

Procedure

- ▶ Items were embedded in contexts

- ▶ Introduction of the pseudoword



'This is a glip'



'This is another one'

- ▶ Simple situation the respective aliens are in

'Last week, the glips listened to each other's songs'

- ▶ Question to elicit the pertinent form of /s/

'What happened last week?'

- ▶ Expected answer

*'The **glips** listened to each other's songs'*

Contexts



Look, this is a blouf.



And this is another one.

Last week, the bloufs listened to each other's songs.

What happened last week?

Last week, the bloufs listened to many songs.

The cloops listened to each other's songs.

Last week, the two cloots listened to each other's songs.

Last week, the two glifs listened to each other's songs.

Last week, both the bloups listened to each other's songs.

Recordings

- ▶ 40 participants
 - ▶ 26 female, 14 male; average age 28.7 years
 - ▶ native speakers of Southern British English

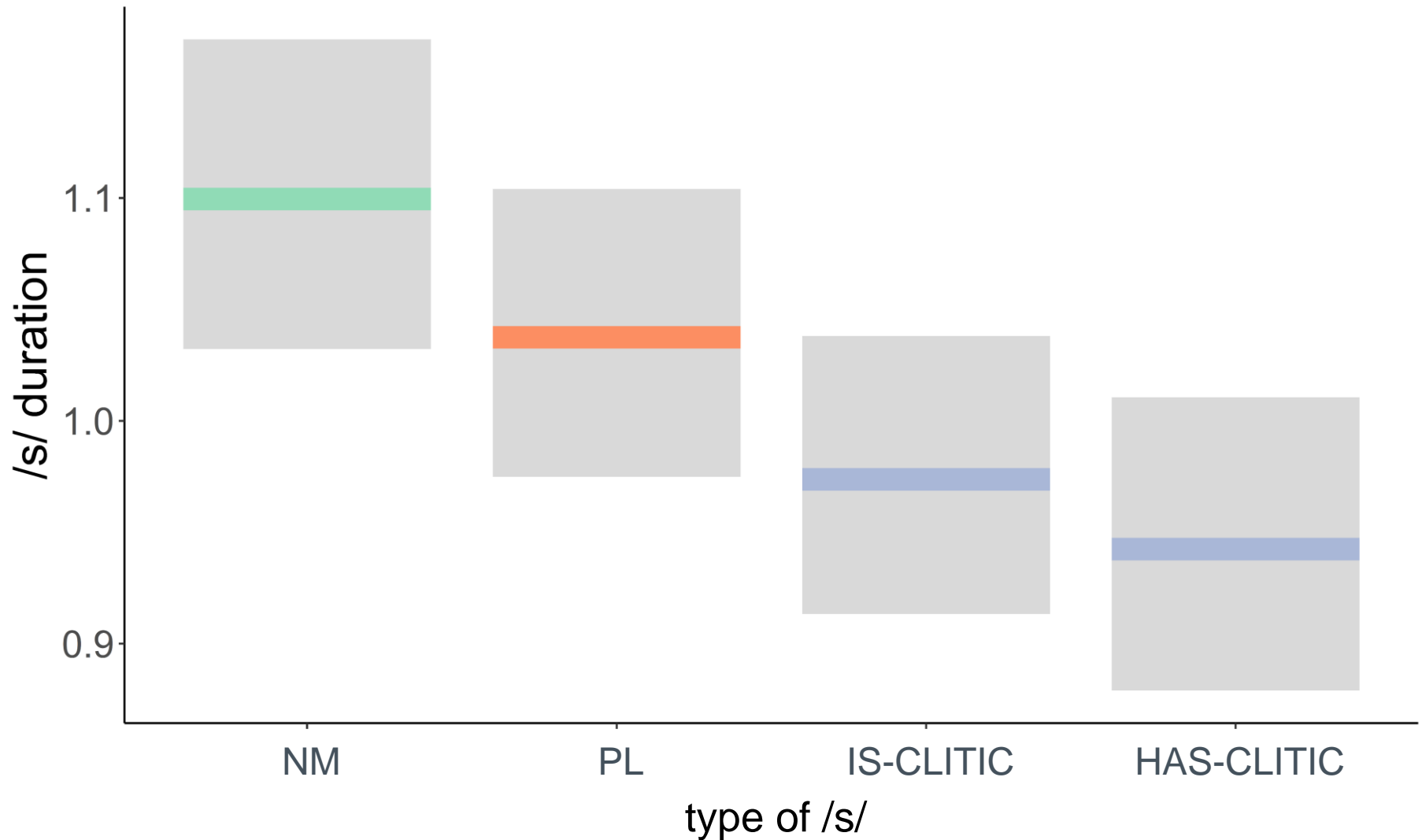
- ▶ 1 146 target items with word-final /s/ were produced

non-morphemic	plural	has	is
315	380	159	292

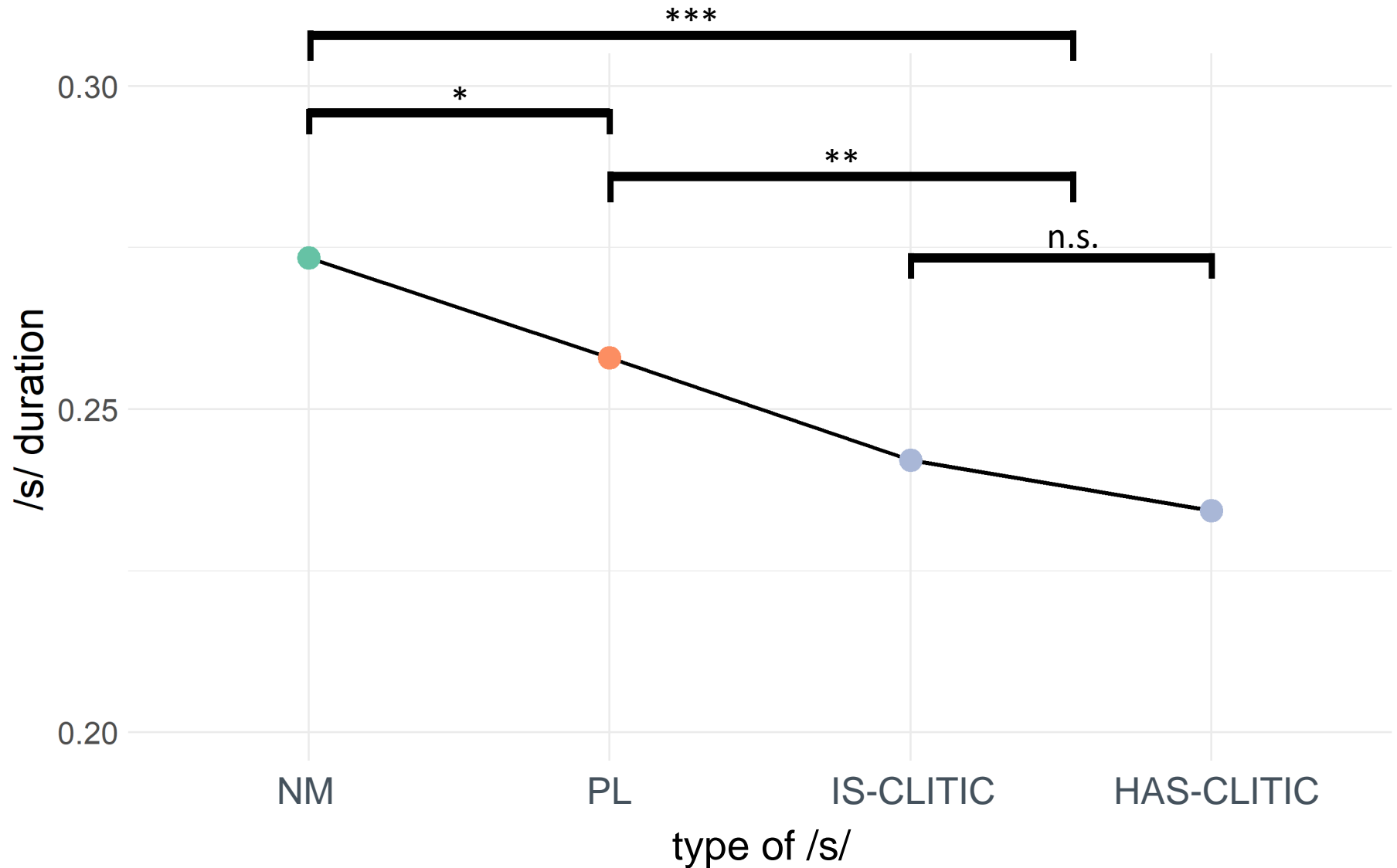
Statistical modelling

- ▶ Linear mixed effects regressions analysis using LME4 in R
- ▶ Response variable: /s/ duration
- ▶ Fixed effects:
 - ▶ Type of /s/
 - ▶ Type of following segment
 - ▶ Biphone Probability
 - ▶ Mono-/Multilinguality of speaker
 - ▶ Base duration
 - ▶ Pause following the /s/
 - ▶ Speaking rate
- ▶ Random effect:
 - ▶ Speaker

Effect of type of /s/



/s/ durations overall



New Zealand English

Zimmermann 2016

nm > pl > clitics

North American English

Plag et al. 2017, Tomaschek et al. 2019

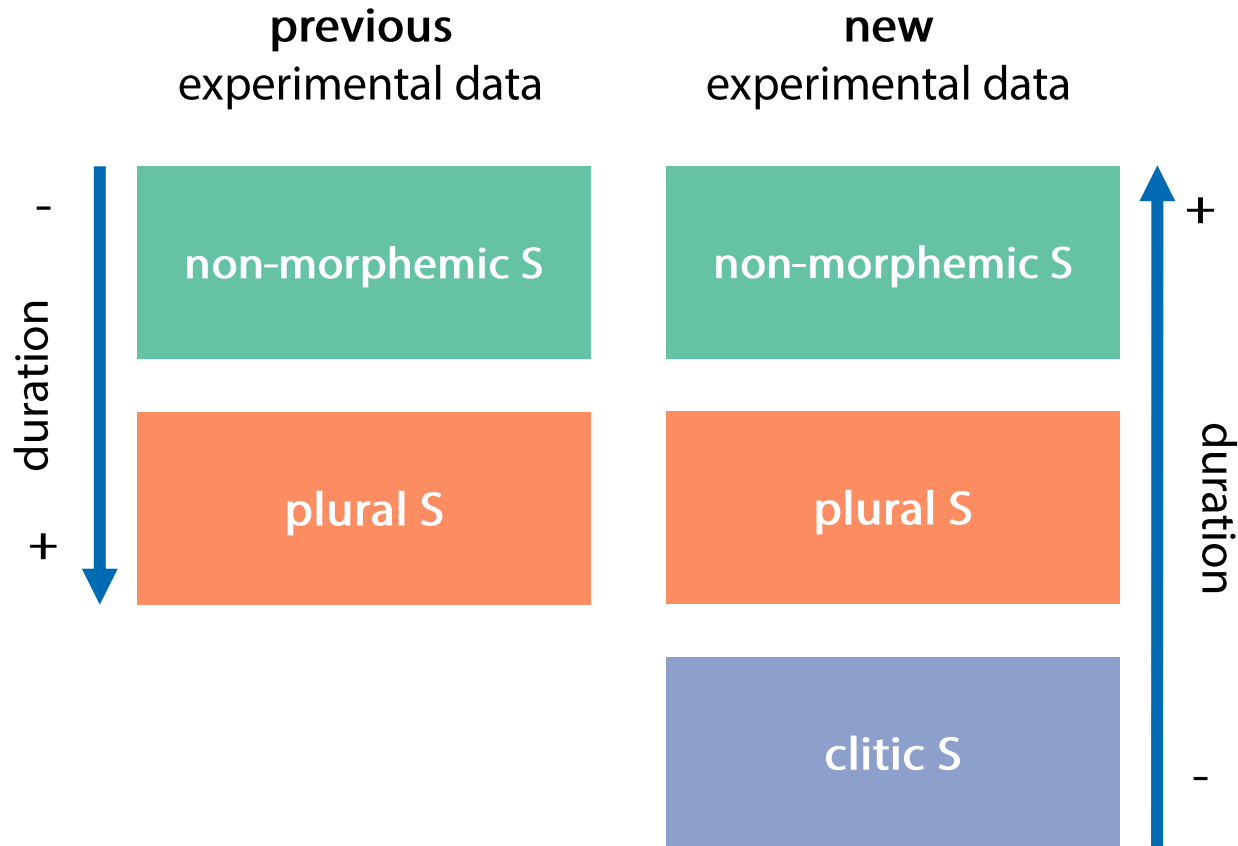
nm > pl > clitics

Southern British English

pseudowords

nm > pl > clitics

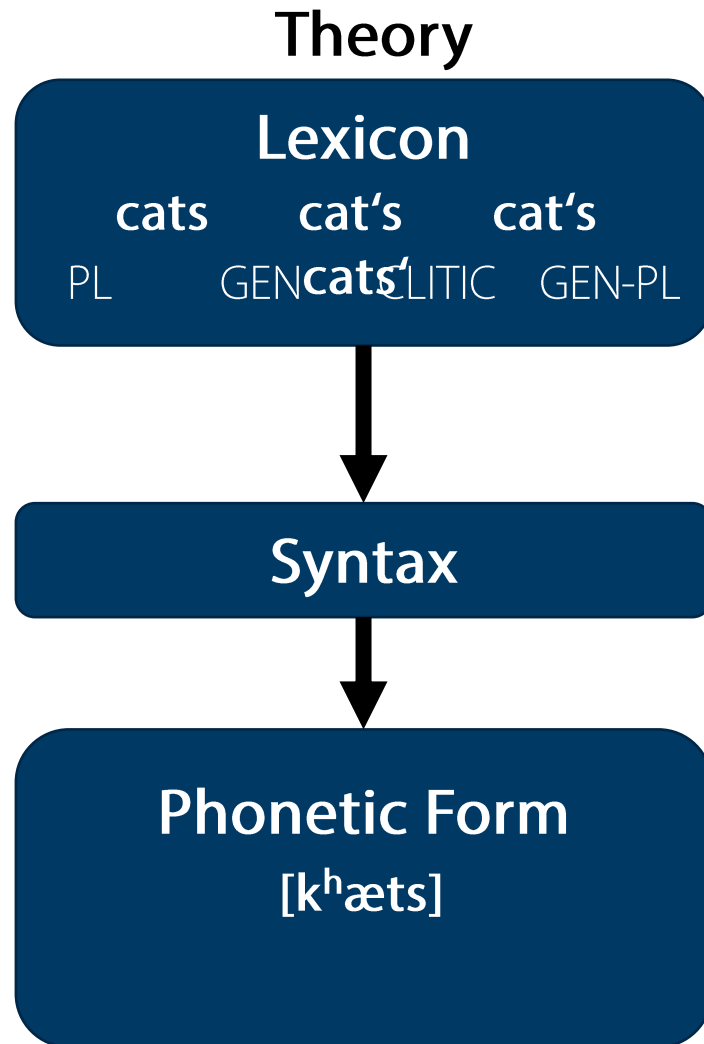
Discussion



Conclusion

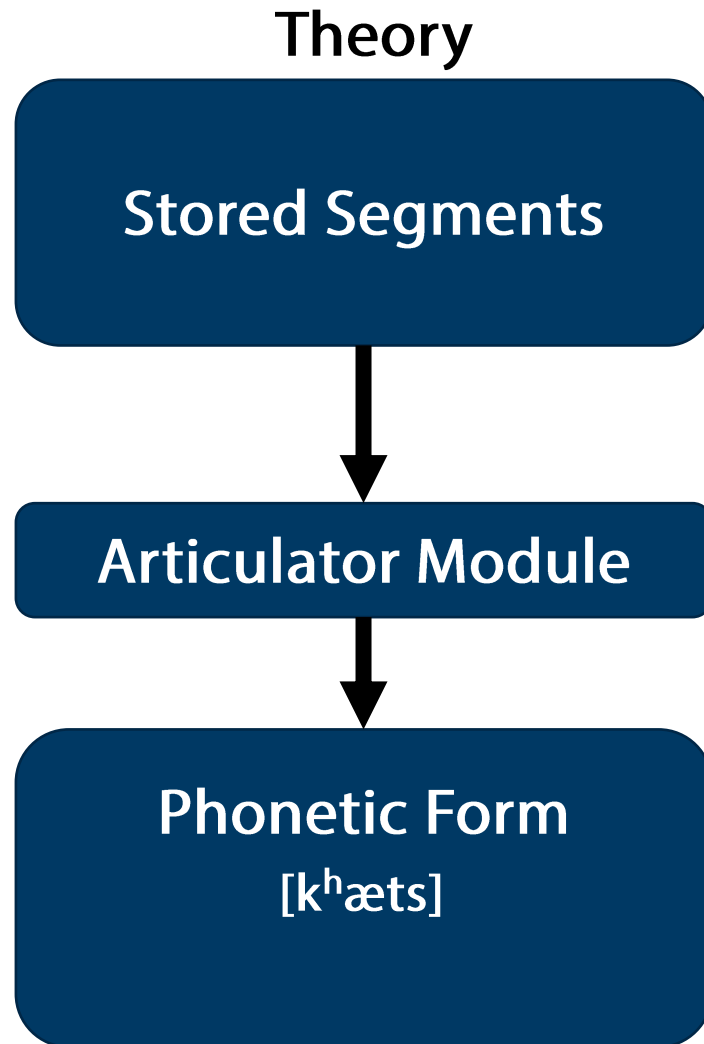
- ▶ First study to use pseudowords to examine durational differences of different types of /s/
 - ▶ This rules out the influence of potential storage effects (e.g. Caselli et al. 2016) which might have been part of previous results
- ▶ Hence, durational differences appear to be of a robust morphological nature rather than a simple by-product

Conclusion



e.g. Kiparsky (1982)

Conclusion

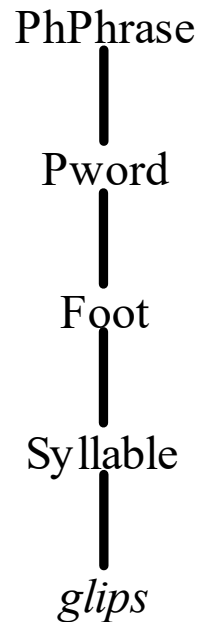


e.g. Levelt et al. (1999)

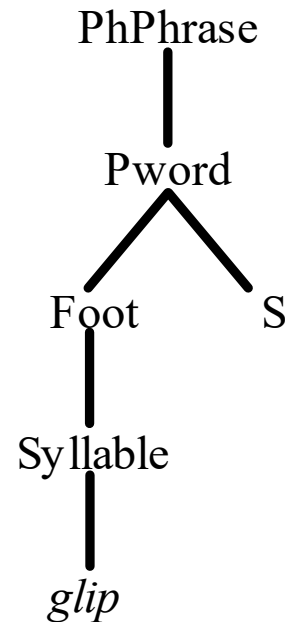
Conclusion

Theory

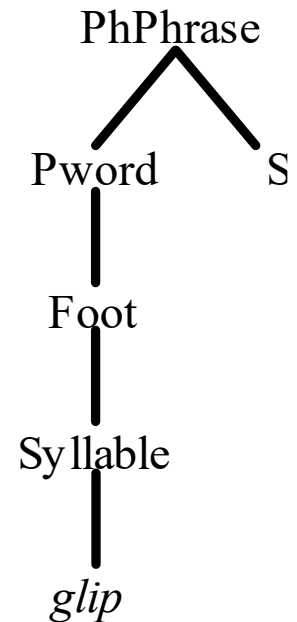
(13) non-morphemic S



(14) plural S
'internal clitic'



(15) clitic S
'free clitic'



Data appears to explain current findings, but not previous findings, e.g. differences between suffixes

e.g. Booij (1983), Goad (1998), Goad et al. (2003)

Conclusion

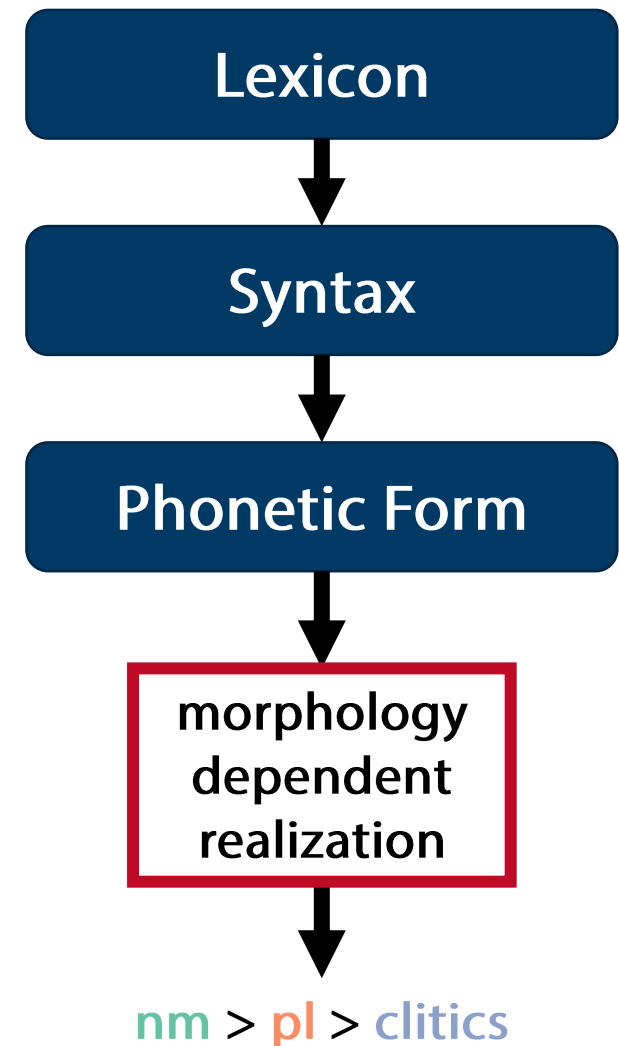
Theory exemplar-based models may explain how durational differences between different types of word-final /s/ may result from stored phonetic representations

Data leaves open the question of how such systematic differences between clouds of exemplars come about in the first place

e.g. Goldinger (1998), Bybee (2001), Pierrehumbert (2001, 2002), Gahl & Yu (2006)

Conclusion

- ▶ This calls into question the morphology independent realization of segments, which predicts homophony for all types of /s/



Thank you!



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