An S is an S is an S, or is it?

On the pronunciation of complex words

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‘Spoken Morphology‘

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- Variability in the pronunciation of complex words (book-s, un-true)
- Variability in phonetic detail: acoustics and articulation
- Variability in alternations: ánalyse ◆ ánalysable ~ analýsable
- Why is this important?
- Organization and structure of the mental lexicon

How do we perceive, store, and produce complex words?

Background

- Complex words: words with more than one meaningful unit

  clue-less dis-agree fondness cap-s

- Storage vs. computation, whole-word vs. segmentation

- Gradient morphological and phonological structure

  government disappoint business

- First problem:
  Does the varibility in phonetic detail reflect morphological structure? If so, how?

Speech production: How to verbalize ideas

Concept

Lemma	‘cap‘	Noun [+ concrete] [+count]	‘more than one‘ [plural]
Phonological representation	/kæp/		/-z/
Phonological rules		[k^{h}æps]	
Syllabary		[$ kæps $]	
Articulation		<movement of articulators>	
Acoustic signal			

Crucial point

No morphological information available post-lexically

A case in point: English S

Plag, Ingo, Julia Homann & Gero Kunter. 2015. Homophony and morphology: The acoustics of word-final S in English. *Journal of Linguistics.*

- An S is an S is an S

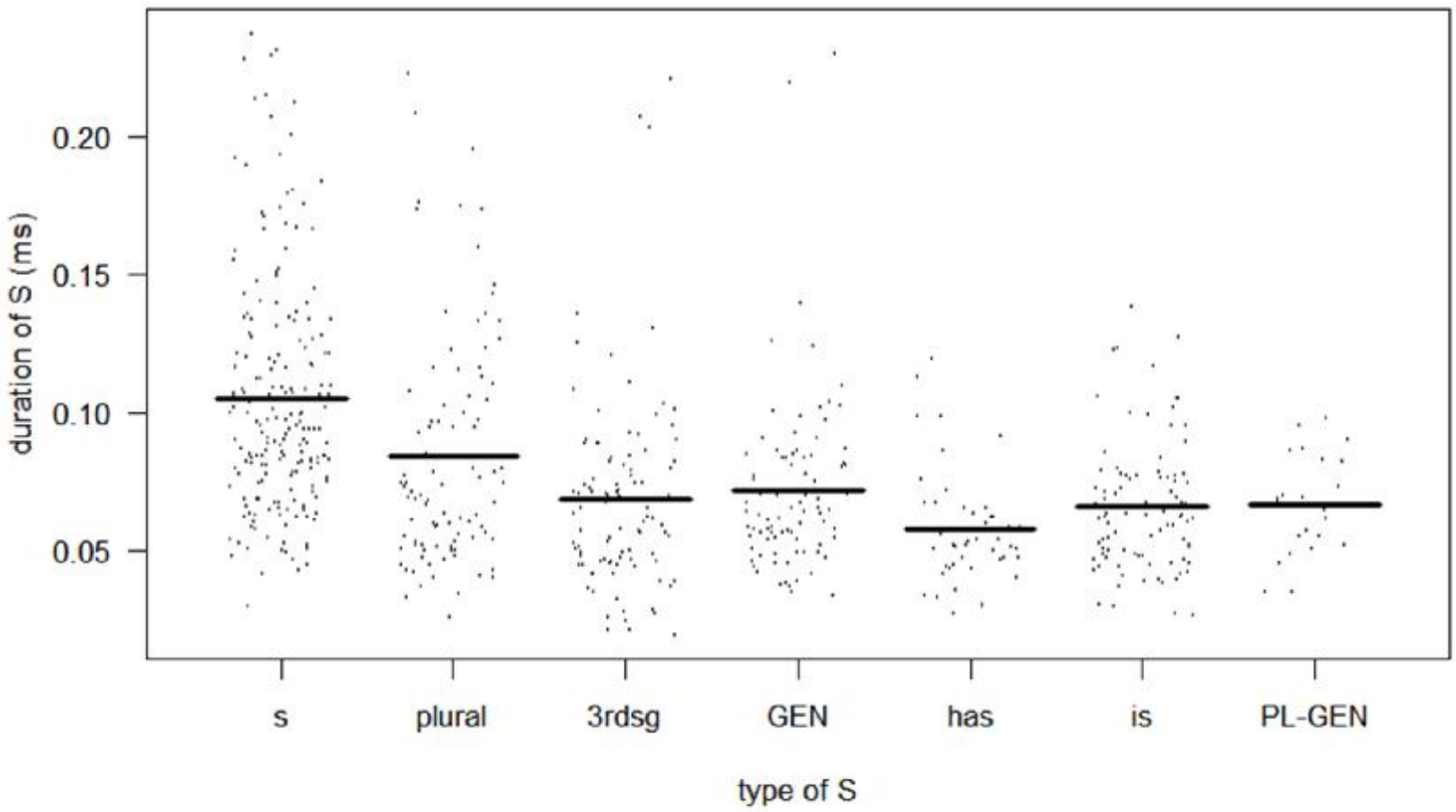
caps /kæp**s**/	*keeps* /kip**s**/	*lapse* /læp**s**/
PLURAL	3sg	non-morphemic

- Or is it?
- *time* and *thyme* are acoustically different (Gahl 2008)
- *like* (verb), *like* (particle) and *like* (quotative) are acoustically different (Drager 2010)
- Stems are acoustically different when part of a complex word (e.g. Kemps et al. 2005, Blazej & Cohen-Goldberg 2015)

Methodology

- /z/ and /s/ (henceforth ‘S‘)
- Buckeye Speech Corpus, natural conversations, North American English
- plural, genitive, genitive singular, 3sg, clitics of *has, is*
- N = 447, up to 100 per category
- Acoustic analysis
- Statistical analysis: duration by type of S (LMER, beta regression)

The data


duration of S (ms)
0.20
0.15
0.10
0.05
s
plural
3rdsg
GEN
has
is
PL-GEN
type of S

Analysis

- Many other potential influences (covariates)
- Multiple regression

Covariates (selection)

- voicing
- number of consonants in rhyme
- number of syllables in host
- context (in utterance: *middle* or *final,* following consonant, before a phrase-final boundary)
- frequency
- speech rate (local, non-local)
- N-gram frequencies, phonological neighbors, orthographic neighbors ...

Main results

- We find robust differences between different types of S
- Duration hierarchy reflects boundary strength

  Non-morphemic S >> suffix S >> clitic S

- We also find differences in other acoustic parameters (center of gravity)
- We find acoustic differences between different D‘s (past tense D, adjectival D, clitics of *would, had, did*)
- Challenges current models of lexical phonology and models of speech production

The other problem: Alternations

Stress shift with *-ity, -arian, -ory*

(1) a. accéptable ◆ acceptabílity
impéccable ◆ impeccabílity
b. authórity ◆ authòritárian
legálity ◆ legalitárian
c. antícipate ♦ antícipatory ~ antìcipátory
círculate ♦ círculatory ~ cìrculátory

No stress shift with *-able*

(2) a. adóre ◆ adórable
understánd ◆ understándable
ánswer ◆ ánswerable
b. preférable ◆ préferable
compáre ◆ cómparable
c. ánalyze ◆ ánalyzable ~ analýzable
réconcile ◆ réconcilable ~ rèconcílable

(http://dict.leo.org)

(http://dict.cc)

Alternations

- ‘Rule vs. exception‘ does not work (too many ‘exceptions‘)
- Compatibility of variation with existing theories is unclear
- What determines the variation?
- Is the variation systematic and productive?

Experimental study

Arndt-Lappe, Sabine & Javier Sanz. In preparation. The variability of stress shift in English derivation.

30 speakers

97 sentences from *Corpus of American Soap Operas* (Davies 2012)

Hey, listen. I'm in the mood for a **celebratory** drink...

celebr**á**tory

cel**é**bratory

c**é**lebatory

First results

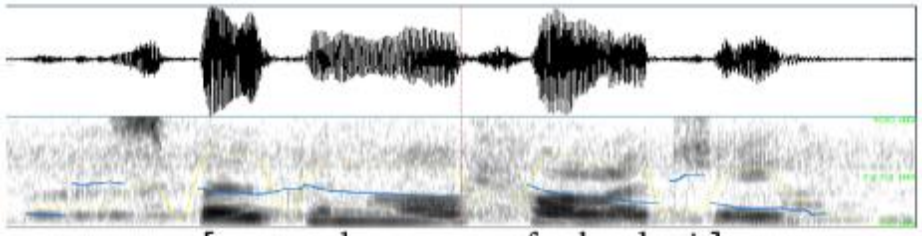
- only 121 items, 5 speakers
- A lot of variation, robust differences between speakers
- Rhythm of base word is preserved
- Base-final stress only if it is a heavy syllable
- Base-final stress is dependent on segmental structure:

  [aɪ] favors, [uː] disfavors base-final stress

  certi**fí**able at**trí**butable
- Results challenge traditional rule-based approaches to stress shift
- Which theoretical model can account for these results?
- Analogy? Naive Discrimantive Learning? To be tested!

Summary

- There is much more variation in the pronunciation of complex words than is traditionally recognized
- This variation challenges long-cherished concepts in many areas of linguistic research (e.g. phonology, morphology, psycholinguistics)
- An investigation of this variation can yield important insights into the nature of complex word, of the mental lexicon and of models of lexical processing.
- Stay tuned and watch out for more @ Research Unit FOR 2373!



Thank you very much for your attention!