

What causes subphonemic differences between different types of /s/ in English?

Evidence from pseudowords

FOR 2373 Spoken Morphology

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Dominic Schmitz, Ingo Plag & Dinah Baer-Henney
Heinrich-Heine-Universität Düsseldorf

Dominic.Schmitz@uni-duesseldorf.de, Ingo.Plag@uni-duesseldorf.de, Dinah.Baer-Henney@uni-duesseldorf.de

hhu Heinrich Heine Universität Düsseldorf

Theoretical Background

- Recent research has shown that seemingly homophonous elements, e.g. **words** (e.g. [1], [2]), **stems** (e.g. [3], [4]), and **prefixes** (e.g. [5], [6]), differ in their acoustic duration due to their morphological makeup, e.g.

free in *freezes* = morphologically complex is longer than
free in *freeze* = morphologically simple [14]

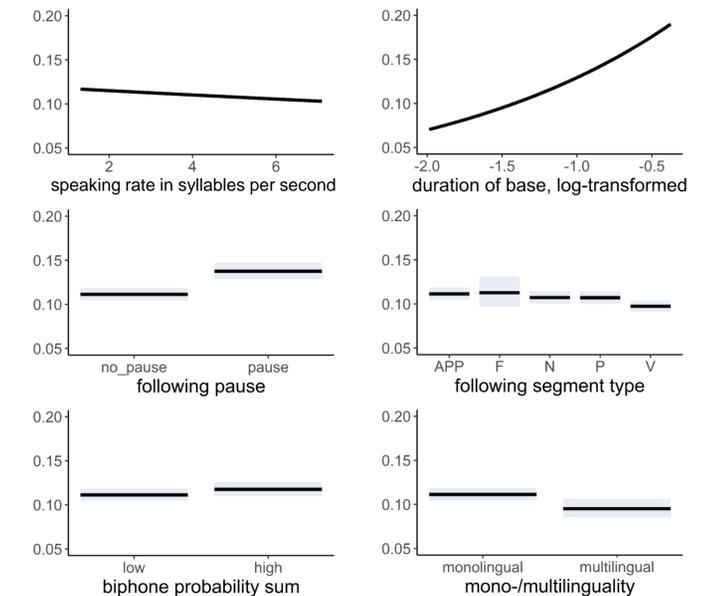
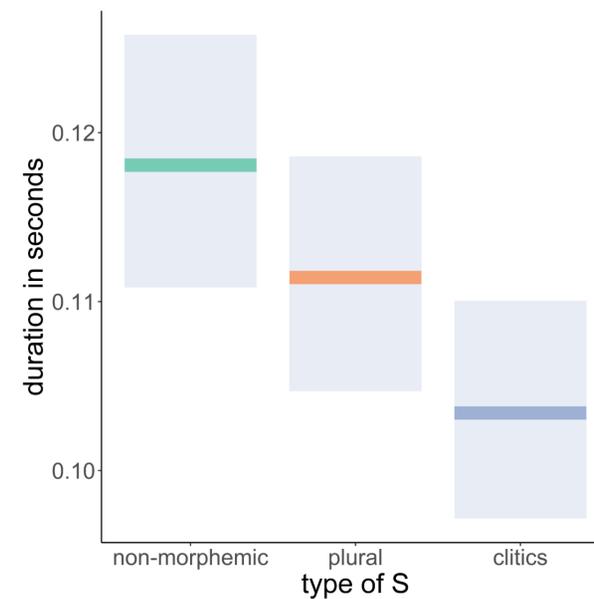
- Such findings pose a challenge for **theories of speech production** (e.g. [7], [8]) because it is currently unclear how morphological information would come to influence articulation
- A prominent case for seemingly identical **individual segments** differing in their duration due to their morphological category is word-final /s/ in English
- However, studies found results of opposite directions:
 - Corpus studies** (e.g. [9], [10], [11])
non-morphemic > **suffixes** > **clitics**
 - Experimental studies** (e.g. [12], [13], [14])
suffixes > **non-morphemic** > **clitics**?
- Additionally, previous results on /s/ durations may be **flawed** by
 - unbalanced or small data sets
 - lack of phonetic covariates
 - lack of appropriate statistical methods
 - lack of a proper distinction of voiced and voiceless segments
- Thus, a study is called for
 - to investigate the durational nature of different types of word-final /s/
 - with carefully controlled data avoiding potentially confounding effects

Method

- Highly controlled **production study** with 40 native speakers of Southern British English
- Adopting [15]'s 'wug' paradigm, **pseudowords** were used as items to eliminate confounding effects of lexical properties (e.g. [16])

- Speakers produced almost **1200 pertinent forms**, i.e. **non-morphemic**, **plural**, **is-** and **has-clitic** /s/
- Statistical analysis was carried out with linear mixed effects regression models
 - Dependent variable**
/s/ duration
 - Explanatory variable**
type of S (i.e. **non-morphemic**, **plural**, **is-** and **has-clitic**)
 - Control variables**
speaking rate, base duration, pause occurrence, biphone probability sum, following segment type, speaker mono-/multilingualism

Results



	non-morphemic	plural	is-clitic	has-clitic
non-morphemic		*	***	***
plural			**	***
is-clitic				
has-clitic				
mean	0.263	0.248	0.233	0.225
std. error	0.040	0.040	0.041	0.041

Discussion

- Our result:
non-morphemic > **suffixes** > **clitics**
- Results are in line with findings by corpus studies (e.g. [9], [10], [11])
- Results are not in line with previous experimental studies (e.g. [12], [13], [14])
- Durational differences are neither caused by
 - unbalanced distributions in data sets typical for corpus data
 - nor by potentially confounding effects of lexical and contextual properties
- Hence, type of S appears to be a strong, significant predictor of segmental duration
- This calls for revisions of models of speech production in which morphology does not play a role in later stages of production

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