

Synchronic evidence for diachronic pathways of change:

/g/-deletion and the life cycle of phonological processes

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1. Introduction

Velar nasal plus

Diachrony and synchrony

The life cycle

2. Conversational data

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3. Elicitation task

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Summary

Velar nasal plus

(Wells 1982: 365)

- Presence of post-nasal /g/ in varieties spoken in the North West and West Midlands of England
 - **Birmingham** (Thorne 2003); **Cannock** (Heath 1980); **Liverpool** (Knowles 1973); **West Wirral** (Newbrook 1999); **Manchester** (Schleef et al. 2015); **Cheshire** (Watts 2005); the **Black Country** (Mathisen 1999; Asprey 2015)
- Well-attested in dialectological literature but the nature of its variation is comparatively understudied
- Envelope of variation can be split into two distinct environments:

(ing) → [ɪn] [ɪŋ] [ɪŋg] e.g. *think**ing***

(ng) → [Vŋ] [Vŋg] e.g. *wro**ng***

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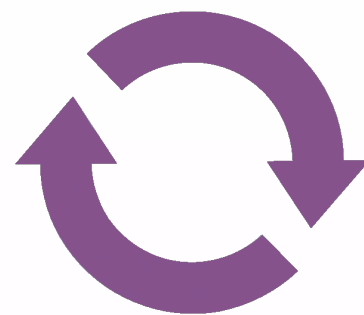
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Summary

Diachrony and synchrony

- Historical origin and development of post-nasal /g/-deletion has been discussed in detail
- Claimed that this rule, which deletes coda /g/ after nasals, follows the ‘life cycle of phonological processes’ (Bermúdez-Otero 2013)
- The life cycle makes strong predictions about how this rule should behave synchronically, which have yet to be tested
- This talk aims to:

show how diachronic
accounts of /g/-deletion
can explain its synchronic
variation



provide synchronic
evidence to support
theories of its diachronic
development

- It also explores the mechanisms behind what appears to be a recent innovation in pre-pausal position

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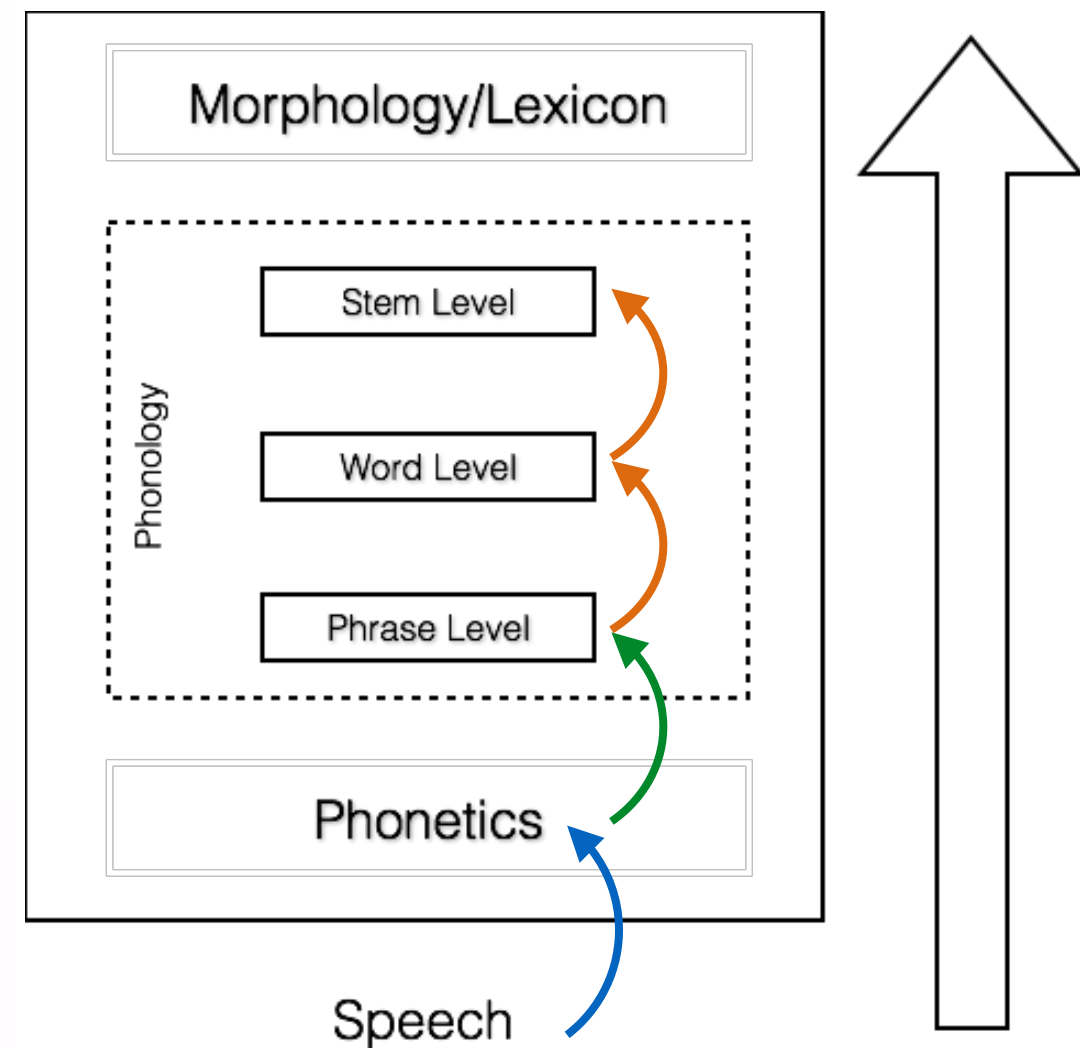
Summary

The life cycle of phonological processes

(Bermúdez-Otero & Trousdale 2012)

- **phonologisation**: speech > phonetics
- **stabilisation**: phonetics > phonology
- **domain narrowing**: phrase-level > word-level > stem-level

- 
1. PHRASE-LEVEL: can see the whole **phrase**
she didn't want to **sing** aloud
 2. WORD-LEVEL: can only see the **word** itself
she didn't fancy herself as a **singer** anymore
 3. STEM-LEVEL: can only see the **stem**
she didn't fancy herself as a **sing**-er anymore



The life cycle: diachronic predictions

- Deletion in *sing* || / *sing tunes* when rule reaches **phrase-level**
- Deletion in *sing it* only when rule reaches **word-level**
- Deletion in *singer* only when rule reaches **stem-level**
- Deletion never occurs in *finger**

Stage	Surface form of underlying /ŋg/				Level reached by rule	Language variety/register
	<i>finger</i>	<i>sing-er</i>	<i>sing it</i>	<i>sing</i> <i>sing tunes</i>		
0	[ŋg]	[ŋg]	[ŋg]	[ŋg]	-	Early Modern English
1	[ŋg]	[ŋg]	[ŋg]	[ŋ]	phrase	Elphinston (formal)
2	[ŋg]	[ŋg]	[ŋ]	[ŋ]	word	Elphinston (colloquial)
3	[ŋg]	[ŋ]	[ŋ]	[ŋ]	stem	Present Day English

Adapted from Bermúdez-Otero (2011: 2024)

The life cycle: synchronic predictions

- Synchronic implication under a cyclic analysis:
 - more 'levels' that meet the rule's criteria = more chances to apply during the phonological derivation = higher application rate on the surface
- /t,d/-deletion (Guy 1991) and /l/-darkening (Turton 2014, 2017) have been analysed under similar frameworks



	<i>finger</i>	<i>singer</i> _V	<i>sing it</i> _#V	<i>sing ll</i> _#ll	<i>sing tunes</i> _#C
Stem-level	/fɪŋ.gə/	/sɪŋg/	/sɪŋg/	/sɪŋg/	/sɪŋg/
Word-level	/fɪŋ.gə/	/sɪŋ.gə/	/sɪŋg/	/sɪŋg/	/sɪŋg/
Phrase-level	/fɪŋ.gə/	/sɪŋ.gə/	/sɪŋ.gɪt/	/sɪŋg/	/sɪŋg.tʃuːnz/
Chances to apply:	0	1	2	3	

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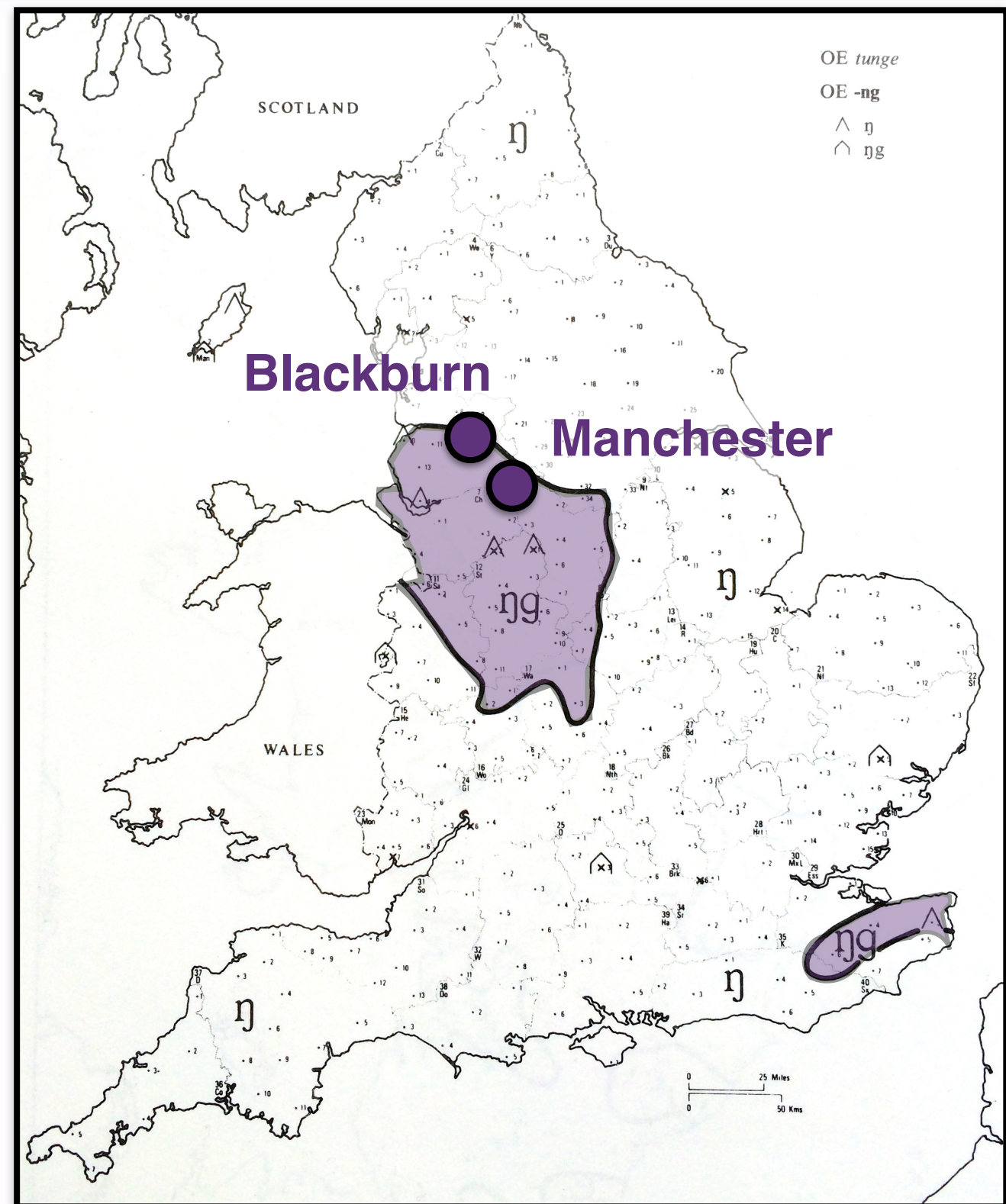
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Methodology

- Quantitative approach using twenty-four sociolinguistic interviews conducted with North Western speakers
 - ▶ two speakers recorded in 1971 for a real-time component
- Stratified by age and sex (all 'working class' speakers)
- Dependent variable coded auditorily for [g]-presence/absence
- Mixed-effects logistic regression using lme4 in R, with *speaker* and *word* as random factors
- **941 tokens of (ng)**



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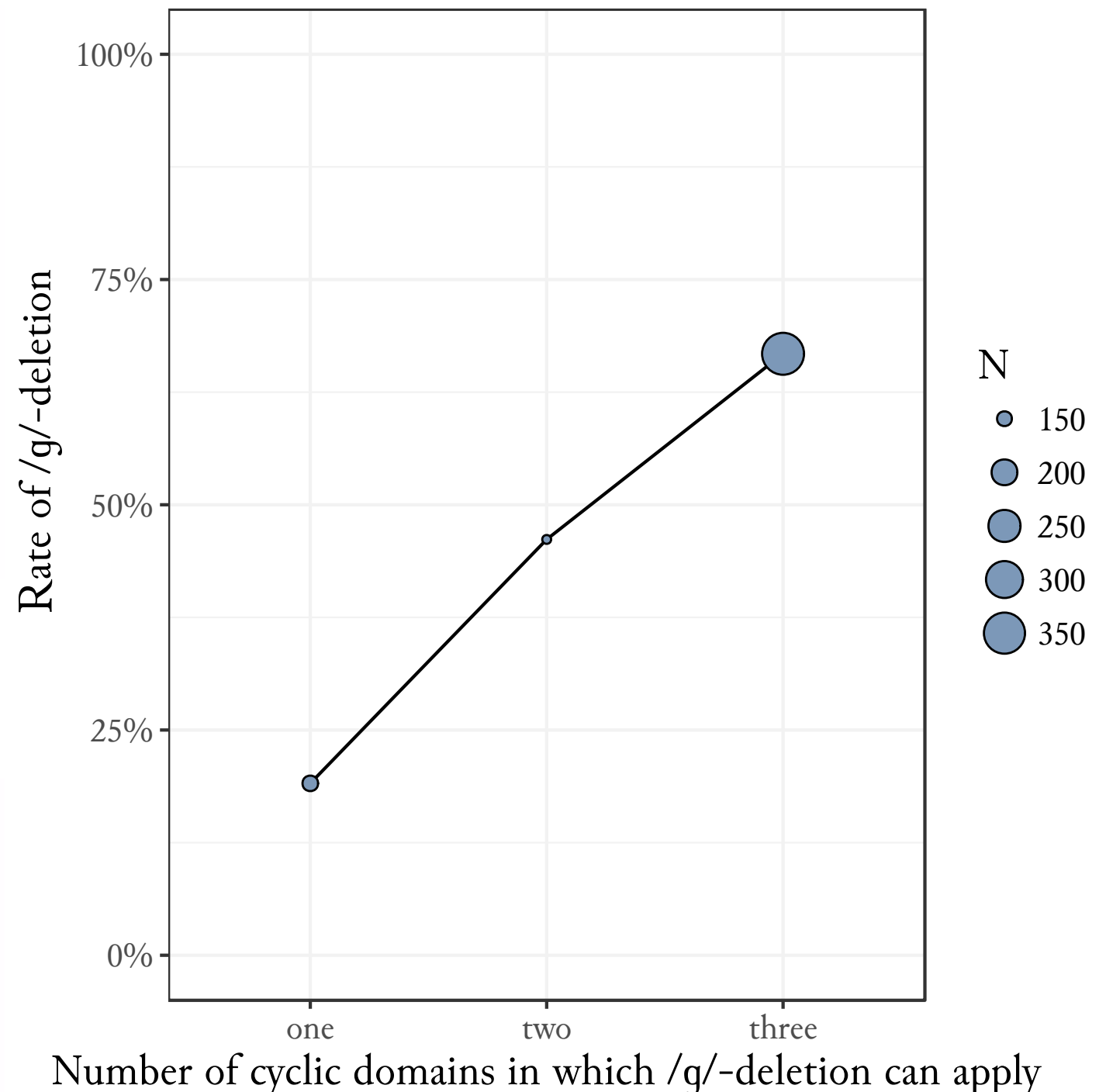
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Life cycle's predictions

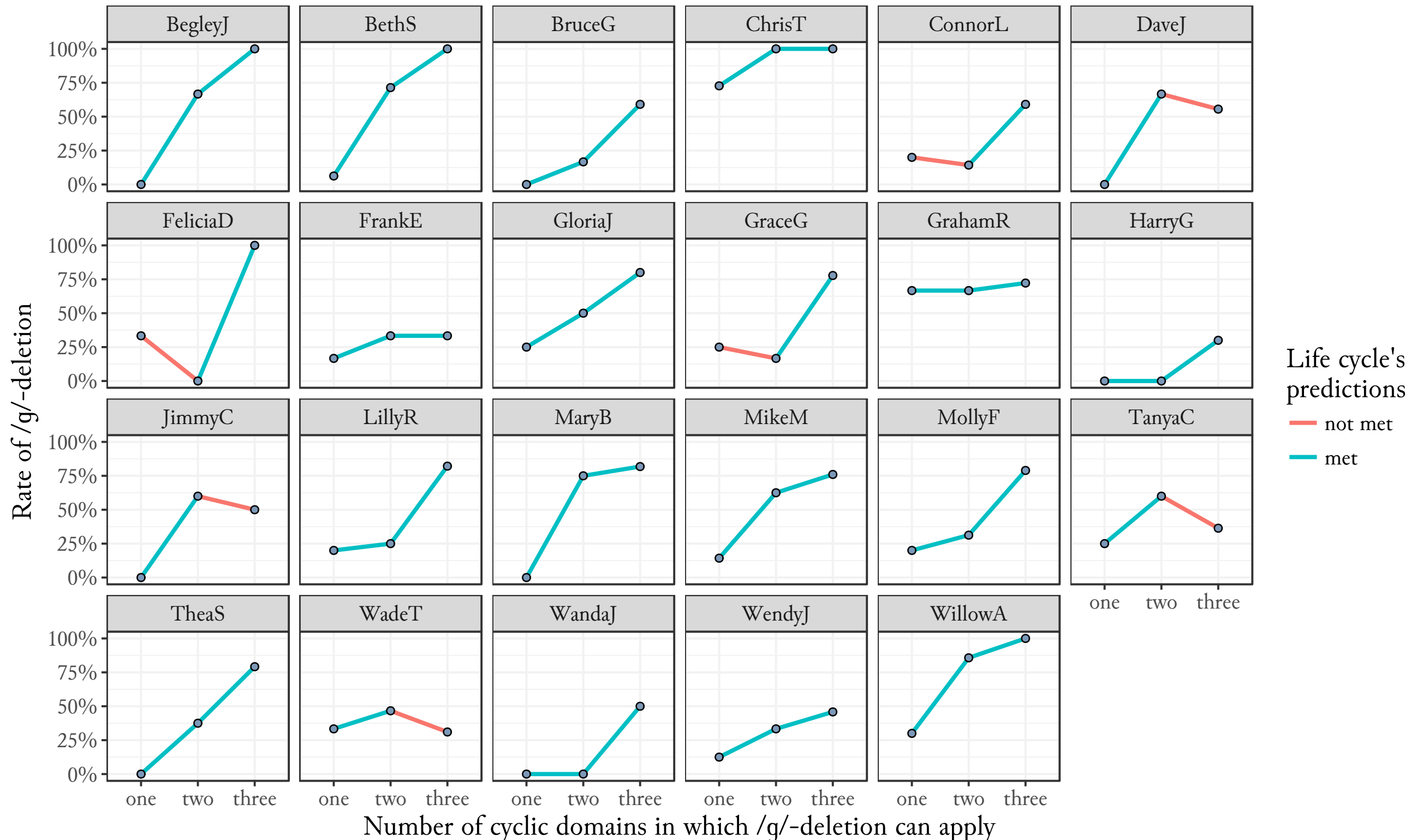
Morphophonological effects

- Prediction: correlation between surface rate of application and the number of cyclic levels in which it had *chance* to apply
- Turns out to be the strongest predictor of [g]-presence
 - *one chance*: 19% deletion
 - *two chances*: 46% deletion
 - *three chances*: 67% deletion



Life cycle's predictions

Morphophonological effects

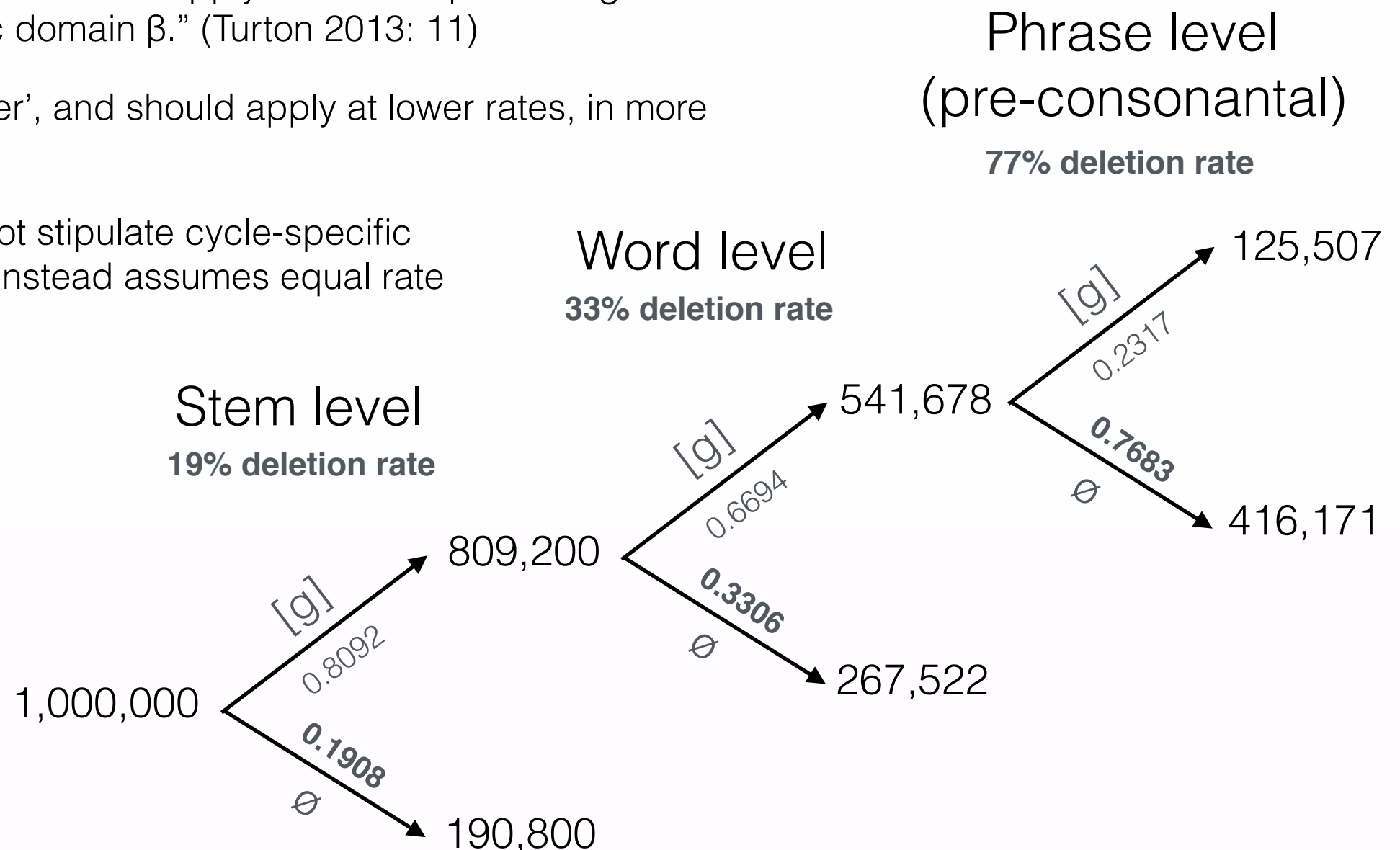


Life cycle's predictions

Cycle-specific deletion rates

- **Variation corollary of the Russian Doll Theorem**

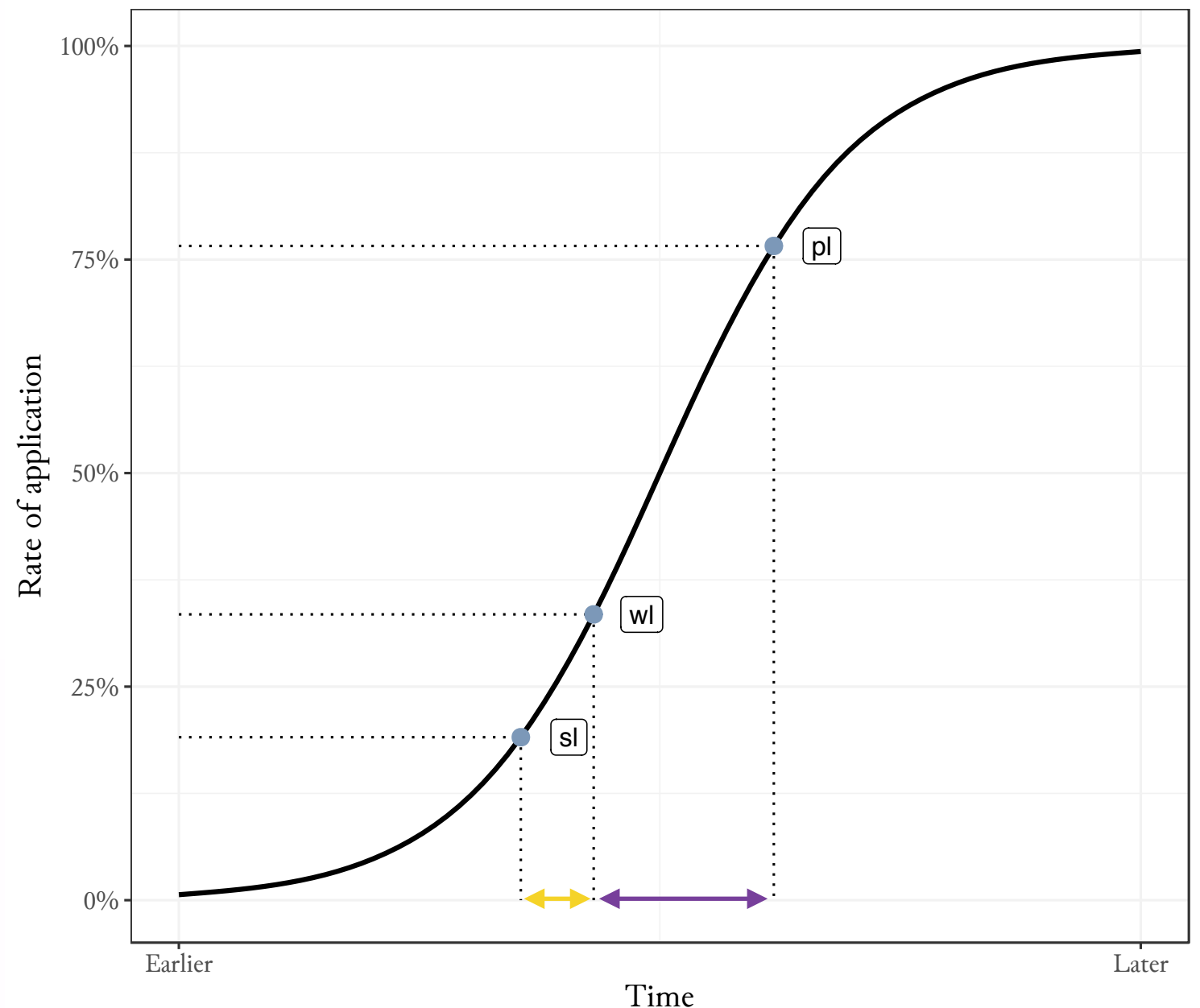
- “if a phonological process π shows a rate of application x in a small embedded domain α , then π will apply at a rate equal to or greater than x in a wider cyclic domain β .” (Turton 2013: 11)
- The deletion rule is ‘younger’, and should apply at lower rates, in more embedded domains
- cf. Guy (1991) who does not stipulate cycle-specific deletion rates for /t,d/ and instead assumes equal rate of application



Life cycle's predictions

Cycle-specific deletion rates

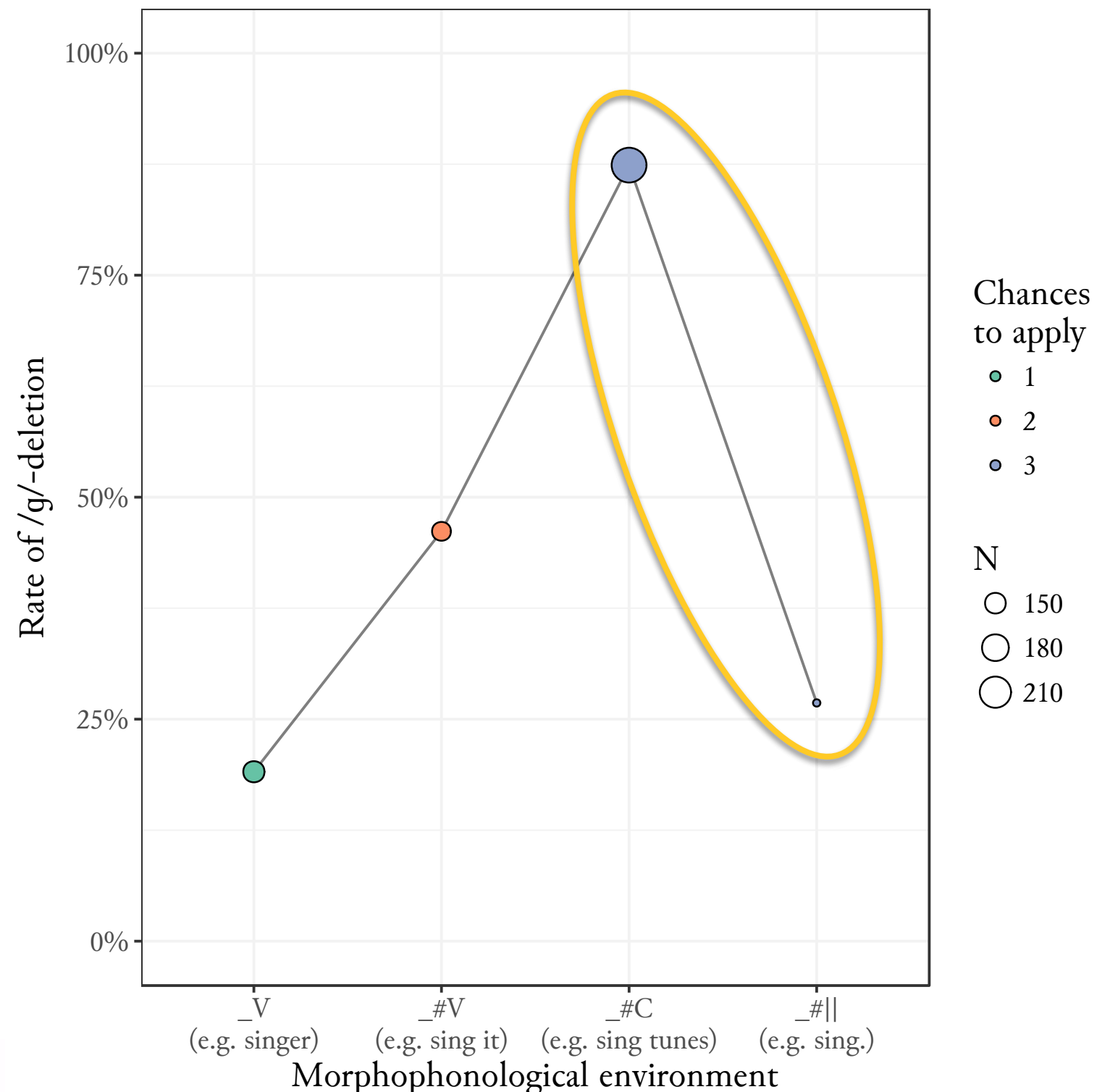
- Assuming each domain's deletion rule follows a traditional 'S-shaped' curve of language change, there is evidence that the word-level rule is much closer to the stem-level rule in time
- Supports the simulations of Lignos (2012), who shows that word-level deletion is very susceptible to domain narrowing
- Represents a more general trend of coda-targeting processes in Modern English being particularly vulnerable to domain narrowing at the word-level, due to the language's 'impoverished' inflectional system (Bermúdez-Otero 2013)



Life cycle's predictions

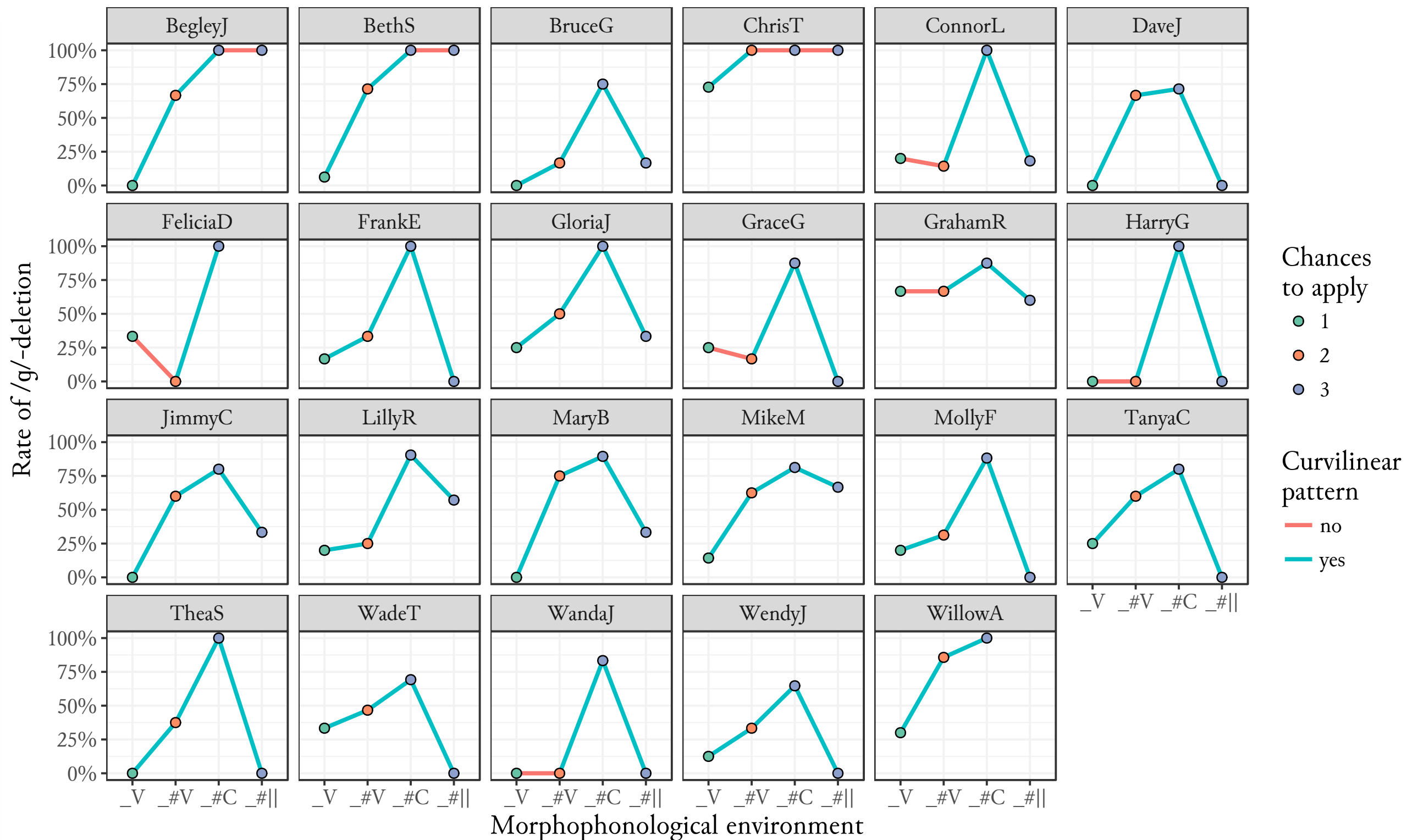
Morphophonological effects

- A purely cyclic account of /g/-deletion would predict comparable behaviour in pre-pausal and pre-consonantal environments
 - the [g] can not resyllabify as an onset in any cyclic domain
 - the rule has three chances to apply in both
- We actually find high rates of deletion pre-consonantly (as predicted), but extremely *low* rates pre-pausally (not predicted)



Life cycle's predictions

Morphophonological effects

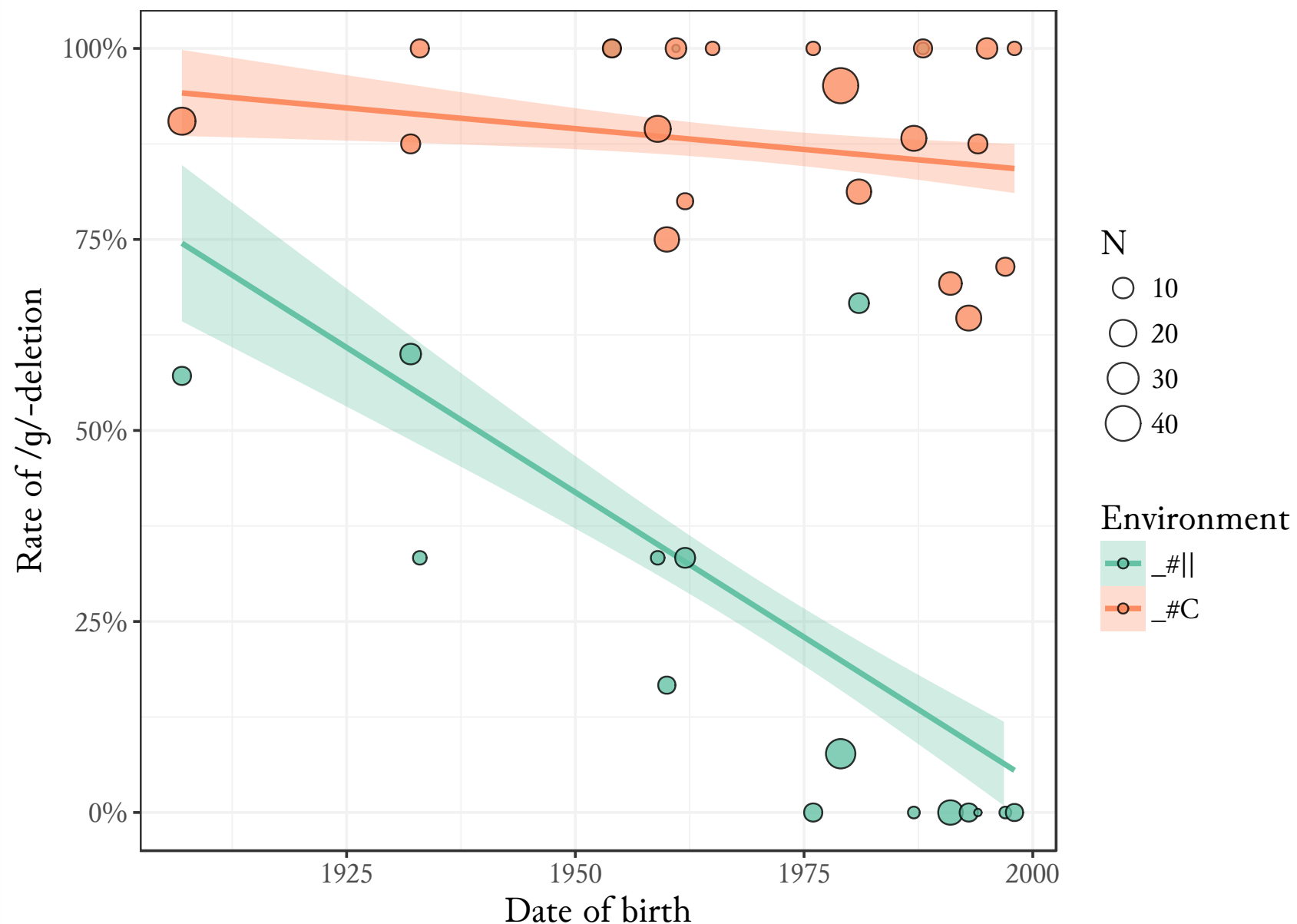


Life cycle's predictions

Morphophonological effects

- Is this a problem for the life cycle? Not if pre-pausal retention stems from a *separate innovation*...
- Despite the overall stability of (ng), pre-pausal /g/-retention does seem to be a recent phenomenon
- Almost all speakers born after 1975 actually have **categorical /g/-retention** in this environment
- Linked to a parallel change of increasing ejectives? McCarthy & Stuart-Smith (2013) find that it is also favoured:
 - phrase-finally
 - with velar place of articulation
 - and after nasals
- e.g. *think* (cf. *thing*), *sink* (cf. *sing*)

Negative correlation between date of birth and phrase-final deletion rate ($\rho = -0.63$)



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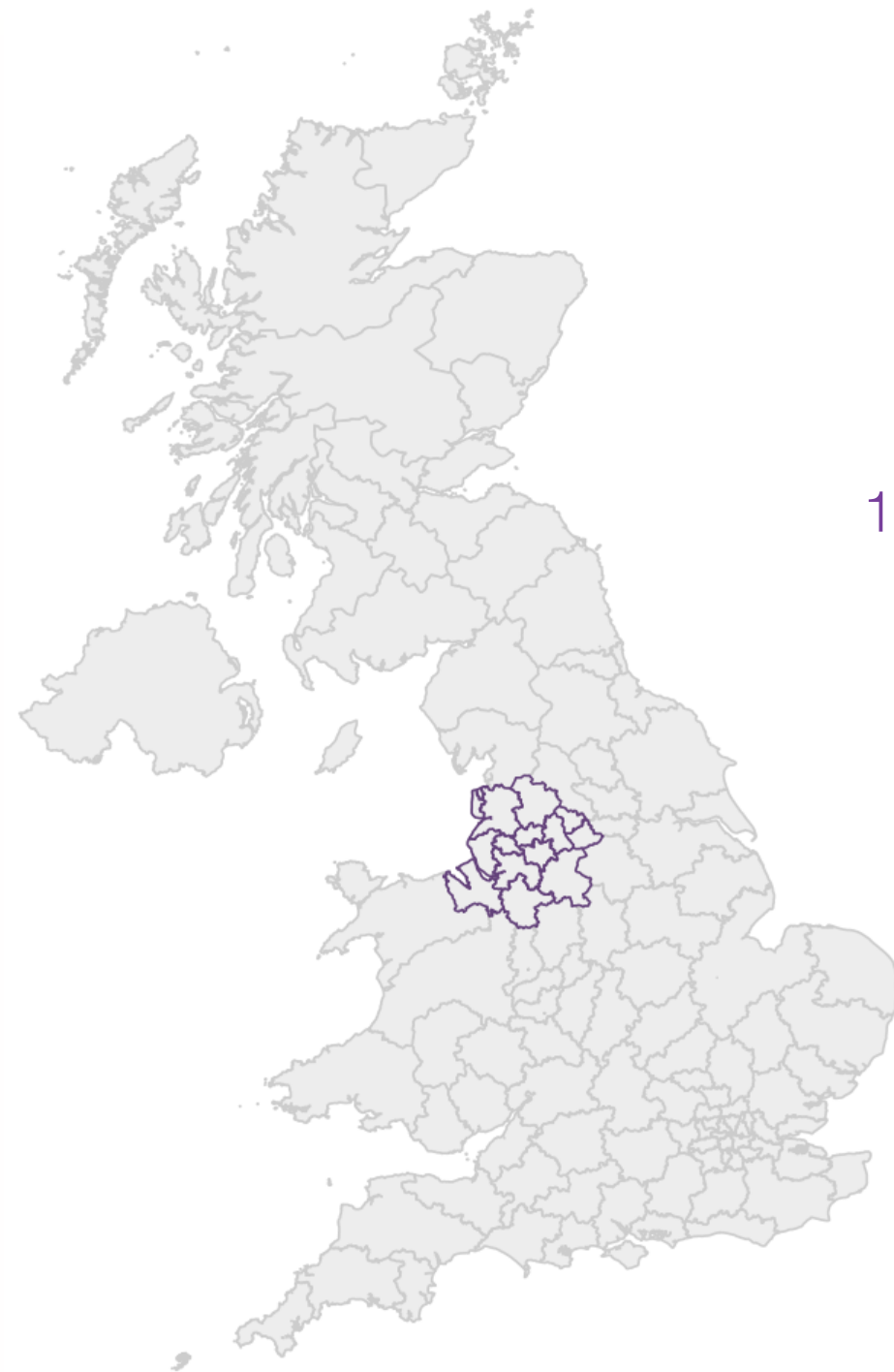
Elicitation task

- **Research questions** - is [g]-presence triggered pre-pausally due to the segmental lengthening effects of pre-boundary lengthening or is it a direct effect of prosodic position? Is /g/-deletion best modelled by:
 - nasal duration?
 - position in some prosodic constituent (final vs. medial)?
 - something else (e.g. duration/presence of a following pause)?
- **Methodology** - elicit word-final /ŋg/ before prosodic/syntactic boundaries of different ‘strengths’, adapted from Sproat & Fujimura 1993, that should trigger different magnitudes of lengthening:
 - **1. Suffix boundary** - e.g. *The [wrong]-ful accusation was very insulting*
 - **2. NP-internal boundary** - e.g. *He liked feeding [the young baboon]_{NP}*
 - **3. VP boundary** - e.g. *[The sting]_{NP} [became painful]_{VP}*
 - **4. VP-internal boundary** - e.g. *She sent [the gang]_{IO} [potential targets]_{DO}*
 - **5. Intonational phrase boundary** - e.g. *[“The film was too long,”]_{IP} Michelle said*
 - **6. Utterance boundary** - e.g. *[Her fans didn’t like the new song.]_U*
- Controlled for following segment (vowel vs. obstruent) and height of the preceding vowel (equal number of high and low vowels in each boundary context)



Methodology

Elicitation task



912 tokens from
19 speakers across
the North West



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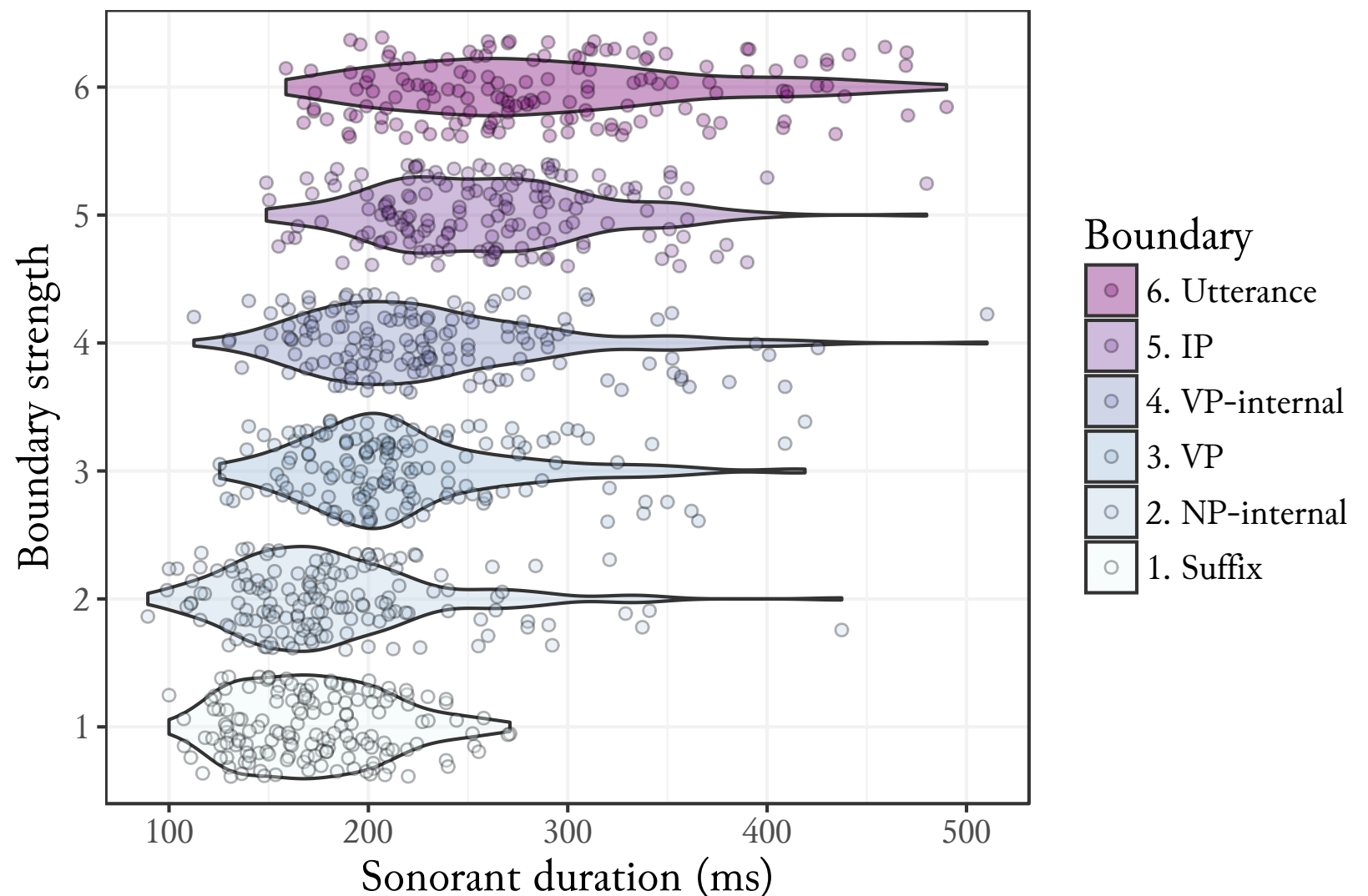
Summary

Measures of lengthening

- Sonorant duration ‘best’ measure of PBL (V+[η] period)
- Chosen methods/stimuli successfully elicit gradient scale of pre-boundary lengthening
 - positive correlation between perceived boundary strength and sonorant duration ($\rho = 0.63$)

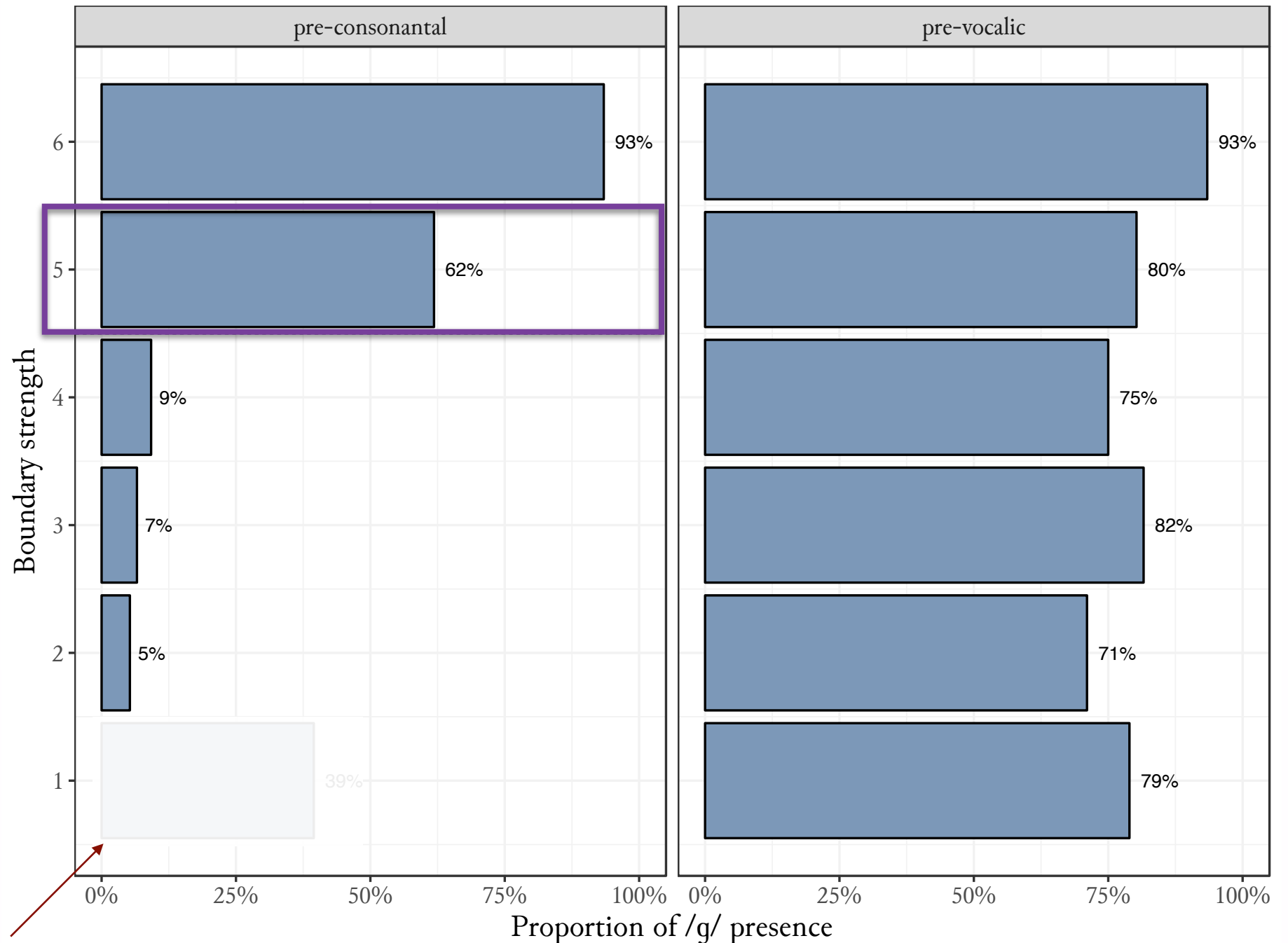
Average sonorant duration (ms) by boundary strength

1	2	3	4	5	6
174	183	218	233	262	292
+9	+35	+15	+29	+30	



Pre-boundary /ŋg/

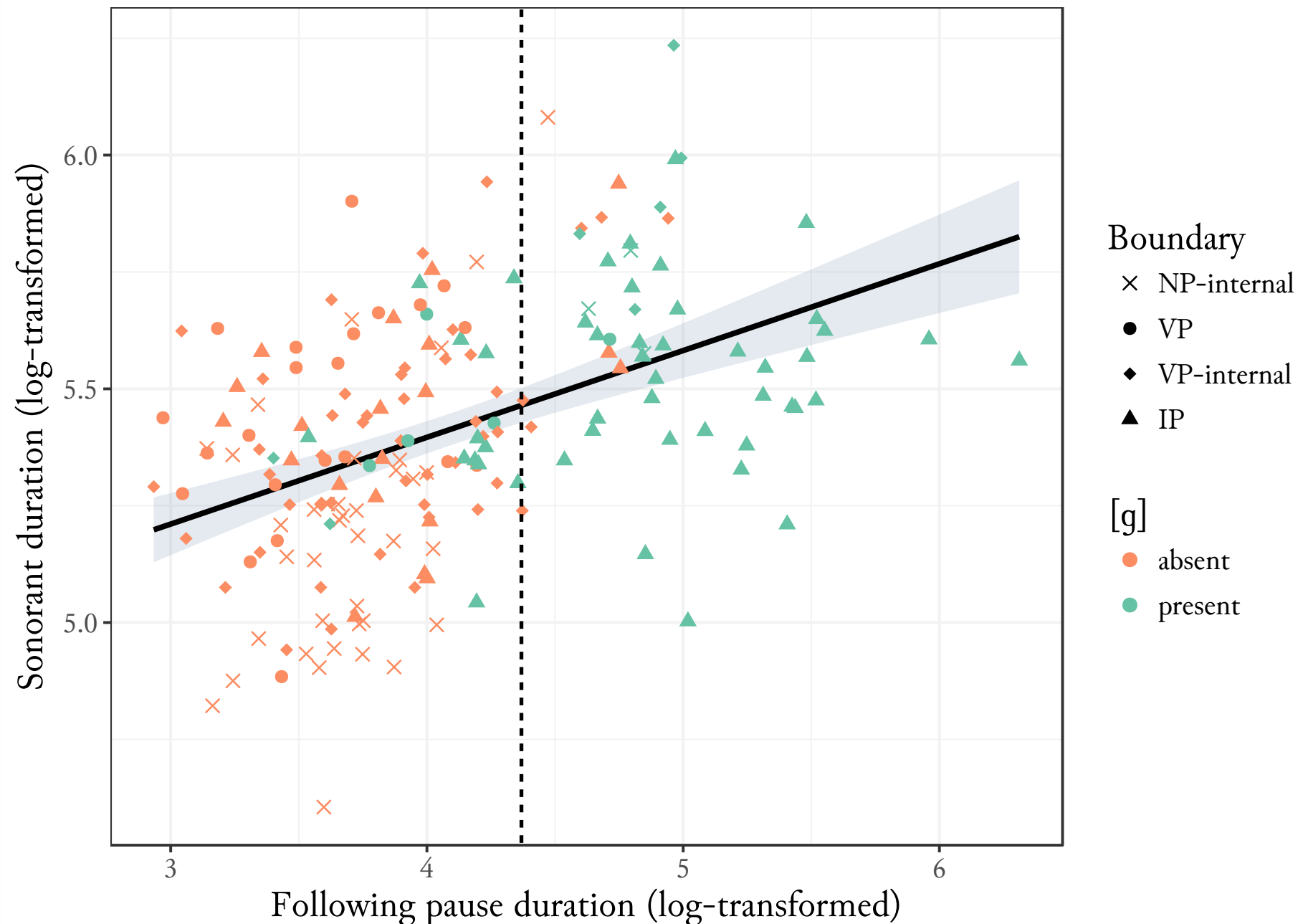
- Strong effect of following segment (already established)
- For pre-consonantal tokens, a gradient scale of [g]-presence is successfully elicited
- But it seems more like a categorical distinction between boundaries 2-4 and boundaries 5-6
 - i.e. IP-medial vs. IP-final
- Why is [g]-presence so variable at the utterance-medial IP boundary though?



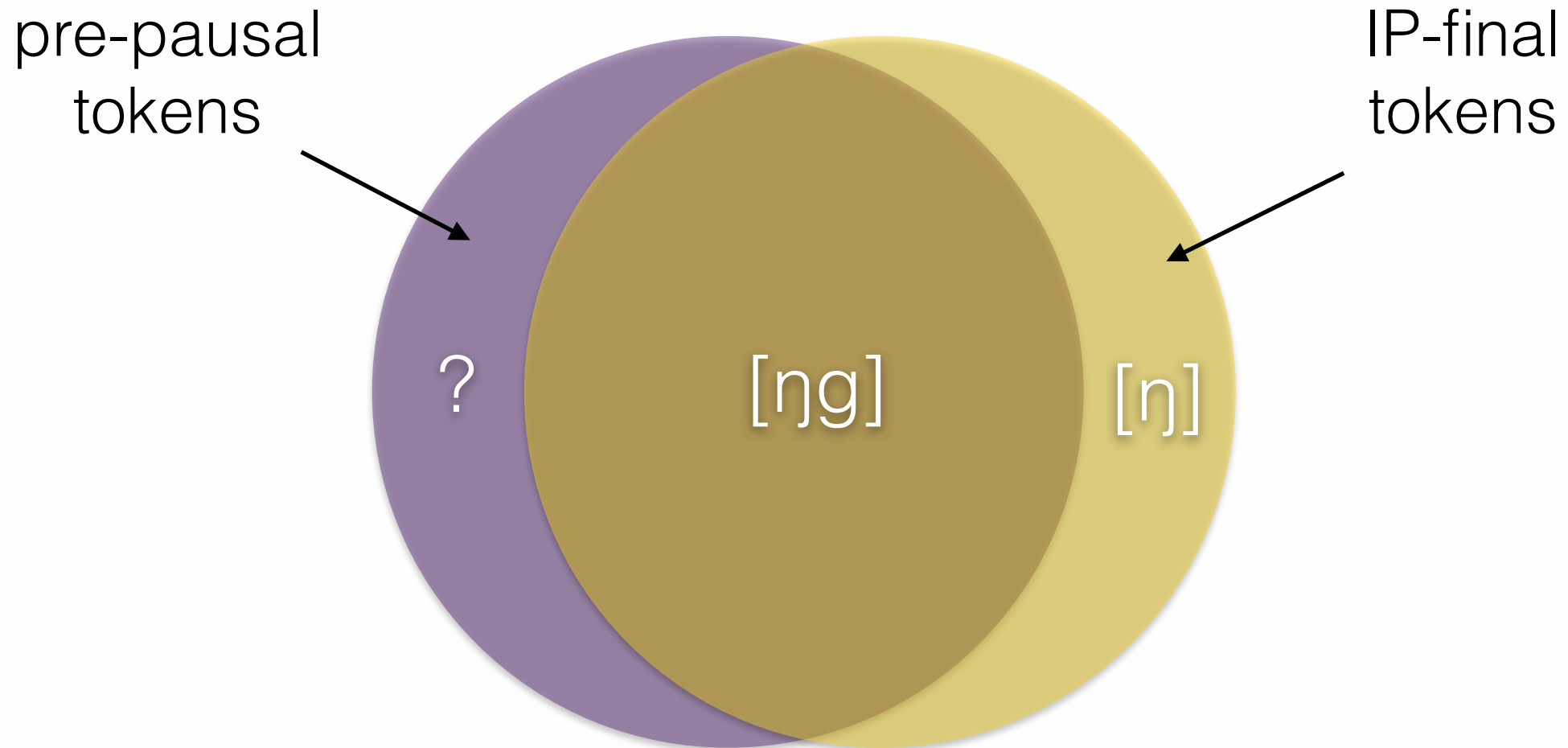
(tokens before the suffix boundary show unusually high rates of [g]-presence; possible excrescence?
See Appendix slides)

Pre-boundary /ŋg/

- Perhaps we still see 38% deletion in this environment because not everybody pauses here!
- Duration of the following pause is a much better predictor of [g]-presence than duration of the sonorant period that precedes it
 - greater separation on the x-axis than the y-axis
- Best-fitting regression model contains IP position *and* pause duration (adding the latter leads to a significant increase in fit by ANOVA comparison, $p < 0.001$)



Pause, IP, or both?



- Do we find high rates of [g]-presence IP-medially before pauses?
 - If so, [g]-presence is likely triggered by a following pause, *independent* of its position in the IP (see also /r/-devoicing in Turkish, Kaisse 1990)

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- Post-nasal [ŋ]-presence predicted almost entirely by assuming cyclic application of deletion across stem-, word-, and phrase-level domains
- Synchronic variation reflects centuries of change, providing empirical evidence in support of the ‘life cycle of phonological processes’ (Bermúdez-Otero & Trousdale 2012)
- New innovation pre-pausally (or IP-finally?) where post-nasal [ŋ] is present almost all the time for younger speakers
- Internal motivations?
 - other coda-targeting lenition processes show similar ‘instability’/variability in pre-pausal position, e.g. /tð/-deletion (see Guy 1980; Santa Ana 1996; Tagliamonte & Temple 2005) and /s/-debuccalisation in Spanish (see Harris 1983; Kaisse 1996)
- External motivations?
 - pre-pausal position clearly the most salient environment - could this innovation reflect a change in how velar nasal plus is socially evaluated? Are younger speakers using velar nasal plus as a way of projecting a northern identity?

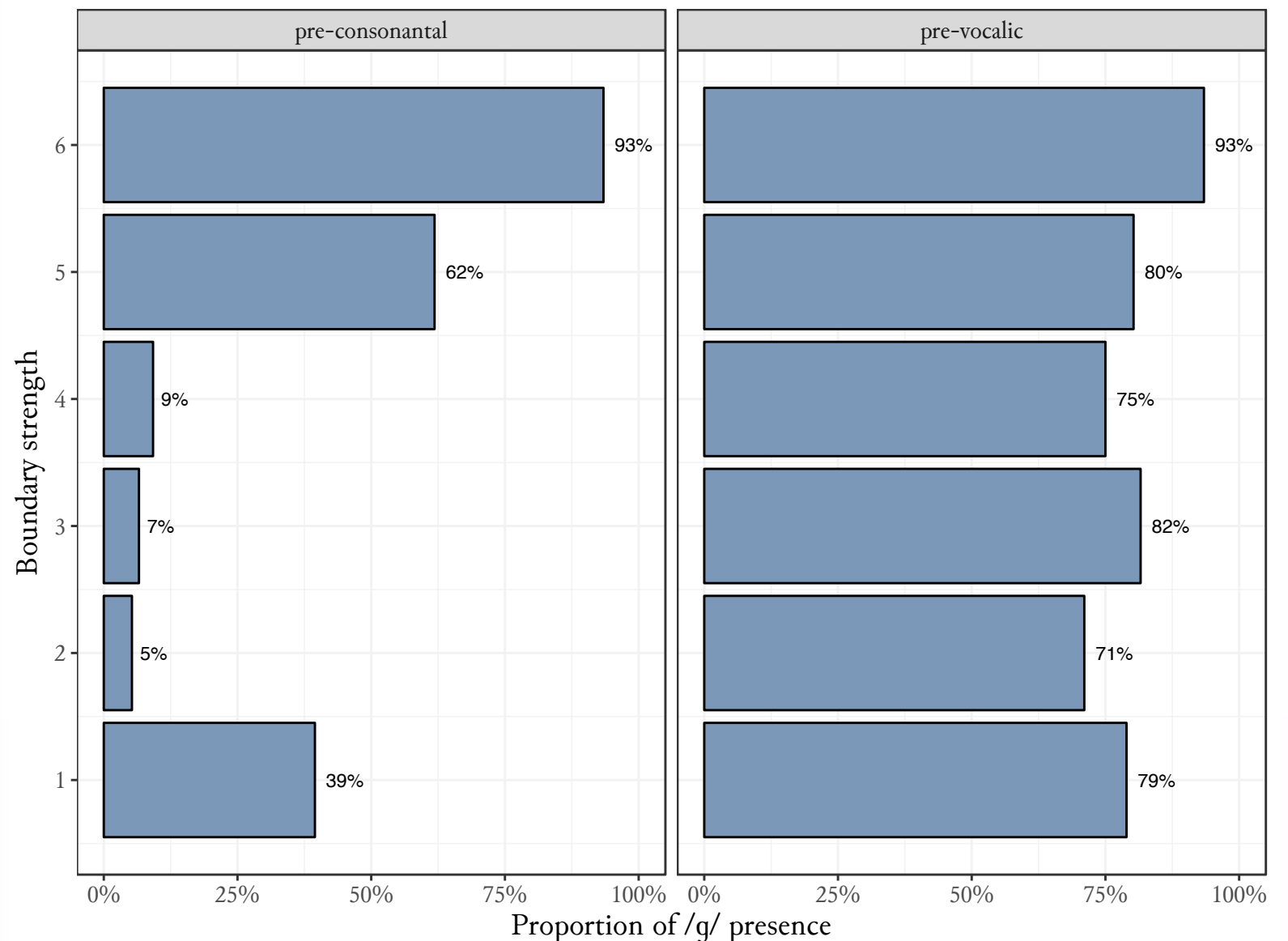
Thanks for listen[ing]

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What's going on at the suffix boundary?

- Unusually high rate of [g]-presence at the pre-consonantal suffix boundary, e.g. *youngster*, *wrongful*
- Likely to be excrescence
- See similar effects for other nasal +sibilant clusters, e.g.
 - bilabials: *'hamster' > ham[p]ster*
 - alveolars: *'prince' > prin[t]s*



What's going on at the suffix boundary?

- Spectrogram/waveforms for a **non-VNP** speaker (born and raised in Acton, London) clearly show presence of a stop in words like *gangster* - the nasal+stop+sibilant cluster is identical between *gangster* and *prankster*, providing evidence of excrescence
- Is the same thing happening for our VNP speakers?

