Velar nasal plus in the north of (ing)land

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The topic

Velar nasal plus in **the north** of **(ing)**land

- **(ing)** - alternation between [ɪn] and [ɪŋ] in unstressed <-ing> clusters

- **The north** - (ing) behaves differently here, in ways that aren't well-studied

- **Velar nasal plus** - a third possible variant exclusive to the north west (and west midlands) of England

Velar nasal plus

- Third variant, where post-nasal /g/ is retained - [ɪŋg]

- Expanded envelope of variation to stressed clusters, e.g. *thing* [θɪŋ]~[θɪŋg]

(ing) ⟶ [ɪn] [ɪŋ] [ɪŋg]

(ng) ⟶ [Vŋ] [Vŋg]

- This talk: variationist study of how [ŋg] patterns along social dimensions, and how this is constrained by language-internal factors

The origins of (ing)

- Old English present participle *-inde* and verbal noun form *-ynge/-inge* (Visser 1966)

- Reduction (and later deletion) of the final vowels; simplification of the consonant clusters

- This historical alternation has a residual effect on modern-day (ing) variation

    - grammatical category - verbs favour *-in,* nouns favour *-ing* (Labov 1989)

- Northern dialect regions retained the final /g/, leading to what Wells (1982) terms ‘velar nasal plus’

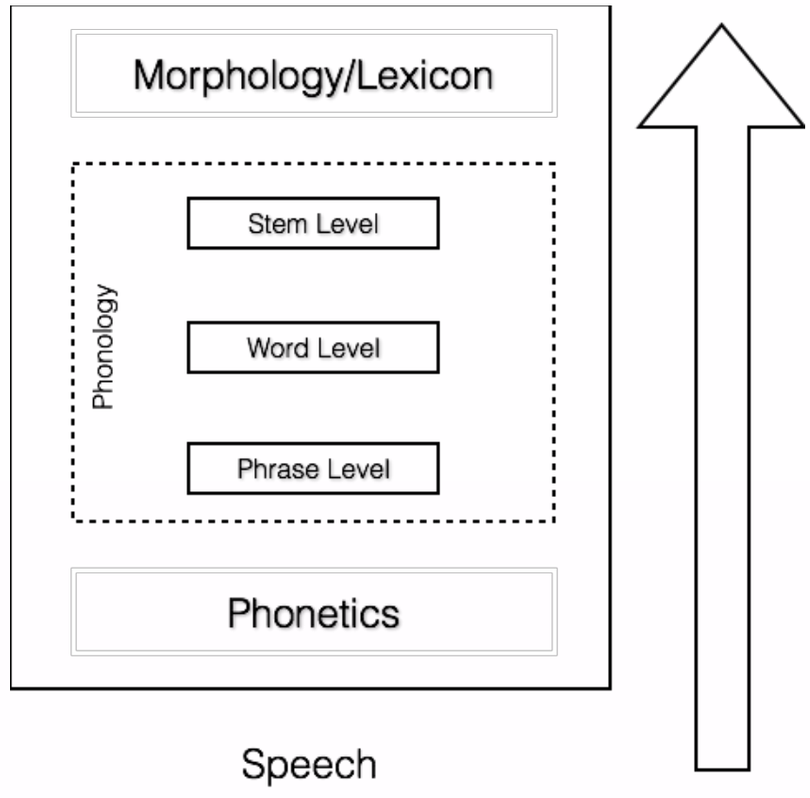
- Deletion of post-nasal /g/ was not immediately exhaustive, it has its own diachronic trajectory

The life cycle of phonological processes (Bermúdez-Otero 2011)

- Diachronic trajectory for phonological processes that begin as extragrammatical factors
- Begins applying at the phrase-level, before progressing to the word- and stem-level
- The evolution of post-nasal /g/-deletion
- /g/ ⟶ ø / ŋ ___ σ]

Stage	Surface form of underlying /ŋg/				Language variety/ register
	finger	*sing-er*	*sing it*	*sing* ‖	
0	[ŋg]	[ŋg]	[ŋg]	[ŋg]	Early Modern English
1	[ŋg]	[ŋg]	[ŋg]	[ŋ]	Elphinston (formal)
2	[ŋg]	[ŋg]	[ŋ]	[ŋ]	Elphinston (colloquial)
3	[ŋg]	[ŋ]	[ŋ]	[ŋ]	Present Day English

Adapted from Bermúdez-Otero (2011: 2024)



Adapted from Bermúdez-Otero & Trousdale (2012: 700)

The life cycle of phonological processes (Bermúdez-Otero 2011)

- Synchronic implication under a cyclic analysis:
    - more chances to apply in the derivation = higher application rate on the surface

- See Guy (1991) on /t,d/-deletion and Turton (2013, 2014) on /l/-darkening

Word	*finger*	*singer*	*sing it*	*sing* ‖
Stem-level	/fɪŋ.gə/	/sɪŋg/	/sɪŋg/	/sɪŋg/
Word-level	/fɪŋ.gə/	/sɪŋ.gə/	/sɪŋg/	/sɪŋg/
Phrase-level	/fɪŋ.gə/	/sɪŋ.gə/	/sɪŋ.gɪt/	/sɪŋg/
	0	1	2	3

1. Introduction
   - The topic
   - Velar nasal plus
   - Historical origin

2. Methodology

3. Results
   - Unstressed (ing)
   - Stressed (ng)

4. Conclusion
   - Summary
   - Ongoing work

Methodology

- Quantitative approach drawing upon natural language data from fifteen sociolinguistic interviews

- Stratified by age, sex, and speech community (Manchester and Blackburn)

- Interviews typically one hour long, followed by a reading passage and word list

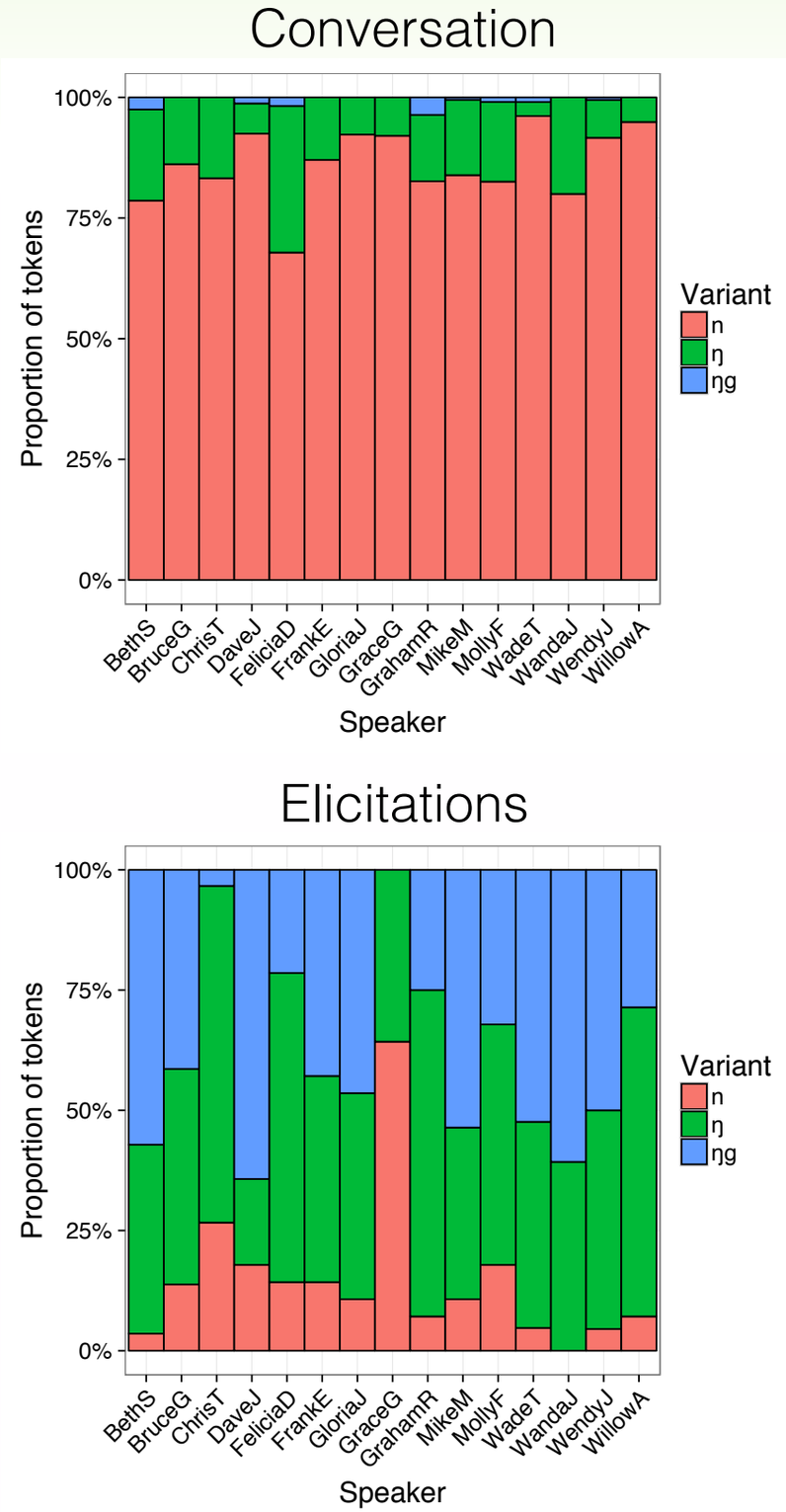
- Tokens of (ing) and (ng) coded auditorily, with inspection of spectrogram for ambiguous tokens

	Conversation	Elicited	Total
(ing)	2069	410	**2479**
(ng)	507	236	**743**
Total	**2576**	**646**	**3222**

Results

Unstressed (ing)

- Three-way alternation in the unstressed **-ing** suffix…
- … but it's more like a two-way alternation, at least in the conversation
- Velar nasal plus in unstressed clusters only really present in elicited speech



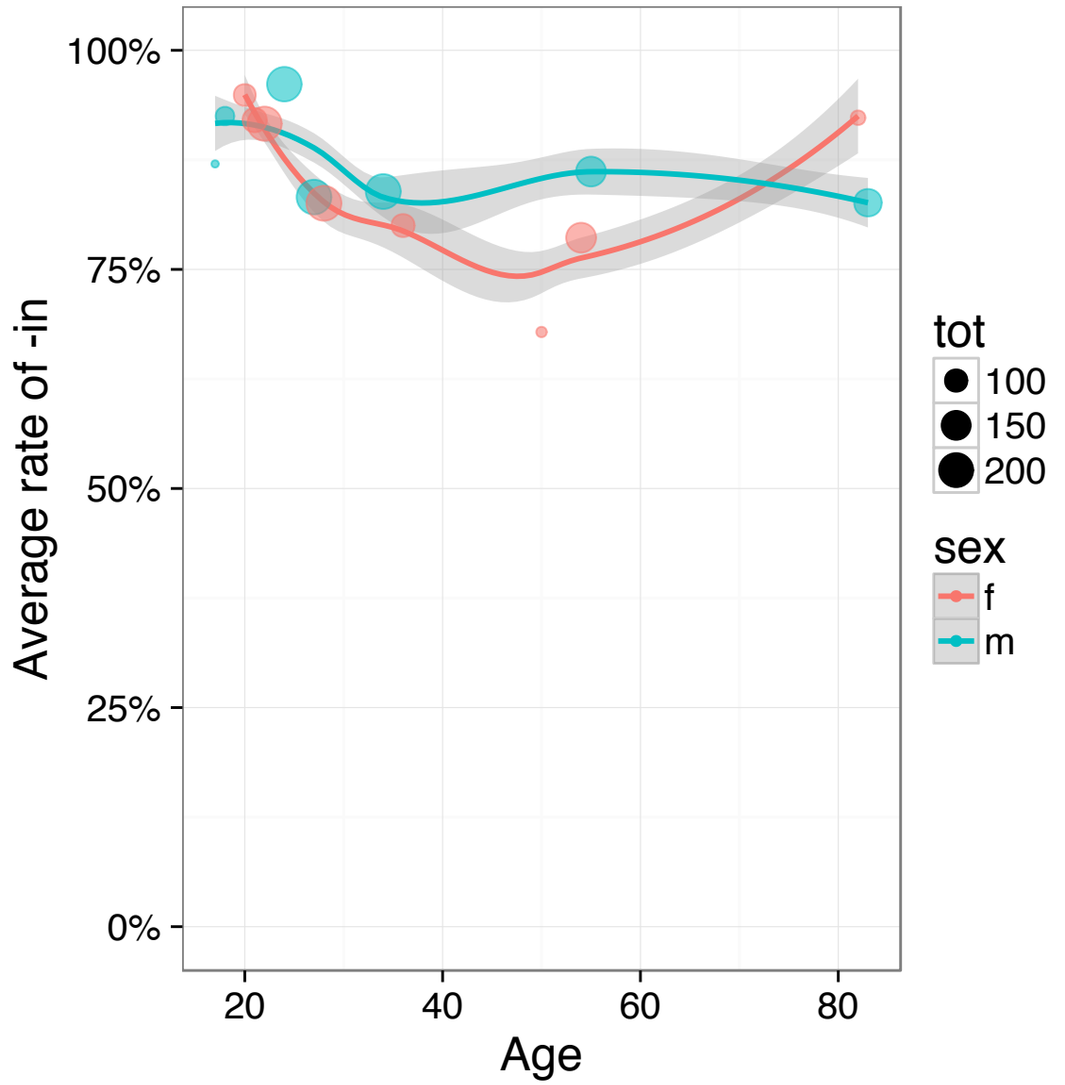
Social factors

Unstressed (ing)

- Slight age-graded pattern, though more observable for females than males

- Males show more of a preference for *-in*

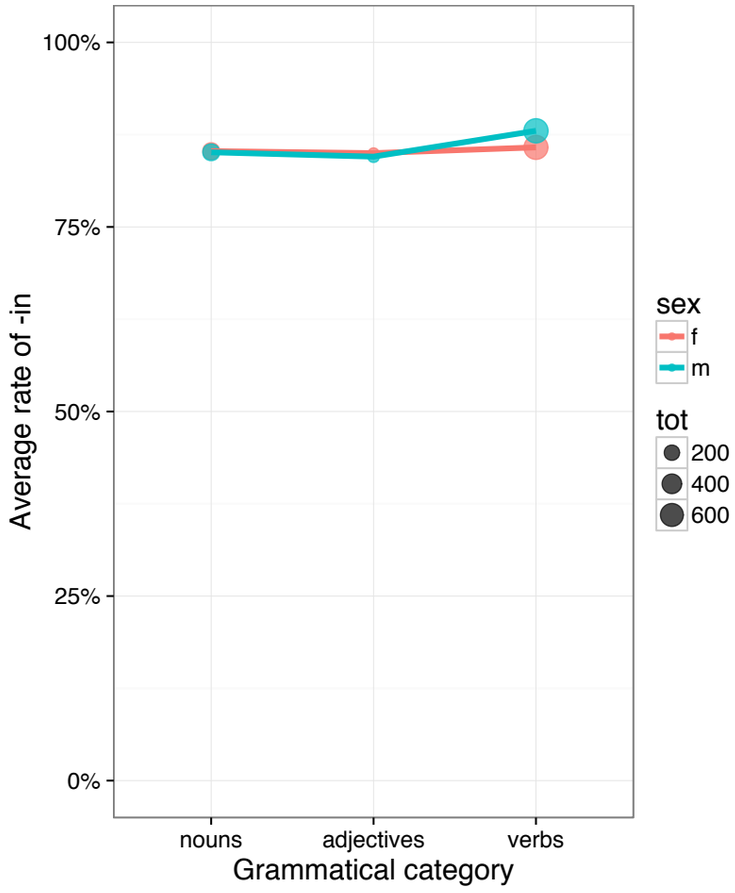
- Expected results, given the well-established status of (ing) as a stable sociolinguistic variable with high social awareness

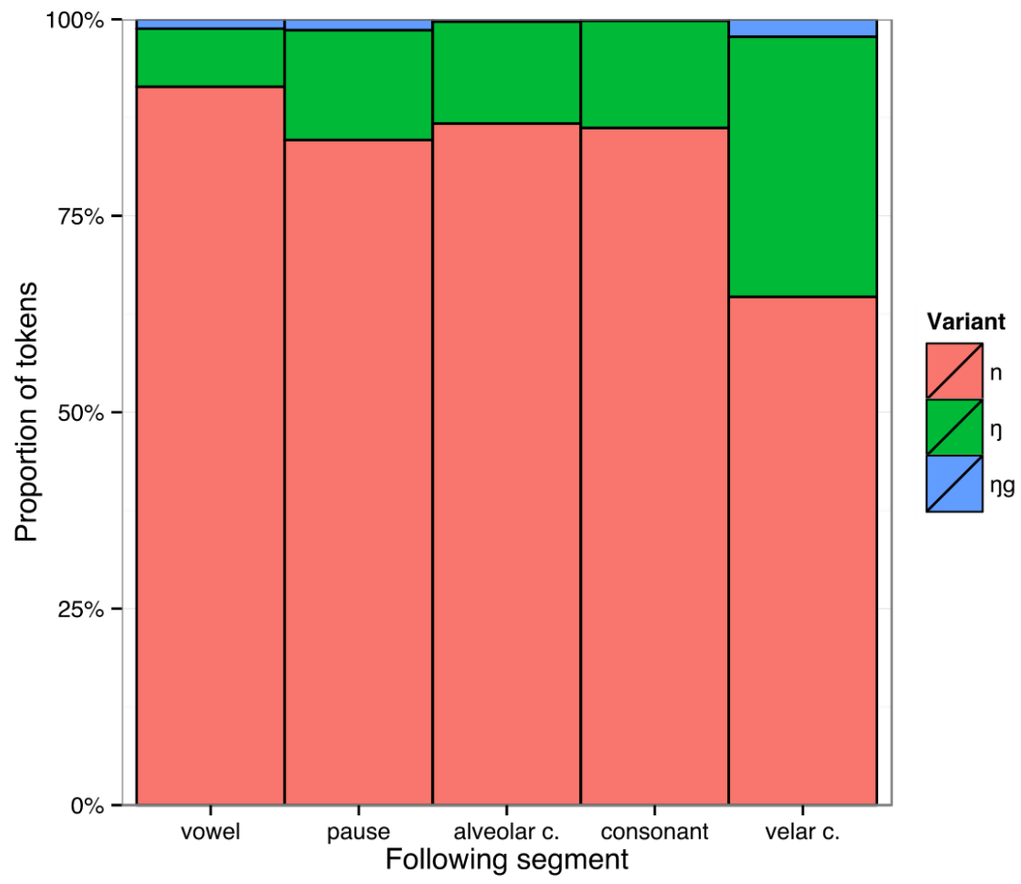


Internal factors

Unstressed (ing)

- No significant effect of part of speech
- Regressive assimilation with following velar consonants





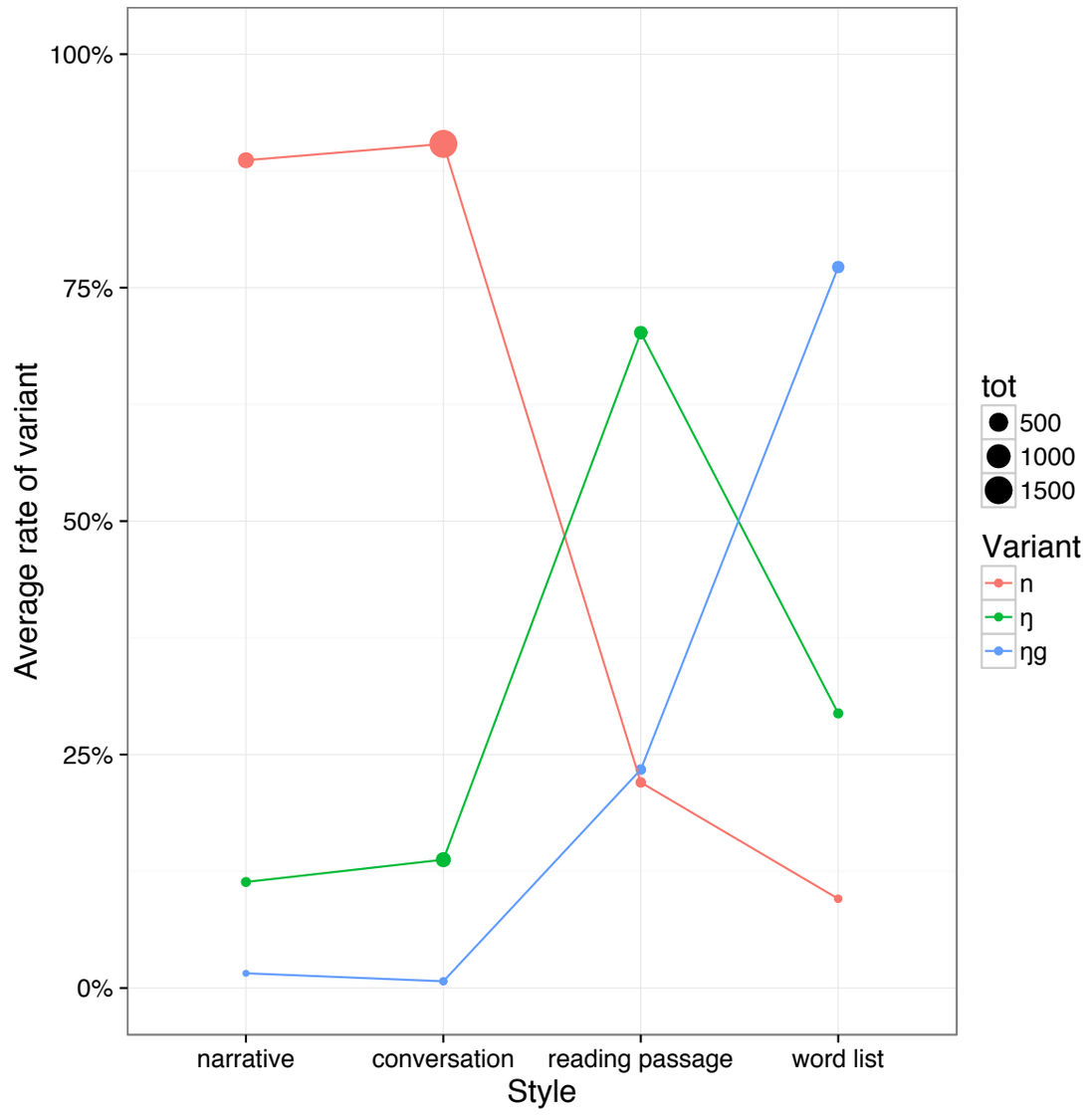
Style

Unstressed (ing)

- A fine-grained look at style reveals interesting behaviour

- Reading passage: decrease of *-in* and increase of *-ing* and *-ingg*

- But word list: *-ing* actually decreases, and *-ingg* becomes remarkably frequent (~76% of all tokens)



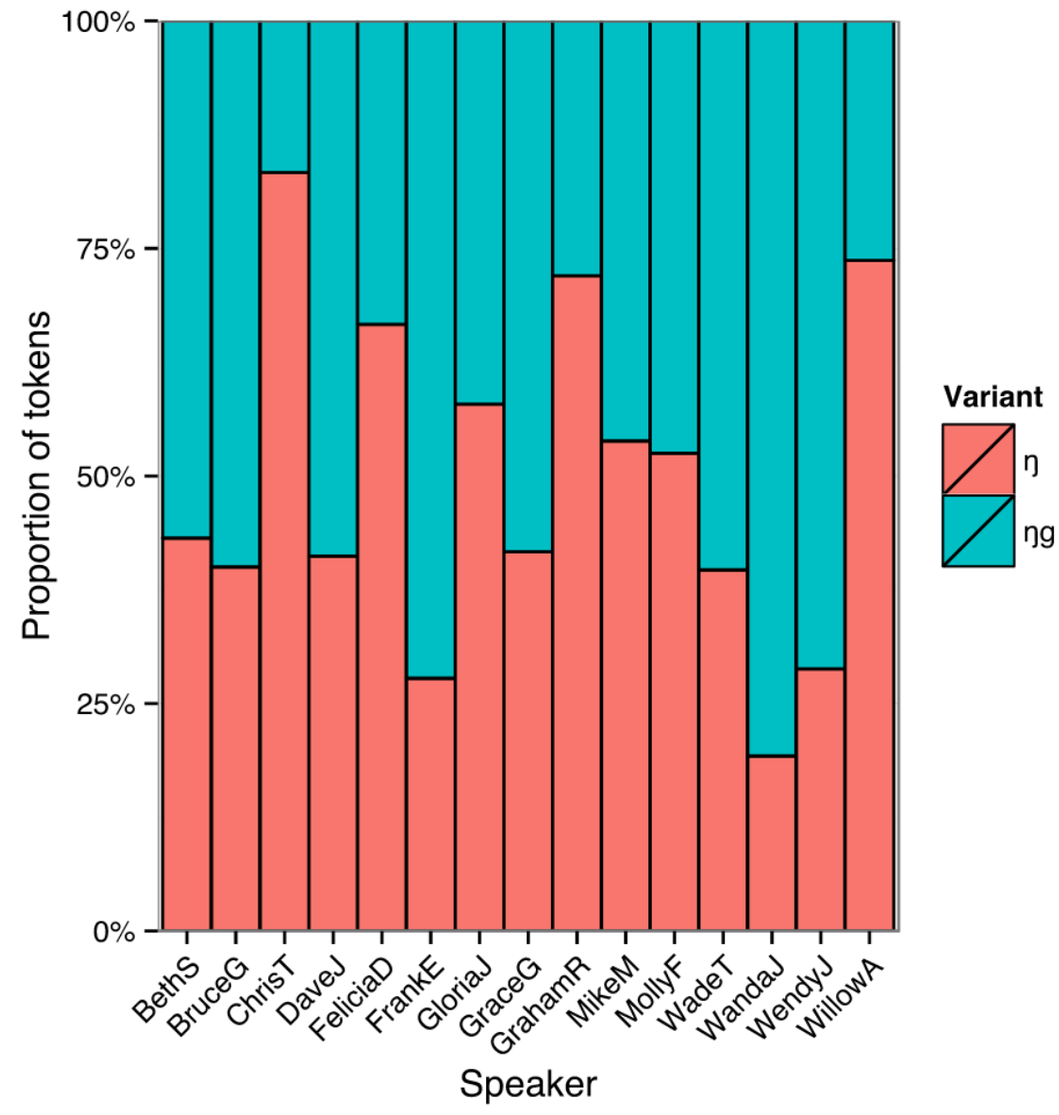
Results

Stressed (ng)

- Two-way alternation between [ŋ] and [ŋg] in stressed contexts; variable application of /g/-deletion rule

- Highly variable in conversational data

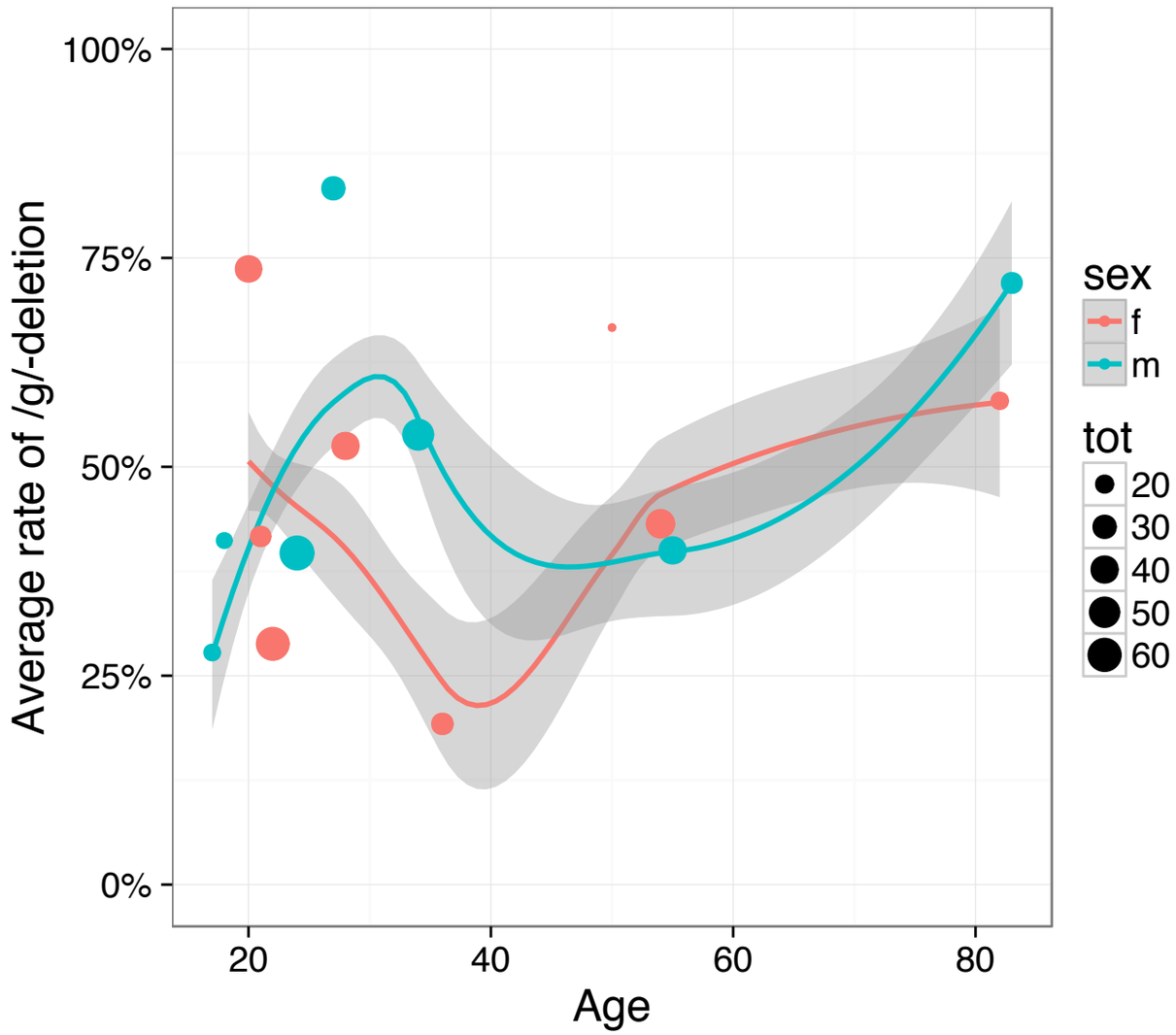
    - both within-speaker and between-speaker variation



Social factors

Stressed (ng)

- Effect of age and sex somewhat less clear than for unstressed (ing)
- Suggestion that older speakers show more /g/-deletion
- No clear pattern in terms of age or sex

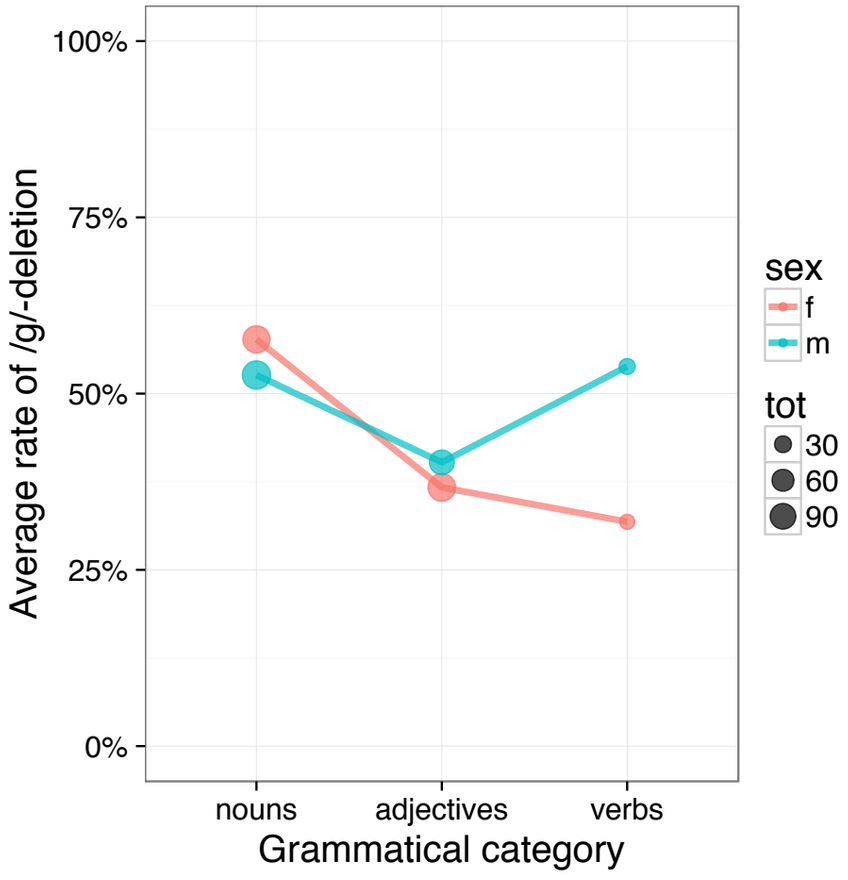


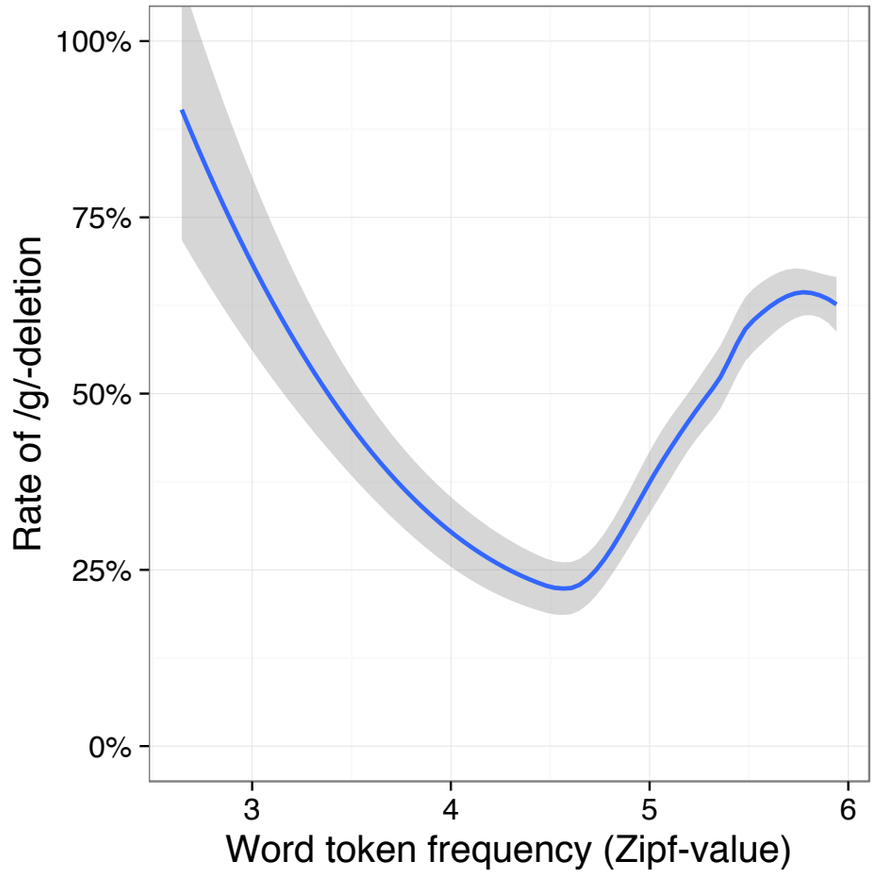
Internal factors (i)

Stressed (ng)

- Grammatical category isn't much better - nice monotonic pattern for females, but not for males

- Unusual curvilinear effect of word token frequency

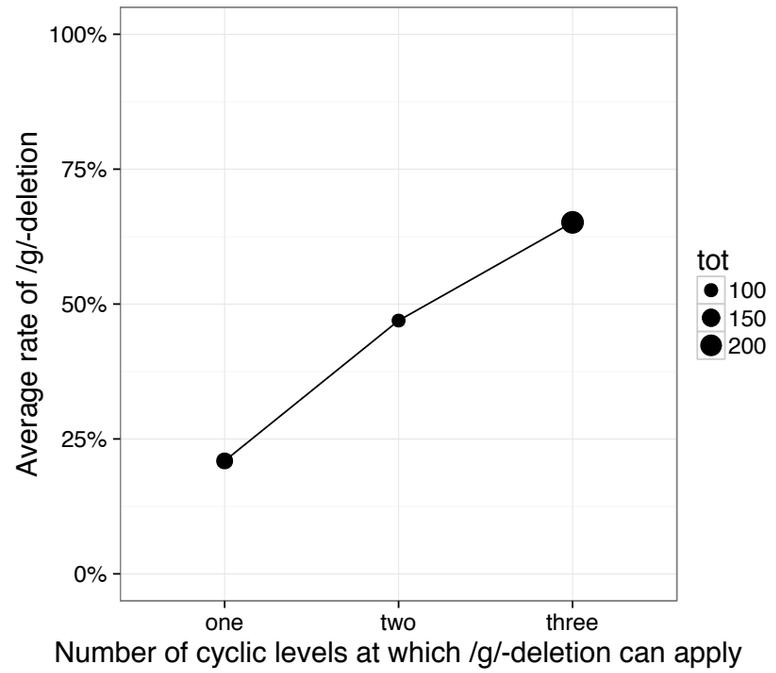


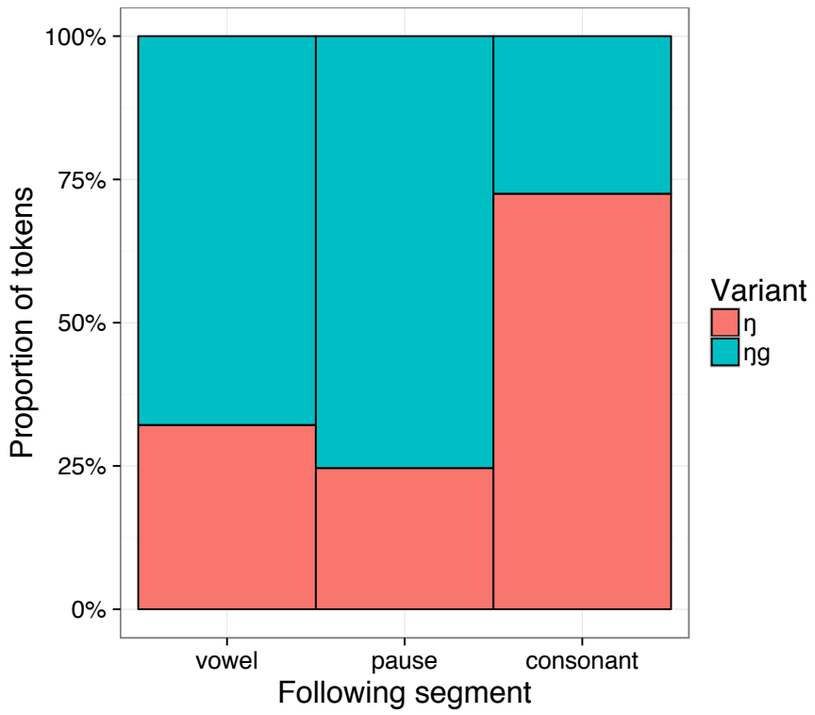


The life cycle (i)

Stressed (ng)

- The diachronic trajectory of /g/-deletion along the life cycle has interesting synchronic implications
- Correlation between surface rate of application and the number of cyclic levels in which it *can* apply
- This turns out to be a really strong predictor
- Word-final /ŋg/ should show comparable behaviour in pre-pausal and pre-consonantal environments
- But we actually find high rates of deletion pre-consonantally (as predicted), but extremely *low* rates pre-pausally (not predicted)





Style

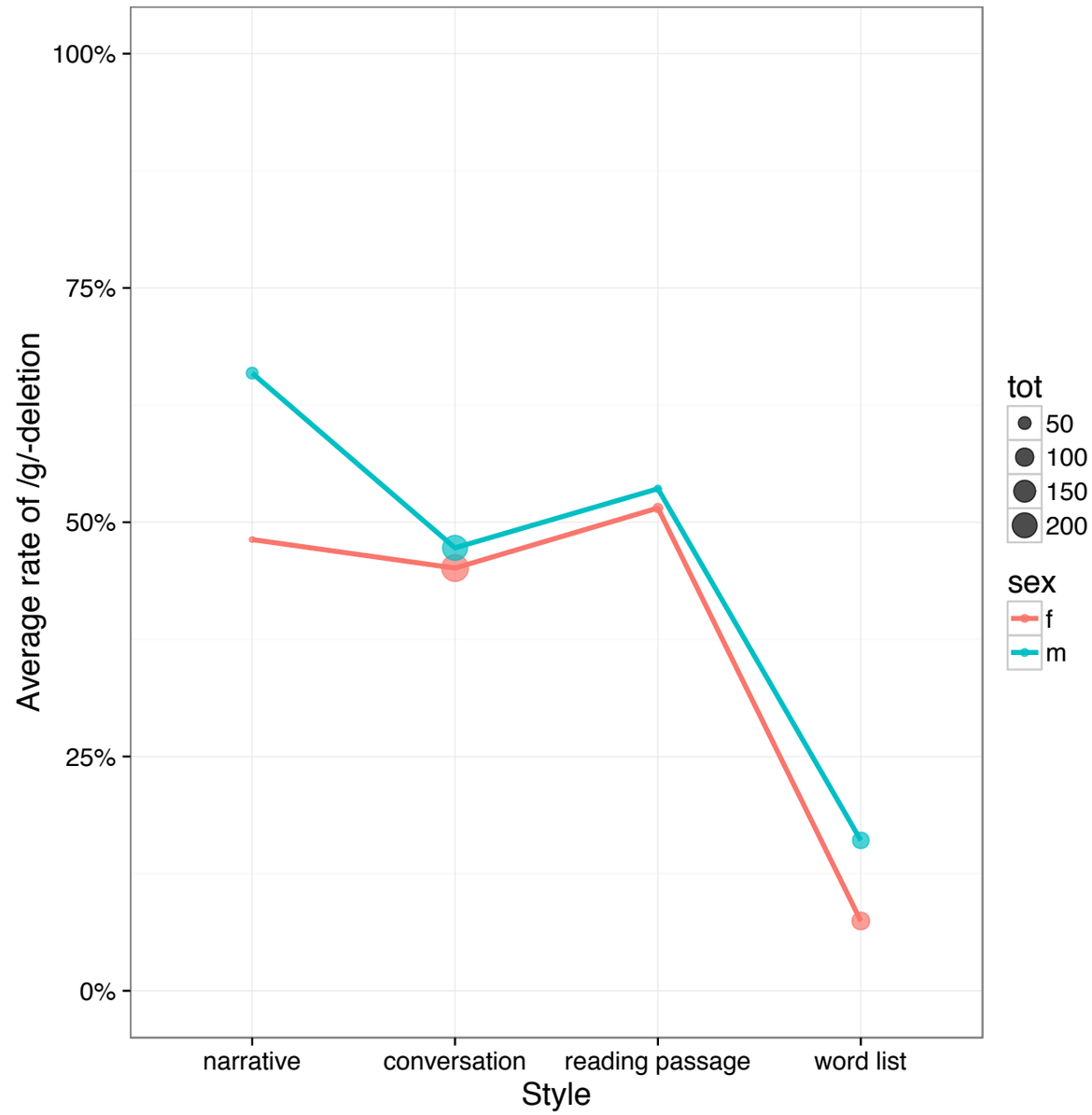
Stressed (ng)

- Another interesting pattern across the four-way style distinction

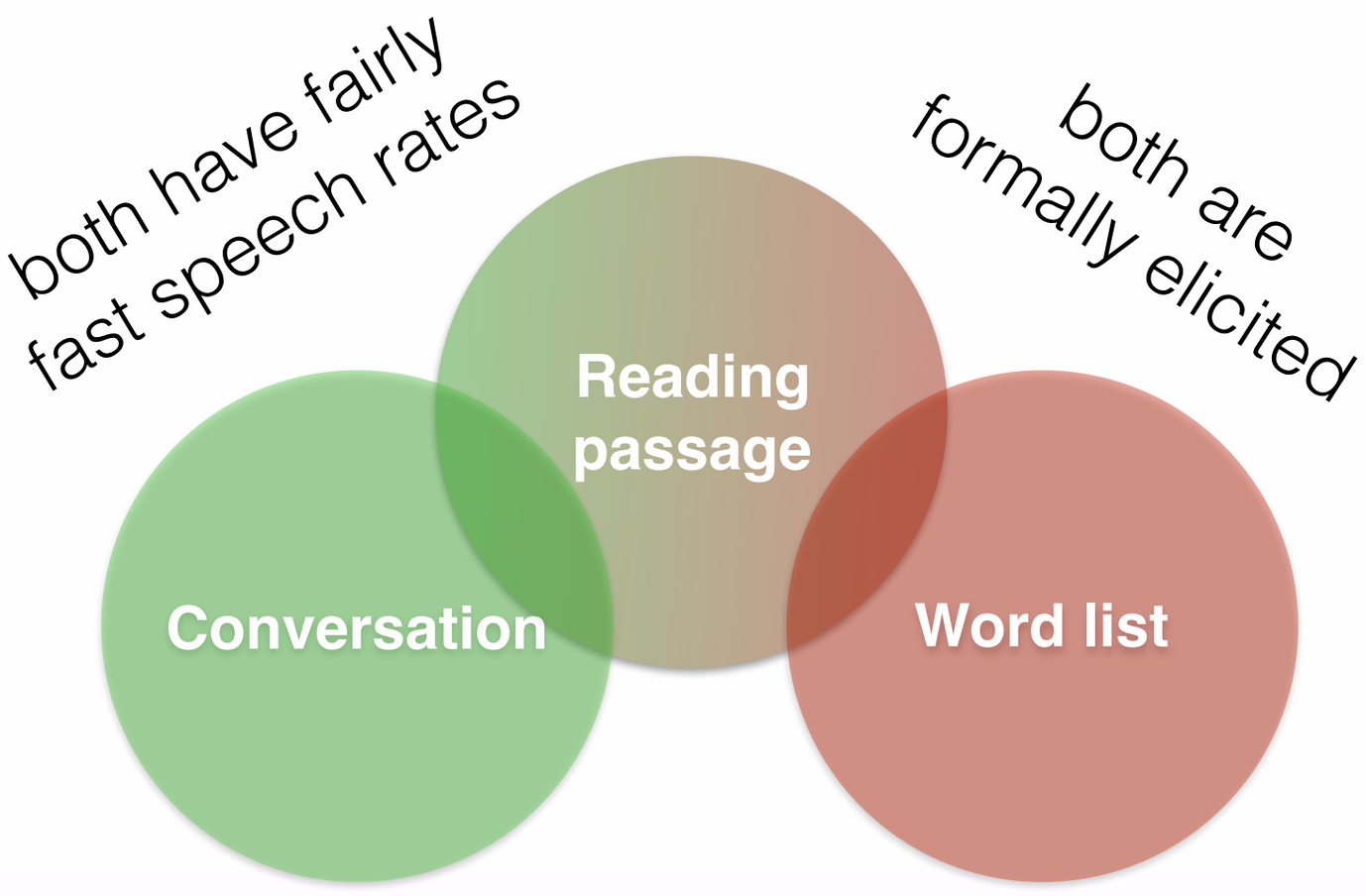
- Rate of /g/-deletion doesn't decrease from conversation to reading passage, despite the latter being elicited

    - but [ŋg] is supposedly prestigious!

- Massive decrease in the word list



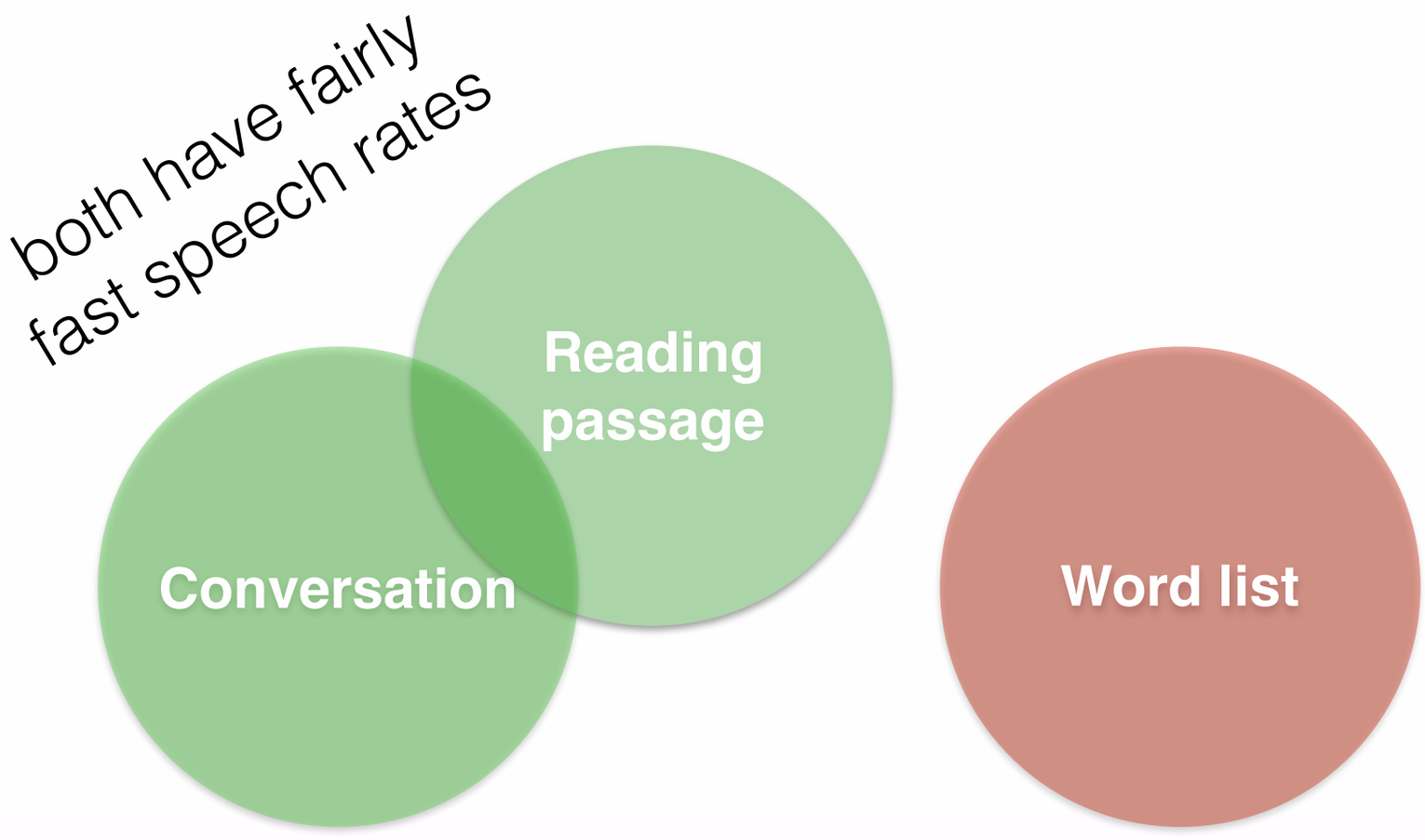
Why?



But what if style/formality is irrelevant?

What if this stylistic pattern actually reflects speech rate, not formality?

Why?



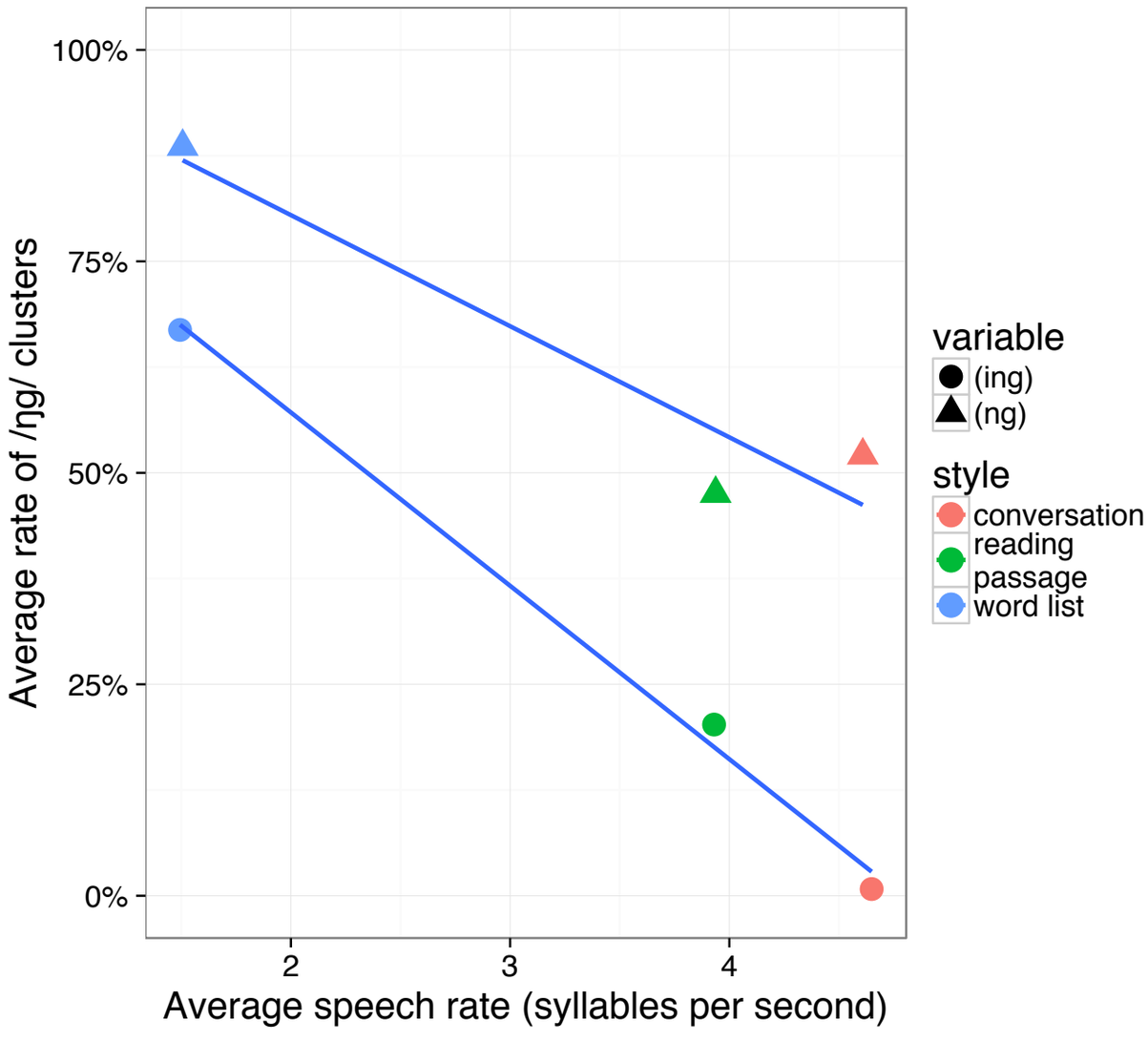
But what if style/formality is irrelevant?

What if this stylistic pattern actually reflects speech rate, not formality?

Then it makes perfect sense!

Style and speech rate

- There is clear collinearity between style and speech rate
    - More formal style = slower rate of speech
- Fairly linear relationship between average /g/-deletion and speech rate across the three discourse styles
- More work should be conducted to tease apart these two factors



Summary

- Velar nasal plus exists in these two northern varieties of English, in (ing) and (ng)
- For (ing), [ɪŋg] almost entirely absent in conversation, but very common in word list elicitations
- For (ng), lots of variation in conversational data but not modelled particularly well by social factors; almost entirely predicted by:
    - the cyclic nature of /g/-deletion
    - inhibition of the deletion rule pre-pausally
    - model with just these two predictors better by AIC (447, cf. 461) with only a minimal increase in deviance (435, cf. 423) compared to a model with all social/internal predictors

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Ongoing work

- **Pre-boundary lengthening and duration** - do we see a gradient scale of [g]-presence correlating with prosodic and syntactic boundary strength and rime duration?

- **Phonetics** - [g]-presence in /ŋg/ clusters often devoiced and ejectivised, just like underlying /k/ phrase-finally

    - **Displaced contrast** - pre-fortis clipping before underlying /k/ means that the underlying laryngeal contrast may be neutralised, but transferred onto preceding engma duration

    - **Perception** - how much do speakers rely on engma duration as the primary acoustic cue to solving *sing~sink* ambiguity in these varieties?

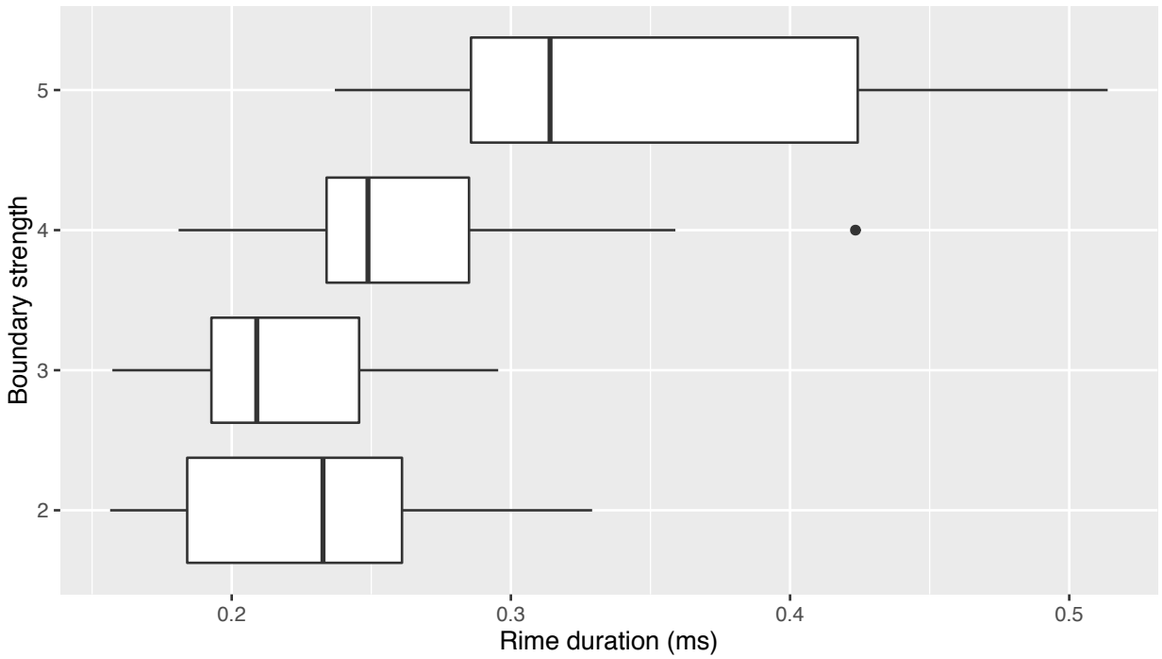
- **Prestige** - need independent evidence to uncover social perception of /ŋg/, both from perception studies and from investigating social class in this variationist study

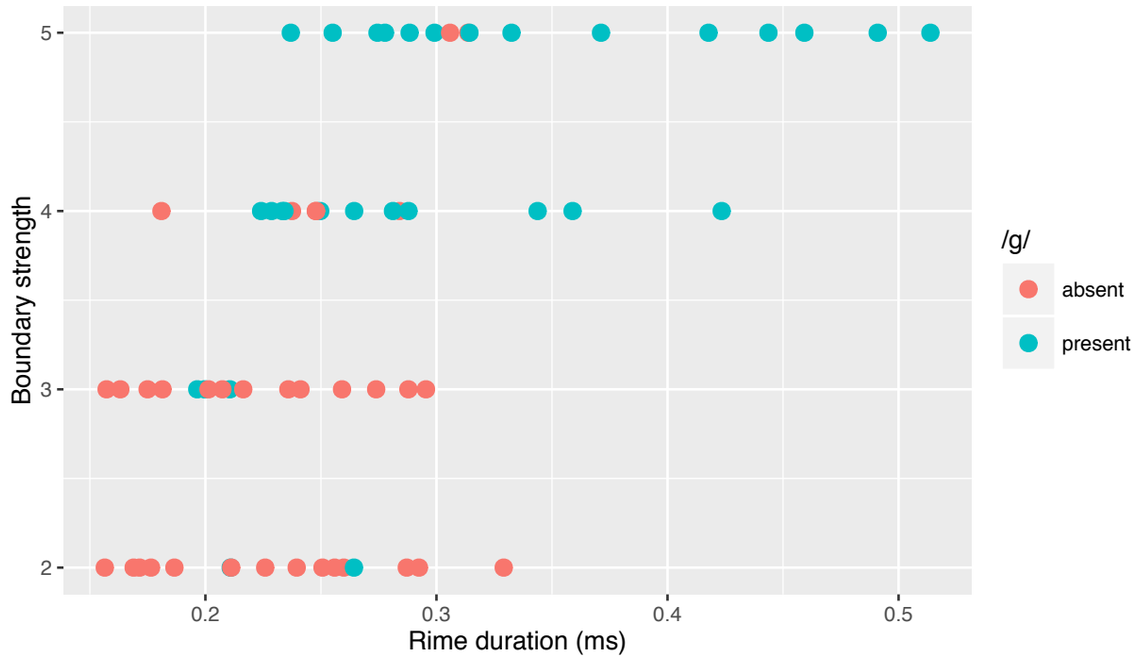
Ongoing work: rime duration

- **Research questions**: is deletion inhibited pre-pausally because velar nasal plus is used as a boundary marker? Is /g/-presence correlated with rime duration and boundary strength (through pre-boundary lengthening)?

- **Methodology**: elicit word-final /ŋg/ before prosodic/syntactic boundaries of different 'strengths'

- **Preliminary results**: correlation between boundary strength and rime duration (r = 0.51); correlation between rime duration and [g]-presence (r = 0.48)





Ongoing work: displaced contrast

- Phonetically, post-nasal /g/ sounds **devoiced** and sometimes **ejectivised**
- Ejectivisation of word-final /k/ is well-attested in English (e.g. Gordeeva & Scobbie 2011; McCarthy & Stuart-Smith 2013)
- Neutralisation of underlying laryngeal contrast
- Still a contrast in engma duration due to pre-fortis clipping, leading to minimal pairs like *sing~sink*
    - [sɪŋg̥’] ~ [sɪŋ̆k’]
- Do speakers really just use engma duration as the acoustic cue for this alternation? Where’s the cut-off point? Is this phonetic variation socially stratified, changing over time etc.? How do southern speakers (who don’t usually rely on engma duration) behave in forced identification/discrimination tasks?

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Appendix

Logistic regression model for (ng); /g/-deletion as application value

Predictor	**Log-odds**	**Std. error**	**z-value**	***p*-value**
cyclic levels *three*	3.2631	0.4830	6.756	**<0.001**
cyclic levels *two*	1.1996	0.4673	2.567	**0.01026**
pre-pausal *yes*	-3.2544	0.4374	-7.440	**<0.001**
AIC: 447.4	Deviance: 435.4	*C*: 0.790	D_{xy}: 0.581	

(speaker and word entered as random factors)

Appendix

Logistic regression model for (ng); /g/-deletion as application value

Predictor	**Log-odds**	**Std. error**	**z-value**	***p*-value**
sex - *male*	-0.08703	0.97621	-0.089	0.929
age - *old*	0.89791	1.28125	0.701	0.483
age - *young*	0.04535	0.85882	0.053	0.958
location - *Manchester*	0.34596	0.66449	0.521	0.603
speech rate	0.07116	0.14398	0.494	0.621
cyclic levels - *three*	2.94629	0.51926	5.674	**1.40E-08**
cyclic levels - *two*	0.80181	0.51639	1.553	0.12
word frequency	0.33294	0.30688	1.085	0.278
pos - *adverb*	-12.93915	1547.52842	-0.008	0.993
pos - *adjective*	-12.93268	1547.52839	-0.008	0.993
pos - *noun*	-12.67719	1547.52841	-0.008	0.993
pos - *pronoun*	-12.41297	1547.52871	-0.008	0.994
pos - *verb*	-12.63804	1547.52847	-0.008	0.993
pre-pausal - *yes*	-3.40533	0.45095	-7.551	**4.30E-14**
male:old	1.20136	1.83021	0.656	0.512
male:young	0.55798	1.22213	0.457	0.648
AIC: 460.8	Deviance: 422.8	*C*: 0.828	D_{xy}: 0.657	

(speaker and word entered as random factors)