

t-glottalling, flapping  
and pre-glottalisation  
in British Englishes:  
Patterns in  
phonological and  
social variability

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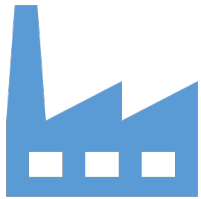
5<sup>th</sup> December 2019

# Overview

- We'll be considering a range of t-lenition processes in English
  - glottalling, flapping and pre-glottalisation
- Variation conditioned by a multitude of factors:
  - phonological context
  - morpho-syntactic context
  - sociolinguistic factors (age, sex, social class)
- Variation is entirely orderly when considering it from the perspective of phonological theory
  - Synchronic reflections of the life cycle of phonological processes

# Three examples

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glottal stops in  
Manchester



flapping in Blackburn



pre-glottalisation in  
Newcastle

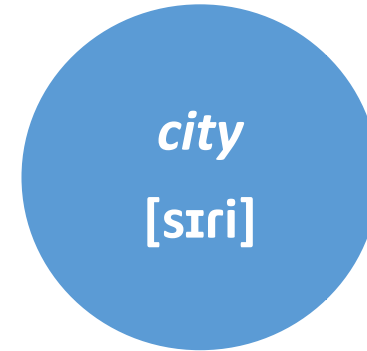
# Theoretical background

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# t-lenition processes

Kiparsky (1979) on American English flapping

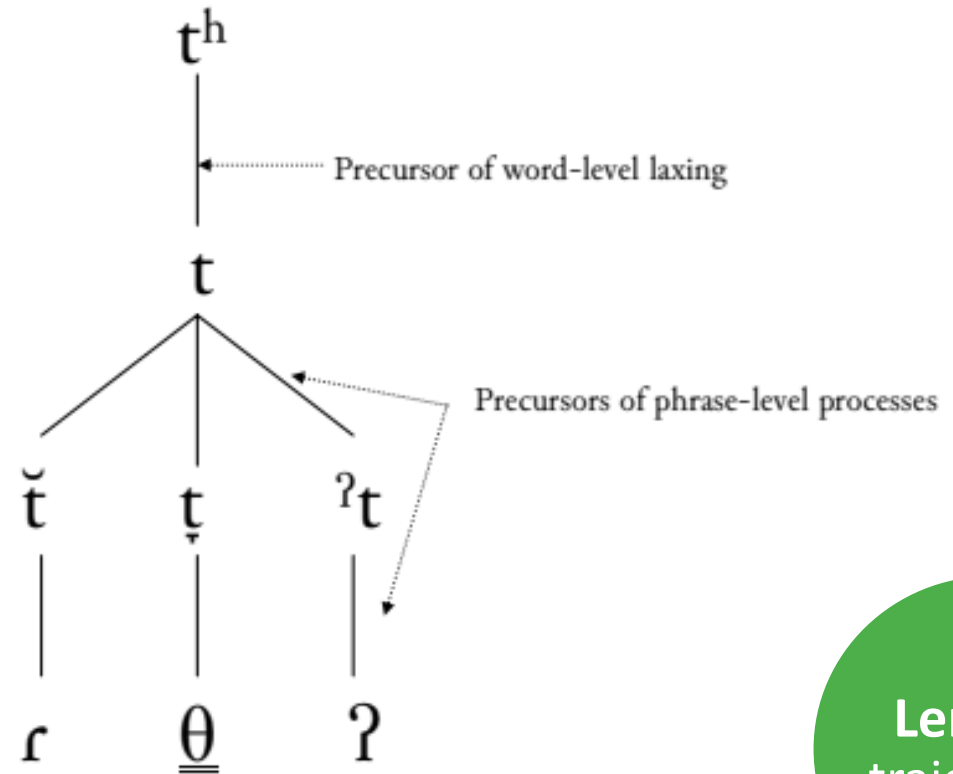
- Stage 1 : word level
  - /t/s which are not foot-initial are laxed
    - *city, sit on, sit here, sit*
    - *\*attack*
- Stage 2: phrase level
  - lax tokens of /t/ between vowels are flapped
    - *city, sit on*



# t-lenition processes

What happens to laxed /t/s at the word level outside of V\_V?

- Stage 1 : word level
  - /t/s which are not foot-initial are laxed
    - *city, sit on, sit there, sit*
    - \**attack*
  - American English – unreleased
  - RP – pre-glottalisation
  - Scouse – fricativisation
  - Urban British – glottal stop

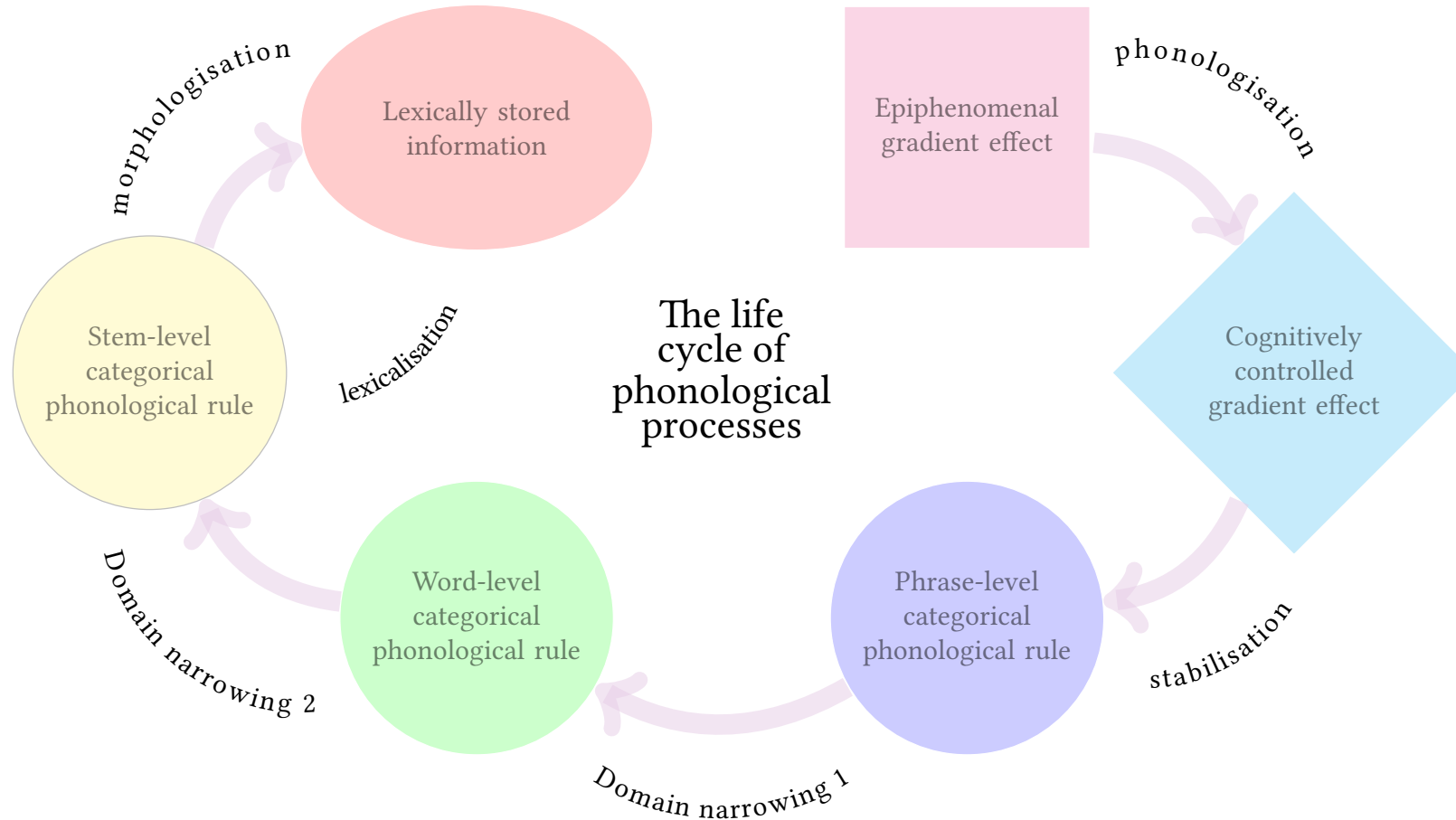


**Lenition**  
trajectories

See also Harris & Kaye (1990)

# The life cycle of phonological processes

Bermúdez-Otero (2015)



Ramsammy (2015); Turton (2017)

# Example: English /l/-darkening

//  
darkens in  
the coda

	<i>light</i>	<i>helium</i>	<i>heal-ing</i>	<i>heal it</i>	<i>heal</i>
RP	[l]	[l]	[l]	[l]	[ɫ]
Am. Eng. 1	[l]	[l]	[l]	[ɫ]	[ɫ]
Am. Eng. 2	[l]	[l]	[ɫ]	[ɫ]	[ɫ]
Am. Eng. 3	[l]	[ɫ]	[ɫ]	[ɫ]	[ɫ]

Cruttenden (2008); Jones (1966)

Sproat and Fujimura (1993); Gick (2003)

Olive et al. (1993)

Hayes (2000); Yuan and Liberman (2011)

**Stage 1:** /l/ darkens  
in the coda at the  
phrase level



# Example: English /l/-darkening

	<i>light</i>	<i>helium</i>	<i>heal-ing</i>	<i>heal it</i>	<i>heal</i>
RP	[l]	[l]	[l]	[l]	[ɫ]
Am. Eng. 1	[l]	[l]	[l]	[ɫ]	[ɫ]
Am. Eng. 2	[l]	[l]	[ɫ]	[ɫ]	[ɫ]
Am. Eng. 3	[l]	[ɫ]	[ɫ]	[ɫ]	[ɫ]

Cruttenden (2008); Jones (1966)

Sproat and Fujimura (1993); Gick (2003)

Olive et al. (1993)

Hayes (2000); Yuan and Liberman (2011)

**Stage 2:** /l/ darkens  
in the coda at the  
word level

# Example: English /l/-darkening

Domain  
narrowing

	<i>light</i>	<i>helium</i>	<i>heal-ing</i>	<i>heal it</i>	<i>heal</i>
RP	[l]	[l]	[l]	[l]	[ɫ]
Am. Eng. 1	[l]	[l]	[l]	[ɫ]	[ɫ]
Am. Eng. 2	[l]	[l]	[ɫ]	[ɫ]	[ɫ]
Am. Eng. 3	[l]	[ɫ]	[ɫ]	[ɫ]	[ɫ]

Cruttenden (2008); Jones (1966)

Sproat and Fujimura (1993); Gick (2003)

Olive et al. (1993)

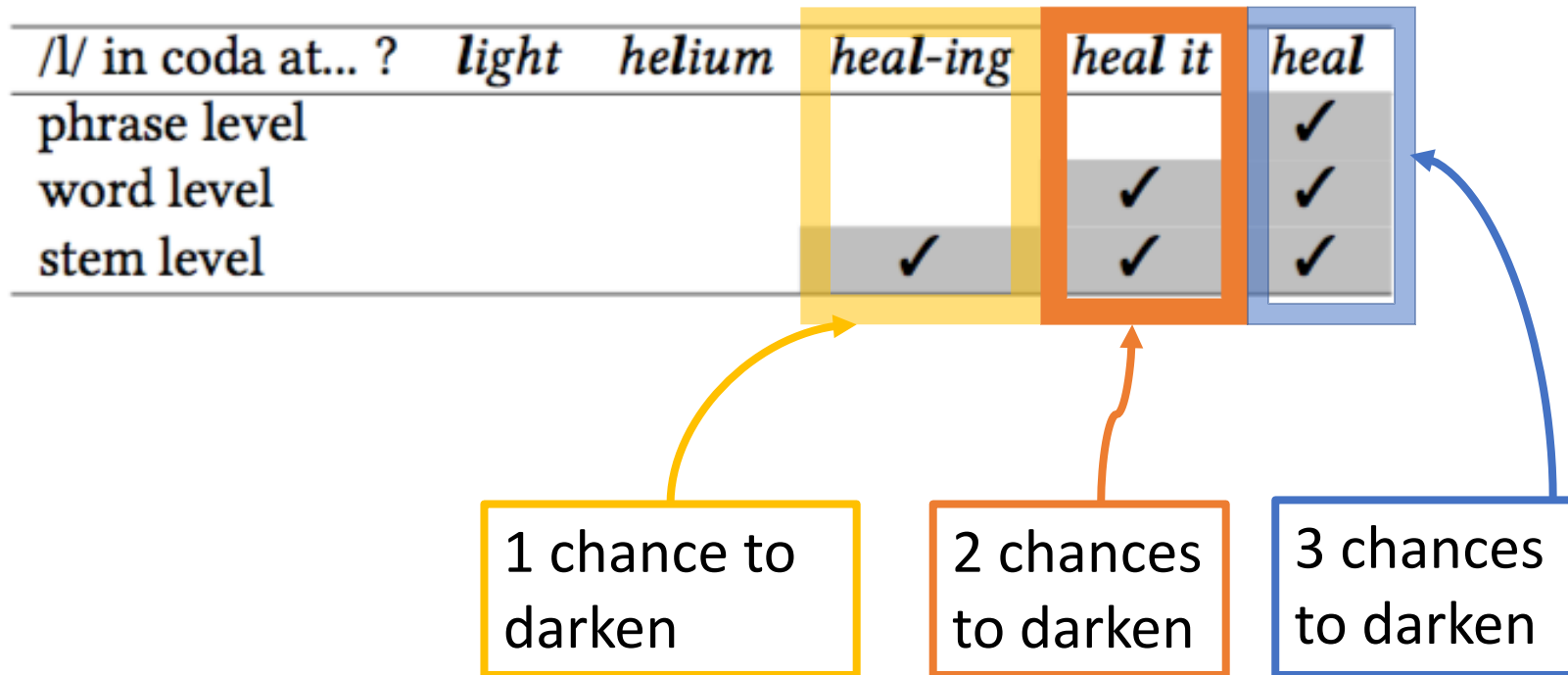
Hayes (2000); Yuan and Liberman (2011)

**Stage 3:** /l/ darkens  
in the coda at the  
stem level

# The variation corollary

*If a phonological process  $\pi$  shows a rate of application  $x$  in a small embedded domain  $\alpha$ , then  $\pi$  will apply at a rate equal to or greater than  $x$  in a wider cyclic domain  $\beta$ .*

Turton (2016: 139)



See also Guy (1991)  
Boersma & Hayes (2001)

# Example: English /l/-darkening

	<i>light</i>	<i>helium</i>	<i>heal-ing</i>	<i>heal it</i>	<i>heal</i>	
RP	[l]	[l]	[l]	[l]	[ɫ]	Cruttenden (2008); Jones (1966)
Am. Eng. 1	[l]	[l]	[l]	[ɫ]	[ɫ]	Sproat and Fujimura (1993); Gick (2003)
Am. Eng. 2	[l]	[l]	[ɫ]	[ɫ]	[ɫ]	Olive et al. (1993)
Am. Eng. 3	[l]	[ɫ]	[ɫ]	[ɫ]	[ɫ]	Hayes (2000); Yuan and Liberman (2011)

Coda-level  
darkening

# Example: English /l/-darkening

Rule  
generalisation

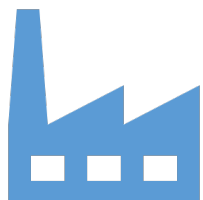
	<i>light</i>	<i>helium</i>	<i>heal-ing</i>	<i>heal it</i>	<i>heal</i>	
RP	[l]	[l]	[l]	[l]	[ɫ]	Cruttenden (2008); Jones (1966)
Am. Eng. 1	[l]	[l]	[l]	[ɫ]	[ɫ]	Sproat and Fujimura (1993); Gick (2003)
Am. Eng. 2	[l]	[l]	[ɫ]	[ɫ]	[ɫ]	Olive et al. (1993)
Am. Eng. 3	[l]	[ɫ]	[ɫ]	[ɫ]	[ɫ]	Hayes (2000); Yuan and Liberman (2011)

Foot-based  
darkening

# The data

sociolinguistic  
interviews

auditorily  
coded



**Manchester**

13,648 tokens, 128 speakers



**Blackburn**

3,200 tokens from 28 speakers

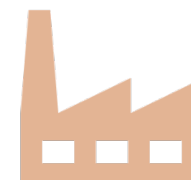


**Newcastle**

4,203 tokens, 32 speakers

# t-glottalling

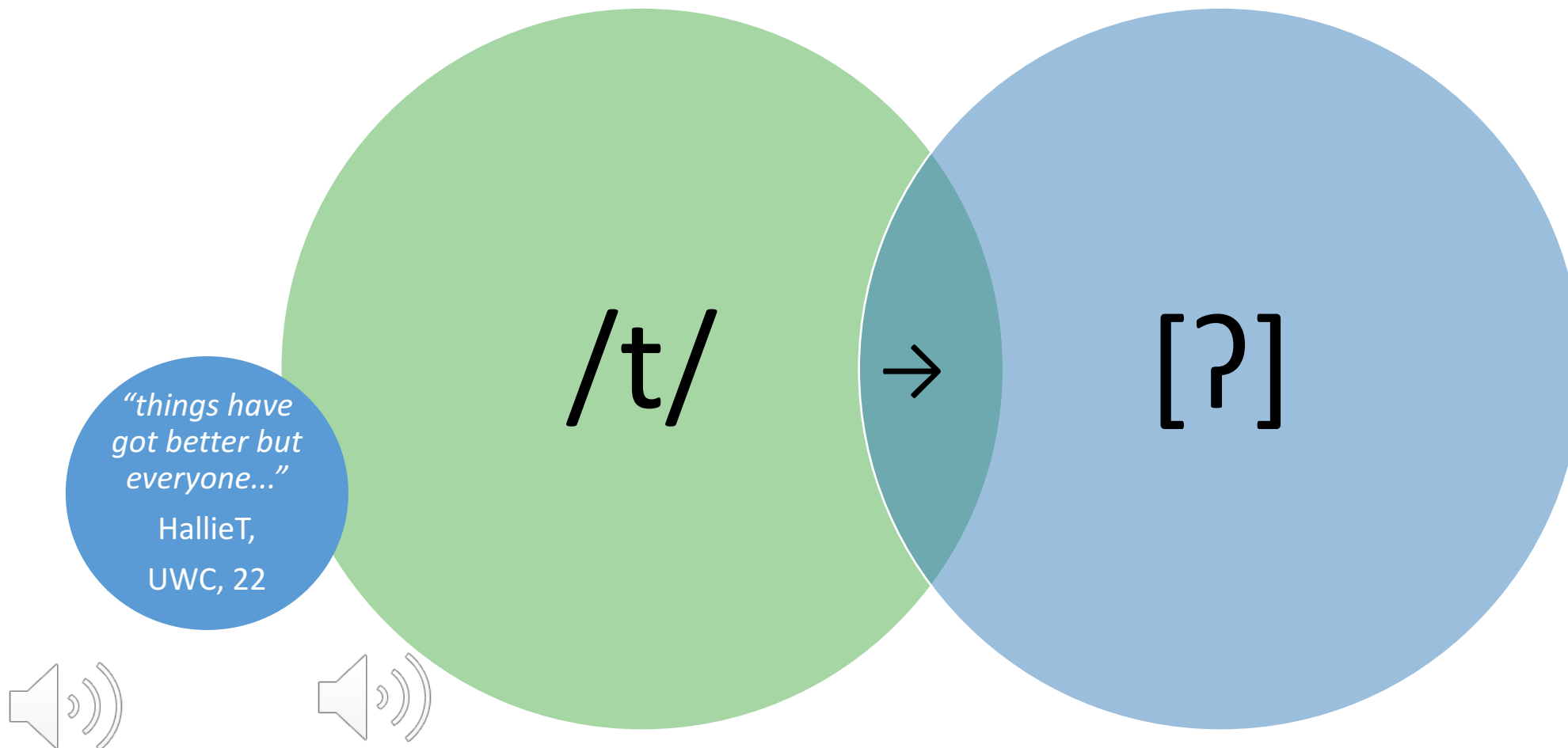
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**Manchester**

13,648 tokens, 128 speakers

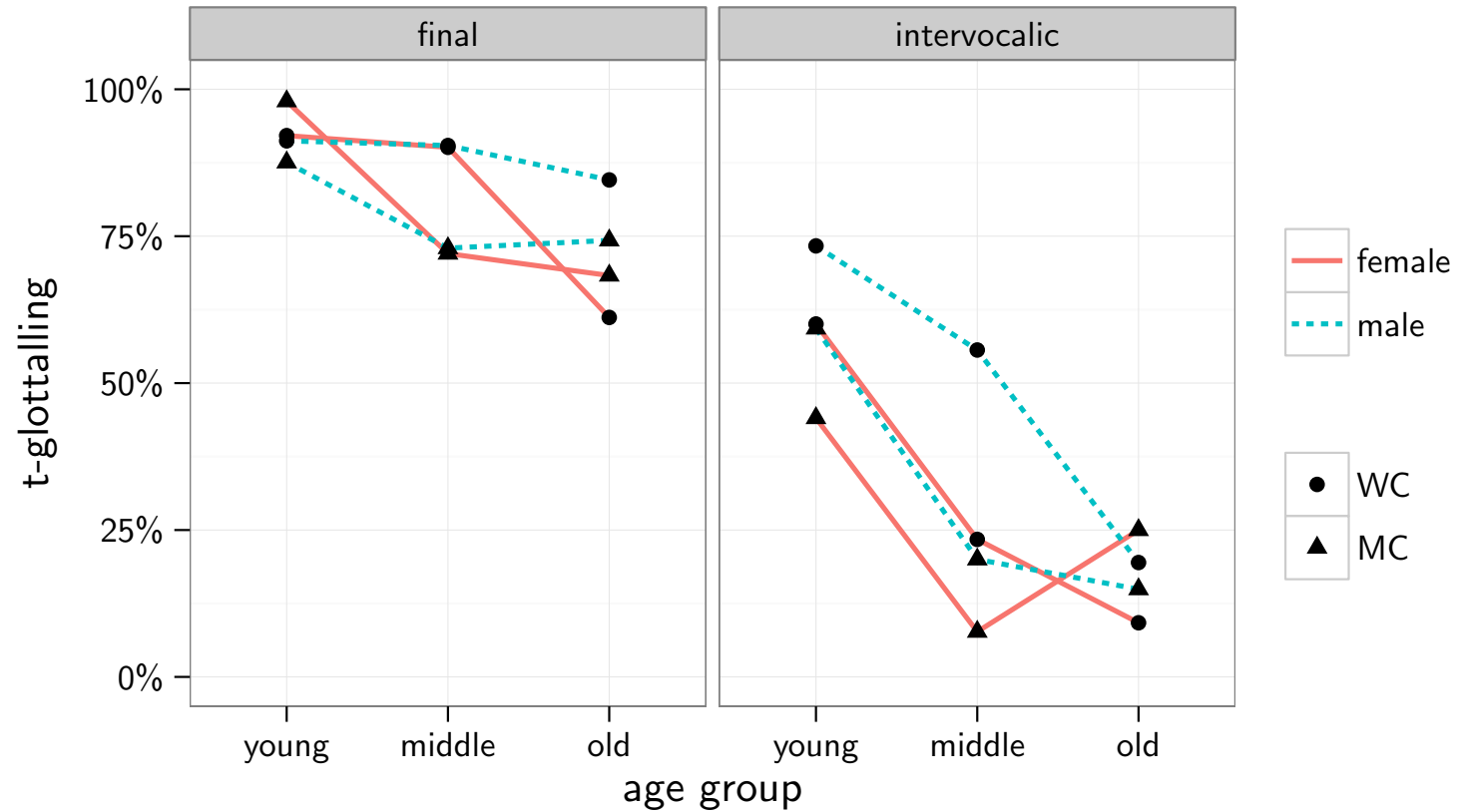
# /t/-glottalling in Manchester





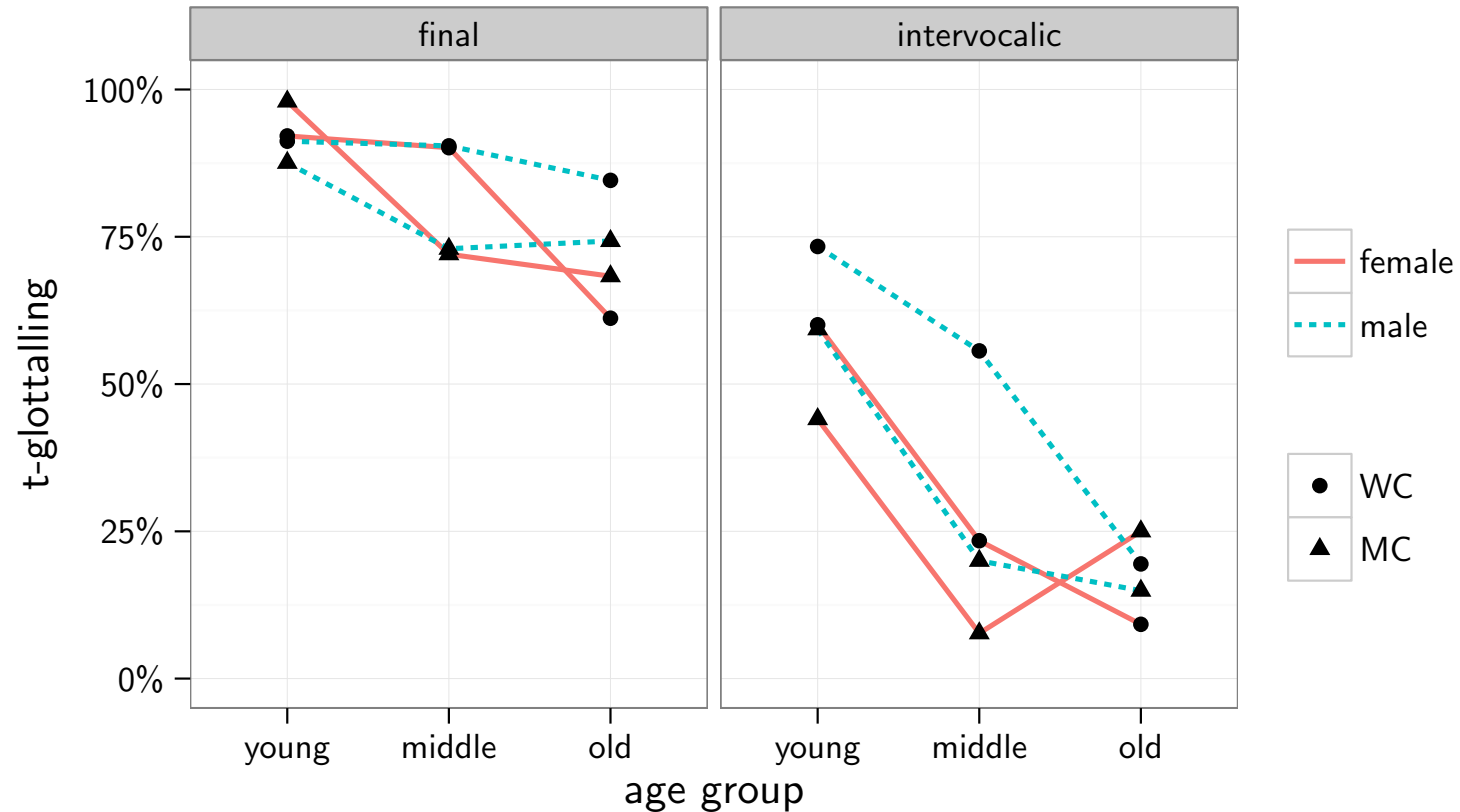
# /t/-glottalling

Manchester (Baranowski & Turton, 2015)



# Rule generalisation: /t/-glottalling advancing from syllable to foot

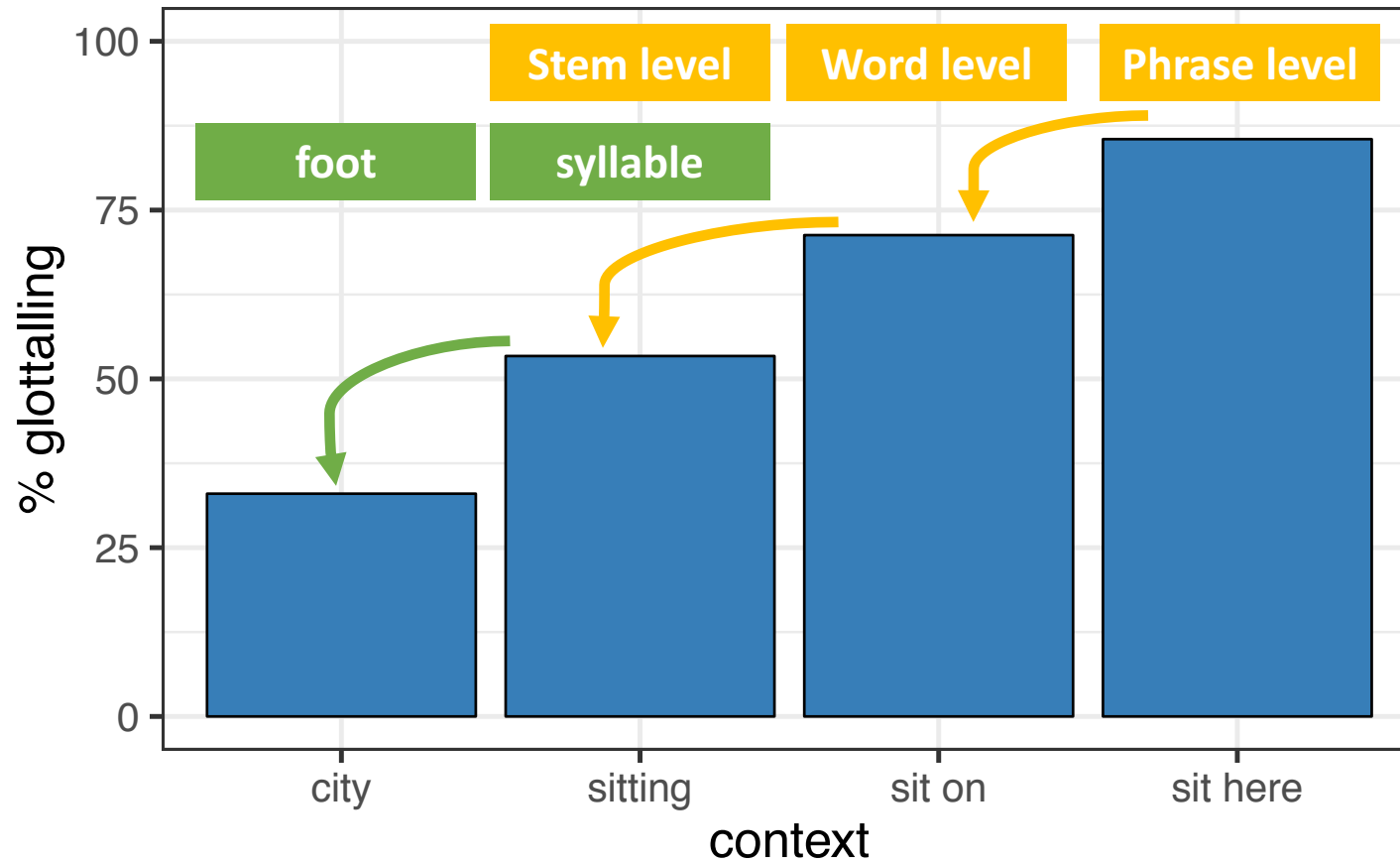
Manchester (Baranowski & Turton, 2015)



sit here    sit on    sitting    city

# Manchester glottalling

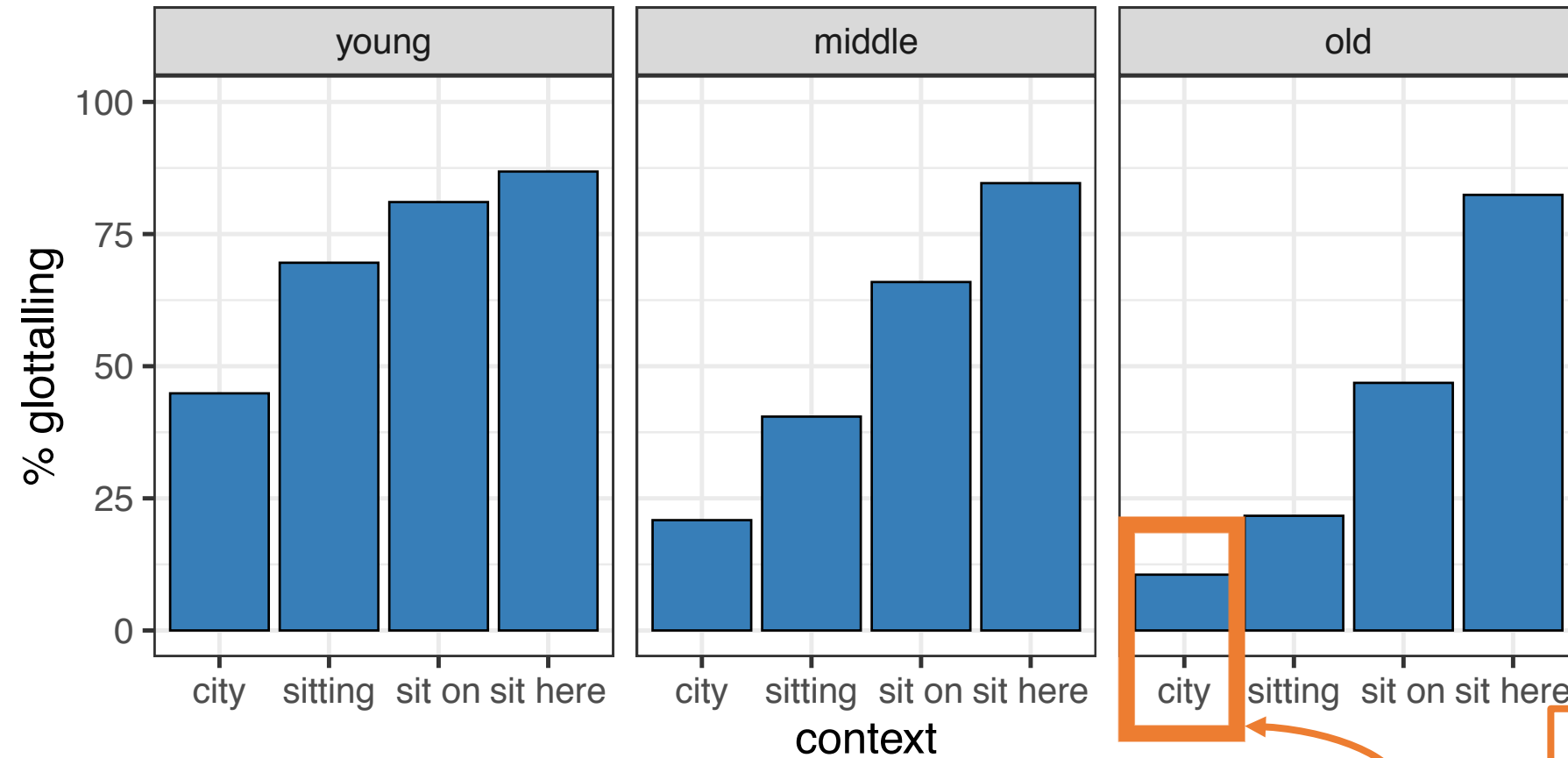
Domain  
narrowing



Rule  
generalisation

Variation  
corollary

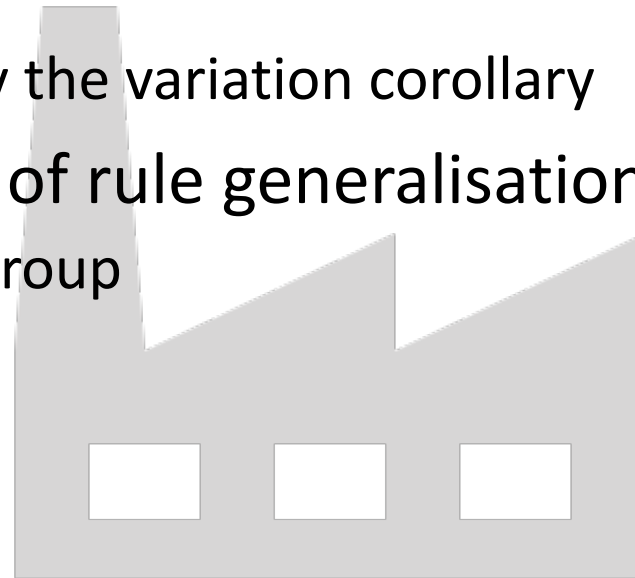
# Glottalling contexts across age groups



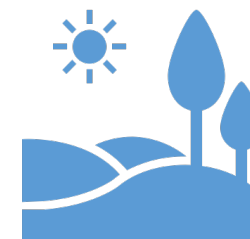
almost all  
syllabic /n/s

# Manchester summary

- Rates of application of t-glottalling in Manchester respect the architecture set out by the life cycle of phonological processes
  - domain narrowing: *sit here* > *sit on* > *sitting*
  - and rule generalisation: *sitting* > *city*
  - Frequency rates reflect those as predicted by the variation corollary
- Oldest age group show no/little evidence of rule generalisation yet
  - This stage was advanced by the middle age group



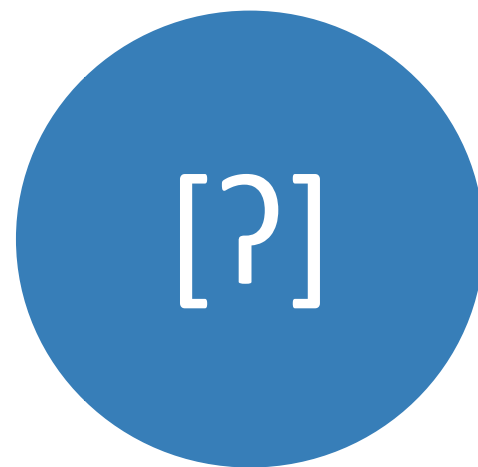
t-flapping



**Blackburn**

3,200 tokens from 28 speakers

# Blackburn /t/: three main variants



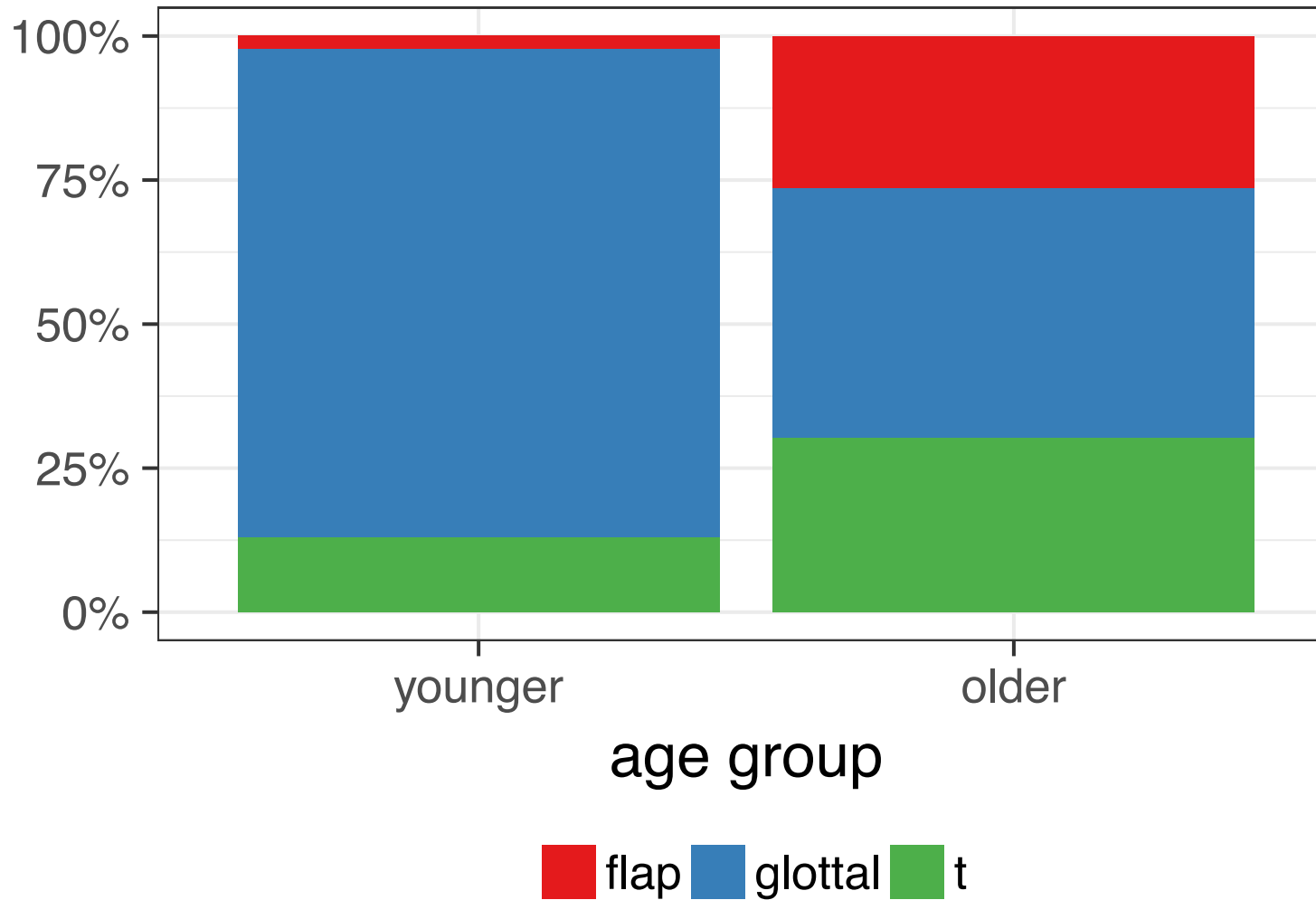
# Flaps in British English varieties



- Flaps have always been in British English (Haugen 1938, Minkova 2014: 147, Wells 1982)
  - It's variable (unlike American English)
- Dickens' drunken characters t-flap
- Primary contextual target is different to glottalling:
  - Glottalling intervocalically is advanced
  - Flapping intervocalically is expected – it's flapping's main domain!
- More recently South-East “educated” varieties
  - David Cameron/Tony Blair flapping (Hagyard 2015, Jell 2016)

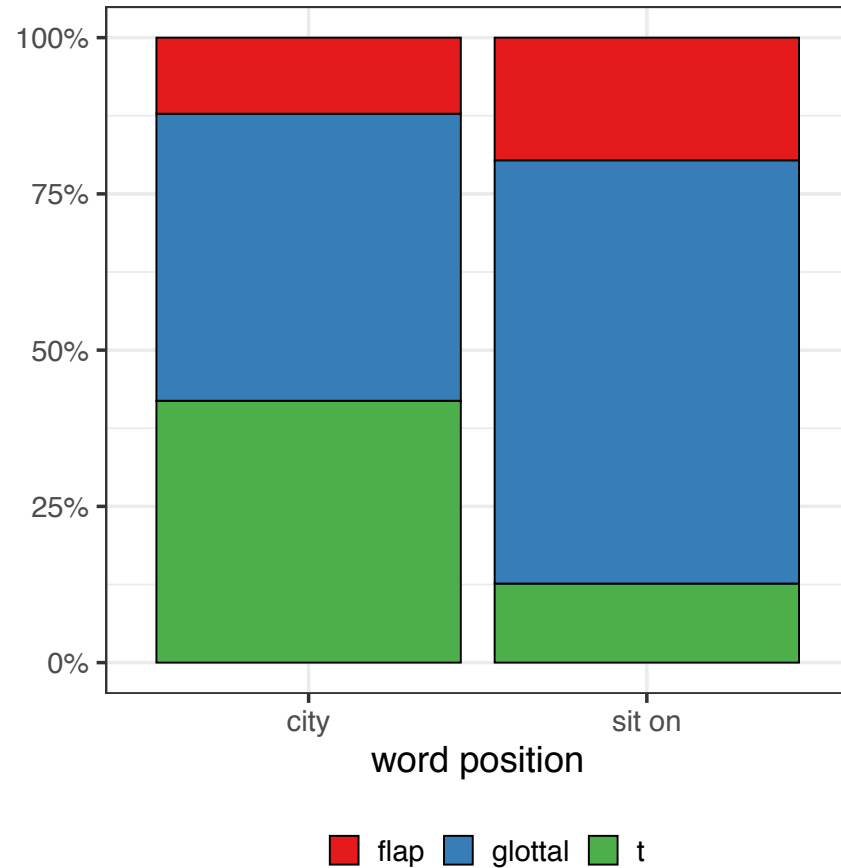


# Blackburn: Younger speaker don't flap as much



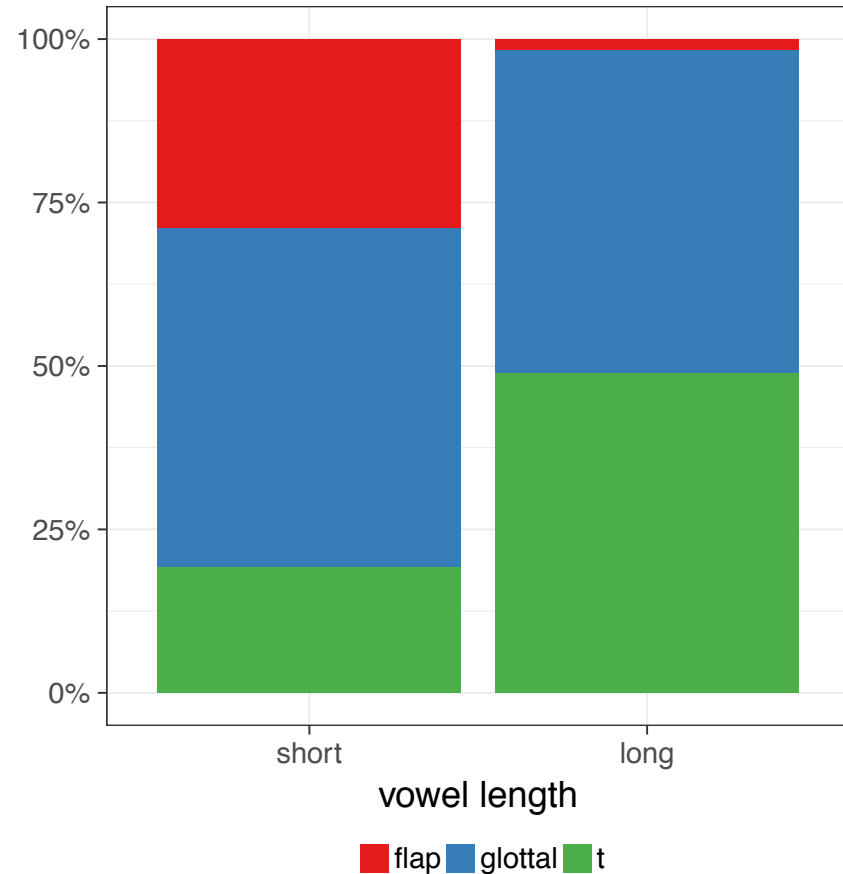
intervocalic position

# Word position



- As expected, more glottalling at the end of words than internally
- Very similar rates of flapping in both word-internal and final position.
  - If flapping is a phrase-level process, this is what we'd expect

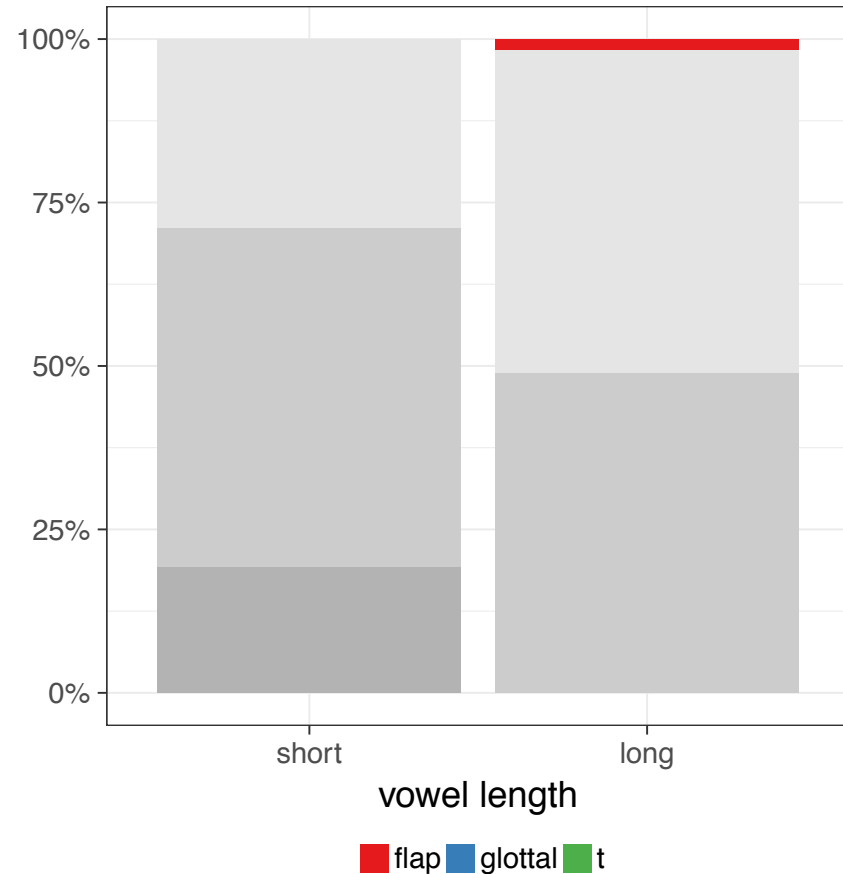
# Preceding vowel length



- Speakers can't seem to flap after a long vowel
- Flaps in *city, get it, getting, protestant, pretty, little*
- But not in *Katie, computer, totally, caught it*
- Preceding stage of sound change?

intervocalic position

# Preceding vowel



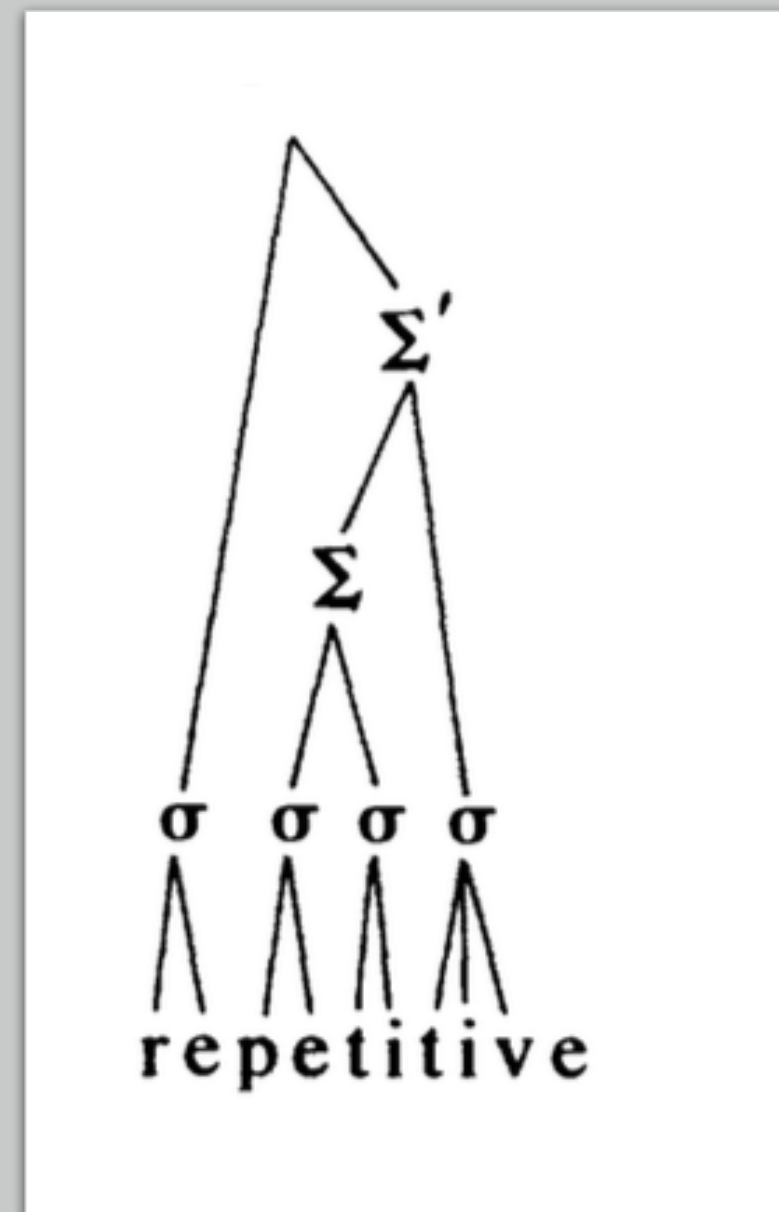
- 16 tokens of flapping after a long vowel
- *Waiting, thought about, outta, quite a, forty*
- Almost always uttered by old males in the dataset
- This pattern is also reported for New Zealand basilect vs. acrolect (Bye & de Lacy 2008)

intervocalic position

## Intermediate stage of rule generalisation?

### The minimal or maximal foot projection

- the /t/ of (cí.ty) flaps because it is contained in the minimal foot-projection (and non-initial),
- the /t/ of ((Ká)tie) doesn't.
- Perhaps most commonly discussed with reference to *competitive* reduction
  - Second /t/ can only be lenited if the first is:  
*\*repe[t]i[r]ive, \*compe[t]i[r]ive* (McCarthy 1982; Harris & Kaye 1990)
- Not discussed in terms of sound change
  - Long vs. short vowels see Balogné Berces & Honeybone (2012), Balogné Berces (2015)



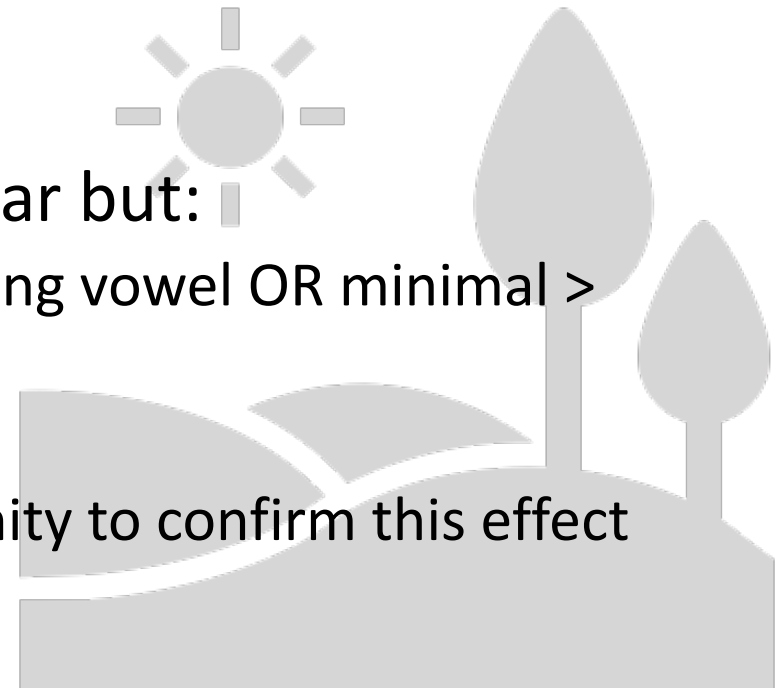
# Am I saying that old men are leading sound change?



- Well, they're the most advanced users in phonological terms
- But they're not leading a sound change.
- This older generation reflects the furthest this sound change went before it ran out of sociolinguistic steam
- Flapping didn't get that far, and new developments have taken over

# Blackburn summary

- Glottalling has taken over from flapping for youngest generation
- Glottalling follows predictions of life cycle:
  - *city/sitting* < *sit on*
  - No data for *sit here* contexts (yet!)
- For flapping, predictions were initially unclear but:
  - data shows the possibility for a short vowel > long vowel OR minimal > maximal foot hierarchy
  - more data needed e.g. judgement elicitation
  - Blackburn may not be the best speech community to confirm this effect
    - Older American English recordings?



# Newcastle glottalisation



4,203 tokens, 32 speakers



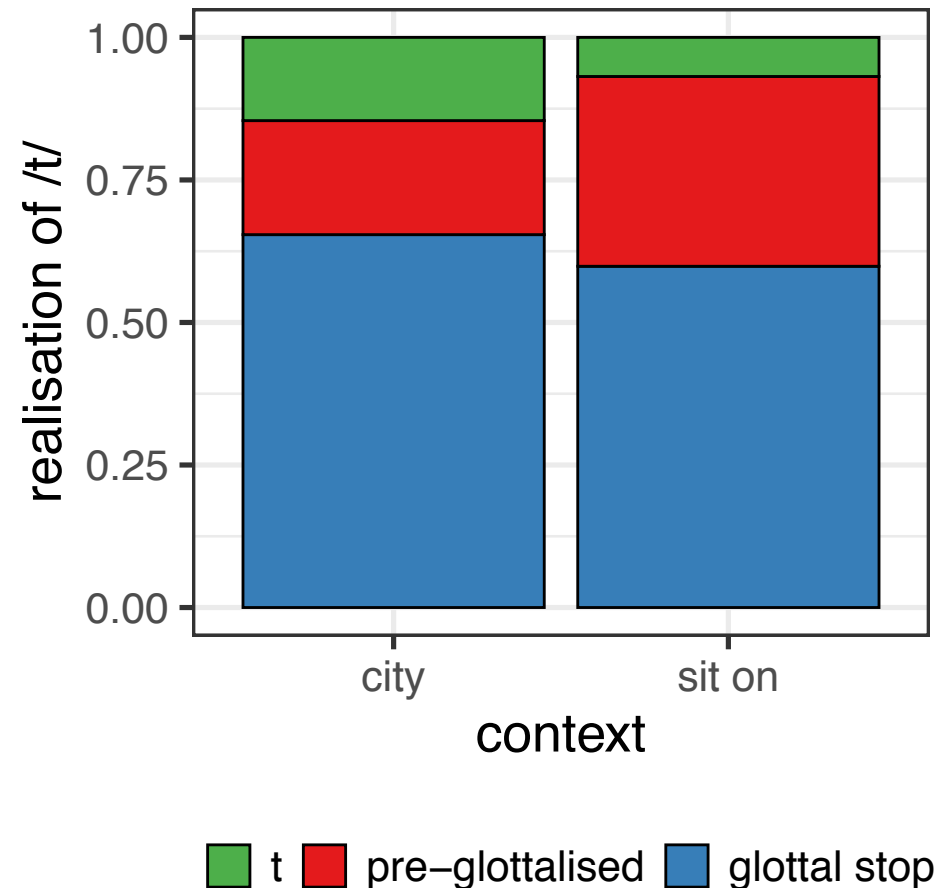
# Glottalisation in Newcastle and Tyneside

Docherty & Foulkes (1999, 2005); Milroy et al. (1994)

- The phonological conditions under which Newcastle selects glottalised variants are different from the rest of the British Isles.
  - It occurs between vowels (or sonorants)
  - Same environment as flapping
- The phonetic realisation is also different
  - Wells (1982): glottal masking of the oral plosive burst
- Traditionally reported that...
  - Full glottal stop replacement does not occur. Instead we find pre-glottalisation
  - Pre-pausal position is strong and requires release e.g. *sit*
- **Phonetically like glottalling, phonologically like flapping**
- Has this changed at all today?

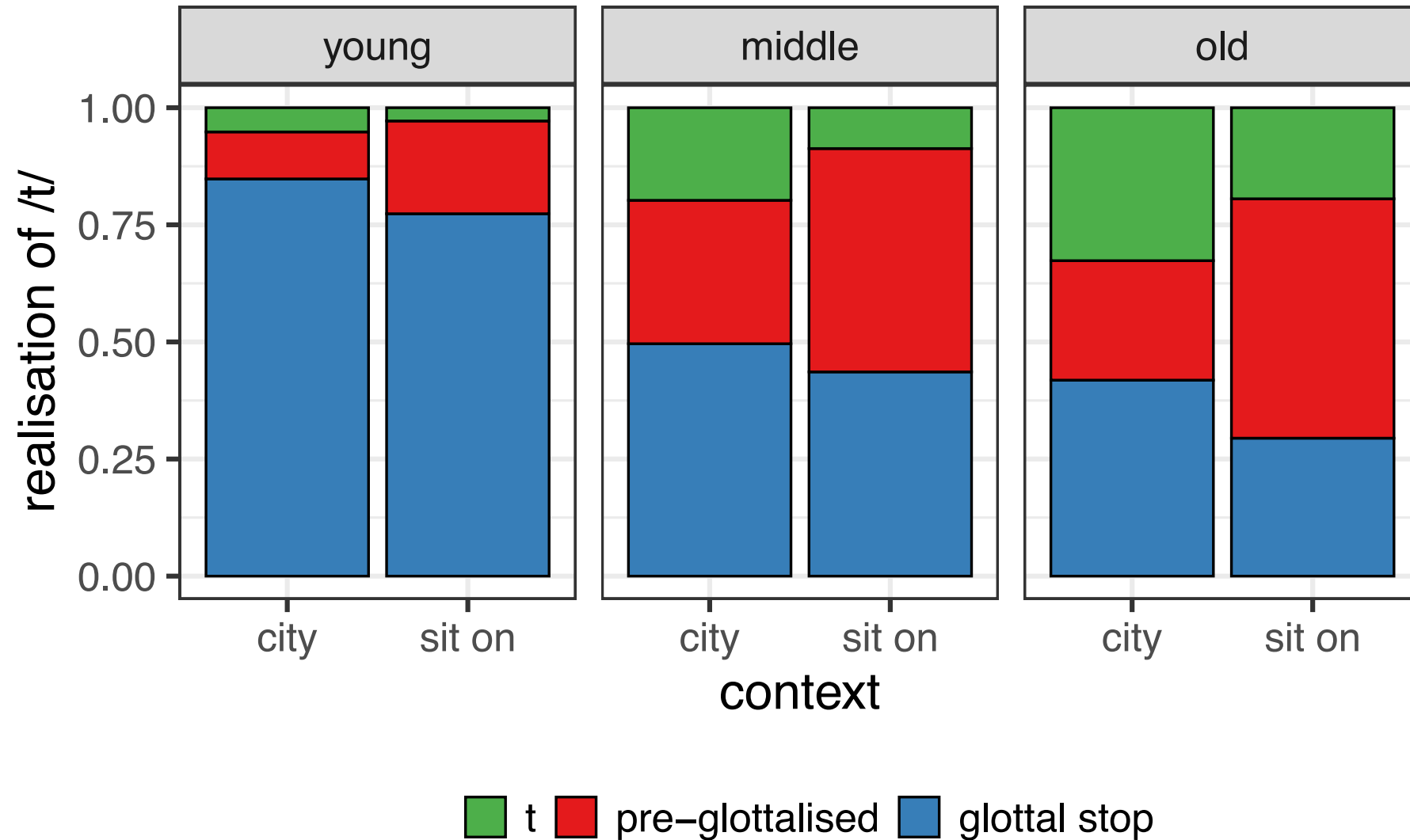


# Full glottal stop replacement has reached Newcastle



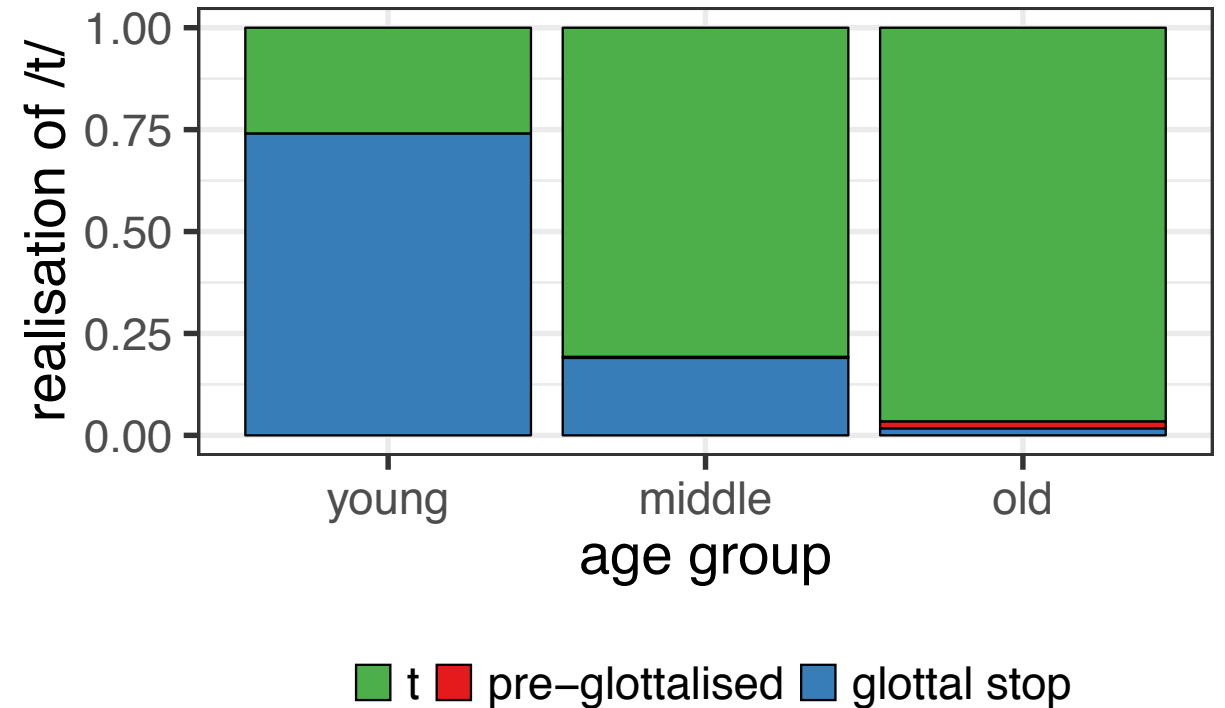
- Change from outside the speech community? Or lenition trajectory?
- Higher in *city* than *sit on*. Is this a problem for the life cycle approach?
- Or is it what we'd expect given the phonology of this variety?
- Pre-glottalisation's target is intervocalic position
- Full glottal stop replacement is building on this

# Effect found across age groups



# Pre-pausal glottalling

- Previously unreported for Newcastle
  - Change from outside the speech community
- Target was intervocalic/sonorant – the same as flapping
- Seems to have made in-roads into younger speakers' speech
- What does their phonology look like?



# Newcastle summary

- Work in progress!
- Full glottal stop replacement exists
  - An old rule internal to the speech community competing with a new rule external to the speech community
  - Or just an advancement of the lenition trajectory?
- Pre-pausal glottalling exists
- Requires much further analysis (probably computational)



# Conclusion

- t-lenition processes in English are highly variable, but constrained:
  - Glottalling in Manchester shows evidence of domain narrowing and rule generalisation
    - *sit here* > *sit on* > *sitting* > *city*
  - Blackburn flapping shows new evidence of the role of the minimal vs. maximal foot in rule generalisation
    - *city* > ?\* *Katie*
  - Variation in Newcastle glottalisation is messy:
    - but demonstrates that understanding the phonological system is important for interpreting the direction of change.
    - more to come!
- The variation shows a great deal of orderliness when considering the perspective of the life cycle of phonological processes and the social and linguistic constraints in tandem

# Thanks for listening and thanks to...

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Laura Bannan,  
Hannah Lindsay,  
Jessica Gledhill,  
Megan Rawnsley

My  
speakers

# References

- Balogné Bérces, Katalin. 2015. Consonant lenition inside and outside the “minimal foot”. a strict CV phonology analysis. *Acta Linguistica Hungarica* 62:141–155.
- Balogné Bérces, Katalin, and Patrick Honeybone. 2012. Splitting ‘intervocalic’: expanding the typology of lenition environments. *Acta Linguistica Hungarica* 59:27–48.
- Baranowski, Maciej, and Danielle Turton. 2015. Manchester English. In *Researching Northern Englishes*, ed. Raymond Hickey. Amsterdam and Philadelphia: John Benjamins.
- Baugh, Josie. 2017. A comparison of /t/ variation in young tyneside and southern speakers. BA dissertation, Newcastle University.
- Bermúdez-Otero, Ricardo. 2007. Diachronic phonology. In *The Cambridge handbook of phonology*, ed. Paul de Lacy, 497–517. Cambridge: Cambridge University Press.
- Bermúdez-Otero, Ricardo. 2015. Amphichronic explanation and the life cycle of phonological processes. In *The Oxford handbook of historical phonology*, eds. Patrick Honeybone and Joseph C. Salmons, 374–399. Oxford: Oxford University Press.
- Boersma, Paul, and Bruce Hayes. 2001. Empirical tests of the gradual learning algorithm. *Linguistic Inquiry* 32:45–86.
- Bye, Patrik, and Paul de Lacy. 2008. Metrical influences on fortition and lenition. *Lenition and fortition* 173–206.
- Cruttenden, Alan, ed. 2008. *Gimson’s pronunciation of English*. London: Hodder, 7th edition.
- Docherty, Gerard J, and Paul Foulkes. 1999. Derby and Newcastle: instrumental phonetics and variationist studies. In *Urban voices: accent studies in the British Isles*, eds. Paul Foulkes and Gerard Docherty, 47–71. Arnold London.



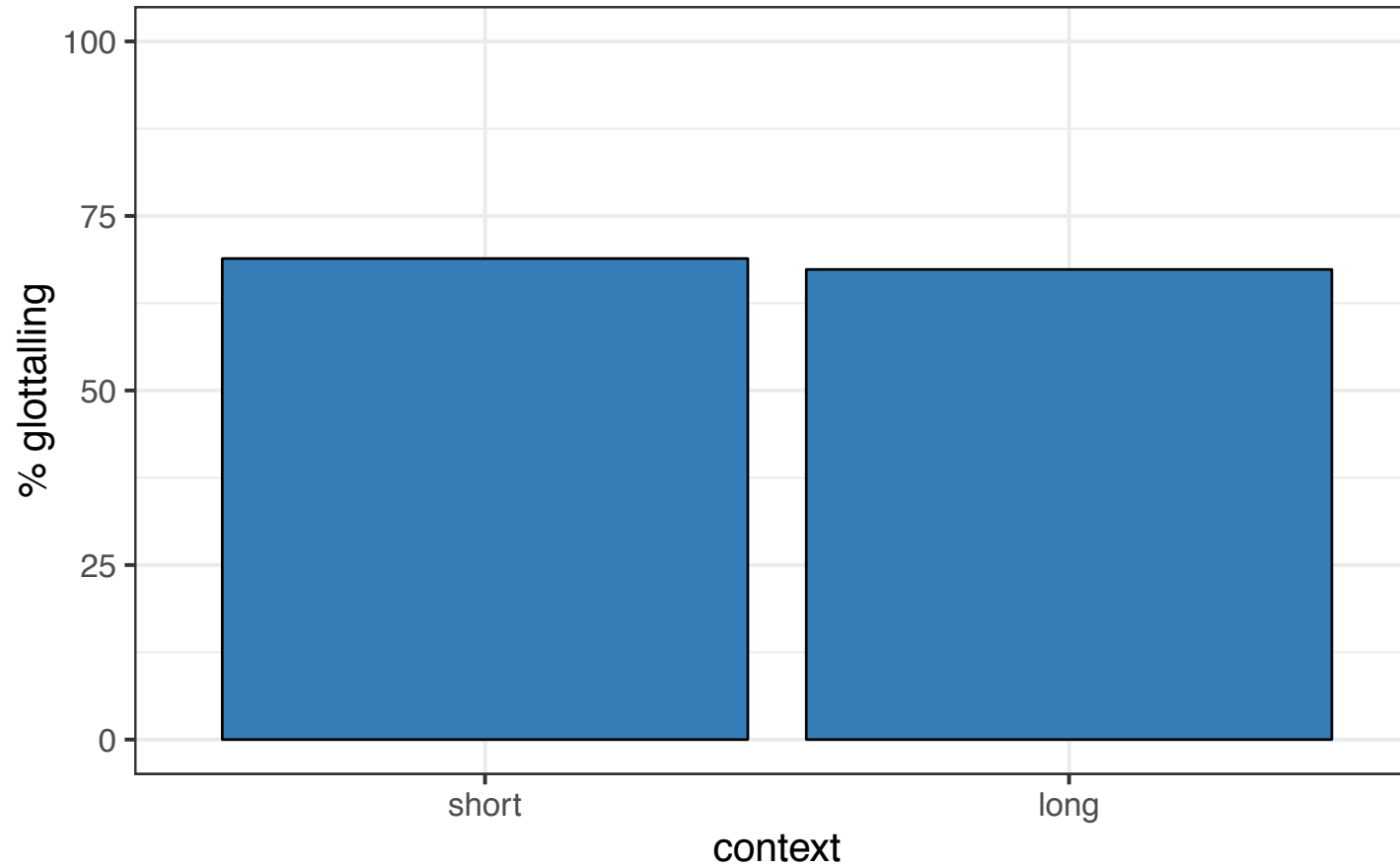
# References II

- Docherty, Gerard J, and Paul Foulkes. 1999. Derby and Newcastle: instrumental phonetics and variationist studies. In *Urban voices: accent studies in the British Isles*, eds. Paul Foulkes and Gerard Docherty, 47–71. Arnold London.
- Docherty, Gerard J, and Paul Foulkes. 2005. Glottal variants of /t/ in the Tyneside variety of English. *A figure of speech: A festschrift for John Laver* 173–197.
- Foulkes, Paul, and Gerald Docherty, eds. 1999. *Urban voices: accent studies in the British Isles*. London: Arnold.
- Gick, Bryan. 2003. Articulatory correlates of ambisyllabicity in English glides and liquids. In *Phonetic interpretation: papers in laboratory phonology vi*, eds. John Local, Richard Ogden, and Rosalind Temple. Cambridge: Cambridge University Press.
- Guy, Gregory R. 1991. Explanation in variable phonology: an exponential model of morphological constraints. *Language Variation and Change* 3:1–22.
- Hagyard, Alice. 2015. Intervocalic t-flapping in tony blair from 1997 and 2010. Undergraduate research paper, Newcastle University.
- Harris, John, and Jonathan Kaye. 1990. A tale of two cities: London glottalling and New York City tapping. *The Linguistic Review* 7:251–274.
- Haugen, Einar. 1938. Notes on ‘voiced-t’ in American English. *Dialect Notes* 6:627–634.
- Hayes, Bruce. 2000. Gradient well formedness in Optimality Theory. In *Optimality Theory: phonology, syntax, and acquisition*, eds. Joost Dekkers, Frank van der Leeuw, and Jeroen van de Weijer, 88–120. Oxford: Oxford University Press.
- Honeybone, Patrick. 2014. The origins of Northern English T-to-R: categorical frequency effects through multiple lexicalisation. Paper given at Symposium on Historical Phonology, Edinburgh.
- Jell, Catherine. 2016. t-flapping in received pronunciation. Undergraduate research paper, Newcastle University.
- Jones, Daniel. 1966. *The pronunciation of English*. Cambridge University Press, 4th edition.

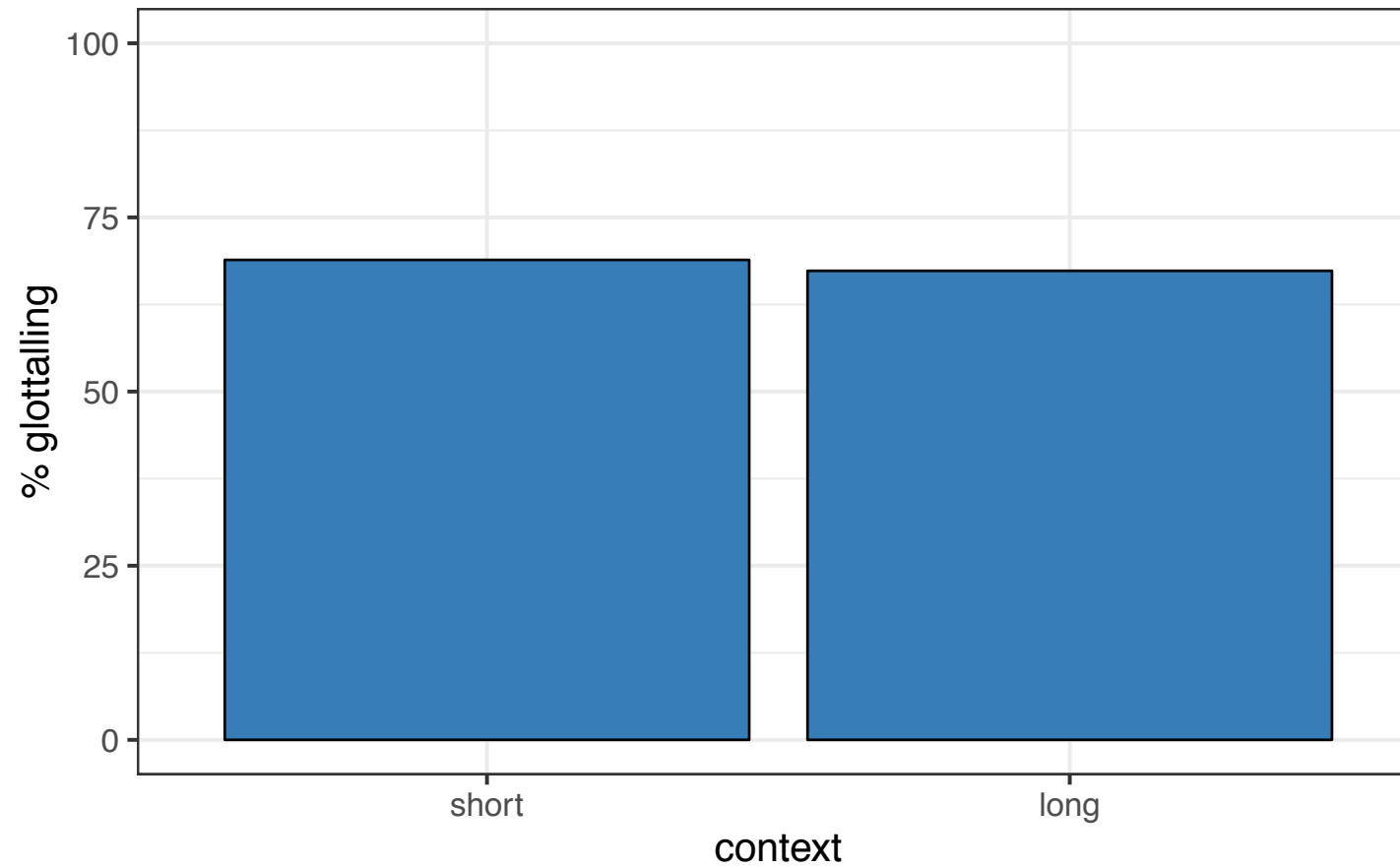
# References III

- Kiparsky, Paul. 1979. Metrical structure assignment is cyclic. *Linguistic Inquiry* 10:421– 441.
- McCarthy, John. 1982. Prosodic organization in morphology. Ms., University of Texas, Austin.
- Milroy, James, Lesley Milroy, Sue Hartley, and David Walshaw. 1994. Glottal stops and Tyneside glottalization: Competing patterns of variation and change in British English. *Language Variation and Change* 6:327–357.
- Minkova, Donka. 2013. *A historical phonology of English*. Edinburgh University Press.
- Olive, Joseph P., Alice Greenwood, and John Coleman. 1993. *Acoustics of American English speech: a dynamic approach*. New York: Springer Verlag.
- Ramsammy, Michael. 2015. The life cycle of phonological processes: accounting for dialectal microtypologies. *Language and Linguistics Compass* 9:33–54.
- Sproat, Richard, and Osamu Fujimura. 1993. Allophonic variation in English /l/ and its implications for phonetic implementation. *Journal of Phonetics* 21:291–311.
- Turton, Danielle. 2014. *Variation in English /l/: Synchronic reflections of the life cycle of phonological processes*. Doctoral Dissertation, University of Manchester.
- Turton, Danielle. 2016. Synchronic stratum-specific rates of application reflect diachronic change: morphosyntactic conditioning of variation in English /l/-darkening. *Papers in Historical Phonology* 1.
- Wells, J. C. 1982. *Accents of English*. Cambridge: Cambridge University Press.
- Yuan, Jiahong, and Mark Liberman. 2011. /l/ variation in American English: A corpus approach. *Journal of Speech Sciences* 1:35–46.

# Preceding vowel length in Manchester glottalling

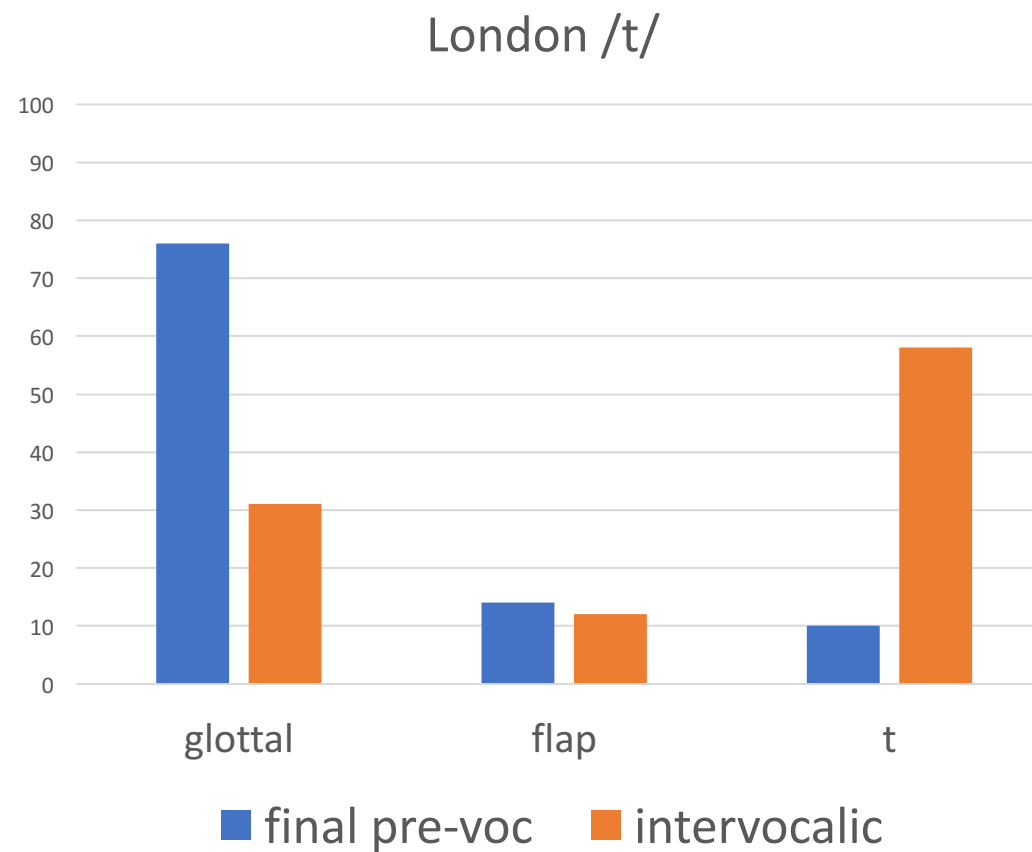


# Preceding vowel length in Tyneside

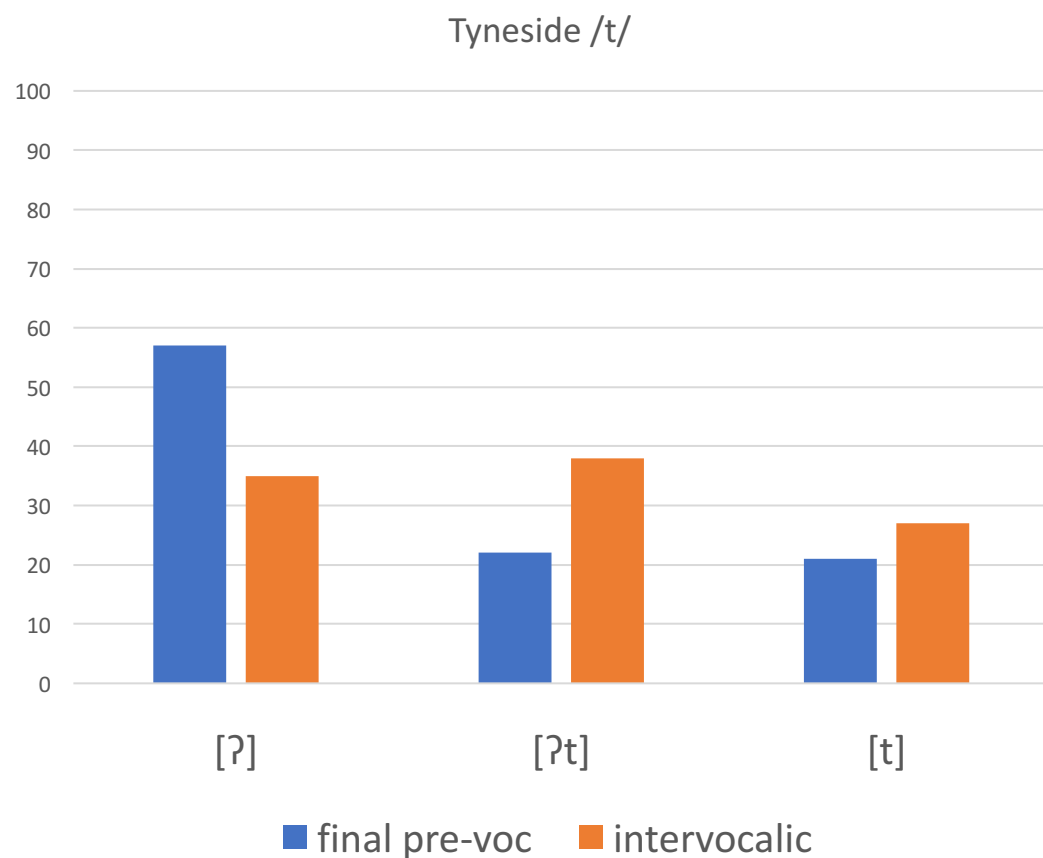


# London /t/

- London is famous for glottal replacement, in all non-foot initial /t/s
- Speakers in Baugh (2017) upwardly mobile student types
- Glottalling less likely word-medially
- More evidence of /t/-flapping in South-East “educated” varieties (Hagyard 2015, Jell 2016)
  - Newer phenomenon?
  - How would the phonological application work?
  - It mirrors glottalling application here
  - Can flapping “piggyback” onto glottalling, whilst remaining intervocalic/sonorant?
  - Evidence after long vowels too



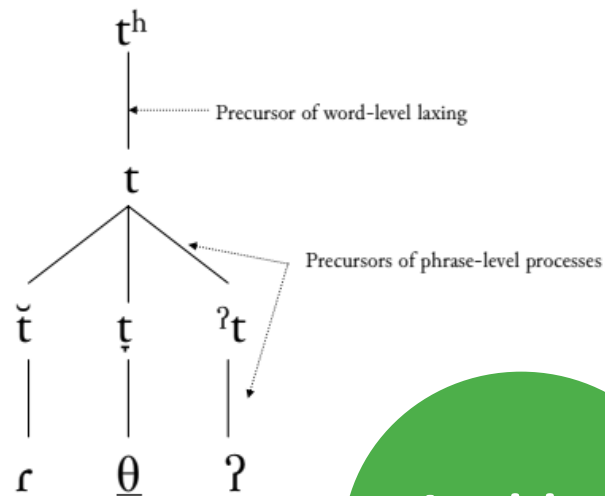
# Tyneside vs. London /t/



- Tyneside's traditional variant occurs only in intersonorant position
  - Described as pre-glottalised, glottally reinforced, glottal masking...
- Present day situation is complicated:
  - Docherty & Foulkes (2005) say next to no full glottal
  - In 2017, younger speakers show UK-wide glottal stop variant word-finally and internally
- Rates of traditional reinforced variant are exactly what we expect:
  - higher in *getting* than in *get off*

# Lenition trajectories

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Lenition trajectories

- Harsher forms of lenition typically apply at lower levels of the grammar.
- What happens to /t/s that are laxed at the word level but not between vowels?
  - in conservative American English, they are typically unreleased
  - Urban British English replaces them with a glottal stop
    - This may be happening in some American varieties too (Eddington & Taylor 2009)
  - Scouse fricativises/spirantises them
    - As do Irish English speakers
  - RP pre-glottalises
- Other examples:
  - /l/ vocalisation
  - Loss of post-vocalic /r/