Phonetic realisation of linking and intrusive /ɹ/ in Australian English

Ivan Yuen, Felicity Cox,
Katherine Demuth
Linguistic Department, CCD,
Macquarie University

Introduction

- In citation form, *manna/manor* are homophonous in Australian English, though one has an orthographic 'r' and the other doesn't

- In connected speech, however, an epenthetic [ɹ] may appear before a vowel <small>(McCarthy 1993, Foulkes 1997, Gick 1999, Hay & Sudbury 2005, Uffmann 2007, Heselwood 2009, Cox & Buckley in sub)</small>
  - Intrusive /ɹ/: Please say *manna (r)* again
  - Linking /ɹ/ : Please say *manor* again

- This raises the question of whether the phonetic realisation of epenthetic 'r' is similar for both forms
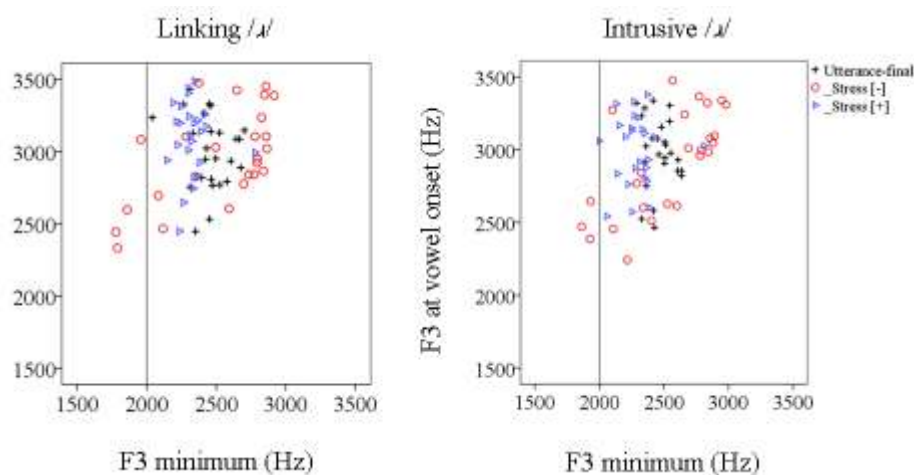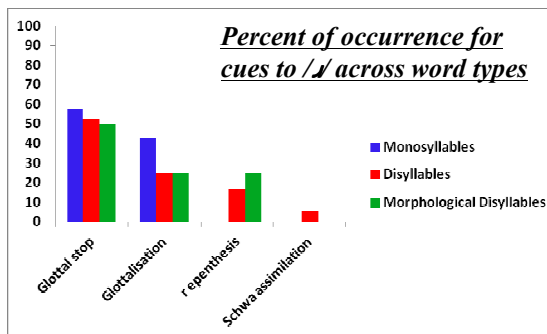
Predictions

- Epenthetic /ɹ/ will manifest pre-vocalically, but not utterance-finally
- Epenthetic /ɹ/ breaks up contiguous vowels for words containing orthographic and non-orthographic r
- More epenthetic /ɹ/ expected before an unstressed vowel (i.e. schwa) than a stressed vowel
- No difference in use of /ɹ/ epenthesis between monosyllables and disyllables

Methodology: Preliminary Data

- Participant: 1 female speaker, 27 yrs., Melbourne
- Procedure: reading aloud task
- Stimuli: 50 items x 3 phonological contexts = 150 items
  - monosyllables (*law/lore*) containing either /ɐː/, /oː/ (20 items)
  - non-morphological disyllables (*manna/manor*) ending in /ə/ (18 items)
  - morphological disyllables (*cheetah/cheater*) ending in /ə/ (12 items)
- Phonological Contexts: 3
  - utterance-final position
  - before a stressed vowel (Please say _ only)
  - before an unstressed schwa (Please say _ again)

Preliminary Findings

- Acoustically analysed 150 items using Praat
- No difference between r in orthographic and non-orthographic forms, therefore collapsed
- No epenthetic /ɹ/ for the utterance-final items
- No epenthetic /ɹ/ for monosyllables
- A glottal stop or vowel-final glottalisation was primarily used to break up contiguous vowels
- Epenthetic /ɹ/ in disyllables only in /ə_ə/ (unstressed vowel) context

Percent of occurrence for cues to /ɹ/ across word types

■ Monosyllables
■ Disyllables
■ Morphological Disyllables

(x-axis: Glottal stop, Glottalisation, r epenthesis, Schwa assimilation)

Linking /ɹ/

Intrusive /ɹ/

+ Utterance-final
○ _Stress [-]
▷ _Stress [+]

F3 at vowel onset (Hz)

F3 minimum (Hz)

There was a positive correlation between F3 at vowel onset and F3 minimum in the _stress [-] context

linking /ɹ/: r = 0.604, n = 25, p < 0.001

intrusive /ɹ/: r = 0.688, n = 25, p < 0.0001

Linking /ɹ/   Intrusive /ɹ/

F3 at vowel onset (Hz)

F3 minimum (Hz)   F3 minimum (Hz)
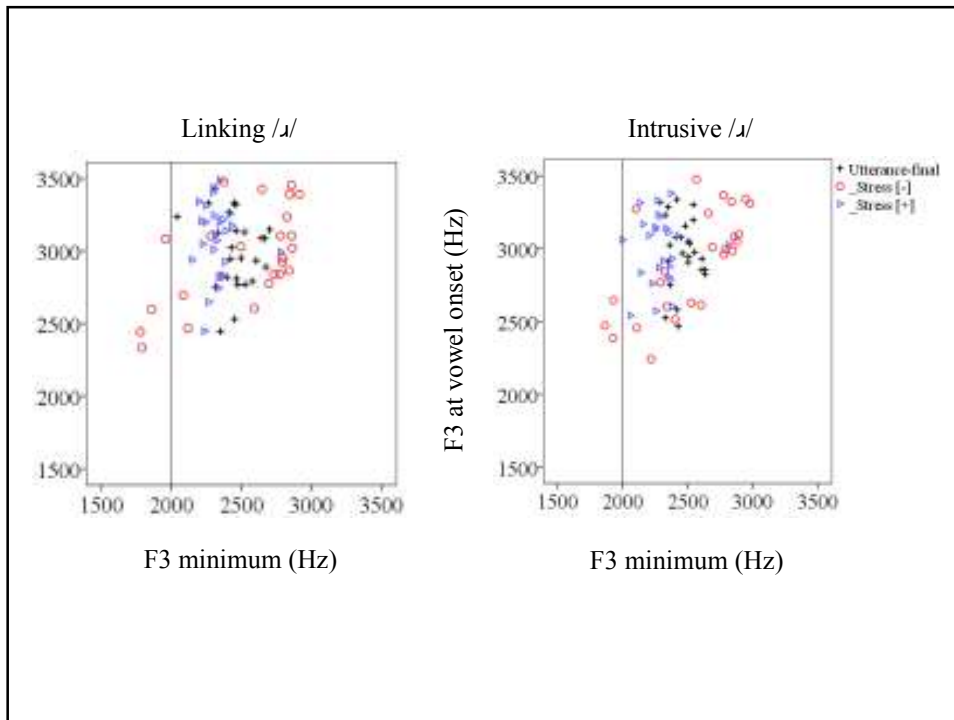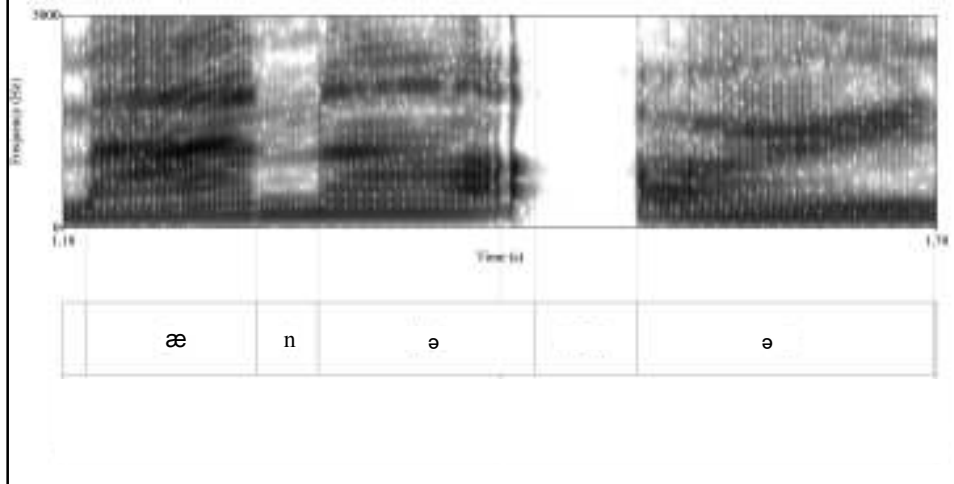
Phonological Contexts of Glottal Realisations

- More use of glottal stop before stressed /ə /
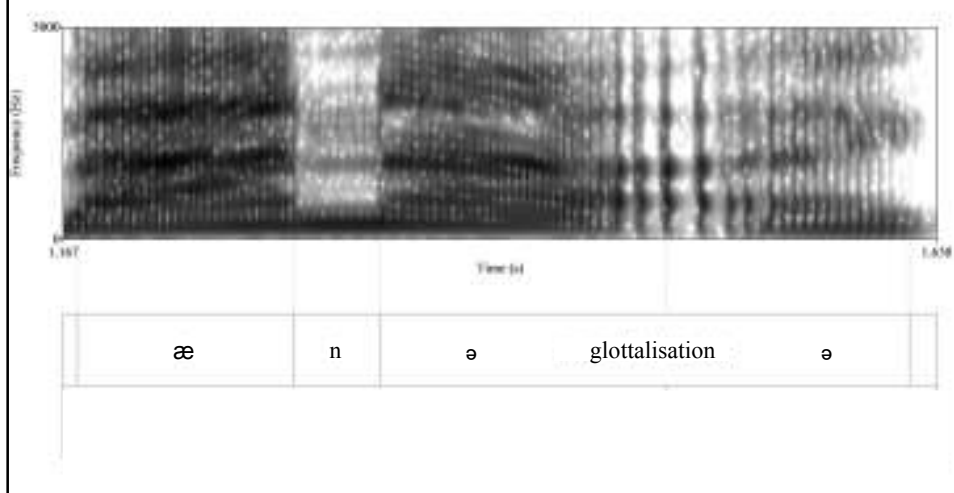- More use of glottalisation before unstressed /ə/

Percent occurence of glottal cues to /ɹ/ across contexts and word types

■ _ɔ context
■ _əʉ context

Glottal stop   Glottalisation   Others
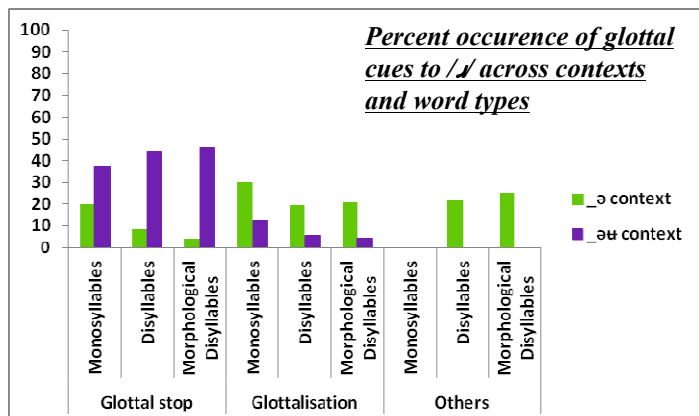
Glottal Stop Realisation

Example: 'Please say *manna* only'

æ	n	ə		ə

Glottalisation Realisation

Example: 'Please say *manna* again'

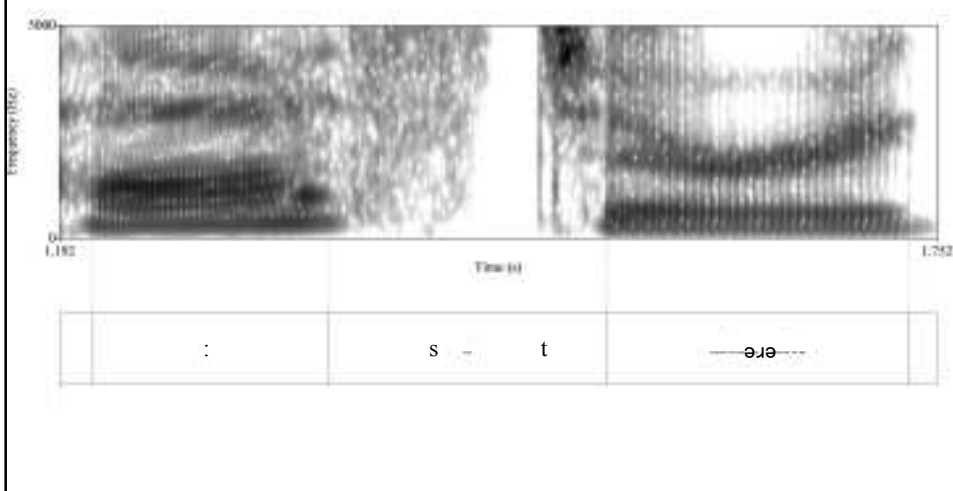| æ	n	ə	glottalisation	ə

Linking -/ɹ/

Example: 'Please say *pastor* again'
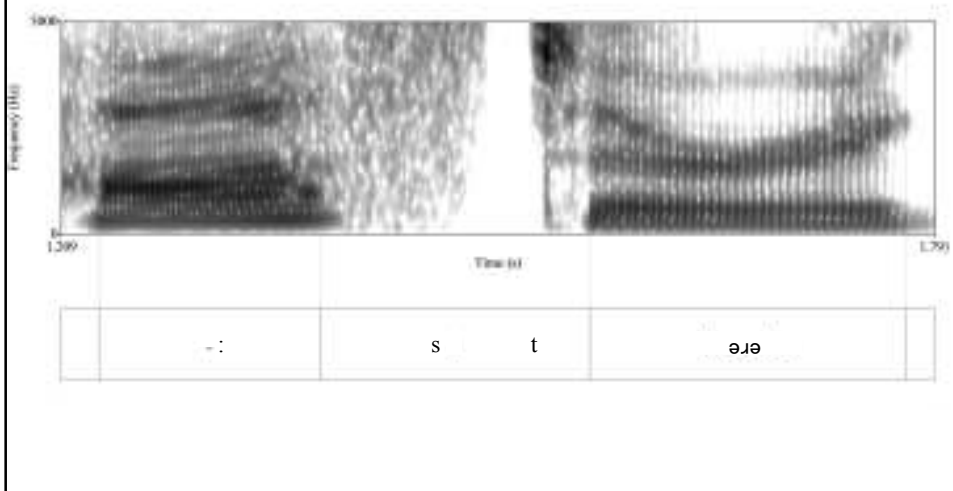
Intrusive -/ɹ/

Example: 'Please say *pasta* again'

Conclusion & Future Research

- As predicted, no epenthesis found utterance-finally
- The use of glottal stop and glottalisation to break up two adjacent vowels also raises the question of whether they might be related to boundary strength
- No /ɹ/ epenthesis in monosyllables, compared to disyllables, raises the question of 'stress' and weak/reduced vowels in conditioning /ɹ/ epenthesis
- Interestingly, F3 minimum positively correlated with F3 at vowel onset in the _stress [-] context, suggesting epenthetic /ɹ/ as a gradient event
- More subjects will be needed to test for generalizability

References

- Cox, Felicity & Linda Buckley. In sub. Hiatus resolution and linking /ɹ/ in Australian English
- Foulkes, Paul. 1997. English [r]-sandhi – A sociolinguistic perspective. *Histoire Epistemologie Language* 19, 73-96
- Gick, Bryan. 1999. A gesture-based account of intrusive consonants in English. *Phonology* 16, 29-54.
- Hay, Jennifer & Andrea Sudbury. 2005. How rhoticity became r-sandhi. *Language* 81, 799-823.
- Heselwood, Barry 2009. R vocalisation, linking r and intrusive r: Accounting for final schwa in RP English. *Transactions of the Philological Society* 107, 66-97.
- McCarthy, John. J. 1993. A case of surface constraint violation. *Canadian Journal of Linguistics* 38, 169-195.
- Uffmann, Christian. 2007. Intrusive [r] and optimal epenthetic consonants. *Language Sciences* 29, 451-476.