

# STOP EPENTHESIS REVISITED

## Amalia Arvaniti

Department of Linguistics

University of California, San Diego

### BACKGROUND

- ❖ Fourakis and Port (1986): in American English, epenthetic consonants, such as the [t] of *prince*, are shorter than underlying consonants, such as the [t] of *prints*.
- ❖ Yoo and Blankenship (2003): there is no difference in the closure duration of underlying and epenthetic [t]s.

### Research questions and hypotheses

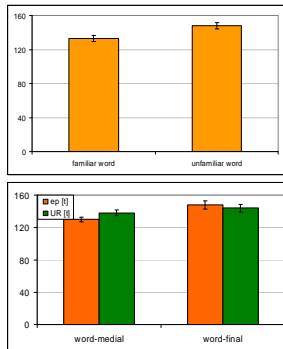
- ❖ Could the results of the two studies reflect a change in progress, such that for younger speakers epenthetic [t]s are becoming grammaticalized? (Note that the two studies are almost 20 years apart.) Or do the differences reflect the greater variability found in the Yoo and Blankenship (2003) data?
- ❖ If the data reflect a change in progress, then could word familiarity play a role in the realization of epenthetic [t]?
- ❖ Since epenthetic [t]s appear to be more frequent word-finally, could position in the word affect their realization?

### METHOD

- Materials:** Near minimal pairs of words with [nts] and [ns] sequences in word-medial and word-final position; words were independently rated as familiar or unfamiliar (familiarity ratings match those in the Hoosier Mental Lexicon); words presented in naturalistic contexts that did not draw attention to the near-minimal pairs; e.g. *When she's in Laura's presence, Belinda always acts nervous vs. I hate shopping for presents, but this weekend I have to buy one for my dad.*
- Speakers:** Native speakers of Southern Californian English; 10 speakers were between 18-23 years old; 9 speakers between 40-55 years old.
- Procedures:** Six randomized repetitions of the sentences and appropriate fillers recorded in the lab, or in the speaker's home; four middle repetitions used for measurement.
- Measurements:** Duration of vowel+[n], stop closure, burst, and [s] were measured by simultaneous inspection of waveforms and spectrograms.
- Statistics:** Within subjects ANOVAs of durations with FAMILIARITY, WORD-POSITION and [t]-STATUS as independent variables, and AGE as a between subjects factor; analysis  $\chi^2$  tests were used to examine the frequency of stop closure and burst for epenthetic and underlying [t]s; all differences reported here are significant at  $p < 0.05$ .

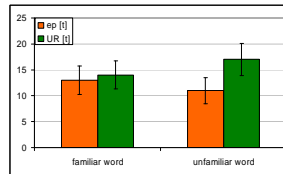
### RESULTS

#### Vowel+[n] duration



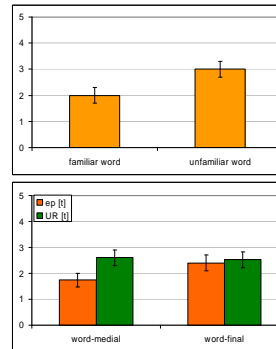
- ❖ V+[n] is longer in unfamiliar words
- ❖ It is affected by epenthesis in word-medial position only, where
- ❖ V+[n] is shorter before epenthetic [t] than before underlying [t]

#### [t] closure duration



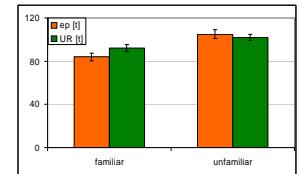
- ❖ Epenthetic and underlying [t] have similar closure durations in familiar words, but underlying [t]s are longer in unfamiliar words
- ❖ For underlying [t], closure is longer in unfamiliar words
- ❖ For epenthetic [t] closure is not affected by familiarity

#### Burst duration



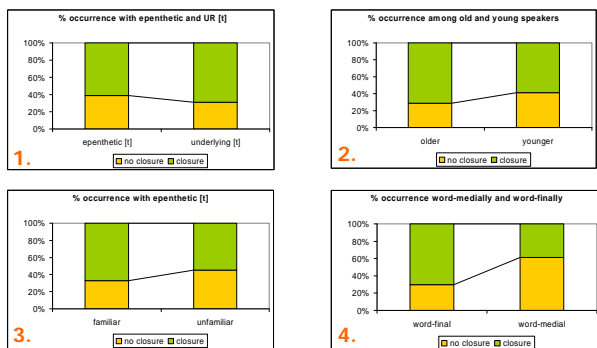
- ❖ Bursts are longer in unfamiliar words
- ❖ Bursts are shorter in epenthetic [t]s than in underlying [t]s, but the effect holds only word-medially

#### [s] duration



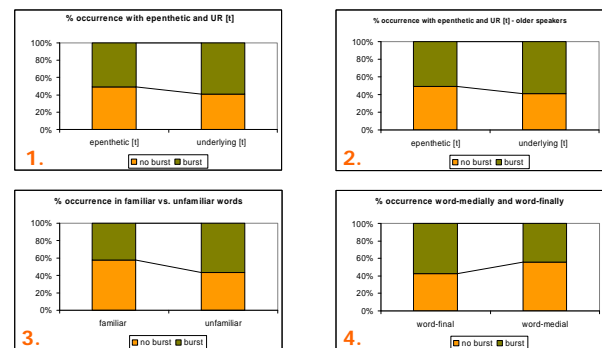
- ❖ [s] is longer in unfamiliar than in familiar words, independently of [t]-status
- ❖ However, in familiar words, [s] is shorter after an epenthetic [t] than after an underlying [t]
- ❖ There is no such difference in unfamiliar words

#### Likelihood of [t] closure (longer than 5 ms)



1. Closure is more likely if [t] is underlying than if it is epenthetic
2. Closure is more likely to occur in the data of the older speakers, for both underlying and epenthetic [t]s
3. In words with epenthetic [t], closure is more likely if the word is familiar (in words with underlying [t], the likelihood of closure does not depend on familiarity)
4. The position of the [n(t)]s sequence in the word does not affect the likelihood of closure, except in unfamiliar words with epenthetic [t]: in this case, a closure is more likely to occur word-finally

#### Likelihood of burst (longer than 1.5 ms)



1. Bursts are more likely to occur with underlying than epenthetic [t], but
2. this effect holds only for the older speakers; for younger speakers, [t] status is n.s.
3. Bursts are less likely to occur in familiar words; this applies whether the [t] is underlying or epenthetic
4. Bursts are more likely word-finally than word-medially if the [t] is epenthetic
5. Bursts are also more likely word-finally than word-medially if the [t] is underlying, but only if the word is unfamiliar; position does not play a role if the word is familiar

### DISCUSSION AND CONCLUSION

- ❖ The results did not show strong evidence of change across generations; however, some differences are present between the older and younger speakers: e.g. younger speakers are more likely to produce epenthetic [t]s with a burst, i.e. their epenthetic [t]s that are more like underlying [t]s.
- ❖ In terms of durations, the results support those of Fourakis and Port (1986) in showing shorter closure durations for epenthetic [t]s, and shorter bursts (under certain conditions).
- ❖ However, durational differences interact with position in the word and with familiarity, in ways which suggest that epenthetic [t]s in word-final position and in familiar words are more like underlying [t]s, in that they have similar closure durations and bursts and affect the duration of other segments in a similar fashion to underlying [t]s.
- ❖ Epenthetic [t] closures are also more likely to occur in these environments (familiar words and word-finally), where they are also more likely to be accompanied by a burst.
- ❖ Overall, the results suggest the beginnings of a change towards a more regular production of epenthetic [t]s, initially in familiar words in which epenthetic [t]s are word-final.
- ❖ Further research is underway to test the perceptual properties of epenthetic and underlying [t]s in Southern Californian American English.

#### REFERENCES

Fourakis, M. & R. Port (1986). Stop epenthesis in English, *Journal of Phonetics*, 14, 197-221.  
 Yoo, I. W. & B. Blankenship (2003). Duration of epenthetic [t] in polysyllabic American English words, *JIPA*, 33, 153-164.

#### ACKNOWLEDGEMENTS

UCSD COR grant no LIN/RF681C to Amalia Arvaniti  
 Ryan Shosted and David Romano for assistance with data collection and measuring