Listeners' pronunciations and how they perceive *pin-pen* merger

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Introduction

➢*PIN-PEN merger*

Brown (1990; 1991)
- ✦Merger between **/I/ - /ɛ/** in the pre-nasal position. Typically, **/ɛ/** is raised to **/I/** .
- ✦Most advanced in monosyllabic words without consonant clusters.
- ✦Originated in Southern US, known to be spread in African American varieties throughout the US.

Koops et al. (2008)
In Houston, TX, the merger is associated with rural, less educated relatively older speakers.

➢Dialectal Adaptation and Lexical Processing

Dahan et al. (2008)
/æ/ raised to /ɛ/ in front of g (e.g., bag /bɛg/)
Lexical competition between *BAG* and *BACK*
learning dialect/speaker-specific /bɛg/
→ less looks to the competitor *BACK*
→ less looks to BAG upon listening to BACK
Adaptation => **lexical re-organization**

Trude & Brown-Schmidt (2012)
/æ/ raised to **/ɛI/** in front of g (e.g., bag /bɛIg/)
→ more looks to the competitor *BAGLE*

Research Question

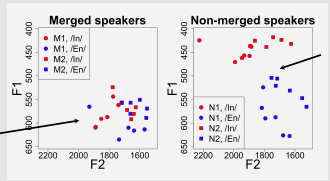
Do listeners' own pronunciation patterns of front vowels **/I/ - /ɛ/** predict how they adapt to *pin-pen merger*?

Experiment

➢Auditory Stimuli
2 merged and 2 non-merged speakers recruited in central Ohio.
"***Click on the XXX.***"
6 critical pairs: pencil-pins, bench-bin, fence-fins, men-mint, tent stake-tin-can phone, dentist sign-dinner plate
32 distractors

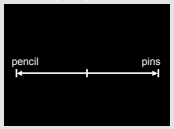
➢F1 and F2 distributions of the critical words:

Vowels in -in words were produced within their /ɛ/ spaces.

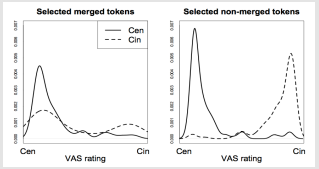


Clear separation between –en words and –in words

➢Offline judgment of critical stimuli:



Visual Analogue Scale Task
Click on the line to indicate how likely the given syllable /CVn/ is extracted from the two opposing words.



/Cin/ syllables were judged as parts of /Cen/ words with Merged voices.

Eye-tracking Experiment

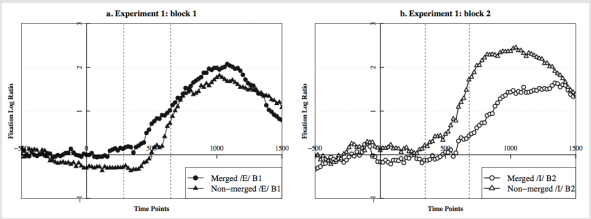
➢Subjects: 80 OSU undergraduate students
➢Task: Listen to auditory instructions "***Click on the XXX***." and click on the object
➢Eye-tracking: Tobii 1750, Sampling rate 50 Hz

	Block1	→	Block2	→	Block3
	bench		fins		bench, pencil
Non-Merged	/bɛntʃ/		/flnz/		/bɛntʃ/ /pɛnsɬ/
Merged	/bɛntʃ/		/fɛnz/		/bɛntʃ/ /pɛnsɬ/

➢Adaptation to voice-specific pronunciation should lead to:
Non-merged Voices: faster target detection in Block3 than in Block1
Merged Voices: ***SLOWER*** target detection in Block3 than in Block1

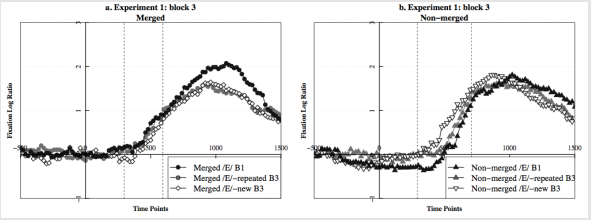
➢Visual Stimuli: 8 object photos including the -in & -en pair (e.g., pencil – pins)
Facial photos: RACE (Black or White) X OUTFIT (Unprofessional or Professional)

Results from the 80 participants: Log ratio Target/Competitor



Block 1: No effect of voice on target

Block 2: *slower* detection of 'fins' with merged /fɛnz/ than with non-merged /flnz/.

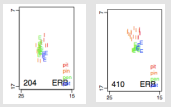


Block 3: faster detection of –en targets with non-merged than with merged voices.

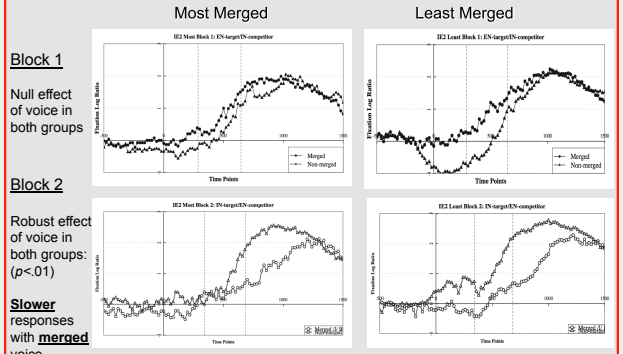
Block 1 vs. Block 3:
Merged voices: relatively fewer looks to the –en target in Block 3
Non-merged voices: faster fixations to the target in Block 3

Analysis according to participants' pronunciations

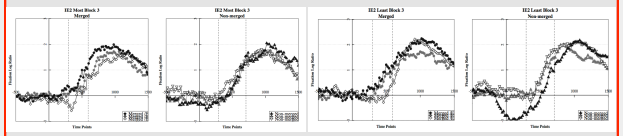
Participants were ranked by degree of merger, by the Pillai's trace statistic -in and -en tokens in F1/F2 space (Hall-Lew, 2009; Hay et al 2006).15 most merged and 15 least merged participants were selected.



Most-merged vs. least-merged participants



Block 3: **Slower** responses with **merged** voice in both groups (*p<.05*).



Block 1 vs. 3

Both groups showed Voice x Block interaction (*p*<.05) ***but…***

Most Merged participants

Slower responses to **Merged** voices in Block 3 than in Block 1. (*p*<.05)

No Block effect on Non-merged voices .

Least Merged participants

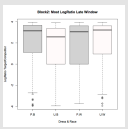
Marginally **faster** responses to **Non-merged** voices in Block 3 than in Block 1. (*p*<.1)

No Block effect on Merged voices .

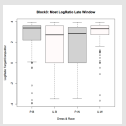
Participants showed higher sensitivities to the voices with the pronunciation patterns ***closer to their own***.

In addition, only **Most Merged** participants showed Race x Outfit interaction in:

Block 2 (*p*<. 1)



Block 3 (*p*<.05)



Professional outfit led to faster detection of target for Black faces.
Outfit had the opposite effect for White faces.

Conclusion

Listeners learned speaker-specific pronunciation patterns (in Block 2) and this changed their responses to the voices that had pronunciation patterns similar to their own.

Listeners' pronunciation patterns may also affect how they process sociolinguistic cues.