



4aScb3 Generational and dialectal effects on children's vowel identification

Ewa Jacewicz and Robert Allen Fox

Speech Perception and Acoustics Labs, The Ohio State University, Columbus, OH



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ABSTRACT

This study examines vowel identification by 8-13 years old children who grew up in either Southeastern Wisconsin (whose regional variety is affected by the Northern Cities Shift) or Western North Carolina (affected by the Southern Vowel Shift). In the first identification task, the children responded to words edited from sentences which elicited both stressed and unstressed vowel exemplars. This speech material was produced by multiple talkers representing two generations (children and older adults who represent their grandparents' generation). In the second identification task, the children were presented with citation-form tokens produced by three generations of talkers (children, their possible parents, and their possible great-grandparents). Both within- and cross-dialect vowel identification was examined. The cross-generational results showed that some vowels were identified more accurately when spoken by children, some when spoken by adults and for others there were no cross-generational differences. The cross-dialectal results indicated generally more accurate identifications of vowels produced by talkers from the same dialect region as the listeners. For selected vowels, there were significant interactions between dialect and generation. As a whole, the study shows children's sensitivity to cross-generational vowel changes and the attunement to their own dialect.

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THE STUDY

It is known that adult listeners are sensitive to the phonetic features of their own regional dialect. The aim of this study is to examine whether this sensitivity is already manifested in the responses of young children who have acquired a specific regional variety of American English. Two experiments tested vowel identification by children who were born and grew up in either the North (Southeastern Wisconsin) or the South (Western North Carolina) in the United States. The aims were to assess children's ability to identify the vowels while controlling for selected linguistic factors (consonantal and prosodic contexts, speaking style) and non-linguistic factors (task demands, variation as a function of speaker age and gender).

Experiment 1: Cross-generational vowel identification (same dialect, vowels from two generations of speakers)

Listeners

- 8 Wisconsin children from the Madison, Wisconsin area
- 8 North Carolina children from the Cullowhee, North Carolina area
- All children aged 8-13 years, girls and boys, normal hearing

Perception stimuli

- Natural speech; a set of 5 vowels in bVd words spoken in sentence context
- The 5 vowels were: /ɪ/ (bids), /e/ (bades), /el/ (bads), /aɪ/ (bides)
- Two types of read sentences which elicited two levels of vowel emphasis
- Emphatic (stressed): "Ted thinks the fall **BIDS** are low."
- Nonemphatic (unstressed): "Ted thinks the fall **bids** are LOW."

Procedures

- Words were edited out of sentences read by two generations of speakers
 - Children generation (10 boys and 10 girls aged 8-13 years from the same geographic area as listeners)
 - Grandparents generation (10 men and 10 women aged 51-65 years from the same geographic area as listeners)
 - 400 stimulus words from all speakers (40 speakers x 5 words x 2 emphasis levels) were presented randomly in two sets (200 words each), preceded by a practice set
 - Listeners identified the vowels using a 7-button response window displayed on the computer screen containing 7 choices
- BEADS BIDS BADES BEDS BIDES BUDS
- Wisconsin children responded to Wisconsin stimuli (400 words) and North Carolina children responded to North Carolina stimuli (400 words).

Cross-generational results

Wisconsin children response										
Speaker dialect	Vowel emphasis	Speaker age	Talkers played	BEADS	BIDS	BADS	BIDES	BUDS	BEADS	BIDS
WI	emp	8-13	children	8.6	87.8	8.6	8.6	8.6	8.6	8.6
WI	emp	51-65	children	8.6	87.8	8.6	8.6	8.6	8.6	8.6
WI	emp	8-13	adults	8.6	87.8	8.6	8.6	8.6	8.6	8.6
WI	emp	51-65	adults	8.6	87.8	8.6	8.6	8.6	8.6	8.6
WI	non-emp	8-13	children	8.6	87.8	8.6	8.6	8.6	8.6	8.6
WI	non-emp	51-65	children	8.6	87.8	8.6	8.6	8.6	8.6	8.6
WI	non-emp	8-13	adults	8.6	87.8	8.6	8.6	8.6	8.6	8.6
WI	non-emp	51-65	adults	8.6	87.8	8.6	8.6	8.6	8.6	8.6
WI	non-emp	8-13	children	8.6	87.8	8.6	8.6	8.6	8.6	8.6
WI	non-emp	51-65	children	8.6	87.8	8.6	8.6	8.6	8.6	8.6
WI	non-emp	8-13	adults	8.6	87.8	8.6	8.6	8.6	8.6	8.6
WI	non-emp	51-65	adults	8.6	87.8	8.6	8.6	8.6	8.6	8.6

North Carolina children response										
Speaker dialect	Vowel emphasis	Speaker age	Talkers played	BEADS	BIDS	BADS	BIDES	BUDS	BEADS	BIDS
NC	emp	8-13	children	8.6	79.8	8.6	8.6	8.6	8.6	8.6
NC	emp	51-65	children	8.6	79.8	8.6	8.6	8.6	8.6	8.6
NC	emp	8-13	adults	8.6	79.8	8.6	8.6	8.6	8.6	8.6
NC	emp	51-65	adults	8.6	79.8	8.6	8.6	8.6	8.6	8.6
NC	non-emp	8-13	children	8.6	79.8	8.6	8.6	8.6	8.6	8.6
NC	non-emp	51-65	children	8.6	79.8	8.6	8.6	8.6	8.6	8.6
NC	non-emp	8-13	adults	8.6	79.8	8.6	8.6	8.6	8.6	8.6
NC	non-emp	51-65	adults	8.6	79.8	8.6	8.6	8.6	8.6	8.6
NC	non-emp	8-13	children	8.6	79.8	8.6	8.6	8.6	8.6	8.6
NC	non-emp	51-65	children	8.6	79.8	8.6	8.6	8.6	8.6	8.6
NC	non-emp	8-13	adults	8.6	79.8	8.6	8.6	8.6	8.6	8.6
NC	non-emp	51-65	adults	8.6	79.8	8.6	8.6	8.6	8.6	8.6

- Overall mean identification rate was higher for Wisconsin children (83.7%) than for North Carolina children (74.9%).

- Both groups of children responded similarly: There were no clear differences as a function of speaker generation, differences were found for the effects of emphasis: emphatic vowels obtained higher rates than nonemphatic vowels.

- For Wisconsin, the accuracy was lowest for /æ/ (bads) - confused mostly with /e/ (bads).

- For North Carolina, the accuracy was lowest for /ɪ/ (bids) - confused mostly with /e/ (bads).

Experiment 2: Cross-dialectal vowel identification (different dialect, vowels from three generations of speakers)

Listeners

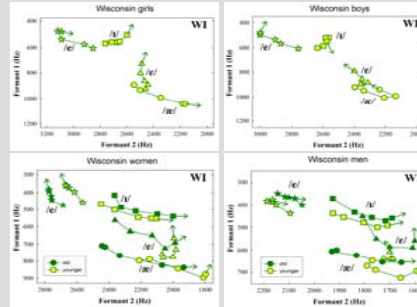
- The number of listeners, their background and age as in Exp. 1
- New listeners (none of them participated in Exp. 1)

Perception stimuli

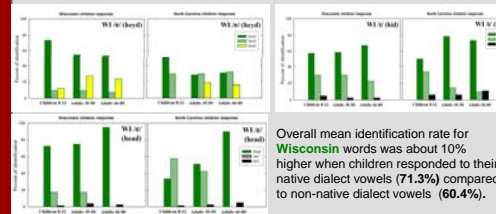
- Isolated (citation form) words produced by 60 WI speakers and 60 NC speakers
- 3 generations of speakers: children (8-12 years), younger adults (parents: 35-50 years), old adults (great grandparents: 66-80 years); 10 males and 10 females in each group
- Vowel set: 12 vowels in hVd context
/i/ (heed), /ɪ/ (hid), /e/ (heyd), /el/ (head), /aɪ/ (had), /a/ (hod), /ɔ/ (hawed), /o/ (hoed), /u/ (hood), /u/ (who'd), /ɜ-/ (heard), /aɪ/ (hide)
- Each speaker produced 6 words for a total of 720 stimulus words used in Exp. 2; 720 stimuli were presented randomly in 3 sets (240 stimuli in each set); there were 60 unique exemplars of each vowel (60 x 12 vowels = 720)
- Listeners identified the vowels using a 12-button response window displayed on the computer screen containing all 12 words

Cross-dialectal: Wisconsin vowels

Mean formant values for selected stimuli (WI vowels in heyd, hid, head, had)



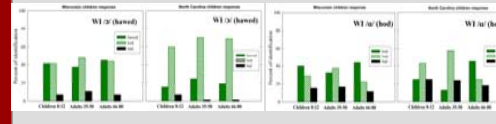
Wisconsin children response										North Carolina children response									
Speaker dialect	Vowel emphasis	Speaker age	Talkers played	HEED	HID	HEAD	HAD	HEED	HID	HEAD	HAD	HEED	HID	HEAD	HAD				
WI	emp	8-13	children	8.6	87.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
WI	emp	51-65	children	8.6	87.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
WI	emp	8-13	adults	8.6	87.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
WI	emp	51-65	adults	8.6	87.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
WI	non-emp	8-13	children	8.6	87.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
WI	non-emp	51-65	children	8.6	87.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
WI	non-emp	8-13	adults	8.6	87.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
WI	non-emp	51-65	adults	8.6	87.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
WI	non-emp	8-13	children	8.6	87.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
WI	non-emp	51-65	children	8.6	87.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
WI	non-emp	8-13	adults	8.6	87.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
WI	non-emp	51-65	adults	8.6	87.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				



Overall mean identification rate for Wisconsin words was about 10% higher when children responded to their native dialect vowels (74.3%) compared to non-native dialect vowels (60.4%).

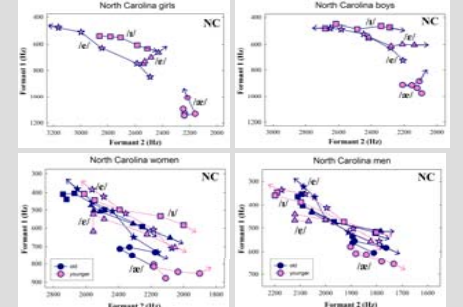
Evidence for children's attunement to their own dialect: WI heyd was confused mostly with head by NC children and head by WI children; WI head was confused mostly with had by NC children (reflecting sensitivity to cross-generational differences); WI hid was confused with head differently by WI and NC children.

Further evidence from the hawed/hod distinction: lower identification rates for both vowels and a different confusion pattern for NC children compared to WI children.

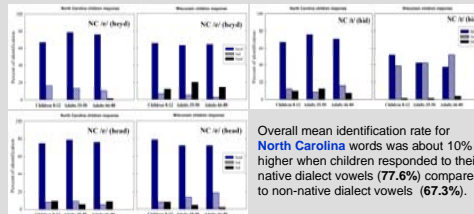


Cross-dialectal: North Carolina vowels

Mean formant values for selected stimuli (NC vowels in heyd, hid, head, had)



North Carolina children response										Wisconsin children response									
Speaker dialect	Vowel emphasis	Speaker age	Talkers played	HEED	HID	HEAD	HAD	HEED	HID	HEAD	HAD	HEED	HID	HEAD	HAD				
NC	emp	8-13	children	8.6	79.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
NC	emp	51-65	children	8.6	79.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
NC	emp	8-13	adults	8.6	79.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
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NC	non-emp	51-65	children	8.6	79.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
NC	non-emp	8-13	adults	8.6	79.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				
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NC	non-emp	51-65	adults	8.6	79.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6				



Overall mean identification rate for North Carolina words was about 10% higher when children responded to their native dialect vowels (77.6%) compared to non-native dialect vowels (67.3%).

NC heyd was confused mostly with had by NC children and head by WI children; NC head was confused mostly with hid by NC children and with had by WI children; a large group difference for NC hid (sensitivity to cross-generational differences in the number of hid/head confusions by WI children but not by NC children). The hawed/hod distinction: lower identification rates for hod by WI children compared to NC children (and more confusions with hawed); however, lower identification of hawed by NC children compared to WI children.

