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Implications of Language Experience for Accuracy of Speaker Identification

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HOPE COLLEGE

BACKGROUND

•Previous studies suggest that listeners can identify speaker gender and ethnicity from auditory information (Lass et. al., 1979; Thomas & Reaser, 2004; Perrachione et. al., 2008).

•A previous study analyzing for the conditions of temporal, phonetic complexity, speaker gender, and speaker ethnicity found that, overall, listeners were significantly more accurate in identifying forward, sentences, males, and European Americans (Trent-Brown et. al., 2011).

•A previous study found that female listeners (69%) were significantly more accurate than male listeners (67%) in identifying speaker $F(1,233)=$ 6.439 (Trent-Brown et. al., 2011).

Listener Gender: Accuracy p=.012 η_p^2=.027

Percentage — Gender (Females 69, Males 67)
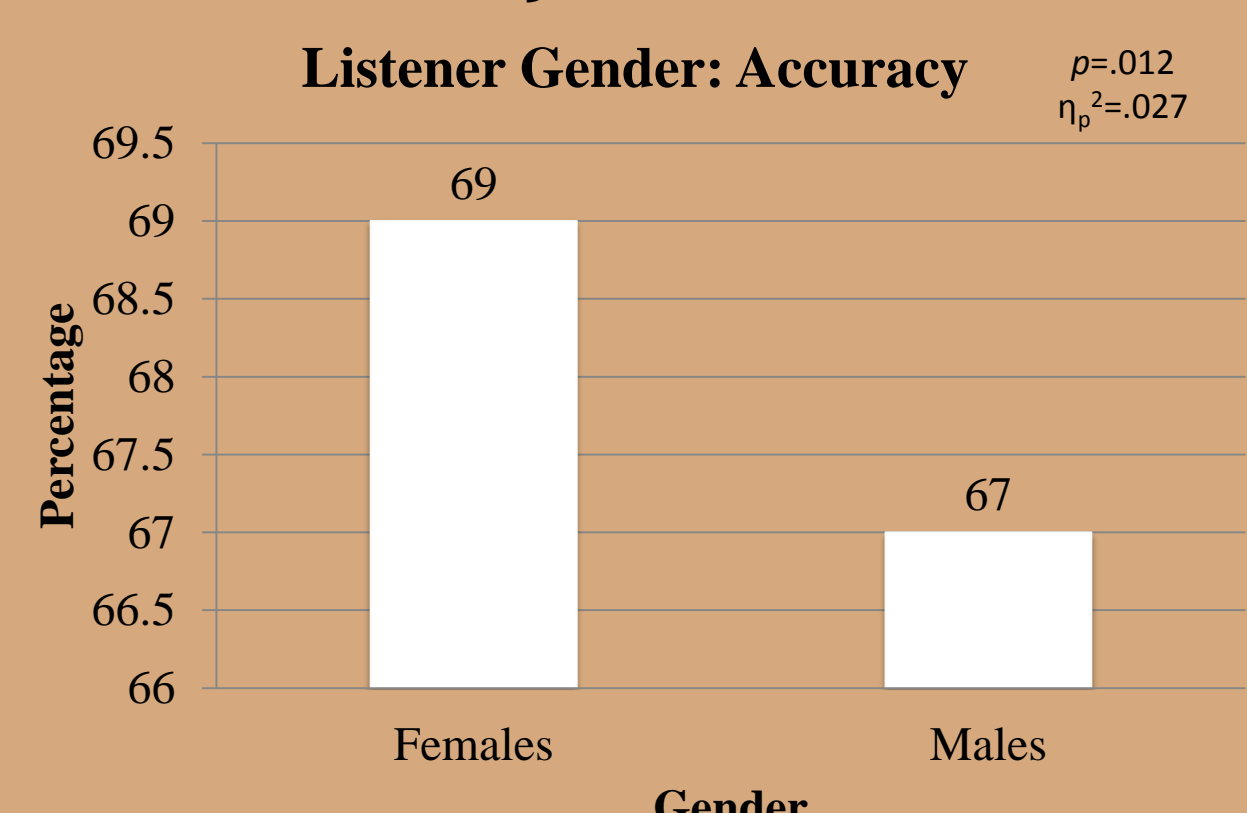
•This study examines the extent to which some listener characteristics influence listener's accuracy in identifying speakers.

•Given that the language experience listeners have been exposed to influences individual language formation, this study examines how language experience influences listeners' ability to correctly identify speakers.

HYPOTHESES

•Participants who have lived in more places and more regions will have better accuracy in speaker identification.

•Participants who have lived in places with more demographic diversity will have better accuracy in speaker identification.

- Participants who have lived in places with a higher European American population will have higher accuracy identifying European American speakers compared to participants who have lived in places with a lower European American population.

- Participants who have lived in places with higher African American populations will have higher accuracy identifying African American speakers compared to participants who have lived in places with lower African American populations.

•Multilingual participants will have higher accuracy identifying speakers.

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METHOD

Participants

•Data from 466 listeners (295 females, 171 males) was used in the study.

•Most participants were undergraduate college students (mostly from Hope College) and the majority of them were 18-22 years old.

•All participants were English speakers and all had lived in the United States for at least 3 months.
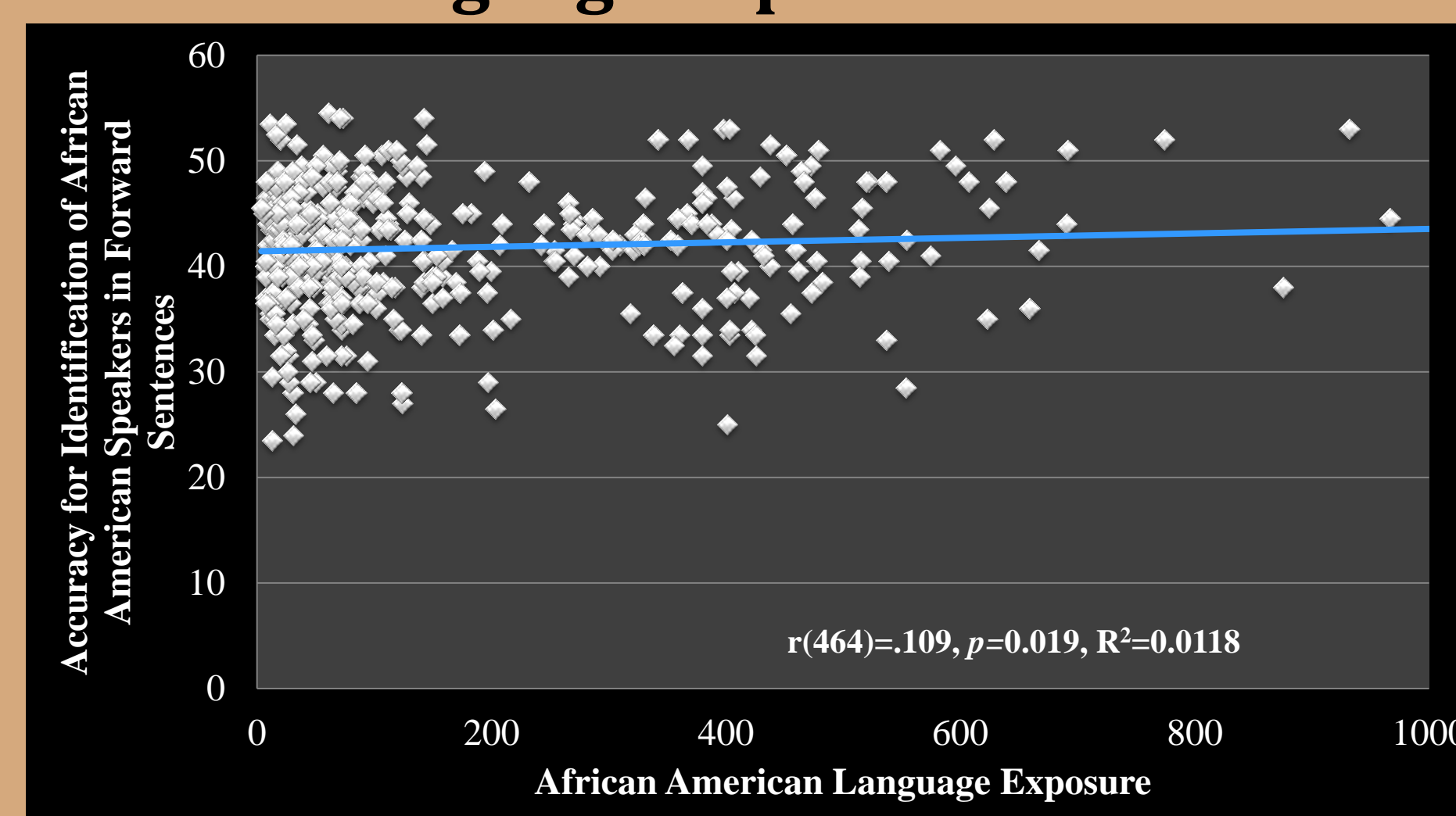
•Mostly European Americans.

Procedure

•Before completing the study, participants completed a Language Background Questionnaire with questions such as:

- List the places in the United States (City/State) you have lived in for 3 months or more
- List the places outside the United States you have lived in for 3 months or more
- Was English your first language?
- Are you fluent in another language(s) other than English? Which one(s)?

•Participants listened to four blocks, two with sentences and two with words and two reversed and two normal. Each block was made up of 220 items with an equal number of items spoken by either an African American and European American, and female and male.

•Listeners had to click on the image in the screen of the speaker they thought the audio belonged to.
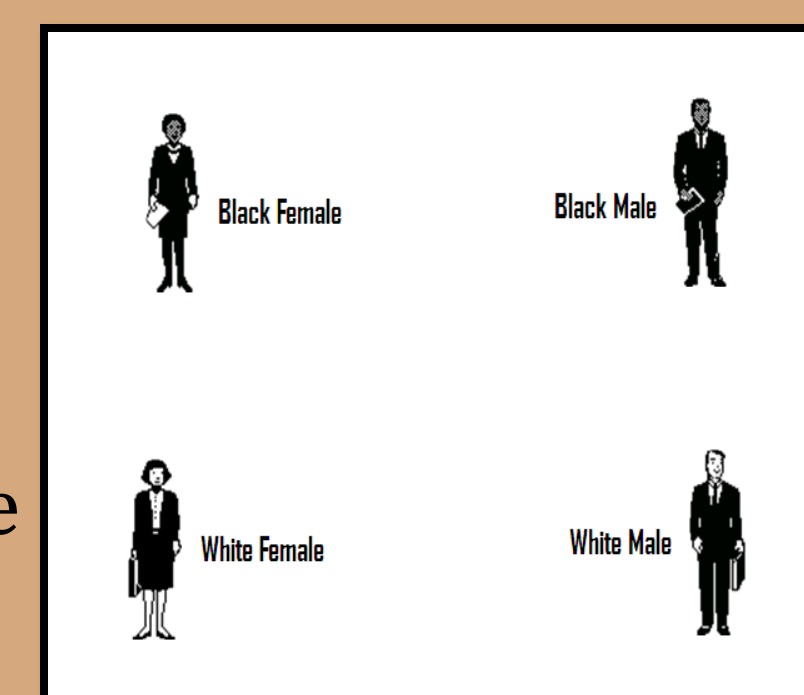
RESULTS

African American Language Exposure

Accuracy for Identification of African American Speakers in Forward Sentences vs. African American Language Exposure

r(464)=.109, p=0.019, R^2=0.0118

Our hypothesis **was** supported

Variable 1	Variable 2	Pearson Correlation	Significance (2-tailed)	N
African American Language Exposure	Overall Identification Rating Time for African American Speakers in Forward Sentences	.119	.010	466
African American Language Exposure	Overall Accuracy for Identification of European American Speakers in Forward Sentences	-.092	.046	466

European American Language Exposure

Our hypothesis was **not** supported

Variable 1	Variable 2	Pearson Correlation	Significance (2-tailed)	N
European American Language Exposure	Overall Accuracy for Identification of European American Speakers in Forward Sentences	.075	.106	466
European American Language Exposure	Overall Accuracy for Identification of African American Speakers in Forward Sentences	-.015	.745	466

Number of Regions

Variable 1	Variable 2	Pearson Correlation	Significance (2-tailed)	N
Number of Regions	Overall Accuracy for Speaker Identification in Forward Sentences	-.003	.941	466

Our hypothesis was **not** supported

Number of Languages

Our hypothesis was **not** supported

Variable 1	Variable 2	Pearson Correlation	Significance (2-tailed)	N
Number of Fluent Languages	Overall Accuracy for Speaker Identification in Forward Sentences	-.023	.621	466

MEASURES

Variables

•What places did the participants live in and for how long?

•Percentage of African Americans in each place (U.S. Census Bureau 2010 and USA.com)

•Percentage of Whites in each place (U.S. Census Bureau 2010 and USA.com)

•Language Exposure Index

•Number of regions

•Languages participants are fluent in

•Race

•Gender

North American English Dialects

•We used a map that divides the United States into 8 dialectic regions.

•For the analysis, we numbered continents to represent regions outside the United States.
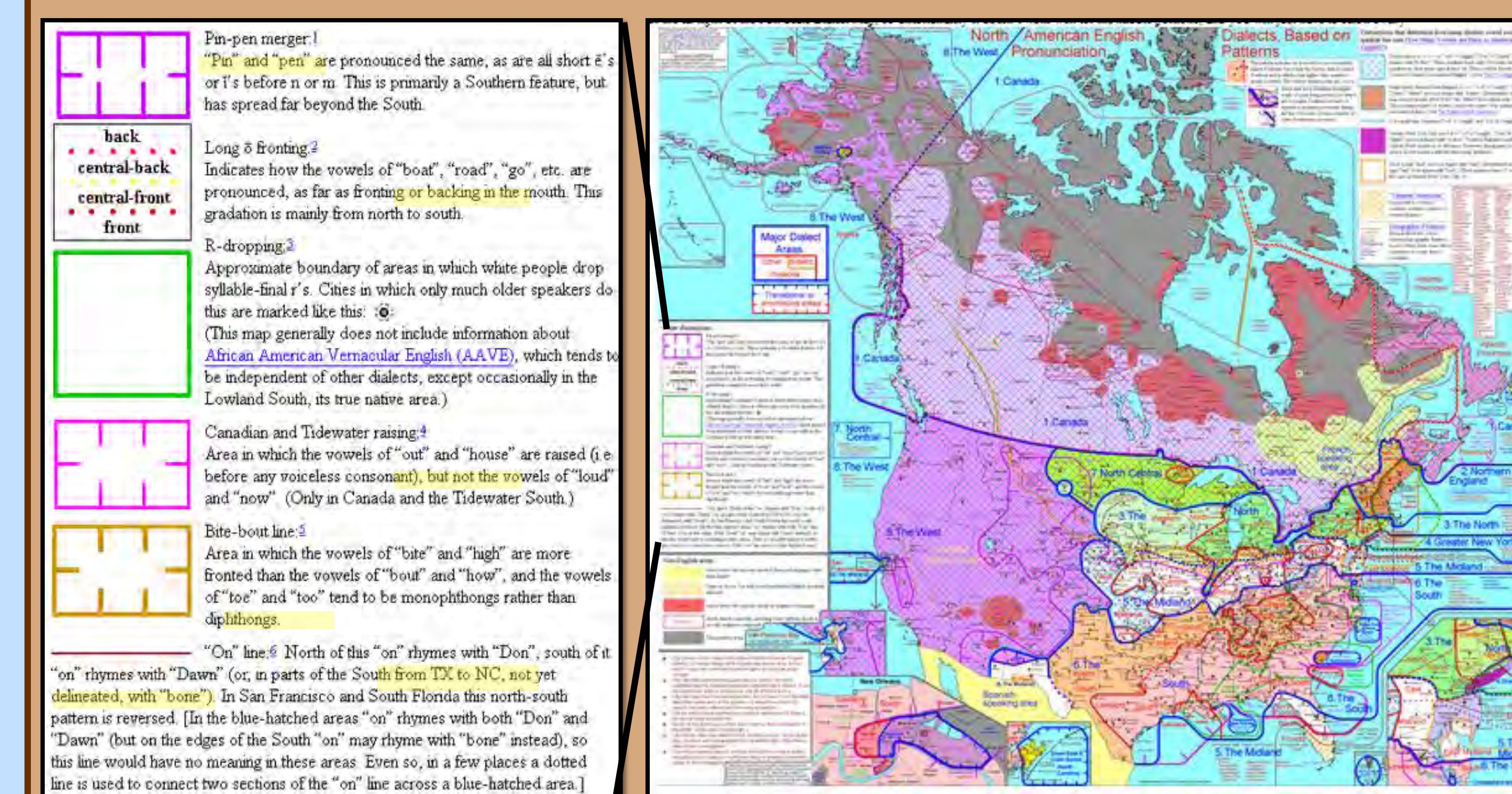
DISCUSSION

•We found that participants who have lived in more regions did not have a higher accuracy in identifying speakers than participants who lived in less number of regions.

•Multilingual participants were not more accurate than participants who were fluent in one language in identifying speakers.

•Participants who had a higher European American language exposure were not more accurate in identifying European American speakers than participants with a lower European American language exposure.

•We found that participants who had higher African American language exposure were more accurate in identifying African American speakers and were less accurate in identifying European American speakers in forward sentences.

•Therefore, our results suggest that it is not overall language experience that affects accuracy for speaker identification, but rather it is the specific and direct language exposure to a specific group.

ACKNOWLEDGMENTS