Leveraging African American English Knowledge:

Cognition and Multidialectal Processing

by

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Abstract

This dissertation uses theories and methodologies from sociolinguistics, neurolinguistics, and psycholinguistics to investigate how American English-speaking listeners cognitively interact with voices from Black and White individuals. For so long, social and cognitive subfields in linguistics have been pursued independently. Sociolinguistics focuses on where language comes from; living, breathing, diverse individuals. Sociolinguistic methods span a variety of modes, providing nuanced insight into communities, variation, and change. However, most sociolinguistic methods are offline, and this can be limiting when considering not only how language exists within individuals and interpersonally, but how language is processed in real time. Psycholinguistics provides a range of methods and theories that evidence how speakers and listeners process language in real time. However, psycholinguistic methods have historically looked at standard or colonizing languages, rather than minoritized ones. Incorporating study of minoritized language varieties is paramount to broaden and refine our knowledge of how human language is processed.

In this dissertation, I investigate how different parts of grammar modulate variation in perception from a sociolinguistic frame of reference. The data presented come from over 90 sociolinguistic interviews, four online surveys, a virtual eye-tracking study, and two EEG neurolinguistic experiments. In Chapter 2, I investigate the relationship between perception of race and perception of emotion by operationalizing the Angry Black Woman Trope through a survey including stimuli from one Black woman and one White woman. Results showed that the Black voice was most correctly identified racially in the Angry and Neutral conditions, while the white voice was correctly identified in the Happy condition. However, low base rate correctness overall in race identification did not coincide with free-write responses from participants, indicating their perception of "lax" voices sounding Black and "enunciated" voices sounding White.

This disagreement between the audio identification and the free-write responses formed the impetus for Chapter 3, in which virtual eye-tracking was incorporated to better understand

listener's implicit perceptions of emotional speech from Black and White women. Participant experiential linguistic knowledge was measured through exposure and familiarity surveys, and usage through virtual sociolinguistic interviews. It was hypothesized that listeners with higher experiential linguistic knowledge of African American English (AAE) would show less bias, determined by identifying emotional speech with emotional and racialized image stimuli correctly, as recorded through the virtual eye-tracker. The results from this study indicate that participants have a broad range of experiential linguistic knowledge with AAE, and trends in the data suggest that higher usage can predict less bias.

Chapter 3 shows the benefit of using implicit processing models to probe cognition and variation. Chapter 4 extends the findings of emotional prosody perception to syntactic prediction during processing. Two electroencephalography (EEG) experiments focus on syntactic variation between AAE and Standardized American English (SdAE), probing variation in listener expectations. Results show that AAE and SdAE are processed differently when produced by a so-called Black bidialectal speaker and a white speaker.

This dissertation contributes to further understanding how social information interfaces with online processing, and expectations that may be formed depending on the perceived identity of a voice. Future research will build upon these findings to investigate broader claims about languages as they exist and vary in context, from person to person, further contributing to a multidialectal cognitive model of language.

Chapter 1 Introduction

Linguists have long been interested in structure and variation across languages. Within the past 70 years, the emergence of the field of cognitive science has brought a new lens to the study of linguistics, where an interest in structure and variation within languages has expanded to research on how language is processed and perceived (Miller 2003). Despite this attention to understanding languages from a cognitive perspective, to this day there is little understanding of the cognitive processing within multidialectal societies and within minoritized language varieties. African American English (AAE) is the most well-studied minoritized variety of English in the United States, and even still, there is so much we do not know about cognitive processing of the variety. This dissertation focuses on the interaction of AAE with Standardized American English (SdAE), at the phonological and syntactic levels, incorporating speakers who hold intersectional identities, as processed by listeners who all have a variety of American English as their first language or one of their first languages.

AAE is defined in this dissertation as a minoritized linguistic repertoire – an umbrella term for English language varieties spoken mostly by Black people in the United States. SdAE is considered the standard linguistic variety in the United States (Silverstein 1998). which reflects the sociocultural processes which position SdAE forms as the only correct, acceptable, and accurate ways of speaking. The unmarkedness of SdAE is an ideological construct that privileges the linguistic varieties spoken by middle-class White Americans. Consequentially, other American English varieties are often marked as disorderly relative to the standard (Hill 2008).

AAE is one part of the American linguistic landscape amongst hundreds of other English varieties as well as other languages.

Another underlying theme of this dissertation is that studying language in context also includes the experience of people in the world as they relate to language. Studying language in context is necessary to advance theories about how people process and understand language in a multilingual world. A theory of multidialectal processing could be that humans have access to multiple grammars and can leverage those during processing, even when they are not fluent speakers. A theory like this might predict that more access to multiple varieties results in ease of processing language beyond someone's L1. This dissertation expands upon decades of work on cognition and linguistic variation. It takes our globalized world into account when constructing experiments, illuminating how perception and processing differs depending on the identities of speakers. It lays the groundwork for future research to consider intersectional identities (Crenshaw 1989) within experimental frameworks and how those identities result in nuanced and varied perceptions and processing patterns.

Speakers of American Englishes have vast and complex knowledge of English speech. Despite not having an official U.S. language, many lay people consider SdAE (often referred to as Mainstream U.S. English, Standard English, and even simply "Proper English") as the national language of the United States (Silverstein 1998; Hill 2008). Though the U.S. does not have a federally funded body like the Académie Française in France or the Real Academia Española in Spain to govern standard English, language practices in institutions of education, law, and media de facto standardize language varieties (cf. Cameron 2012); for example, through the publication and use of the style guides and dictionaries (Cooper 1989, Stamper 2017).

Despite language being an everchanging entity, in the United States there is a pervasive view that there is only one correct way to speak English, which is often conflated with what is taught in grammar school and brings along with it arbitrary rules that result in people having particular English language peeves (Milroy & Milroy 1985, Agha 2005). Oftentimes, people's qualms with 'ungrammaticality' really come from limited perspectives which do not take into consideration language variation and change, ethnolinguistic variation, and sociolects. These ideological stances (Jaffe 2009) are often bound up with prejudices against language that comes from minoritized communities (Baker-Bell 2020). One consequence of these prejudices is that AAE is often discussed using a deficit model wherein the variety is characterized by a list of features that differ from the SdAE is used to characterize the variety (Green 2011, 219). This results in SdAE getting characterized as the unmarked norm, with AAE characterized as a deviation from that norm (Green 2011).

Features of AAE are stigmatized by virtue of being produced by Black people (Drager 2010, Bucholtz 2010, Rickford & King 2016). For example, Nielsen (2010) shows that the falsetto register in AAE was consistently and incorrectly perceived as "an indicator of indignation." Another example is Troutman's forthcoming work on "Sassy Sasha: The intersectionality of (im)politeness and sociolinguistics: A case study of an African American Speech Community," which describes the negative perceptions of young Black girls' linguistic practices, and how those perceptions follow those young Black girls into their adulthood, where they are then labeled Angry Black Women. Troutman uses the example of President Barack Obama's daughter, Sasha Obama, a high profile young Black woman in America whose language was incessantly scrutinized by the media, who drew upon racist Angry Black Woman tropes to

criticize her behavior.[1] We often associate stigmatization of AAE varieties with lower class individuals, a process that has been extensively discussed, for example, by linguists concerned with the treatment of Rachel Jeantel during George Zimmerman's murder trial (Rickford & King 2016, Slobe 2016). However, these prejudices also transcend socioeconomic class. For example, high profile individuals such as Anita Hill as a witness called to speak against Clarence Thomas' Supreme Court appointment (Mendoza-Denton 1995), critiques of Vice President Kamala Harris' line of questioning during the Judge Kavanaugh hearings[2] and performance on the vice-presidential debate stage.[3] Audiences, Supreme Court members, and juries have consistently found the testimonies of Black women not credible, inauthentic, angry, and at worst, "incomprehensible" (Gillon 2015).

The practice of stigmatizing certain English varieties such as AAE while privileging others as not, points to two phenomena: 1) There is a spectrum of Englishes that SdAE and AAE fall within and 2) English speakers have varied knowledge of different English varieties. Thomas and Reaser (2004) show that listeners can detect African American voices even devoid of stereotypical morphosyntactic cues, indicating that a wide range of features in the AAE grammar can cue Blackness to listeners. Clopper and Pisoni's work (2004a) shows that individuals with previous experience with a specific regional dialect can more accurately pinpoint a speaker's origin than someone who has less exposure to the language varieties of a specific region. Sumner & Samuel (2009) investigate broadly how the effect of experience shapes perception and representation of dialect variants by considering how exposure affects perception in variable ways depending on long term versus short term storage of information through lexical decision

[1] https://nypost.com/2020/12/02/sasha-obama-tiktok-dance-video-deleted-after-going-viral/
[2] https://news.yahoo.com/what-the-kavanaugh-confirmation-hearings-reveal-about-kamala-harris-194959878.html
[3] https://www.nytimes.com/2020/10/07/us/politics/kamala-harris-faced-a-double-standard-on-the-debate-stage.html

and priming tasks. Looking at New York and Georgia dialects of American English, their results indicate that dialect production of New York dialect does not entail correct dialect perception; however, dialect strongly influences the correct word recognition process. The means by which they assessed experience are limited, noting that participants were "given a post-test questionnaire and a short exit interview to assess which participants were NYC or GA speakers, and the extent to which the participant had prior experience with the other dialect" (Sumner & Samuel 2009; pg. 489). There is no explanation of specific measures taken to pin down experience other than what seems to be vague questioning.

Clearly, researchers are aware of the importance of considering how exposure and experience impact perception and processing, yet there remains a question of how to pin down experience specifically and quantitatively. This reality adds to the ever-expanding impetus to investigate how varied knowledge contributes to listeners processing language varieties that are beyond the ones they speak themselves (Sumner & Samuel 2009). It is critical to study these issues – humans are interactive beings and a model of language processing that does not include multiple language types is an insufficient and inaccurate representation of reality. In sum, language models need to account for who users are, and the experiences they have as individuals.

Sociolinguists have shifted their theoretical approaches to speech communities. The field has come a long way from thinking about monolithic speakers, especially with respect to AAE, where the 'typical' speaker was once conceptualized as young, male, and living in the 'inner city' (Rickford 2016). Research on AAE continues to expand, showing how race, place, and identity are reflected in speech pattern variation (King 2021). Sumner & Samuel (2009) show that regional dialect production doesn't equate to accurate perception of a variety in their sample

looking at New York and Georgia American accents. This work shows the need to look beyond individual factors such as race, region, gender, and age, because they do not map onto the multifaceted realities of speaker's linguistic knowledge. The need to look beyond one-to-one mappings not only necessitates but highlights the reality of intersectional identities within individuals. In 1989, Kimberlé Crenshaw coined the term *intersectionality* in the journal article, "Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics." She centers Black women to discuss how intersectionality results in a unique and different kind of oppression than that which affects others who do not hold multiple marginalized identities at the same time. Crenshaw challenges the notion that race and gender are mutually exclusive categories, and centers the experiences of Black to show how, "it become[s] more apparent how dominant conceptions of discrimination condition us to think about subordination as disadvantage occurring along a single categorical axis" (Crenshaw 1989, pg. 140). Attention to intersectionality within identity studies shows how sociological categories related to race, ethnicity, gender, sexuality, class, immigration status, etc. interact with one another to share the everyday experiences of individuals.

At a macro linguistic level, there have been multiple perspectives on who speaks AAE. A speaker-centered view holds that not all Black people are speakers of AAE, nor grow up in AAE-speaking communities. Additionally, while much has been theorized about women's language (e.g., Lakoff 1972, Cuellar 2006, Morikawa 2019), little research has considered the intersectional nuances of Black women's language and white women's language with regard to perception and processing. However, Lanehart (1996) argues that all Black people in the U.S. speak some form of AAE given that they are Black people in the United States. Exploring the

nuances of intersectionality informs a model of language that accounts identity-types held by Black women, as well as for any and all individuals that have multiple, intersecting identities that may inform their language practices.

As noted above, linguistic knowledge is complex in that language use is not always equal to experience or familiarity (Sumner & Samuel 2009); Individuals can have experience with a language variety without being a speaker of that language variety themselves, based on, for example, the community they grew up in (Otwinowska et al. 2019). Knowledge of minoritized language varieties can be particularly difficult to probe because AAE is stigmatized by the general public (Bucholtz 2010), and often even by speakers of the language variety themselves. Thus, measures used in previous work to assess language experience with explicit questions – e.g. "How many friends of yours speak this variety?" (McGowan 2015) – may not work in the context of American Englishes. Such an approach could in fact be seen as offensive because AAE is not perceived as a "legitimate language." Additionally, there is growing evidence that SdAE speakers are overconfident in their comprehension of AAE, thus asking these kinds of explicit questions can elicit dishonest responses (Jones & Hall 2019). This dissertation expands research that incorporates experience as an indicator of dialect perception, and quantifies listener experience to use it as a predictor in multidialectal processing.

The desire to do the work surrounding perception and processing on AAE poses another issue. Despite the ever-growing literature on AAE, an unanswered question is what to do about the difference between hearing speech as "sounding Black" and "sounding like AAE speech/grammar." Researchers have struggled to pinpoint exactly what "sounding Black" means (Scharinger et al. 2012), and some have argued that if one is Black, then whatever speech is

produced is African American language (Lanehart 1996). The ideas surrounding "sounding Black" remain inconclusive, though it is clear that "sounding Black" greatly effects individuals and communities, including most blatantly, in cases of racial profiling (Rickford and King 2016, Purnell et al. 1999, Wright 2020). As AAE researchers have expanded their conceptualizations of the variety across and gender, region, and socioeconomic class (e.g., Lanehart 2009, Holliday and Villarreal 2020, King 2021), it has become clear that there is a hierarchy of AAE features ideologically associated with the variety – that is, some features are strongly enregistered (Agha 2005) as AAE. Even in the absence of morphosyntactic features, people can still discern when speech is coming from a Black individual (Thomas & Reaser 2004, Holliday and Villarreal 2020, Weldon 2021). In particular, a growing body of research on the prosodic and intonational features of AAE shows that features of AAE prosody can be perceptually indicative of race (Holliday 2021).

There is evidence that acoustic correlates of rhythm can differ as much between American dialects as between different languages (Grabe 2002). For example, AAE speakers tend to use forestressing, the pattern of placing primary stress on the first syllable of words (e.g., *police* pronounced as [polis] (Thomas 2015)). AAE has also been described as having a higher rate of L+H* pitch accent use[4], more stresses, and more high tonal events overall in speech; this is, of course, in relation to rates of use in SdAE (Kendall 2013; Holliday 2016). Although the variation in pitch has also been found to be prominent in other varieties of American English (Burdin, Holliday, and Reed 2018), its prominence in AAE makes it strategically available to index Blackness. However, there has been little inquiry into the potential relationships between prosodic variation, perception, and processing with respect to intersectionality. In fact, prior

[4] Beckman & Ayers 1994 Tones and Break Indices Annotation Conventions

research studying relationships between prosody, gender identity, and perception of emotion have tended to focus on White women, SdAE speakers, as the norm and as the control (Kim & Sumner 2017, D'Onofrio 2015, Slobe 2018). Taking an intersectional approach that considers Black women's identities in relation to prosody provides the opportunity to test how stereotypes, such as The Angry Black Woman trope, affect linguistic perception and processing of individuals with intersectional identities.

The goal of this dissertation is to study language processing of intersectional speakers within a multidialectal society, which necessitates interdisciplinary work across sociolinguistics and psycholinguistics. Sociolinguistic methods have historically provided a window into the nuances and variation of speech phenomenon (Bucholtz 1999, Norris et al. 2003, Sumner & Samuel 2009, Eckert 2012). However, sociolinguistics has not broadly drawn on methods that account for real time processing of language as it is used in contexts of linguistic varieties. While psycholinguistic methods range in their abilities to measure online processing from brain region to neural and behavioral responses and beyond. However, psycholinguistics has historically focused on standard linguistic varieties rather than minoritized languages (Van Berkum et al. 2008, Hanulikova et al. 2012). Consequently, the field has not considered how multiple languages with variable social status are processed by individual listeners. This dissertation combines methods from sociolinguistics and psycholinguistics, spanning behavior survey research, virtual eye-tracking, and electroencephalography (EEG), to investigate the processing and perception of AAE and SdAE. Findings from this work extend to work on listener experience to account for stereotypes to consider how they influence perception and processing of the varieties at hand. In the remainder of this introduction, I will briefly outline the three major chapters that together compose this dissertation.

In Chapter 2, I take a first step into perception of intersectional identity in the emotional prosody realm by testing how perception of race influences perception of emotion. This research is a direct response to Kim & Sumner's (2017) work on emotional prosody processing, incorporating an African American woman to probe how happy, angry, and neutral speech from women is processed. I operationalize the Angry Black Woman trope, a stereotype that is specific to Black women in the United States, to see if the pervasive emotion stereotype holds when listening to emotional speech from SdAE and AAE women's speech. Participants listened to tokens from an AAE speaking woman and an SdAE speaking woman using happy, neutral, and angry prosodies, and were asked to explicitly indicate the perceived race and emotion of the speaker.

Results from this experiment show that SdAE was rated whitest in the happy condition, whereas AAE was rated Blackest in neutral and angry conditions. Acoustic analyses of the tokens show that they are distinguishable as evidenced from creak variation and pitch across angry and happy speech and within each speaker across those axes. The results also indicated a disconnect between rating the voices correctly for race and rating the voices for emotional perception in long-form responses. Given the explicit nature of the task (asking what race and emotion the token was associated with), results indicate that while perception of race influence perception of emotion, implicit processing models might give us a greater sense of how people are processing these different varieties (Hanulikova 2012, Phillips & Pylkkänen 2019). Also, given that there was only one speaker of each variety, individual and language variety are conflated by design. Including multiple speakers would have helped better determine if listeners' responses were to the individual or to the language variety. Finally, given that experience with varieties influences perception (Drager 2010), a measure to probe variation in experience could

have made clearer the results of perception of race and emotional speech. All of these questions are addressed in Chapter 3.

Chapter 3 extends the findings in Chapter 2 to look at emotional prosody processing perception with some additional methods and experimental enhancements to get closer to answering the questions about multidialectal processing, perception, and emotion. Using multiple speakers of SdAE and AAE, this study was designed to provide a larger platform to address responses to language variety rather than individual speakers. Eye-tracking were incorporated in order to examine how the influence of varied linguistic knowledge modulates perception and subsequently online processing through audio-visual integration. Happy and angry sentence stimuli came from three SdAE-speaking women and three AAE-speaking women, and 12 images were aligned with each speaker for race and emotion (6 images, with a happy and angry face counterpart). The task asked individuals to look on the screen at who they thought was speaking after a sentence played in their earphones. In order to measure individual's experience with AAE, exposure and familiarity surveys were taken by participants post the virtual eye-tracking study, usage-based experience was measured through AAE feature use as evidenced from a sociolinguistic interview conducted on zoom following the familiarity survey. Experience-based measures are couched in an exemplar-based model which brings together mental representations, memory, and number of tokens (Gahl and Yu 2006). In operationalizing the American cultural stereotype of The Angry Black Woman, this study demonstrates how emotional linguistic cues indicate preferential looking responses based on varied knowledge, either based in accuracy or based in stereotyped knowledge. The results of the study indicate that participants vary greatly in their looking patterns via virtual eye-tracking and in their experiential linguistic knowledge of AAE. There is a trend in the data showing that higher experiential

linguistic knowledge results in lower Bias Scores, though it should be noted that only the Usage Score was at significance regarding predicting Bias Scores. The results overall indicate how language variety, stereotyping, and racialization play parts in that processing and how implicit processing tasks can illuminate these trends. This overall pattern is not surprising, as the perception literature has shown how exposure can modulate perception and social attribution (Drager 2010, D'Onofrio 2015, D'Onofrio 2019).

Chapters 2 and 3 probe the influence of stereotypes and AAE experience on perception and processing, but they do not consider potential relationships between listener experience and perception and processing of particular linguistic varieties. To address this, Chapter 4 delves into online processing of AAE and SdAE in an attempt to disentangle whether or not American individuals have one grammar, (SdAE grammar or some variety of Mainstream English), in their head which they use to characterize all other varieties into non-standard, minoritized "other" categories. Alternatively, it could be that individuals hold multiple grammars, even those they might not speak themselves.

It is worth acknowledging here that the terms used to describe the language varieties are broad. In discussing SdAE, I am referring to the English that is broadly accepted in the United States and is not stigmatized. AAE described the minoritized language set as described previously – there are many varieties of AAE but importantly the language set itself is stigmatized broadly by listeners, whereas SdAE is not.

Continuing with the method of using implicit processing models, Chapter 4 examines syntactic variation across AAE and SdAE through two EEG experiments. EEG allows researchers to use prediction during sentence processing, as seen through the P600 Event Related Potential Event (Hanulikova 2012). EEG permits passive monitoring of neural activity, which

allows investigation of implicit linguistic and social expectations on behalf of listeners. It also illuminates when participants' expectations for speech are violated, indicating that prediction is taking place. This study incorporates a grammatical feature of AAE, which is the possibility of having or not having an overt auxiliary in sentences like "My brother, he is taking the train today," and also incorporated an ungrammatical morphosyntactic feature, 'll, to put in the auxiliary position. This ungrammatical feature was incorporated to test if grammatical knowledge of both Englishes was being brought to bear during online processing.

Study 1 indicates that listeners process AAE and SdAE differently when the stimuli come from a single, so-called bidialectal Black male speaker. Participants did not elicit a surprisal effect to either variety when this speaker had the phonological content of "is" in the auxiliary position, nor when not having phonological content in the auxiliary position. However, the ungrammatical 'll feature in the auxiliary position did show a neurological response of surprisal within the SdAE condition for listeners. In Study 2, the results indicate that when listening to a white, monodialectal man's stimuli, listeners show a P600 ERP response to lack of phonological content in the auxiliary position as well as to the ungrammatical "'ll." By contrast, there is no such response to the AAE stimuli in any of the grammatical conditions, like in Study 1.

These studies indicate that speaker identity and speaker's language variety are taken into account in tandem during processing, which has been shown across the sociophonetic perception literature (Drager 2010, 475). Looking forward, this study, like the study in Chapter 2, could benefit from multiple speakers creating the stimuli, to distinguish neural responses to individuals versus language varieties. In addition, looking for neural responses to the absence of something in the auxiliary position instead of some overt morphosyntactic feature could affect results.

Overall, Chapters 3 and 4 highlight the benefits of using implicit processing models to probe perception and processing of AAE and SdAE. Some of these benefits include the theoretical implication of disentangling complexity of a model of language, which should encompass multiple language streams to be leveraged during processing. This work paves the way for more research concerning processing of multiple varieties within individuals.

This dissertation as a whole provides an analysis of two American Englishes, AAE and SdAE, and shows how perception and processing across these varieties differ within listeners. Speaker's gender and race of speakers influence listeners' perception and processing. Additionally, prosodic variation within emotional speech, also bound up with ideologies of gender and race, results in varied perception and processing. One should come away from this dissertation not only learning how these two Englishes are treated cognitively, but also see a call to action to do more research not only on minoritized language varieties but also on speakers with intersectional identities. This work contributes to our understanding of how social information interfaces with online processing, and expectations that may be formed depending on the perceived identity of a voice. I extend theories within psycholinguistics to account for sociolects of various social statuses and how their variability is perceived. Finally, this dissertation deepens theories of perception in sociolinguistics, which are examined here through online and offline processing measures.

My engagement with how emotion is produced and perceived by speakers of multiple varieties of American English enhances our knowledge of emotional prosody processing with respect to identity and intersectionality. By operationalizing the trope of the Angry Black Woman, this dissertation reifies the relevance of prejudice and its influence on perception and processing. Each of the chapters within this dissertation stands alone, and each provides unique

results that build upon prior work and theories surrounding perception and processing. The chapters also fit together as they contribute to how a theory of processing focused on multiple dialects provides a more accurate account of language cognition in the globalized world today than a model of language processing that assumes monolingualism.

1.1 References

Agha, Asaf. 2005. Voice, Footing, Enregisterment. *Journal of Linguistic Anthropology,* 15:1, 38-59.

Baker-Bell, April. 2020. Linguistics justice: Black language, literacy, identity, and pedagogy. Routledge, Abingdon, Oxfordshire.

Bucholtz, Mary. 1999. "Why Be Normal?": Language and Identity Practices in a Community of Nerd Girls. *Language in Society,* 28:2, 203-223.

Bucholtz, Mary. 2012. White Kids. *Cambridge University Press,* Cambridge, United Kingdom.

Burdin, Rachel Steindel, Nicole Holliday, and Paul Reed. 2018. Rising Above the Standar: Variation in L+H* contour use across 5 varieties of American English. *Proceedings at 9th International Conference on Speech Prosody.*

Cameron, Deborah. 1995. Verbal Hygiene. *Routledge,* London, England.

Cooper, Robert L.1989. Language Planning and Social Change. Cambridge University Press, University of Massachusetts at Amherst.

Crenshaw, Kimberlé. 1989. Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics. *University of Chicago Legal Forum,* 1:8.

Cuellar, Sergio Bolaños. 2006. Women's language: a struggle to overcome inequality. *Forma Y Función,* 19, 137-162.

Drager, Katie. 2010. Sociophonetic Variation in Speech Perception. *Language and Linguistics Compass,* 4/7, 473-480.

D'Onofrio, Annette. (2015). Persona-based information shapes linguistic perception: Valley Girls and California vowels. Journal of Sociolinguistics 19(2):241–56.

D'Onofrio, Annette. (2019). Complicating categories: Personae mediate racialized expectations of non-native speech. Journal of Sociolinguistics, 23(4), 346-366.

Eckert, Penelope. (2012). Three waves of variation study: The emergence of meaning in the study of sociolinguistic variation. Annual review of Anthropology, 41, 87-100.

Gahl, Susanne and Alan C. L. Yu. 2006. Introduction to special issue on exemplar-based models in linguistics. *The Linguistic Review,* 23:213-216.

Gillon, V. 2015. The Killing of an 'Angry Black Woman.': Sandra Bland and the Politics of Respectability. Illinois: Augustana Digital Commons.

Grabe, Esther. 2002b. Variation adds to prosodic typology. *Proceedings of the Speech Prosody,* 127-132. Aix-en-Provence, Laboratoire Parole et Langage.

Green, Lisa J. 2011. Language and the African American Child. *Cambridge University Press. Cambridge, England.*

Hanulikova, A., Petra.M. van Alphen, Merel M. van Goch, Andrea Weber. 2012. "When one person's mistake is another's standard usage: The effect of foreign accent on syntactic processing." *Journal of Cognitive Neuroscience.* 24:4, pp. 878–887. Massachusetts Institute of Technology.

Hill, Jane. 2008. *The Everyday Language of White Racism*. Massachusetts: Wiley-Blackwell Publishing.

Holliday, Nicole. 2016. Identity Performance among Black/Biracial Men through Intonation: Examining Pitch Accents and Peak Delay. *University of Pennsylvania Working Papers in Linguistics,* 11:2.

Holliday, Nicole, Villarreal Dan. 2020. Intonational variation and incrementality listener judgements of ethnicity. *Laboratory phonology,* 11:1.

Jaffe, Alexandra. 2009. Stance: sociolinguistic perspectives. *Oxford University Press,* Oxford, United Kingdom.

Jones, Taylor and Christopher Hall. 2019. Grammatical Reanalysis and the Multiple N-words in African American English. *American Speech,* 94:4, 478-512.

Kendall, Tyler. 2013. Speech rate, pause, and sociolinguistic variation: studies in corpus sociophonetics. Springer.

Kim, S., Sumner Meghan. 2017. *Beyond lexical meaning: The Effect of Emotional Prosody on Spoken Word Recognition*. United States: Journal of the Acoustical Society of America.

King, Sharese. 2021. Rethinking race and place: The role of persona in sound change reversal. *Journal of Sociolinguistics,* 25:2, 159-178.

Lakoff, R. T. 1975. Language and woman's place. New York: Harper & Row Publishing.

Lanehart, Sonja. 1996. The Language of Identity. *Journal of English Linguistics,* 24:322.

Lanehart, Sonja, 2009. African American Women's Language: Discourse, Education and Identity. Cambridge Scholars Publishing.

McGowan, Kevin. 2015. Social Expectation Improves Speech Perception in Noise. *Language and Speech,* 58.4: 502-521.

Mendoza-Denton, Norma. 1995. Pregnant Pauses: Silence and Authority in the Anita Hill-Clarence Thomas Hearings. *Gender Articulated: Language and the Social Constructed Self,* 51-66.

Miller, George A. 2003. The cognitive revolution: A historical perspective. *Trends in Cognitive Science,* 7:3,1 41-144.

Milroy, James, Lesley Milroy. 1985. Linguistic change, social network and speaker innovation. *J. Linguistics,* 339-384.

Morikawa, Eleanor A. 2019. This Is What a Feminist Tweets Like: "Women's Language" and Styling Activist Identities in #YesAllWomen Twitter Corpus. *CUNY Academic Works.* https://academicworks.cuny.edu/gc_etds/3379.

Nielsen, Rasmus. 2010. "I aint Never Been Charged with Nothing!": The Use of Falsetto Speech as a Linguistic Strategy of Indignation. *University of Pennsylvania Working Papers in Linguistics,* 15:2.

Norris, Dennis, James M. McQueen, Anne Cutler. 2003. Perceptual learning in speech. *Cognitive Psychology,* 2: 204-238

Otwinowska, Agnieszka, Malgorzata Foryś-Nogala, Weronika Kobosko, Jakub Szewczyk. 2019. Learning Orthographic Cognates and Non-Cognates in the Classroom: Does Awareness of Cross-Linguistic Similarity Matter? *Language Learning,* 70:3, 685-731.

Phillips, Sarah, Liina Pylkkänen. 2019. Investigating the neural effects of code-switching on combinatory processing with MEG. *Talk presented at Conference on Multilingualism,* Leiden, Netherlands.

Purnell, Tomas, William Idsardi, John Baugh. 1999. Perceptual and Phonetic Experiments on American English Dialect Identification. *Journal of Language and Social Psychology* 18: 10-30.

Rickford, John. 2016. Labov's contributions to the study of African American Vernacular English: Pursuing linguistic and social equity. *Journal of Sociolinguistics,* 20:4, 561-580.

Rickford, John R. and Sharese King. 2016. Language and linguistics on trial: Hearing Rachel Jeantel (and other vernacular speakers) in the courtroom and beyond. *Language* 92: 948-988.

Scharinger, Mathias, Philip J Monahan, William J. Idsardi. 2012. Linguistic category structure influences early auditory processing: Converging evidence from mismatch responses and cortical oscillations. *Neuroimage,* 128: 293-301.

Silverstein, Mihcael. 1998. Monoglot “Standard” in America: Standardization and Metaphors of Linguistic Hegemony. *The Matrix of Language.*

Slobe, Tyanna. 2016. Creepy-ass cracker in post-racial America: Don West’s examination of Rachel Jeantel in the George Zimmerman murder trial. *Text & Talk*, 36:5, 613-635.

Slobe, Tyanna. 2018. Style, stance, and social meaning in mock white girl. *Language in Society* 47:4, 541-567.

Sumner, Meghan, Arthur Samuel. 2009. The effect of experience on the perception and representation of dialect variants. *Journal of Memory and Language,* 60: 487-501.

Stamper, Kory. 2017. Word by Word: The Secret Life of Dictionaries. *Penguin Random House.*

Thomas, Erik R. 2015. Prosodic features of African American English. *The Oxford handbook of African American language.* University of Missouri.

Thomas, Erik R, Jeffrey Reaser. 2004. Delimiting perceptual cues used for ethnic labeling of African American and European American Voices. *Journal of Sociolinguistics.* 8:1, 54-87.

Van Berkum, Jos. J. A., Danielle van den Brink, Cathelijne M. J. Y. Tesink, Miriam Kos, and Peter Hagoort. 2008. “The neural integration of speaker and message.” Journal of Cognitive Neuroscience, 20:4, pp. 580–591. Massachusetts Institute of Technology.

Weldon, Tracey L. 2021. Middle Class African American English. Cambridge University Press.

Wright, Kelly. 2020. Raciolinguistic Profiling: Passing for American means Speaking Without an Accent. *Colloquium, University of Kent.*

Chapter 2 Sounding Like a Stereotype: Behavioral Listening Survey on the Influence of Emotional Prosody on Race Perception[1]

KEYWORDS: prosody, emotional prosody processing, African American English

Abstract

This study investigates how individuals process multidialectal linguistic input through an emotional prosody and race perception study. Participants listened to isolated words from an African American English (AAE) speaker and a Standardized American English (SdAE) speaker in happy, neutral, and angry prosodies, and were asked to indicate perceived race and emotion of the speaker. Results showed that SdAE was rated whitest in the happy condition, whereas AAE was rated blackest in neutral and angry conditions. Across the board, however, there was a low base rate for correct identification of race, with a bias for picking the white voice. This choosing of the white voice aligns with hegemonic standards regarding normativity and neutrality, a colorblind effect of "I don't see race, I don't hear race." However, there was an evidenced disconnect between the survey results with participants' free-write responses, in which by and large they indicated their awareness of what the study was about (i.e., self-reporting that when the voices were "low and aggressive" they went with Black but when "high-pitched and happy," they went with white). This leads to the question of how implicit versus explicit measures can inform what types of knowledge are leveraged during cognitive processing and decision making

[1] This chapter is adapted from a published proceedings paper: Weissler, Rachel Elizabeth, and Julue Boland. 2019. "Sounding like a stereotype: The influence of emotional prosody on race perception." In Sasha Calhoun, Paola Escudero, Marija Tabain & Paul Warren (eds.) Proceedings of the 19th International Congress of Phonetic Sciences, Melbourne, Australia 2019 (pp. 2169-2173). Canberra, Australia: Australasian Speech Science and Technology Association Inc.

based on raciolinguistic stereotypes. Varied perceptions of emotional prosody could noy only lead to misunderstandings but also perpetuate dialect discrimination, making emotional prosody a crucial point of further inquiry for sociophoneticians and cognitive scientists.[5]

1. Introduction

Stereotypes influence linguistic perceptions of identity (Baker-Bell et al. 2020, Charity-Hudley et al. 2018, Rickford & King 2016, Hill 2008, D'Onofrio 2015). This chapter investigates how American listeners process multidialectal, emotionally prosodic linguistic input given their knowledge of specific English varieties and stereotypes. The studies presented look at race perception between African American English (AAE) and Standardized American English (SdAE) to consider how perception of race influences perception of emotion and vice versa when hearing isolated words. The research design is informed by literature on emotional prosody processing literature, the sociophonetic work on perception, and aa small body of research that exists on the Angry Black Woman trope. Overall, the research presented in this chapter probes multiple layers of linguistic differences that are bound up in single words across two English varieties, and tests how listeners make explicit choices about racial and emotional differences in speakers' the voices based on the production of single words.

This research integrates listeners' perceptions of race perception with their perceptions of emotion perception. It also illuminates some of the limitations of behavioral studies that rely on explicit judgments, especially with respect to questions about race in the sociocultural climate of the 21st century in the United States. Speech perception researchers should keep in mind that listeners have knowledge of multiple languages and grammars apart from their L1. Furthermore, listeners can employ their knowledge of those grammars, as well as the stereotypes that they hold about speech communities, to form expectations about a speaker.

This chapter provides an initial probe into multidialectal cognition through an explicit behavioral perception task. In doing so, it forges the path to studies in Chapters 3 and 4 which

incorporate implicit processing measures (Virtual Eye-Tracking and EEG) to probe the overarching question of how individuals process multidialectal input across a range of diverse individuals.

The remainder of Chapter 2 is organized as follows: Section 2 engages with the research on emotional prosody processing, and the role of stereotypes in influencing listener perceptions of identity, focusing on the Angry Black Women Trope. In Sections 3 and 4, I outline the study motivation, methods, results, and findings of a survey that was taken by respondents on the platforms Amazon Mechanical Turk and University of Michigan SONA Subject Pool. Section 5 summarizes findings and suggests future lines of research. Reference citations (Section 6) and all Supplementary Materials (Section 7) are available at the end of the paper.

2. Background

2.1 Stereotypes Influencing Sociophonetic Perceptions of Identity

Examining the influence of various stereotypes on listener perception is crucial for greater understanding of linguistic cognition. In her review of previous research on sociophonetic variation in speech perception, Drager (2010, pg. 474) describes that listeners have social and linguistic knowledge that they leverage during cognitive processing and perception of speakers. She highlights the role of the perceiver and their knowledge in discerning socially meaningful phonetic factors. Listeners can discern region, ethnicity, and gender based on a small number of phonetic cues, and features attributed broadly to a subset of individuals belonging to specific identity/affinity groups (Drager 2010). Further research by Hay et al (2006b) shows how listeners are accurate in identifying linguistic variables in New Zealand English, even when those features were not a part of their personal linguistic repertoire. Drager argues that more work is

needed looking at language change and stereotype formation. She also notes the benefit of exploring the mental representations and processing of sociophonetic variants.

Other sociophonetic research has shown that identical speech samples are perceived differently based on different social guises, such as varied faces or varied demographic information as evidenced by Rubin (1992) and Niedzielski (1999). Differing from the earlier Matched-Guise studies from Lambert (1960), Rubin (1992) shows that visual priming of ethnicity (using ethnically Asian and European faces) can affect listeners' evaluations of identical speech samples, where an Asian face prime results in higher ratings of accentedness and lower listener comprehension. Additionally, Niedzielski (1999) shows that priming with varied social information (in this case, which city a speaker is from) can affect listeners' evaluations of identical speech samples. For example, among participants from Detroit, a speaker said to be from Canada was perceived as using diphthongs in speech, while a speaker said to be from Detroit was not perceived to be using diphthongs. These studies remind us that social information and stereotyping have a significant influence on speech perception and must be considered when doing perception experiments.

2.2 Emotional Prosody Perception

Prosody refers to suprasegmental linguistic features such as pitch, intonation, and voice quality. Prosodic variation in speech can convey prominence and emphasis (Dahan 2015, Bak 2016). For example, while a word can maintain its discrete phonetic features in different production contexts, variation in context-specific prosodic features can affect the literal truth-conditional meanings (as in the difference between declarative statements and questions) as well as non-literal meaning (such as annoyance or unsureness). Sociolinguistic research on prosody has also

explored its role in indexing sociological information about a speaker (Gaudio 1994, Holliday & Villarreal 2020, Reed 2020), how it can be used in the construction of stances (Goodwin et al. 2012; Sicoli 2010; Esposito & Gratton 2020), and how prosodic features become enregistered (Agha 2005) with social personae (Podesva 2007, Mendoza-Denton 2011, Podesva & Callier 2015, Slobe 2018, Holliday 2021).

Emotional prosody as discussed in this dissertation concerns suprasegmental patterns that elicit listener perceptions of various affective states. Explorations of emotional prosody have used both behavioral (Kim & Sumner 2017, Pell 2005a, Pell 2005b), and neuroscientific (e.g., fMRI, EEG) methodologies (Dahan 2015, Liu et al. 2014). The existing body of emotional prosody processing literature is somewhat narrow. It consists mostly of studies focusing on SdAE-speaking, white populations and primarily focuses on affective categories of happiness and sadness.

Pell & Skorup (2008) investigated implicit processing of emotional prosody of a foreign accent. They had monolingual English-speaking participants listen to pseudo-Arabic words that contained happy, sad, and neutral prosody. Emotional valence was determined by asking listeners to define the emotionality of the speech they heard. Their results indicated that listeners were able to detect speech as "emotional" when the stimuli were prosodically variable. This means that the listeners could determine that there was emotion elicited, but they had difficulty discerning if the emotion they were hearing was happy, sad, or neutral. The researchers suggest that participants required more exposure to emotional prosody in Arabic to make emotional prosody judgements on Arabic speech.

Evidence from this research leads to the question of whether there are explicit acoustic correlates which participants use to glean emotion from the speech stimuli, or whether variability in pitch and prominence was presumed by the participant to be emotional speech, when in fact the variability could have been attributed to other parts of communication. In attempt to see if emotion-associated words prime perceptions of emotional speech, Kim & Sumner (2017) posit that emotional prosody maps directly to social concepts and representations, thereby influencing the spoken word recognition process. Their work investigates whether emotional information, when carried by a semantically emotionless word, influences lexical access during online processing. Using angry, happy, and neutral prosody types, they had SdAE-speaking women read the semantically emotionless words. Their results in a reaction time study judging emotional valence indicate that angry prosody, when preceded by a non-emotional word uttered in angry prosody, shows affective priming.

To explain the experimental paradigm with an example, the participants in Kim & Sumner's study (2017) heard semantically emotionless word like 'pineapple' uttered in an angry voice, followed by the word FRUSTRATED showing up on their screen. Since FRUSTRATED is an angry-associated word, participants were quicker to press the space bar in this type of trial, than if they heard 'pineapple' uttered in a happy tone beforehand. Affective priming did not show the same effect, though, for happy and neutral prosody, which both had the same effect of association strength. One reason postulated by the authors for this result was that maybe neutral sounding-speech sounded 'happy enough', especially coming from a woman's voice which is already stereotyped as agreeable and friendly.

Women's language has been described as more agreeable-sounding for decades (Lakoff 1972, Eckert & McConnell-Ginet 2013). Bak (2016) finds that it's easier for listeners to glean emotion from women's speech than men's speech. Within the emotional prosody processing field, multiple Englishes have yet to be compared in terms of perceptual variation as it relates to emotional speech. This chapter is motivated by the question: How do conflicting stereotypes for women of different racial backgrounds in the U.S. influence varied perception of emotional speech?

2.3 The Angry Black Woman Trope

Listener ideologies about certain speaker groups inevitably inform their sociophonetic perceptions. Thus, it is important to keep in mind social variables when looking at speech perception, as ideologies about certain speaking groups can inform those perceptions. Perrachione et al. (2009) show that socioculturally-aquired dynamic information, such as speech independent of any other identity cues, results in variation in speaker identification. They find an own-race bias which indicates that while a subset of Black voices were categorized as sounding white by white listeners, the same was not true for Black listeners. An important factor here is that many AAE features are stigmatized, such as the falsetto register being an indicator of indignation in AAE (Nielsen 2010). Recent AAE literature has shown that middle-class AAE speakers tend to use more prosodic AAE features than morphosyntactic ones, which are more overtly recognized as vernacular and stigmatized (Holliday and Villarreal 2020, Weldon 2021). Though prosody and intonation are variable with emotional speech, research has not yet considered that all speakers may not be perceived identically regarding emotion. Furthermore, there is not research on emotional prosody perception within AAE. This is surprising given the

perception of hyper-emotion bestowed on Black women in the U.S., known unfortunately as the Angry Black Woman trope.

The Angry Black Woman trope is a pervasive stereotype deeply entrenched in American society (Baugh 2000, Harris-Perry 2011, Gillon 2015). With its origins in slave times, 'Angry Black Woman' is a pejorative label that caricatures Black women as aggressive and overbearing (Gillon 2015). Furthermore, Marcyliena Morgan suggests that the reason the Angry Black Woman trope is so sparsely studied is because researchers have accepted the stereotype to be true. Reactions of anger in response to being treated as angry and dangerous reify the trope, making it difficult to combat (Ashley 2014). Black women's anger is not seen as legitimate and is often misconstrued as an issue of control according to Harris-Perry (2011). Black women are historically perceived to be hulkishly strong and able to withstand massive amounts of pain and suffering. Thus, Black women's failure to show high degrees of emotion can be detrimental to their health, as doctors often do not recognize their pain as being legitimate.[2] The lack of study regarding the Angry Black Woman trope along with the circular way the trope gets perpetuated is a direct consequence of the stereotype being accepted as true (Ashley 2014).

Even today, Black women often end up in situations in which they are discriminated against, due to this pervasive concept of black women as degenerate (Jones & Norwood 2017). Perceptions of Black women's speech as angry not only creates disadvantages for Black women in the U.S., but even more dire, it can have life-threatening consequences. In "The Killing of an 'Angry Black Woman': Sandra Bland and the Politics of Respectability," Gillon (2015) describes of the murder of Sandra Bland with a critical eye toward the legality of the arrest. At

[2] https://www.vox.com/identities/2018/1/11/16879984/serena-williams-childbirth-scare-black-women

the time of her arrest, Bland was pulled over but did not get out of her car or put out her cigarette when the officer asked her to, saying things like, “I’m in my car, why do I have to put out my cigarette,” and, “You seem very irritated” to the officer. Her reluctance to put out the cigarette was an action read as violent by the officer. Gillion argues that “[t]his idea of Bland being a threatening individual already existed because of the significations that said black women are inherently belligerent It is an expectation that black women will be harder to control” (Gillon 2015, pg. 4). We see in the arrest and mysterious death of Sandra Bland, which was determined as suicide by authorities, how police drew upon the Angry Black Woman trope in their perception of Bland as violent at the time of her arrest. This is an example of how the perception of emotional prosody can be life threatening.

2.4 The Current Study: Research Questions and Hypotheses

This chapter considers the pervasiveness of the Angry Black Woman trope in American culture in its approach to emotional prosody perception based on an individual’s proximity to a language variety. The experiments in this chapter were designed to investigate perceptions of emotion in relation to SdAE and AAE, two language varieties on the English language continuum with socially stratified perceptions. The overarching research question asks: Does perception of race influence perceptions of emotion? Given the Angry Black Woman trope, I hypothesized that Black voices would sound Blackest in the angry condition; white voices would sound whitest in the happy condition; and neutral voices would be perceived as angry when spoken by the Black speaker, a hypothesis which counters Kim & Sumner’s assumption that neutral sounds ‘happy enough’ (2017). Acoustic measurements of the emotional speech stimuli were taken as it was hypothesized that emotional speech would vary acoustically across all emotional states, and across the SdAE and AAE speaker.

3. Methods

3.1 Materials

In order to investigate the role of stereotypes in emotional prosody processing, this study looks at how single words were rated for emotion and race depending on language variety within two populations: Amazon Mechanical Turk participants and college-aged Psychology SONA Subject Pool participants from the University of Michigan. Both studies were identical with the only differentiating factor being the population of focus. The Amazon Mechanical Turk participants were all online, whereas the Subject Pool participants took the study on a computer in person in the Boland Lab space at the University of Michigan.

The stimuli were isolated words, based on the finding that a lexical item as short as "Hello" can indicate to listeners whether the utterance was in SdAE or AAE (Purnell et al. 1999). As previously stated, isolated words in L1 and a foreign language have been successfully used to evoke perceptions of emotional valence (Rubin 1992, Kim & Sumner 2017). Auditory stimuli come from two women native to San Diego, California: one Black AAE speaker and one white SdAE speaker, both in their mid-twenties. Stimuli were recorded through elicitation where each speaker recorded the 24 words in Table 2.2 in the three emotional prosodies used by Kim & Sumner (2017): Angry, Happy, and Neutral. Kim & Sumner pretested these words for neutrality and non-emotionality. The study resulted in a 3 x 2 (emotional prosodies by speakers) design, with six conditions (HappyWhite, AngryWhite, NeutralWhite, HappyBlack, AngryBlack, and NeutralBlack). Each speaker was asked to say each word in a happy, neutral, and angry tone, the same elicitation technique used by Kim & Sumner (2017), which is common in phonological stimuli creation, especially also when eliciting clear speech.

Recordings were rated by 5 linguists prior to usage of the stimuli for the study by uniformly identifying the race of each speaker. Acoustic measurements were taken to look for significant differences across each set of stimuli, shown in Table 2.1. Mean pitch as well as creak duration for all stimuli were submitted to a one-way ANOVA. Mean pitch and creak were focused on given their meaningfulness in other realms of discourse marking (Slobe 2018).

Table 2.1: Mean Pitch and Creak Duration Across Conditions

	Mean Pitch (Hz)	Creak Duration
SdAE Angry Tokens	Range: 145-255 Average: 210.25	Range: 0.03-0.54 Average: 0.22
SdAE Happy Tokens	Range: 167-306 Average: 249.83	Range: 0-0.24 Average: 0.09
SdAE Neutral Tokens	Range: 138-219 Average: 176.29	Range: 0-0.33 Average: 0.06
AAE Angry Tokens	Range: 116-184 Average: 153.63	Range: 0-0.19 Average: 0.11
AAE Happy Tokens	Range: 212-322 Average: 249.04	Range: 0-0.17 Average: 0.02
AAE Neutral Tokens	Range: 124-212 Average: 164.96	Range: 0-0.21 Average: 0.04

Results indicate differences across all groups $F(5, 139) = 81.75$, $p < 0.01$ for mean pitch as well as creak duration. They also indicate differences within mean pitch across SdAE with respect to each emotion $F(2, 71) = 52.41$, $p < 0.01$, and across AAE with respect to each emotion $F(2, 71) = 152.14$, $p < 0.01$. Results also indicate differences within mean pitch across Angry tokens with respect to each language variety, $F(1, 47) = 76.55$, $p < 0.01$, but not within mean pitch across Happy or Neutral tokens, $F(1, 47) = 0.009$, $p = 0.92$ and $F(1, 47) = 5.17$, $p = 0.027$ respectively. This has an interesting connection to the results found by Kim & Sumner (2017) with respect to affective priming, where only angry speech showed a strong association strength

with angry associated words, as opposed to happy and neutral speech. As seen in table 2.1, the mean pitch differences across angry tokens with respect to each variety provides evidence that the angry tokens are clearly different within the AAE and SdAE speakers (i.e., SdAE tokens having an average mean pitch of 210.25 Hz and AAE tokens having an average mean pitch of 153.63 Hz), which in turn can affect the way these tokens are perceived by listeners, and consequently could bolster stereotypical perception.

With respect to creak duration in each token, results do not indicate differences across all groups $F(5, 139) = 17.20$, $p = 0.75$. However, the results do indicate differences within creak duration across SdAE with respect to each emotion $F(2, 71) = 15.58$, $p < 0.01$, and across AAE with respect to each emotion $F(2, 68) = 14.33$, $p < 0.01$. Results also indicate differences within creak duration across Angry tokens with respect to each language variety, $F(1, 46) = 12.25$, $p < 0.01$ and Happy tokens $F(1, 46) = 22.25$, $p < 0.01$, but not within creak duration across Neutral tokens, $F(1, 47) = 1.04$, $p = 0.3$ respectively. Analysis of number of syllables making a difference was not considered for this study.

Table 2.2: List of semantically non-emotional words pretested by Kim & Sumner (2017)

academy	adequate	after	bounce	collide	compact
compose	conference	copy	galaxy	garbage	listen
ministry	multiply	pending	pineapple	planet	question
recall	salary	scale	specialist	stem	transmission

3.2 Participants

One hundred U.S.-based participants were recruited using Amazon Mechanical Turk along with 40 college-aged Subject Pool participants at the University of Michigan, Ann Arbor, to complete an Auditory Rating Task, using the 144 stimuli. Participants were asked about demographic and their upbringings. 87% of these participants identified the racial demographics of their K-12 schools as "Mostly White." Participants were randomly assigned to one of six groups. Each group listened to the 24 words – four in each of the six conditions – pseudo-randomized using a Latin square design.

3.3 Procedure, Data Processing and Analyses

Participants listened to each audio file individually and were asked to identify the speaker's race and mood for each word, before hearing another word. They were given a binary choice for the race ("Black" or "White") and three options for emotion ("Happy," "Angry," and "Neutral"). After rating all of the audio files, participants were then asked some language history and demographic questions and asked what they thought the study was about (only responses to the latter question will be referenced to in this study). Subject means were submitted to an Analysis of Variance (ANOVA) to probe significant differences across the six conditions, and the three emotional prosody types, as well as across the two English varieties of focus.

4. Results

The hypotheses for this study were that if stereotypes do, in fact, influence how emotional prosody is perceived, race judgements should interact with emotion judgements. Specifically, (1) Happy guises will be perceived as whiter, (2) Angry guises will be perceived as Blacker, and (3) the NeutralBlack guise will be perceived as angrier than the NeutralWhite. A repeated measures

ANOVA on race judgements found an interaction between RACE and EMOTION, as shown in Figure 2.1, $F(2, 198) = 43.43$, $p < 0.01$, despite a higher "White" base-rate of correct responses. This interaction is consistent with the first two predictions regarding happy and angry prosody: As seen in Figure 2.1, the White voice was rated whitest in the happy prosody condition, while the Black voice was rated the least Black in the happy prosody condition. In

Figure 2.1 shows clear opposing pattern in terms of which voices are being perceived as which races, across three emotions. It is also clear that there is low race-rating accuracy in all emotional prosody conditions, especially for the Black voice. Tables 2.3 present the percentage of Happy, Angry, and Neutral judgements, for all six conditions. What draws attention in Table 2.3 is that the white happy voice was almost always rated as white (93.5%), whereas the Black happy voice was rated as happy at a much lower percentage by listeners (68%). Table 3 shows that both white and Black angry voices were not often rated as angry (42% and 23% respectively). Previous research on emotional prosody in the non-native speech realm has shown variation in accuracy rates in bilingual Polish-English depending on the task (Bak 2016), so this could account for variability in responses to the Black speaker. There is no support for the third prediction, that the NeutralBlack guise would be read as angrier than the NeutralWhite guise. Across all trials, the Neutral guise was very rarely rated as Angry, though it was rated as Angry more often than as Happy as seen in Table 2.3 and Figure 2.1. These tables depict the percent of time the racialized/emotional token was identified as Happy and Angry. Table 2.3 shows the percentages of perceived emotion from the participants of each voice.

Table 2.3: Perceived Emotion Alongside Race + Emotion in the Online Study (Percentages)

	White Angry	White Neutral	White Happy	Black Angry	Black Neutral	Black Happy
Perceived Happy	21	6	93	7	7	68
Perceived Angry	42	14	2	23	16	7
Perceived Neutral	37	80	5	70	77	25

Figure 2.1: Race Percent Correct

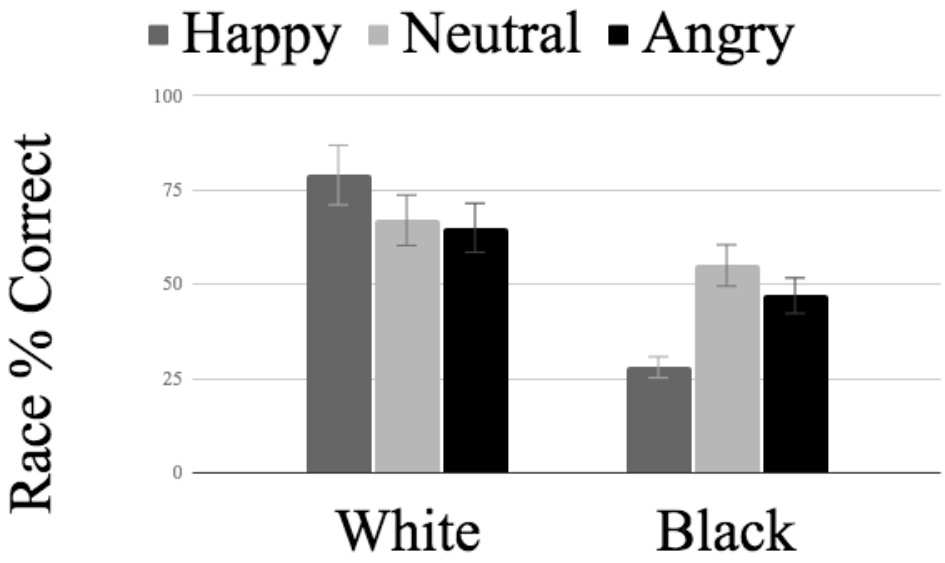


Figure 2.1: This figure depicts the race percent correct that participants had when identifying the Black voice versus the White voice. The x-axis refers to the race of the speaker stimuli, the y-axis refers to the percent correct participants chose each speaker identity, and the shades of grey and black display the different affect in each speaker's stimuli.

As seen in Table 2.3, participants perceived the White Happy voices as happy most of the time, while Black Happy was rated happy only around two thirds of the time. Black Angry and Black Neutral were rated mostly neutral. Table 2.1 shows the Race Percent Correct, and white voices are rated as most correct in the Happy condition, and the Black voices are rated most correctly in the Neutral and Angry conditions, across the board with low accuracy.

The observed patterns were replicated in an in-person study using the same stimuli, but with undergraduates as the population, rather than the Amazon Mechanical Turk population with ages ranging from 18-65. In both versions of the experiment, participants were not very accurate at identifying the race of the speaker, with an overall bias to identify the speaker as white, which goes against the claim made in Purnell et al. (1999) about accuracy in discerning race based on a single word. The in-person replication addressed the possibility that Amazon Mechanical Turk workers were providing low-quality judgements. Turkers tend to complete surveys as quickly as possible, and it is possible that race and emotion judgements were not made carefully. However, the fact that the low base rate and white response bias were replicated in our laboratory suggests that accurate race identification requires more than a single word, unlike Purnell et al. (1999) suggests.

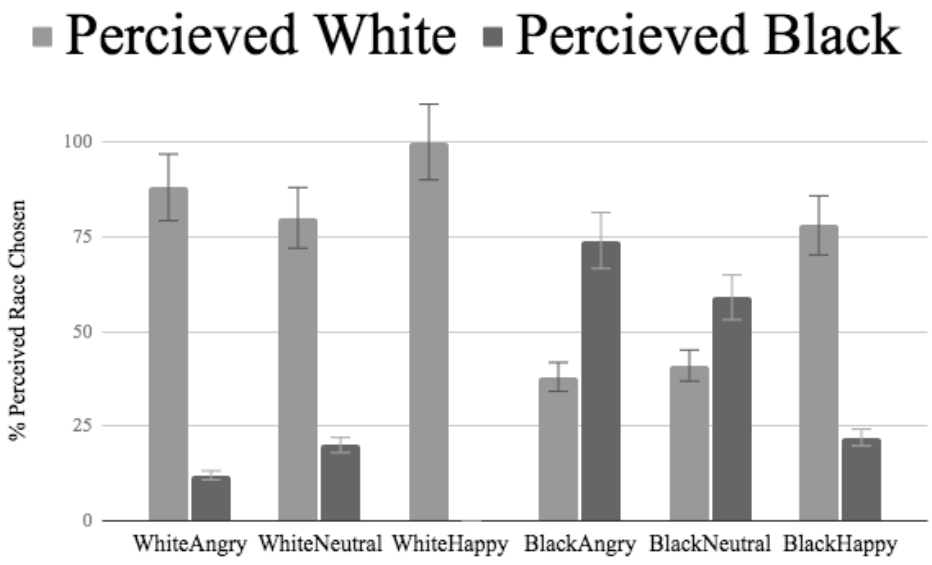
Table 2.4 and Figure 2.2 show the in-person study results as percentages of which tokens were perceived as White and Black across all conditions. These numbers indicate perceptions of participants on the binary white and Black scale in each condition, and thus these columns do equal 100%. As we can see in Table 2.5, the white voice was most correctly identified as white in the happy condition, and the Black voice was most correctly identified as Black in the Angry condition. Figure 2.2 shows these percentage differences as well to show the stark differences

across Black and white perception of each condition. Notice the assuredness on behalf of the participants in the White condition versus all the variability in the Black condition.

Table 2.4: Perceived Race Alongside Race + Emotion in the In-Person Study

	White Angry	White Neutral	White Happy	Black Angry	Black Neutral	Black Happy
Perceived White	88	80	100	38	41	78
Perceived Black	12	20	0	74	59	22

Figure 2.2: In-Person Study: % Perceived Race Alongside Race + Emotion



Results from this study provide evidence that emotional prosody influenced race judgments, with the Happy guise overwhelmingly perceived as white. However, there is a clear low base rate accuracy for identifying the Black voice as Black, leading to a surprisingly low accuracy in

the race identification component. This makes it difficult to conclude anything from the absence of a race effect on emotion identification. The tendency to identify both voices as white raises the possibility of an expertise effect – perhaps listeners are more accustomed (e.g., from media influence) to hearing a wider range of emotions from white female voices than from Black female voices.

Another potential and important factor to consider that is the effectiveness of the single-word tokens and the rationale behind them. Purnell et al. (1999) leaves several questions unanswered, such as whether or not the listeners are tapping into ethnic identification or language variety identification – that is to say, whether or not the study is really about AAE processing and perception, or about sounding Black. The current research and results highlight that people are not accurately discerning the speech, which goes against the claim set out by Purnell et al. (1999). Importantly, the results from this work highlight the need to dig deeper into understanding what listeners are tapping into when they make explicit decisions perceptually.

The research community on African American English will benefit from finding further methodologies and frameworks to investigate whether and how listeners identify Black-sounding speech and AAE. Wolfram (2007) describes that despite the attempt to debunk myths about AAE, researchers are unfortunately also (presumably not intentionally) participating in perpetuating folklore and myths about AAE. The subversion of claims also opens a broader question about what the AAE research community accepts about AAE, and fosters the opportunity to critically think about how to approach the variety, such that claims across the variety can be based in, at least, replicability.

It is also possible that voices that are angry are more recognizable as Black than happy voices, which would align with the acoustic results indicating significant differences between Angry Black versus white voices in relation to creak duration and mean pitch. This may have implications for mental representations of emotional Black women's voices, showing how sounding Black can index negative social ideologies. This work brings to bear the real question of whether this experiment and research done previously on AAE is accounting specifically for the variety or "sounding Black." This work has theoretical implications for this question as it shows that the answer is not clear, and more work is necessary to disentangle what listeners are tapping into and processing when they hear Black speakers of AAE. It is also possible that culture-specific processes could affect how emotions are processed in speech, as suggested by Pell and Skorup (2008).

Another possibility is that participants were reticent to make binary racial choices, as some of their responses on the post-survey questionnaire provide support for predictions that were not borne out in the data. When asked about the purpose of the study, one respondent said, "When the voice was higher and positive with good enunciation, I tended to lean towards white and when it was low, a bit aggressive and/or laxed in enunciation, I leaned towards Black." Another respondent said that they perceived the study to be about, "Determining if people think black speakers are more likely to be angry compared to white speakers even if they both are speaking in an objectively neutral tone." These responses suggest that lay people have a sense that race differences can influence emotion perception and vice versa.

5. Conclusion

The goal of this chapter was to examine the relationship between the perception of emotional prosody and perception of race through American listeners' evaluation of single words. The results indicate that overall, White voices are rated correctly as white most frequently while in the happy emotional prosodic condition, and Black voices are most accurately rated as Black when they showed up in Angry and Neutral emotional prosody conditions. However, despite acoustical differences and norming of the two voices used in the study, participants both online and in person struggled to accurately race the voices. This calls into question the methodological motivations of using a single word which may not actually be enough to glean information of a speaker as Purnell et al. (1999) claim, as well as the pros and cons of overtly asking participants to identify race and emotion in the current sociocultural politically correct landscape.

Keeping these potential pitfalls in mind, these results presented here are consistent with Bak's theory that identity plays a role in emotion recognition from prosody, not only through gender stereotyping, but evidently also through racial and raciolinguistic stereotyping (Bak 2016). This is where the importance of theorizing perception within an intersectional framework comes in. As mentioned earlier, the pervasive Angry Black Woman trope in the United States was a partial motivation for the current study. It could be concluded from the findings of this work that the Black women's voices are perceived most correctly in the angry condition based on the trope. However, further research looking at emotional processing of Black and White male voices alongside Black and White female voices could help shed light on whether or not listeners are evoking the Angry Black Woman trope, and whether there is any racialized bias or variation in perception of the voices, and strengthen the potential claim that listeners' ideologies

about Black people influence their perception of Black speech in general. The results indicate that potential influence of the Angry Black Woman trope could be playing a role in multilingual processing when listening to speakers identical in all aspects except for race, which strengthens the possibility that specifically sounding like a Black Woman elicits different responses that align with emotion and emotion tropes.

The low base rates of race accuracy for the Black voice align with Pell & Skorup's (2008) postulation that listeners need more exposure to prosodic information in non-mainstream languages or varieties in order to make an emotional prosody judgement (Rubin 1992). However, as previously discussed, these results also leave the possibility, that the explicit nature of the behavioral task may have discouraged listeners from marking their honest perceptions of race and emotion.

These results have implications for related explorations in psycholinguistics, sociophonetics, online processing in general, and research on AAE broadly. As far as implications for psycholinguistics, that field needs to contend with the multilingual world and model more specifically processing with multiple streams of language present. Sociophonetics research on AAE will make clearer whether people are processing AAE or speech that "sounds Black." More work is to be done regarding processing and perception of emotional speech, particularly as it related to AAE. Despite AAE being the most well-studied minoritized language variety in the U.S., there are plenty of commonly accepted biases about the variety and its speakers (Wolfram 2007), and this research challenges previous notions set forth by Purnell et al. (1999) and paves the way for more experimental work on AAE to find replicable and well-founded claims about perception and production of the variety.

Chapter 3 sets out to use an implicit processing method to probe listeners' perceptions of AAE and SdAE emotional speech. Given that there were no significant differences acoustically across SdAE or AAE speech, and considering that the third hypothesis was not borne out, Chapter 3 only focuses on Angry and Happy speech which have been shown to be acoustically and perceptually different to listeners. Chapter 3 also employs multiple speakers of each variety, so that results can indicate perceptions of the language variety rather than individual speaker differences. Participants in this study were analyzed as a monolith, and Chapter 3 sets out to ask how experience, as measured by exposure, familiarity, and usage, influence perception and processing within the multidialectal frame.

6. References

Agha, A. 2005. Voice, footing, enregisterment. *Journal of Linguistic Anthropology*, 15: 38– 59.

Bak, H. 2016. Emotional Prosody Processing for Non-Native English Speakers. Switzerland: Springer International Publishing.

Baker-Bell, April. 2020. Linguistics justice: Black language, literacy, identity, and pedagogy. Routledge, Abingdon, Oxfordshire.

Baugh, J. 2000. Linguistic Profiling. New York: Routledge Publishing.

Charity-Hudley, Anne, Christine Mallinson, Mary Bucholtz, Nelson Flores, Nicole Holliday, Elain Chun, Arthur Spars. 2018. Linguistics and Race: An interdisciplinary approach towards an LSA statement on race. *Proceedings Linguistics Society of America Conference,* 3.8:1-14.

Dahan, D. 2015. Prosody and Language Comprehension. New York: Wiley Periodicals. Inc.

Drager, Katie. 2010. Sociophonetic Variation in Speech Perception. *Language and Linguistics Compass,* 4/7, 473-480.

D'Onofrio, Annette. (2015). Persona-based information shapes linguistic perception: Valley Girls and California vowels. Journal of Sociolinguistics 19(2):241–56.

Eckert, Penelope & Sally McConnell-Ginet. 2013. Language & Gender (2nd Edition). *Cambridge University Press.*

Esposito, Luis., & Gratton, C. 2020. Prosody and ideologies of embodiment: Variation in the use of pitch and articulation rate among fitness instructors. *Language in Society*, 1-26.

Gaudio, Rudolf P. 1994. Sounding gay: Pitch properties in the speech of gay and straight men. *American Speech*,69:1, 10-57.

Gillon, V. 2015. The Killing of an 'Angry Black Woman.': Sandra Bland and the Politics of Respectability. Illinois: Augustana Digital Commons.

Goodwin, Marjorie H., Asta Cekaite, Charles Goodwin, and E. Tulbert. 2012. Emotion as stance." *Emotion in Interaction*, 16:41.

Harris-Perry, M. 2011. Sister Citizen: Shame, Stereotypes, and Black Women in America. New Haven: Yale University Press.

Hill, Jane. 2008. *The Everyday Language of White Racism*. Massachusetts: Wiley-Blackwell Publishing.

Holliday, Nicole, and Dan Villarreal. 2020. Intonational variation and incrementality in listener judgments of ethnicity. *Laboratory Phonology: Journal of the Association for Laboratory Phonology,* 11:1.

Holliday, Nicole. 2021. Prosody and Sociolinguistic Variation in American Englishes. *Annual Review of Linguistics*, 7, 55-68.

Jones, T., Norwood, K. 2017. Aggressive Encounters and White Fragility: Deconstructing the Trope of the Angry Black Woman. Iowa: Iowa Law Review.
Kim, S., Sumner M. 2017. Beyond lexical meaning: The Effect of Emotional Prosody on Spoken Word Recognition. United States: Journal of the Acoustical Society of America.

Lakoff, R. T. 1975. Language and woman's place. New York: Harper & Row Publishing

Liu, P., Rigoulot S., Pell M. 2014. Culture modulates the brain response to human expressions of emotion: Electrophysiological evidence. *Neuropsychologia,* 67, 1-13.

Mendoza-Denton, Norma. 2011. The semiotic hitchhiker's guide to creaky voice: Circulation and gendered hardcore in a Chicana/o gang persona. *Journal of Linguistic Anthropology*, 21:2, 261-280.

Niedzielski, N. 1999. The Effect of Social Information on the Perception of Sociolinguistic Variables. *Journal of Language and Social Psychology*. United Kingdom: SAGE Publications.

Nielsen, R. 2010. “I ain’t Never Been Charged with Nothing!”: The Use of Falsetto Speech as a Linguistic Strategy of Indignation. Pennsylvania: Penn Libraries.

Pell, M.D. 2005a. Nonverbal emotion priming: Evidence from the ‘facial affect decision task’. New York: Springer Publications.

Pell, M.D. 2005b. Prosody-face Interactions in Emotional Processing as Revealed by the Facial affect decision task. Heidelberg, Germany: Springer + Business Media, Inc.

Pell, M., Skorup, V. 2008. Implicit Processing of Emotional Prosody in a Foreign Versus Native Language. Amsterdam, Netherlands: Elsevier.

Podesva, Robert J. 2007. Phonation type as a stylistic variable: The use of falsetto in constructing a persona. *Journal of Sociolinguistics*, 11:4, 478-504.

Podesva, Robert J., and Patrick Callier. 2015. Voice quality and identity. *Annual Review of Applied Linguistics,* 35.

Reed, Paul E. 2020. Inter- and intra-regional variation in intonation: An analysis of rising pitch accents and rootedness. *The Journal of the Acoustical Society of America*,147: 1, 616-626.

Rickford, John R. and Sharese King. 2016. Language and linguistics on trial: Hearing Rachel Jeantel (and other vernacular speakers) in the courtroom and beyond. *Language* 92: 948-988.

Rubin, D.L. 1992. Nonlanguage Factors Affecting Undergraduates' Judgments of Nonnative English-Speaking teaching assistants. New York: Springer Publications.

Sicoli, Mark A. 2010. Shifting voices with participant roles: Voice qualities and speech registers in Mesoamerica. *Language in Society*, 521-553.

Wolfram, Walt. 2007. Sociolinguistic Folklore in the Study of African American English. *Language And Linguistic Compass,* 1:4, 292-313.

7. Supplementary Materials

7.1 Consent form for Amazon Mechanical Turk Participants

Consent to be Part of a Research Study

Title of the Project: Word Rating Study
Principal Investigator: Rachel Elizabeth Weissler, PhD Student, University of Michigan
Faculty Advisor: Dr. Julie Boland, PhD, University of Michigan
IRB #: HUM00150667

Thank you for considering participating in this study. In order to participate, you must be an MTurk worker and above 18 years old. Your participation is voluntary. We expect this research experiment to provide information about how people understand speech. There are two benefits of the study. The first benefit is the data you contribute through your participation. The second benefit is that you learn about how research is conducted in linguistics and cognitive psychology.

Before you begin, it is important for you to understand what will be expected of you as a subject in this experiment and what you should do if you decide you no longer wish to participate. You must be 18 or older to indicate consent or participate in this study. By indicating consent, you are letting us know that you understand all that is written in the consent form and you are ready to proceed. If you choose to participate, you will need headphones for this survey. You will be listening to 24 words spoken by a few different people. You can play the audio file as many times as you want. You will be asked to identify the speaker's race and speaker's mood based on the word that you heard. Afterward, you will be asked to fill out a Post-Survey questionnaire about your language history. Information about the purpose of the experiment will be available to you after you complete the experiment. You will receive $5 for your participation. This should take approximately 15-20 minutes to complete.

We will be archiving and analyzing the data we collect from your participation, but only your MTurk ID will be attached to your data. There is no identifying information linking you to this experiment other than your MTurk ID. Records will be kept confidential to the extent provided by federal, state, and local law, although the Institutional Review Board, or university and government officials responsible for monitoring this study, may inspect these records.

Your performance in no way reflects your intellectual abilities or language skills. This study meets the definition of "minimal risk", whereby the probability and magnitude of anticipated discomfort or harm is no greater than that ordinarily encountered in daily life or during the performance of routine psychological tests. The only risks are possible minor discomfort from sitting stationary for 15-20 minutes while doing the survey, and the rare potentiality of breaching confidentiality, which is low because again, there is no identifying information other than your MTurk ID number. The experiment is not timed, so feel free to stand up and move around as you need.

Your participation in this project is voluntary. You may decide to end the study at any time, including after you have signed the consent document and have begun the experiment. If you would like to stop the experiment at any point, simply click out of the browser. You will receive

payment upon completion of the entire experiment (should you choose to withdraw early, any data collected will be destroyed).

After the experiment, feel free to contact me, racheliw@umich.edu, if you have further questions. Should you have questions regarding your rights as a research participant, please contact the Institutional Review Board, 540 E. Liberty Street, Suite 202, Ann Arbor, MI 48104-2210, (734) 936-0933, email: irbhsbs@umich.edu.

Consent of participant:
I have read the information given above. I hereby consent to participate in the study.

ADULT SUBJECT OF RESEARCH

Print Name	Signature	Date

7.2 Consent form for University of Michigan Psychology Sona Subject Pool

Consent to be Part of a Research Study

Title of the Project: Word Listening Study
Principal Investigator: Rachel Elizabeth Weissler, PhD Student, University of Michigan
Faculty Advisor: Dr. Julie Boland, PhD, University of Michigan
IRB #: HUM00150667

Thank you for considering participating in this study. In order to participate, you must be a college student at the University of Michigan enrolled in Subject Pool. Your participation is voluntary. We expect this research experiment to provide information about how people understand speech. There are two benefits of the study. The first benefit is the data you contribute through your participation. The second benefit is that you learn about how research is conducted in linguistics and cognitive psychology.

Before you begin, it is important for you to understand what will be expected of you as a subject in this experiment and what you should do if you decide you no longer wish to participate. You must be 18 or older to sign this form or participate in this study. By signing this sheet, you are letting us know that all your questions have been answered and you are ready to proceed. If you choose to participate, you will be asked to sit in front of a computer screen, listening to a series of words during the experiment and you will periodically be prompted to press the keyboard throughout the experiment. We will be measuring your response time. Afterward, you will be asked to fill out a Post-Survey questionnaire about your language history. The researcher will explain the hypothesis that motivated the research after the conclusion of the experiment. The testing session will last approximately 15 minutes. You will receive Psychology credit for your participation through SONA.

We will be archiving and analyzing the data we collect from your participation, but your name will not be attached to your data; the results of this study are reported by participant number only. The only identifying information linking you to this experiment is your signature on this consent form, which will be kept in a locked filing cabinet in a locked room. Records will be kept confidential to the extent provided by federal, state, and local law, although the Institutional Review Board, or university and government officials responsible for monitoring this study, may inspect these records.

Your performance in no way reflects your intellectual abilities or language skills. This study meets the definition of "minimal risk", whereby the probability and magnitude of anticipated discomfort or harm is no greater than that ordinarily encountered in daily life or during the performance of routine psychological tests. The only risks are possible minor discomfort from sitting stationary for 15 minutes, and the rare potentiality of breaching confidentiality, which is low because again, the only identifying information linking you to this experiment is your signature on this consent form, which will be kept in a locked filing cabinet in a locked room. The experiment is not timed, so feel free to stand up and move around as you need. Please let us know if you are feeling discomfort.

Take the time now to ask the experimenter any questions you may have. Your participation in this project is voluntary. You may decide to leave the study at any time, including after you have signed the consent document and have begun the experiment. If you would like to stop the experiment at any point, simply tell the experimenter that you wish to leave. You will receive credit withdraw early (should you choose to withdraw early, any data collected will be destroyed).

After the experiment, feel free to contact me racheliw@umich.edu if you have further questions. Should you have questions regarding your rights as a research participant, please contact the Institutional Review Board, 540 E. Liberty Street, Suite 202, Ann Arbor, MI 48104-2210, (734) 936-0933, email: irbhsbs@umich.edu.

One copy of this document will be kept with the research records of this study. You will be given a copy to keep.

Consent of participant:
I have read the information given above. Rachel Elizabeth Weissler and Dr. Boland have offered to answer any questions I may have concerning the study. I hereby consent to participate in the study.

ADULT SUBJECT OF RESEARCH

_____

Print Name

7.3 Post-Experiment Questionnaire

Post-Experiment Sociolinguistic Questionnaire

1) What were the racial demographics of the schools you went to growing up?
2) Do you remember if people who went to school with you spoke languages other than English?
    a) If so, which languages?
3) Do you have siblings? If so, what language or languages do you speak with them?
4) Did you learn a foreign language in school? If so, what language or languages?
5) Were you exposed to other languages outside of the classroom of a daily basis?
6) What are the current demographics where you hold your current job/school/position?
7) What television shows (if any) did you watch growing up?
8) What television shows (if any) do you watch now?
9) What radio stations (if any) do you listen to?
10) What do you think this study was about?

7.4 Debriefing Materials for Amazon Mechanical Turk and Subject Pool Participants

Debriefing Material for Amazon Mechanical Turk Participants

This purpose of this study was to investigate whether or not stereotypes influence processing of emotional prosody. You were asked to rate the race of the speaker and the emotion of the word spoken. It is predicted that people will rate happy words as whiter and angry words as more Black. Additionally, it is predicted that the neutral words spoken by the black speaker will be read as angry. The results have implications for psycholinguistics and online processing, as researchers must now contend with multilingualism in their experiments in order to make claims about what listeners might be doing during processing in the real world, outside a monolingual experiment room. Specifically, this research has the potential to tell us not only do listeners have knowledges of multiple languages and grammars apart from their first language, such as mainstream U.S. English speakers having knowledge of African American English in this case, but that they also can employ their knowledge of that grammar as well as their stereotypes of that speaker to form an expectation about the speaker. This can have effects that not only lead to disfluency and miscommunication, and also have the potential to put the lives of black women and black people at risk. This research has the potential to change the way that people are treated in their day-to-day lives based on how they speak.

Debriefing Material for Subject Pool Participants

This purpose of this study was to investigate whether or not stereotypes influence processing of emotional prosody. You were asked to click as fast as you could after the prime written word showed up on the screen, in varying conditions, after listening to a black speaker and a white speaker of English. It is predicted that reaction times to the angry target word will become faster as the target is more strongly associated to the emotion of anger. Regarding the happy words, it is predicted that reaction times will be faster to the Mainstream U.S. English speech than to the African American English speech, as white-sounding female speech has already been discerned to be happy while black-sounding speech potentially does not have the same outcome. It is also predicted that reaction times will be faster for the Mainstream U.S. English speech than the African American English speech in the neutral condition, as it may take more time to discern whether or not the neutral prosody in AAL is indeed neutral if not angry.

The results have implications for psycholinguistics and online processing. Specifically, this research has the potential to tell us not only do listeners have knowledges of multiple languages and grammars apart from their first language, such as mainstream U.S. English speakers having knowledge of African American English in this case, but that they also can employ their knowledge of that grammar as well as their stereotypes of that speaker to form an expectation about the speaker. This can have effects that not only lead to disfluency and miscommunication, and also have the potential to put the lives of black women and black people at risk. This research has the potential to change the way that people are treated in their day-to-day lives based on how they speak.

7.5 Stimuli Coding Key

1) 1-P3-A: Person 3 (white) – Angry – ‘academy’
2) 2-P3-A: Person 3 (white) – Angry – ‘adequate’
3) 3-P3-A: Person 3 (white) – Angry – ‘after’
4) 4-P3-A: Person 3 (white) – Angry – ‘bounce’
5) 5-P3-A: Person 3 (white) – Angry – ‘collide’
6) 6-P3-A: Person 3 (white) – Angry – ‘compact’
7) 7-P3-A: Person 3 (white) – Angry – ‘compose’
8) 8-P3-A: Person 3 (white) – Angry – ‘conference’
9) 9-P3-A: Person 3 (white) – Angry – ‘copy’
10) 10-P3-A: Person 3 (white) – Angry – ‘galaxy’
11) 11-P3-A: Person 3 (white) – Angry – ‘garbage’
12) 12-P3-A: Person 3 (white) – Angry – ‘listen’
13) 13-P3-A: Person 3 (white) – Angry – ‘ministry’
14) 14-P3-A: Person 3 (white) – Angry – ‘multiply’
15) 15-P3-A: Person 3 (white) – Angry – ‘pending’
16) 16-P3-A: Person 3 (white) – Angry – ‘pineapple’
17) 17-P3-A: Person 3 (white) – Angry – ‘planet’
18) 18-P3-A: Person 3 (white) – Angry – ‘question’
19) 19-P3-A: Person 3 (white) – Angry – ‘recall’
20) 20-P3-A: Person 3 (white) – Angry – ‘salary’
21) 21-P3-A: Person 3 (white) – Angry – ‘scale’
22) 22-P3-A: Person 3 (white) – Angry – ‘specialist’
23) 23-P3-A: Person 3 (white) – Angry – ‘stem’
24) 24-P3-A: Person 3 (white) – Angry – ‘transmission’

1) 1-P1-A: Person 1 (white) – Angry – ‘academy’
2) 2-P1-A: Person 1 (white) – Angry – ‘adequate’
3) 3-P1-A: Person 1 (white) – Angry – ‘after’
4) 4-P1-A: Person 1 (white) – Angry – ‘bounce’
5) 5-P1-A: Person 1 (white) – Angry – ‘collide’
6) 6-P1-A: Person 1 (white) – Angry – ‘compact’
7) 7-P1-A: Person 1 (white) – Angry – ‘compose’
8) 8-P1-A: Person 1 (white) – Angry – ‘conference’
9) 9-P1-A: Person 1 (white) – Angry – ‘copy’
10) 10-P1-A: Person 1 (white) – Angry – ‘galaxy’
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12) 12-P1-A: Person 1 (white) – Angry – ‘listen’
13) 13-P1-A: Person 1 (white) – Angry – ‘ministry’
14) 14-P1-A: Person 1 (white) – Angry – ‘multiply’
15) 15-P1-A: Person 1 (white) – Angry – ‘pending’
16) 16-P1-A: Person 1 (white) – Angry – ‘pineapple’
17) 17-P1-A: Person 1 (white) – Angry – ‘planet’
18) 18-P1-A: Person 1 (white) – Angry – ‘question’
19) 19-P1-A: Person 1 (white) – Angry – ‘recall’
20) 20-P1-A: Person 1 (white) – Angry – ‘salary’

21)21-P1-A: Person 1 (white) – Angry – ‘scale’
22)22-P1-A: Person 1 (white) – Angry – ‘specialist’
23)23-P1-A: Person 1 (white) – Angry – ‘stem’
24)24-P1-A: Person 1 (white) – Angry – ‘transmission’

25)1-P2-A: Person 2 (black) – Angry – ‘academy’
26)2-P2-A: Person 2 (black) – Angry – ‘adequate’
27)3-P2-A: Person 2 (black) – Angry – ‘after’
28)4-P2-A: Person 2 (black) – Angry – ‘bounce’
29)5-P2-A: Person 2 (black) – Angry – ‘collide’
30)6-P2-A: Person 2 (black) – Angry – ‘compact’
31)7-P2-A: Person 2 (black) – Angry – ‘compose’
32)8-P2-A: Person 2 (black) – Angry – ‘conference’
33)9-P2-A: Person 2 (black) – Angry – ‘copy’
34)10-P2-A: Person 2 (black) – Angry – ‘galaxy’
35)11-P2-A: Person 2 (black) – Angry – ‘garbage’
36)12-P2-A: Person 2 (black) – Angry – ‘listen’
37)13-P2-A: Person 2 (black) – Angry – ‘ministry’
38)14-P2-A: Person 2 (black) – Angry – ‘multiply’
39)15-P2-A: Person 2 (black) – Angry – ‘pending’
40)16-P2-A: Person 2 (black) – Angry – ‘pineapple’
41)17-P2-A: Person 2 (black) – Angry – ‘planet’
42)18-P2-A: Person 2 (black) – Angry – ‘question’
43)19-P2-A: Person 2 (black) – Angry – ‘recall’
44)20-P2-A: Person 2 (black) – Angry – ‘salary’
45)21-P2-A: Person 2 (black) – Angry – ‘scale’
46)22-P2-A: Person 2 (black) – Angry – ‘specialist’
47)23-P2-A: Person 2 (black) – Angry – ‘stem’
48)24-P2-A: Person 2 (black) – Angry – ‘transmission’

49)1-P1-H: Person 1 (white) – Happy – ‘academy’
50)2-P1-H: Person 1 (white) – Happy – ‘adequate’
51)3-P1-H: Person 1 (white) – Happy – ‘after’
52)4-P1-H: Person 1 (white) – Happy – ‘bounce’
53)5-P1-H: Person 1 (white) – Happy – ‘collide’
54)6-P1-H: Person 1 (white) – Happy – ‘compact’
55)7-P1-H: Person 1 (white) – Happy – ‘compose’
56)8-P1-H: Person 1 (white) – Happy – ‘conference’
57)9-P1-H: Person 1 (white) – Happy – ‘copy’
58)10-P1-H: Person 1 (white) – Happy – ‘galaxy’
59)11-P1-H: Person 1 (white) – Happy – ‘garbage’
60)12-P1-H: Person 1 (white) – Happy – ‘listen’
61)13-P1-H: Person 1 (white) – Happy – ‘ministry’
62)14-P1-H: Person 1 (white) – Happy – ‘multiply’
63)15-P1-H: Person 1 (white) – Happy – ‘pending’
64)16-P1-H: Person 1 (white) – Happy – ‘pineapple’

65)17-P1-H: Person 1 (white) – Happy – ‘planet’
66)18-P1-H: Person 1 (white) – Happy – ‘question’
67)19-P1-H: Person 1 (white) – Happy – ‘recall’
68)20-P1-H: Person 1 (white) – Happy – ‘salary’
69)21-P1-H: Person 1 (white) – Happy – ‘scale’
70)22-P1-H: Person 1 (white) – Happy – ‘specialist’
71)23-P1-H: Person 1 (white) – Happy – ‘stem’
72)24-P1-H: Person 1 (white) – Happy – ‘transmission’

73)1-P2-H: Person 2 (black) – Happy – ‘academy’
74)2-P2-H: Person 2 (black) – Happy – ‘adequate’
75)3-P2-H: Person 2 (black) – Happy – ‘after’
76)4-P2-H: Person 2 (black) – Happy – ‘bounce’
77)5-P2-H: Person 2 (black) – Happy – ‘collide’
78)6-P2-H: Person 2 (black) – Happy – ‘compact’
79)7-P2-H: Person 2 (black) – Happy – ‘compose’
80)8-P2-H: Person 2 (black) – Happy – ‘conference’
81)9-P2-H: Person 2 (black) – Happy – ‘copy’
82)10-P2-H: Person 2 (black) – Happy – ‘galaxy’
83)11-P2-H: Person 2 (black) – Happy – ‘garbage’
84)12-P2-H: Person 2 (black) – Happy – ‘listen’
85)13-P2-H: Person 2 (black) – Happy – ‘ministry’
86)14-P2-H: Person 2 (black) – Happy – ‘multiply’
87)15-P2-H: Person 2 (black) – Happy – ‘pending’
88)16-P2-H: Person 2 (black) – Happy – ‘pineapple’
89)17-P2-H: Person 2 (black) – Happy – ‘planet’
90)18-P2-H: Person 2 (black) – Happy – ‘question’
91)19-P2-H: Person 2 (black) – Happy – ‘recall’
92)20-P2-H: Person 2 (black) – Happy – ‘salary’
93)21-P2-H: Person 2 (black) – Happy – ‘scale’
94)22-P2-H: Person 2 (black) – Happy – ‘specialist’
95)23-P2-H: Person 2 (black) – Happy – ‘stem’
96)24-P2-H: Person 2 (black) – Happy – ‘transmission’

97)1-P1-N: Person 1 (white) – Neutral – ‘academy’
98)2-P1-N: Person 1 (white) – Neutral – ‘adequate’
99)3-P1-N: Person 1 (white) – Neutral – ‘after’
100) 4-P1-N: Person 1 (white) – Neutral – ‘bounce’
101) 5-P1-N: Person 1 (white) – Neutral – ‘collide’
102) 6-P1-N: Person 1 (white) – Neutral – ‘compact’
103) 7-P1-N: Person 1 (white) – Neutral – ‘compose’
104) 8-P1-N: Person 1 (white) – Neutral – ‘conference’
105) 9-P1-N: Person 1 (white) – Neutral – ‘copy’
106) 10-P1-N: Person 1 (white) – Neutral – ‘galaxy’
107) 11-P1-N: Person 1 (white) – Neutral – ‘garbage’
108) 12-P1-N: Person 1 (white) – Neutral – ‘listen’

109) 13-P1-N: Person 1 (white) – Neutral – ‘ministry’
110) 14-P1-N: Person 1 (white) – Neutral – ‘multiply’
111) 15-P1-N: Person 1 (white) – Neutral – ‘pending’
112) 16-P1-N: Person 1 (white) – Neutral – ‘pineapple’
113) 17-P1-N: Person 1 (white) – Neutral – ‘planet’
114) 18-P1-N: Person 1 (white) – Neutral – ‘question’
115) 19-P1-N: Person 1 (white) – Neutral – ‘recall’
116) 20-P1-N: Person 1 (white) – Neutral – ‘salary’
117) 21-P1-N: Person 1 (white) – Neutral – ‘scale’
118) 22-P1-N: Person 1 (white) – Neutral – ‘specialist’
119) 23-P1-N: Person 1 (white) – Neutral – ‘stem’
120) 24-P1-N: Person 1 (white) – Neutral – ‘transmission’

121) 1-P2-N: Person 2 (Black) – Neutral – ‘academy’
122) 2-P2-N: Person 2 (Black) – Neutral – ‘adequate’
123) 3-P2-N: Person 2 (Black) – Neutral – ‘after’
124) 4-P2-N: Person 2 (black) – Neutral – ‘bounce’
125) 5-P2-N: Person 2 (black) – Neutral – ‘collide’
126) 6-P2-N: Person 2 (black) – Neutral – ‘compact’
127) 7-P2-N: Person 2 (black) – Neutral – ‘compose’
128) 8-P1-N: Person 2 (black) – Neutral – ‘conference’
129) 9-P2-N: Person 2 (black) – Neutral – ‘copy’
130) 10-P2-N: Person 2 (black) – Neutral – ‘galaxy’
131) 11-P2-N: Person 2 (black) – Neutral – ‘garbage’
132) 12-P2-N: Person 2 (black) – Neutral – ‘listen’
133) 13-P2-N: Person 2 (black) – Neutral – ‘ministry’
134) 14-P2-N: Person 2 (black) – Neutral – ‘multiply’
135) 15-P2-N: Person 2 (black) – Neutral – ‘pending’
136) 16-P2-N: Person 2 (black) – Neutral – ‘pineapple’
137) 17-P2-N: Person 2 (black) – Neutral – ‘planet’
138) 18-P2-N: Person 2 (black) – Neutral – ‘question’
139) 19-P2-N: Person 2 (black) – Neutral – ‘recall’
140) 20-P2-H: Person 2 (black) – Neutral – ‘salary’
141) 21-P2-H: Person 2 (black) – Neutral – ‘scale’
142) 22-P2-H: Person 2 (black) – Neutral – ‘specialist’
143) 23-P2-H: Person 2 (black) – Neutral – ‘stem’
144) 24-P2-H: Person 2 (black) – Neutral – ‘transmission’

Chapter 3 Does Varying Linguistic Knowledge Impact Eye-Gaze? A Sociolinguistic Perception Study of Emotional Prosody Processing using Virtual Eye-Tracking

KEYWORDS: eye-gaze, varied knowledge, cognitive processing, African American English

Abstract

This study investigates how individuals process visual and linguistic input with an eye-tracking study to test the relationship between emotional prosody and racial stereotyping. African American English (AAE) is the most well-studied minoritized variety of English in the U.S., yet there is still much we do not know about cognitive processing of the variety. Understanding the mechanisms of AAE cognition is critical to building an inclusive model of language. This study focuses on implicit processing of the varieties of English in focus. Given the current sociopolitical climate in the United States where linguistic prejudice and discrimination continue to persist, the need to understand the impact of implicit linguistic bias is paramount (Craft, Wright, Weissler, & Queen 2020). This study tests listeners with varied experiences with AAE as demonstrated through exposure, familiarity, and usage measures. Participants listened to emotional and racially indexed voices while looking at faces; eye gaze to the matching face was measured. Varied exposure and familiarity did not show a statistically significant relationship with variation in eye gaze. The usage measure was just at the level of significance, suggesting that usage of African American English features can predict participants' stereotyped looking preferences. The usage measure result aligns with the findings in Chapter 2 of this dissertation which show that by operationalizing the Angry Black Woman trope, we can see perception of race influences perception of emotion. This work contributes to further understanding of how

social information and stereotypes interface with cognitive processing within a multidialectal frame.

1. Introduction

This chapter examines how the influence of varied linguistic knowledge modulates perception and subsequent online processing of African American English (henceforth AAE), as evidenced by responses elicited from a webcam eye-tracking task. The current research asks how listeners with varied experiential knowledge process emotional prosody within AAE and Standardized American English (SdAE), expanding upon previous research which shows that distinct cultural groups are differently sensitive to emotional differences expressed through speech (Pell & Skorup 2008, Liu et al. 2014). In this study, varied experiential knowledge is quantified through exposure and familiarity surveys as well as through use of AAE features employed during a sociolinguistic interview. Experiential knowledge measures were collected to test if they could predict eye-gaze patterns during the perception of emotional speech. Given the diverse make-up of the North American population, coupled with the fact that the current cultural state of the United States is bound up in its discriminatory and racist history, this study attempts to concretize the ways in which individual differences within Americans individuals results in varied perception of language and emotion, particularly because congruencies and incongruences in emotional face and emotional linguistic cue are indicative of pervasive American cultural stereotypes, i.e. the Angry Black Woman trope, which purports Black American Women as overbearing, hostile, and needing to be controlled (Ashley 2014).

Experience-based measures to look at variation are typically couched in an exemplar-based model (Drager 2010). This model brings together mental representations, memory, and number of tokens such as word frequency, racial identity, and perceived dialect origin of speakers to show how rising numbers of each positively influence the implementation, accuracy, and perception of phonetic features (Gahl and Yu 2006). By operationalizing the American cultural

stereotype of The Angry Black Woman, this work demonstrates how experience with AAE may influence raciolinguistic stereotyping, suggesting that exemplar models are crucial to include in a model of language. This chapter investigate 1) whether people employ their experiential knowledge of AAE during processing, and 2) how speaker identity, stereotyping, and racialization play parts in that processing.

This remainder of this chapter is organized as follows: In Section 2, I review the literature that motivates the current research and methods, including research on AAE, online processing, emotional prosody processing, and sociolinguistics. In Section 3, I go over the methods, including participants, materials, online experimental procedure, and the planned analyses and hypotheses. In Section 4, I share the results, and Section 5 expands on these findings. Section 6 concludes. References can be found in Section 7, followed by supplementary materials in Section 8.

2. Background

2.1 Explicit vs. Implicit Experimental Measures

Eliciting unbiased and unprimed responses from participants in an experimental setting is a challenging task. There are explicit and implicit modes of elicitation, and each has its benefits and drawbacks. Experiments don't happen in a vacuum. Not only do participants bring their own knowledge to the experiment room, but also lived experiences, ideologies, and stereotypes. Stereotype is defined here as a fixed, oversimplified belief about a person, place, or thing. Previous research has shown that stereotypes about personhood, region, and other identity markers influence listener perceptions to the point that participants will claim to hear linguistic units that are not acoustically or syntactically present (Rubin 1992, Niedzielski 1999, McGowan 2015).

From listener evaluations, linguists have been able to identify where implicit bias may be coming into play. McGowan (2015) acknowledges that speech perception is best understood in relation to listeners' ideologies and biases. He proposes looking at high and low levels of experience, specifically in his work with Chinese-Accented English, to investigate listeners' use of social information during speech perception. The results are in line with exemplar model theories (Gahl & Yu 2006), showing that increased activation of social categories increases transcription speed for listeners with variable levels of experience, when presented Chinese-Accented English alongside a Chinese face. Thus, low levels of experience indicate fewer exemplars which limited perception abilities during processing.

Evidence from studies that ask participants explicit questions and tasks has proven to be fruitful for some linguistic questions and it is clear that more experience with a language variety

results in greater ease of processing (Drager 2010, McGowan 2015). This area of research also shows that social information from speech can result in racialization, meaning that a listener assigns a race to an individual in the moment after receiving enough information to their subjective standard to make a conclusion about racial identity (Rubin 1992, Weissler & Boland 2019). As listener ideologies about certain speaker groups inform sociophonetic perceptions, it is important to keep in mind specific social variables about participants when looking at speech perception (Drager 2010). However, asking participants questions overtly (e.g., self-report) does not always result in accurate, measured findings (McGowan 2015, Weissler & Boland 2019). In theory, implicit measures offer the opportunity to elicit immediate reactions that are less impacted by biases during online processing. Still, it remains an open question how explicit and implicit measures reflect different kinds of knowledge and biases.

Neurolinguistic evidence shows that people draw on social knowledge during sentence processing which influences their social categorization of the speaker in relation to the speech signal (Van Berkum et al. 2008, Hanulikova et al. 2012, Kutas et al. 2014, Weissler & Brennan 2020). Through electroencephalography (EEG), linguists (Van Berkum et al. 2008, Hanulikova et al. 2012) have examined sentences wherein some expectation is violated, whether syntactic, semantic, or relating to the identity of the speaker. Different types of violations are shown in Table 3.1. Definitions for specific event related potentials or ERPs (e.g., N400) can be found in Chapter 4.

Table 3.1: Types of Event Related Potential Violations

Type of Sentence	Type of ERP and Violation
"pass the sugar vs. pass the shutters"	N400, Semantic Anomaly
"she's taking the train today vs. she __ taking the train today."	P600, Unexpected Syntax

It is likely that listeners link language varieties to different identities. Zaharchuk et al. (2021) show that the P600 ERP component may be elicited regardless of listener experience with different dialects which conflicts with offline acceptability and intelligibility judgements with respect to double modals (e.g., "might could"), indicating the social influences which come into play during explicit processing may not affect the online implicit P600 response. Beyond electroencephalography, there is also reaction time data from visual processing studies suggesting that speech identity affects implicit measures of language processing. Eberhardt et al. (2004) show that presenting faces of Black people increases participants' speed of detection of crime-relevant objects. Additionally, their work shows that showing object and abstracts concepts such as "crime" and "basketball" result in increased looks toward Black male faces in a Visual World Paradigm. Despite the benefits of these online processing models, one downside is that it can be difficult to tease apart which parts of the stimulus are responsible for the implicit reaction. Thus, a mix of implicit and explicit experimental measures is a proposed solution to get at the nuance in varied responses, where participants' explicit responses are used to predict their implicit processing behaviors.

2.2 Implicit Processing of Emotional Speech

Sociolinguistic literature shows that stereotypes about particular identities can result in varied linguistic perception (Rubin 1992, Purnell et al. 1999, Drager 2010). Just as we make identity inferences based on speech sounds, we also make temperament judgments. For instance, we may notice someone's pitch rises when they are excited or notice utterances from someone becoming terse or short when angry. However, the few studies that focus on emotional prosody processing are somewhat vague regarding how emotional prosody is elicited during stimuli creation, and they do not specify the acoustic features that characterize particular emotionally prosodic contours. For example, in describing the recording process of their stimuli, Kim & Sumner (2017) say, "For critical trials, 24 semantically non-emotional words (e.g., pineapple, transmission) were recorded by a female speaker of American English with two types of emotional prosody (angry and happy) and with neutral prosody" (Kim & Sumner 2017, 50). Additionally, the authors note that, "Which acoustic features characterize a particular type of prosody is an important question, but to our purpose, it is more important to verify if the auditory stimuli are perceived as intended by listeners" (Kim & Sumner 2017, 50).

This lack of acoustic detail demands further exploration within the emotional prosody processing literature, especially for minoritized varieties. As evidenced in Chapter 2, speakers are treated differently based on how they speak, and certain featural markers, such as mean pitch and creak duration, that indicate racialized varieties can possibly also index stereotypes.

Liu et al. (2014) hypothesized that listeners make judgments about speakers rapidly, given linguistic data and perceived identity information with relation to emotion. In a Stroop-like task with congruent and incongruent face-voice pairs, Liu et al. measured response time, accuracy,

and the N400 component. This study was done with two different groups, one testing Chinese responses to Chinese congruencies and incongruences, and the other testing English-Speaking North American responses to Caucasian congruencies and incongruences. They found that English-Speaking North American participants showed a greater interference from irrelevant faces than Chinese participants, who showed more interference from irrelevant voices. This result was in the context of sad emotions versus fearful emotions, and Chinese and Caucasian faces. The authors acknowledge the North American population is very diverse, and so they were very specific about their population of participants; participants had to have at least one grandparent of British decent and further back, it was necessary that they had ancestors of western European descent. Their results showed that the Chinese respondents were more distracted by the incongruent speech, and the North Americans respondents were more distracted by the incongruent faces.

Their results suggest that display rules, defined as culture-specific social norms that regulate how emotions are expressed in socially appropriate way (Liu et al. 2014), play a crucial role in how different cultures process emotional speech. For example, in a comparison of Western cultures and East-Asian cultures, Western cultures tend to be more individualistic while East-Asian cultures tend to be more collective (Liu et al. 2014). In behavior, these cultural norms may manifest as adopting actions such as indirectness and avoiding eye contact in East-Asian cultures, whereas Western cultures encourage overt expressions of emotion and interaction, such as eye contact (Liu et al. 2014). Liu et al. (2014) thus surmise that display rules play a central role in communication, of which language is a part, and therefore can result in varied emotion perception of prosody. This finding highlights how varied linguistic and cultural experiences

influence language processing, as well as how experiential knowledge along with cultural stereotypes can influence variation in perception and processing.

2.3 The Current Study

The current study investigates how varied linguistic experiential knowledge modulates perception and online processing of AAE, as indexed by looking preferences from a virtual eye-tracker. Given that the linguistic brain relates message to speaker within a few hundred milliseconds (Van Berkum et al. 2008), I investigate how varied linguistic knowledge modulates the level of racialization and associated social stereotypes an individual invokes during online processing of emotional speech.

Previous research has analyzed participants as a monolith with similar knowledges of the language varieties presented or ascertained varied knowledge with explicit self-report (Drager 2010, McGowan 2015). This treatment is not without good reason. Flores & Rosa (2015) describe the White Listening Subject as individuals who reject racialized ways of speaking as legitimate language varieties, and this ideology is pervasive in America, held widely by people of all racial identities. In American schools, children are typically taught that SdAE is the standard and all other language varieties are "wrong," even the ones they may speak at home. Analysis and predictions based on racial differences or region can be limiting, given the globalized and multi-glossic state of the world, along with people's varied experiences which likely influences their linguistic outlook. Linguistic experience is multidimensional.

The current research operationalizes linguistic experience according to several different dimensions. To understand the influence of varied linguistic experiential knowledge during online processing speech within a multidialectal frame, multiple speakers of each variety (AAE and SdAE) were employed for the study. Images and voices of women were necessary due to the

experimental focus on the Angry Black Woman trope. AAE Experience was split into exposure, familiarity, and usage measures. It was hypothesized that participants who have more experience with AAE would display less biased looking preferences (i.e., look at a Happy Black face when hearing a Happy Black AAE-speaking voice), than people with less experience with AAE.

3. Methods

3.1 Materials

To test the hypothesis that looking preferences may be modulated by experiential linguistic knowledge between language variety (AAE, SdAE) and Happy or Angry images, 170 experimental sentences were constructed that were semantically neutral, and they were distributed over a Latin Square across each of the trials, across speaker and emotion (see full list in Supplemental Materials for this chapter). These sentences were reviewed by four raters for semantic neutrality. All experimental sentences were produced by six women, three SdAE-speaking women and three AAE-speaking women. Each woman was asked to read the sentence list in a Happy Tone and in an Angry Tone, in accordance with previous elicitation methods (Kim & Sumner 2017), rather than artificially manipulating the voices and taking away key variables within the speech signal. The acoustic properties differentiating the speech samples will be taken up in future research. Speakers were recorded in a sound-attenuated booth at the University of Michigan using an AKG C4000B condenser microphone and an Edirol UA-25 audio interface at a sampling rate of 44,100 Hz. The speakers were paid $20 per hour for their time and participation. Experimental sentences were distributed across six blocks, 48 sentences within each block, resulting in 288 sentence trials across all conditions, distributed using a Latin Square design.

Each speaker was associated with an image (Figure 3.1). Images were created by Cheyenne Varner LLC, and they are meant to provide variation within the categories of Black and White women, aligned with the voices (refer to Section 9.7 in the Supplementary Materials for this chapter to find the Image Norming Results for these images).

Figure 3.1: Images Used in Virtual Eye-Tracking Experiment

Figure 3.1: This figure depicts the images used in the study, each connected to a single speaker. There are three white women depicted and three Black women depicted, each with a happy and angry face component.

The experiment was hosted on Gorilla.sc (from here on Gorilla), an online platform for virtual experiments. The virtual eye-tracker on Gorilla is run through the program Web Gazer[1], and simply requires that participants have a webcam on their laptop or computer. Gorilla.sc experiments cost $1.10 per participant once the experiment is live. Images and voices of women were necessary due to the experimental focus on the Angry Black Woman trope.

[1] The virtual eye-tracker is in beta and requires permission before building the experiment.

Experience measures were divided into three types: Exposure, Familiarity, and Usage. Exposure and Familiarity were collected through two Qualtrics surveys. Each survey features 10 "Please Call Stella" passages, all spoken by women in differing varieties of English (Weinberger 2015). Nine varieties were chosen from the Speech Accent Archive (Weinberger 2015), while the 10th passage was recorded by a Black woman recruited from the Midwest. Speakers were paid $20 per hour for their time and participation.

The purpose of featuring multiple voices is to distract from the primary focus on participants' familiarity with and exposure to AAE. Exposure and Familiarity Survey questions are provided in the Supplementary Materials section of this chapter. The Usage measure was based on a recorded sociolinguistic interview administered virtually via Zoom video-conferencing software. Of the 15 minutes of audio recorded with each participant, five minutes (300 seconds) were analyzed by identifying (from 80 seconds to 380 seconds in each recording) the presence of phonetic and morphosyntactic features of AAE by utterance; features are given in Table 3.1. Each metric was used to measure variation in looking preferences alongside experience measures.

Table 3.2: Features Considered For AAE Usage Measure

Feature	Type
Remote time been	tense/aspect
Other kind of bin	tense/aspect
Invariant be	tense/aspect
Double modal	grammar
Third person singular s	morphosyntax

Possessives	morphosyntax
Negative concord	morphosyntax
Existentials	morphosyntax
Copula and/or auxiliary lack of phonological content	morphosyntax
Dummy it	morphosyntax
Optional past tense marking	morphosyntax
Of optionality (out the way, out the house)	morphosyntax
truncation	morphosyntax
Auxiliary be	morphosyntax
Third person s absence (regularization)	morphosyntax
monopthongization	phonetic
Deletion of singleton consonant	phonetic
Devoicing of syllable final obstruents	phonetic
Penultimate stress	prosodic
L vocalization	phonetic
Lax front vowels by l	phonetic
devoicing final stop consonants	phonetic
Tensed vowel	phonetic
Deletion of unstressed syllables	phonetic
Consonant cluster reduction	phonetic
th-fronting	phonetic
R vocalization	phonetic
Deleting reduplicated syllables	phonetic

Sucks teeth	phonetic/paralinguistic gesture
Rhotacization of /j/ in /Consonant + j/ sequences	phonetic

Table 3.2: This table represents all of the AAE features considered when analyzing the speech of the participants of the study.

3.2 Participants

150 participants were initially recruited via Snowball sample with online recruitment materials (See Supplementary Materials) sent out to professors at universities across the country to disseminate to their students, as well as encouragement to share by word of mouth. As with many studies, there is often an issue of attrition to be dealt with, and the fact that the experiment required four separate components compounded the attrition. Additionally, if participants' eye movements were not being picked up by the eye tracker 75% of the time at least, they were also excluded. Thus, of the 150 participants initially recruited, a total of 80 participants successfully completed the entire study. Results presented herein are the data from those 80 participants. Participants ranged in their free-write responses for ethnic backgrounds (Figure 3.2), regions of origin (Figure 3.3 and Figure 3.4), and age (range 18-67, mean 26.9). White & Caucasian were collapsed together for these figures, as were Black and African American, varying Asian American identities, and Hispanic, Latino, Latinx. Region of origin was defined by birth.

Figure 3.2: Participant Backgrounds Self-Reported

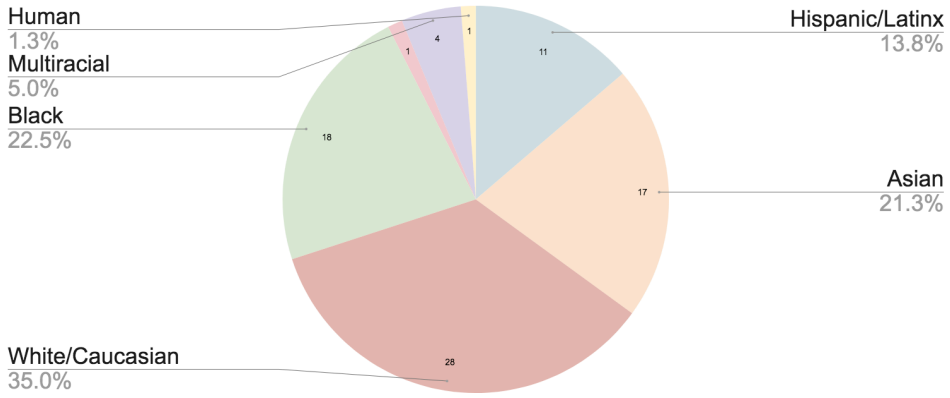

Figure 3.2: This figure displays the self-reported racial backgrounds of each participant. With the largest group being White/Caucasian at 35%, Black and Asian follow behind at 22.5% and 21.3% respectively, with Hispanic/Latinx at 13.8%, Multiracial at 5%, and Human at 1.3%.

Figure 3.3: Participant City of Origin Self-Reported

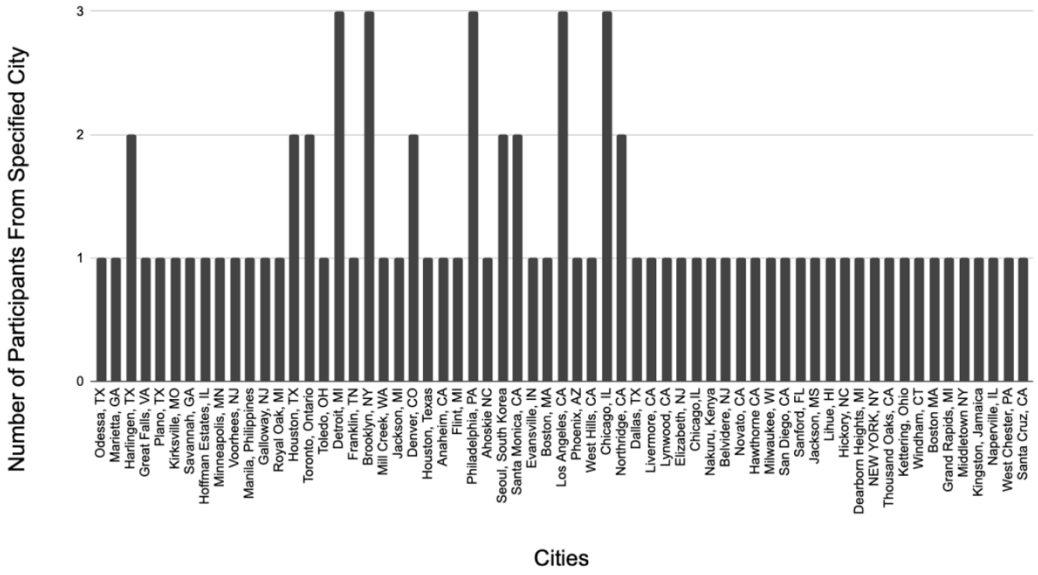

Figure 3.3: This figure represents the cities of origin, self-reported, from the participants. There is wide variability in terms of where participants come form.

Figure 3.4: Participant State + Country Self-Reported

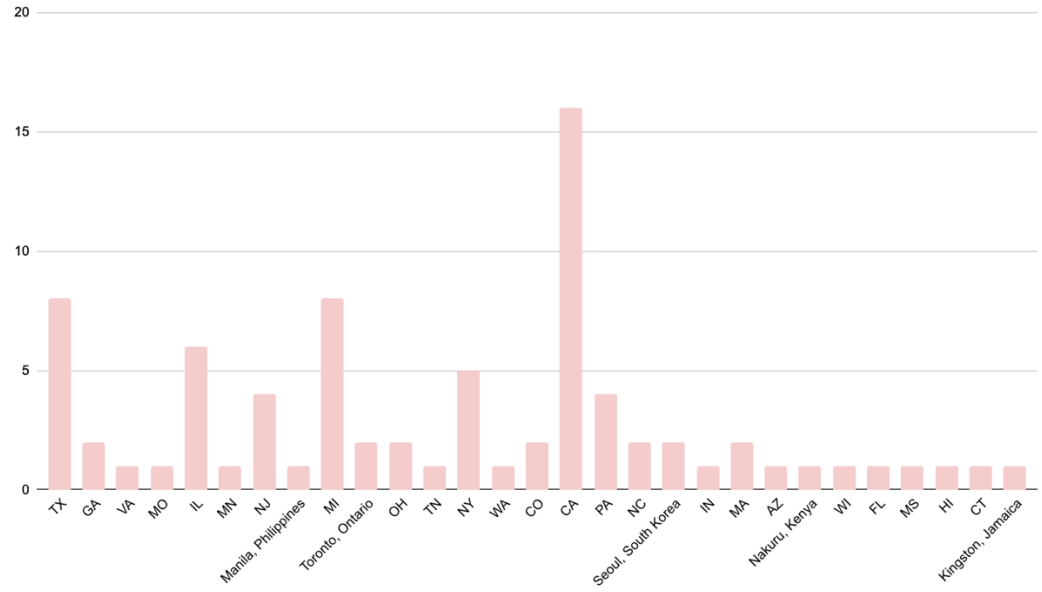

Figure 3.4: This figure depicts the participants' state and countries, self-reported. Many states across the U.S. are represented, along with three variable continents represented in terms of place of origin.

As evidenced in Figures 3.2, 3.3, and 3.4, the snowball sample that was necessitated by the COVID-19 pandemic resulted in a diverse participant pool with respect to racial background and city of origin. Participants all self-identified speaking a American English as their first language. All participants gave informed consent and were compensated fifteen dollars per hour for their time and participation. All experimental protocols are in compliance with and underwent review by the Institutional Review Board at the University of Michigan, IRB #HUM00150667.

3.3 Procedure

Given that this study was run during the COVID-19 pandemic, every interaction was virtual. Participants emailed the Primary Investigator to indicate interest in the study. This email was responded to by the PI with notification about what the study would look like, including the virtual eye-tracking and Gorilla interface, followed by the two Qualtrics surveys, followed by scheduling a 15-minute window in which to do the zoom interview (see full recruitment email Supplementary Materials). When participants opened the link for the virtual eye-tracking study

on Gorilla, they were asked to provide informed consent, after which they indicated their racial background, age, and place of birth. All participants had to confirm that they were using Google Chrome, as that is the only internet browser that successfully supports the virtual eye-tracking package. Participants confirmed that they had a webcam and would be using earphones or headphones for the study.

Following the consent page, participants performed calibration process to ensure that their webcam could follow their eye movements. Participants also did an audio test to ensure that they could hear the experiment audio. These initial routines were followed by the six blocks of the virtual eye-tracking study. Participants were instructed to sit still and attend to a central fixation cross on the screen while a single audio file played. After auditory stimulation, two faces were presented on the right and left of the screen. Participants were instructed to, "look at the image of who you think spoke this sentence." The webcam tracked participant gaze during the seven seconds in which they looked at either or both sides of the screen for every trial. Images would be displayed with same-race images with altered emotional expressions, or differing-race images with identical emotional expressions. These were all critical trials. Playing the audio file was included in the seven seconds. It was hypothesized that listeners with more experience with AAE would have more correct looking patterns aligned with the AAE voices and aligned faces than people with less experience with the variety. Participant looking accuracy combined with their experiences is what motivates having the Bias Score (BS) as it's predicted that the experiences inform the looking preferences. An example trial is shown in Figure 3.5.

Figure 3.5: Trial Screens

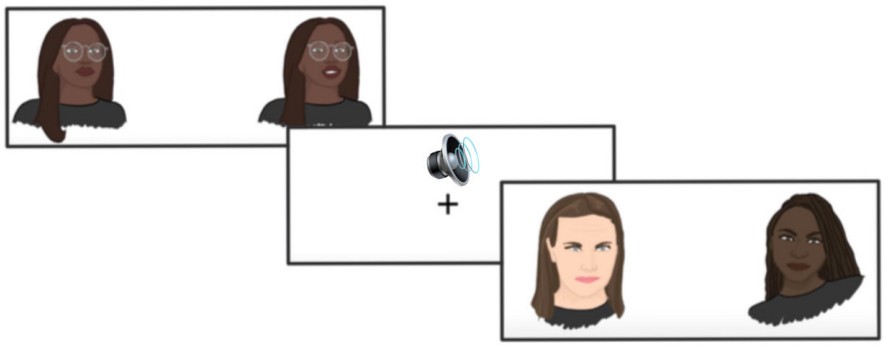

Figure 3.5: This figure depicts one and a half trials. The first rectangle displays a block after hearing audio, displaying two images of the same person with varying emotional states. The second rectangle, in the center, depicts the fixation cross that the participants were instructed to look at while listening to the audio stimuli (depicted by the speaker in this figure). The third rectangle on the far right depicts two people who show up on the screen after the audio is played, in this case, people of differing racial backgrounds with identical emotional states.

There were six blocks with 48 trials per block. Breaks between the blocks gave the individual the opportunity to take a moment before heading into the next block and indicated how many blocks were left. Of the 288 trials, 144 were AAE sentences and 144 were SdAE sentences across the six women (three AAE speakers and three SdAE speakers), broken up into 6 blocks, (48 in each trial), each 48 broken up into three ways with two of the same white faces (differing emotions), two of the same Black faces (differing emotions), and one Black and one White face (same emotion), again varied based on a Latin Square. The virtual eye-tracking in total took between 30-40 minutes depending on the lengths of breaks people took.

Upon completion of the eye-tracking portion of the study, participants were immediately transferred to the first Qualtrics survey assessing Exposure. They were asked to listen to 10 women reading a paragraph, and for each, answer questions about their exposure to each kind of speaker (such as, “I often encounter people who speak this way” or “I have heard people in other

cities speak this way"). This was followed by a redirection to the second Qualtrics survey on Familiarity, which had identical instructions regarding rating each of the 10 (different) voices based on their familiarity with that kind of speaker (such as, "I can understand little of what this person is saying" or "This is how my family and I speak").

At the conclusion of this task, participants were reminded that the last part of the study would be a zoom interview with the PI. During the zoom interview, participants gave their written consent to be audio-recorded. Participants were told they would be partaking in a sociolinguistic interview for 15 minutes, and the structure of a sociolinguistic interview was described to the participant. All interviews were completed with the PI. Questions asked involved what participants have been finding joy in during the pandemic, and other questions were prompted based on participants responses. The conclusion of the interview concluded participants' participation in the study. They were emailed a debrief letting them know what the study was about (see debrief in Supplementary Materials).

3.4 Data processing and analyses

All statistical analyses were completed in R. Eye-Tracking data were downloaded from Gorilla as a csv file and loaded into R. Trials were coded to indicate the images shown per trial, the audio file presented in a given trial, Participant ID, and the amount of time, as a percentage, the participant spent looking at the correct image. Looking times were averaged by participant and speech condition. In terms of looking at the correct image, Gorilla accounted for when participants were looking at the right or the left of the screen. If they were looking at neither (i.e. above the computer, at their phone, talking to their child etc), this was not counted. Thus, the participants' glances to the left and the right did not always equal 100%.

A Bias Score (BS) was also computed to quantify the difference in looking times as a function of emotion, (H)appy or (A)ngry, to (A)frican American versus (W)hite faces: BS = (AA-AH)-(WA-WH). This resulted in a single BS score per participant. Then, experience measures were also converted to a single number per participant. Exposure and Familiarity data from Qualtrics were loaded into R, and merged with the eye-tracking data which included the BS score. The Exposure Score (ES) and Familiarity Score (FS) were quantified by coding the survey answers as to whether they indicated mor or less exposure or familiarity with AAE. For example, "I often encounter people who speak this way" was scored +1 whereas "I don't know anyone who speaks this way" was scored -1. The sum of the scores to questions of each of the two surveys defined ES and FS, respectively. Only survey responses to the African American woman's voice in each of those measures were used in these calculations. A Usage Score (US) was defined based on the five-minute chunk of speech analyzed from the sociolinguistic interview. BS was then merged with FS, ES, and US. Raciolinguistic stereotyping based on the Angry Black Woman trope was then evaluated using a set of linear regressions between each of the three experience measures and BS.

It was predicted that participants would be least likely to look at the Black Happy face overall because of the pervasiveness of the Angry Black Woman Trope in the consciousness of Americans. It was also predicted that people with more experience with AAE, as shown across the three experience measures, would show more correct alignment with Black Happy faces with AAE Happy Prosodic sentences than those with less experience.

4. Results

Results in Figure 3.6 show results for each of the four conditions from all participants. Points indicate individual participant averages The *x*-axis indicates the speech of the audio that the

participants heard, i.e. AA (AAE Angry), AH (AAE Happy), MA (SdAE Angry), and MH (SdAE Happy). The *y*-axis indicates percentage of time looking at the image that correctly matched the spoken sentence.

Figure 3.6: Composite Results of Participants

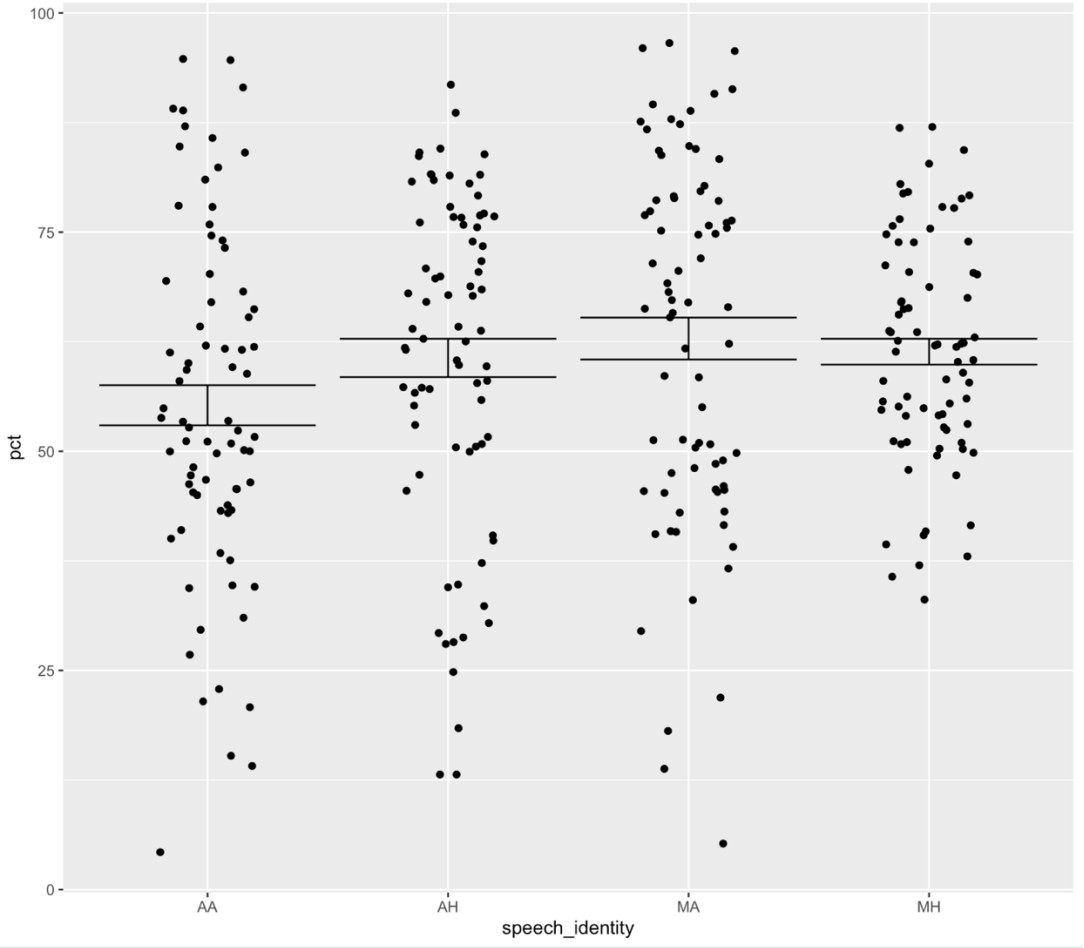

Figure 3.6: This figure depicts where each participant fell on the spectrum of correct looking preferences that matched the spoken sentence. The wide range of variability shows where each participant fell with respect to each emotional, racialized variety. The *x*-axis indicates the speech of the audio that the participants heard, i.e., AA (AAE Angry), AH (AAE Happy), MA (SdAE Angry),

and MH (SdAE Happy). The *y*-axis indicates percentage of time looking at the image that correctly matched the spoken sentence.

Figure 3.6 shows that participants vary widely in their looking preferences with respect to each emotional, racialized variety. On average, participants looked at the left and right equally, with a slight preference for looking to the left, as evidenced in Figure 3.7:

Figure 3.7: Looking Preferences Left versus Right

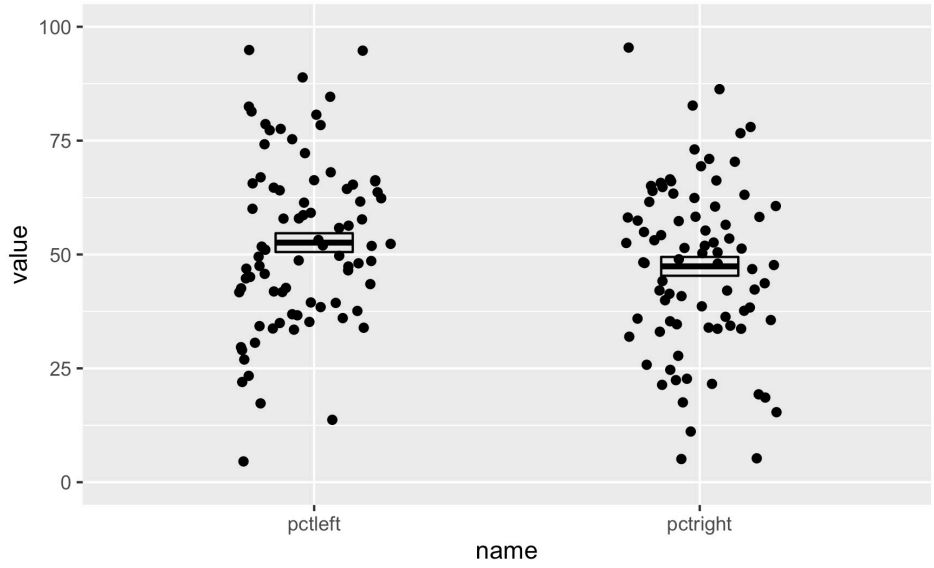

Figure 3.7: This figure depicts the average looking preferences for each participant, who are each represented by a black dot. The y-axis, named 'value,' indicates the percentage of time looking at the left side of the screen. The x-axis, named 'name,' indicates the percent on the left and the percent on the right. The figure depicts variability within looking preferences, though on average participants as a whole seem to be looking left and right almost equally, with a slight preference for the left, as indicated with the error bar.

Specifically, in trials where people had to look at either an angry face or a happy face, they are making an implicit emotion judgment, whereas when they look at either a Black or white

face, they are making a race judgment. Figures 3.8 and 3.9 depict these trials separately, evidencing that the implicit judgments show no difference in percent of time looking at the correct picture for race, but do show difficulty across the board with correctly identifying the Angry Black emotional speech, which does follow a similar pattern as the explicit judgments from Chapter 2. Table 3.3 displays the means and standard deviations for each speaker. Table 3.3 indicates that all speakers were treated equally, and there was not preference for one image over another. It is crucial to note here that while percentage correct was similar to all speakers. but a data processing error led to data from one of the 6 speakers being excluded from the final analysis.

Figure 3.8: Percent Correct Race

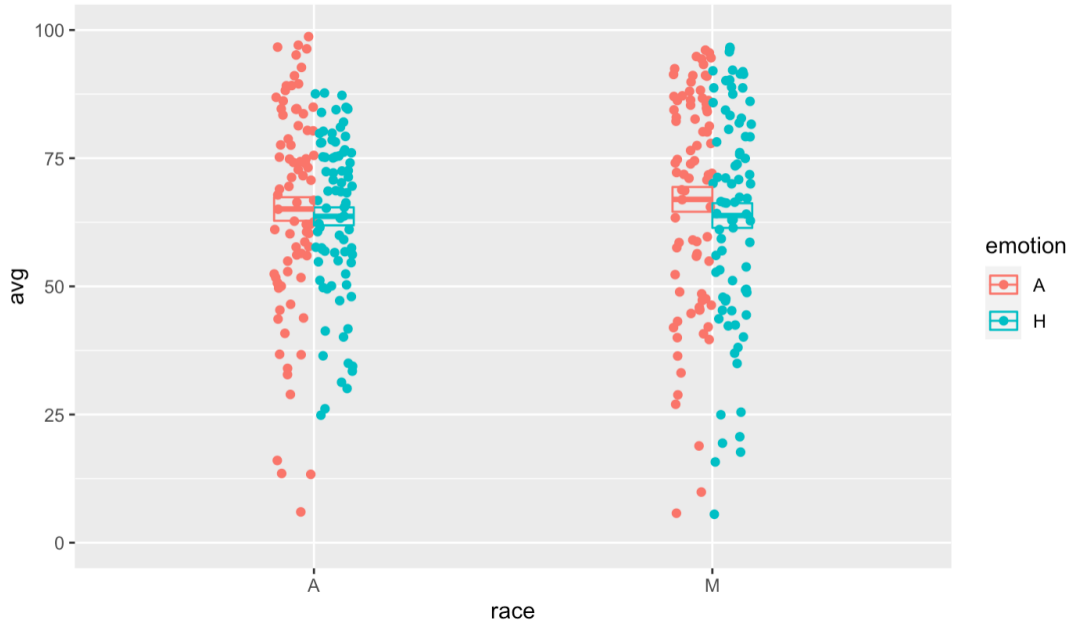

Figure 3.8: This figure depicts the average percent correct for race per participant when they were looking at images with the same emotion and different race. The salmon dots depict Angry faces (A) and the blue dots indicate Happy faces (H). The x-axis has the two races being depicted in the images:

African American (A) and White (M). The y-axis depicts the average. Both are close identical for percent correct identification for race.

Figure 3.9: Percent Correct Emotion

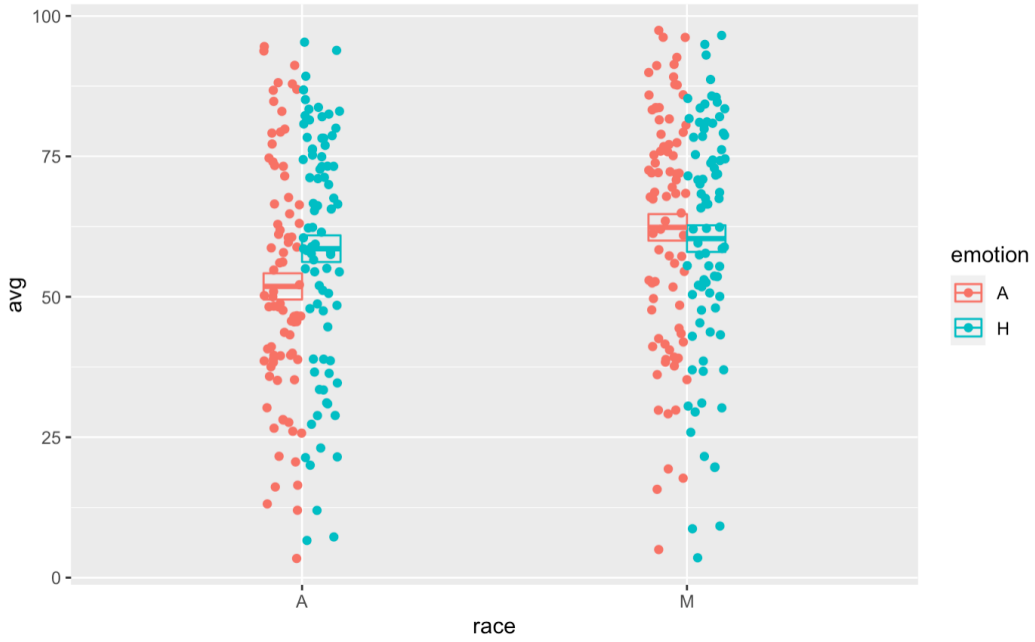

Figure 3.9: This figure depicts the average percent correct for emotion per participant when they were looking at images with the same race and different emotion. Salmon dots depict Angry faces (A) and the seafoam dots indicate Happy faces (H). The x-axis has the two races being depicted in the images: African American (A) and White (M). The y-axis depicts the average. For the white images, participants seem to be getting the emotions correct at the same rate. For the Black images, participants overall seem to have the worst luck with identifying the angry emotions.

Table 3.3: Mean and Standard Deviation of Looking Preferences Based on Speaker

Speaker ID	Speaker Identity	Mean	Standard Deviation
C10	SdAE Angry (MA)	67.51016	23.88003
C10	SdAE Happy (MH)	63.70988	24.50321
C14	AAE Angry (AA)	65.35926	21.91619
C14	AAE Happy (AH)	68.57366	23.18218
C17	SdAE Angry (MA)	64.72469	22.73383
C17	SdAE Happy (MH)	62.10905	25.81284
C18	SdAE Angry (MA)	68.40638	23.05642
C18	SdAE Happy (MH)	64.82016	21.28123
C20	AAE Angry (AA)	65.14550	21.17944
C20	AAE Happy (AH)	61.99024	23.26408

Table 3.3: This table shows the means and standard deviations for looks at each of the images. Average percent of time participants looked at each image that was tied to a specific speaker. The y-axis devicts the average amount of time the images were looked at, and the x-axis, named "speech_speakerID" depicts the Speaker ID of each speaker used as stimuli. The skinny rectangular grey bars indicate the race and emotion of each speaker, i.e. SdAE Angry (MA), SdAE Happy (MH), AAE Angry (AA), and AAE Happy (AH).The distributions are alike in their variability.

Figures 3.8 and 3.9 evidence broad variability within the participant pool with regard to the task. This variability led to looking at pairwise comparisons of the data to see if any of the experiential measures were aligned with one another, shown in Figure 3.10. Pairwise comparisons show distributions of experience scores. The figure shows how the measures are similar or different from one another, and the marginal distributions. From these pairwise comparisons, it is clear that participants don't have to have High Usage speaker to have higher accuracy, but those with higher usage do show better accuracy in audio-visual identification.

Figure 3.10: Experience Measures Results

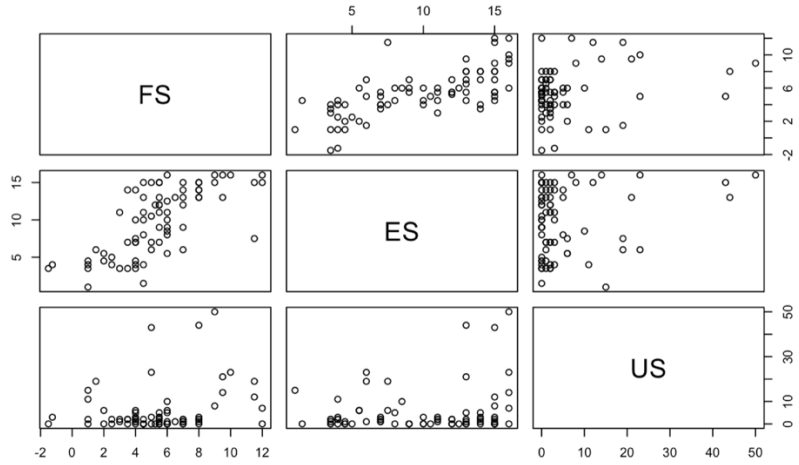

Figure 3.10: This figure displays pairwise scatterplots between each of the three experience measures: Familiarity (FS), Experience (ES), and Usage (US). It depicts distributions of the experience scores, and how these measures are similar or different from each other, along with their marginal distributions. The x-axis in the first column shows the distribution of familiarity scores or example. There is a broad spread in the sample across all measures, though the spread is more uneven with usage, ES and FS tracking quite closely.

Percent correct looks were submitted to a 2-Way ANOVA to look at the effect of each variable (ENGLISH VARIETY and EMOTION) and their interaction. Results indicated a reliable interaction between ENGLISH VARIETY and EMOTION $F(1, 79) = 18.53$, $p < 0.001$, and also found a reliable difference for ENGLISH VARIETY, $F(1, 79) = 38.23$, $p < 0.001$ $F(1, 79) = 18.53$, $p < 0.001$, but not for EMOTION $F(1, 79) = 0.11$, $p = 0.73$. As seen in Figures 3.8 and 3.9, participants in general were at the same rate on average identifying the correct images, with the most difficult being with identifying the emotion for the Black Angry tokens. This aligns with the findings in Chapter 2 where people were more accurate with the white voice than the Black voice. The highest accuracy is seen with the SdAE Happy speech, which is also consistent with the findings in Chapter 2. In this composite form, the AAE Angry speech was least correctly identified with the images.

Figure 3.11 shows the relationship between eye-tracking Bias Score (BS) and per-participant measures of Familiarity (FS), Exposure (ES) and Usage Scores (US).

Figure 3.11: Results for Experiential Linguistic Knowledge Measures

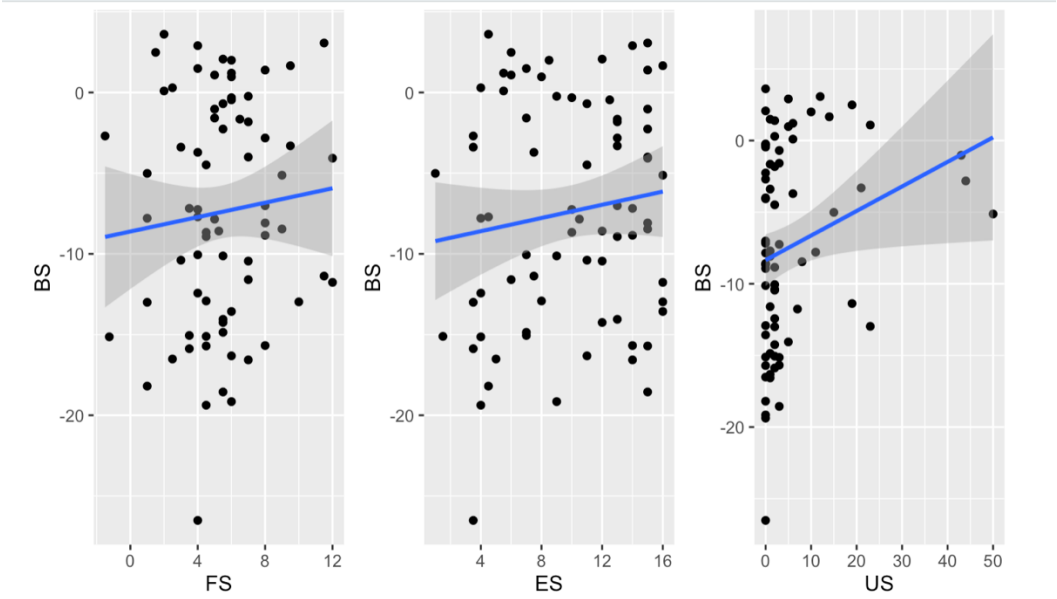

Figure 3.11: These three panels which are aligned with each of the experience measures and where participants fell on those axes alongside the spectrum correct looking preferences that matched the spoken sentence. Each point represents a single participant in each panel, which all participants showing up as a single dot once in each panel. There is wide variance among FS and ES, while US shows a trend for higher US resulting in less BS.

These plots reveal quite a lot of individual variation in all measures. Broadly, there is a full range of Bias Scores across participants with low ES and low FS. We also see a trend toward lower Bias Scores in participants with high ES and FS, which appears to be stronger with the US. Linear regression was used to quantify these relationships which indicated that participants' ES and FS did not predict stereotyped looking preferences, though did show that Usage Scores did

predict looking preferences ($\beta = 0.16$, $t(0.08) = 1.992$, $p = 0.05$) right at the threshold for significance. As a reminder, Exposure Scores (ES) and Familiarity Scores (FS) were determined from surveys, so they were on a continuum from low to high, and Usage Scores (US) were determined by number of AAE features used categorically. It is important to acknowledge that the result for the US could be tied to individual identity, and the plain reality that a lot of Black speakers in this sample were speakers of AAE. The point though, is that despite the distribution being partially tied to the fact that there were so few Black people in the sample, that had skyrocketingly more AAE usage than other speakers, the US provides a clearer window into the fact that there's few AAE users in sample, so sample is statistically heteroskedastic, and thus there are limits based on the limits of the sample. Thus, these trends should be interpreted with caution; the statistics do not show reliable effects that are readily generalizable beyond this sample. Regardless, the variation across participants clearly shows a trend that, more likely than not, higher experiential knowledge of AAE reduces Bias Scores.

5. Discussion

The goal of this study was to investigate how variation in experiential knowledge could predict bias in emotional prosody processing through virtual eye-tracking. Results of this study indicate a trend such that people who have higher experiential linguistic knowledge of AAE show more accurate looking times, quantified in terms of lower bias scores, with a virtual eye-tracking paradigm. However, the statistics show that these results may be difficult to generalize beyond this sample, with only the Usage Scores showing marginal significance in predicting Bias Scores.

There are many possible interpretations regarding the study's outcome, the most pertinent being the method of virtual eye-tracking itself. Gorilla FC states on their platform that there are not currently any studies published using the virtual eye-tracking method, and the eye-tracker itself is still in beta testing. There is room for exploration regarding the accuracy and reliability of the method. Thus, it is possible that that the virtual eye-tracking measure is noisier than lab-based tools, which could have offset the Bias Scores given the multiple potential distractions in an individual's home versus an experiment room. It will be crucial moving forward to quantify the reliability and accuracy of this method. Another relevant factor is the context of a virtual experiment in general. The inability to witness and surveil participants during a study can compound issues with the study and the results, such as fidgeting around or looking at one's phone or other screens during the experiment.

Beyond the virtual eye-tracking method itself, the experience measures themselves warrant further consideration. Previous research methods rely on self-report (Drager 2010, McGowan 2015). FS and ES were formed based on questions regarding these two factors and required explicit responses from participants regarding their self-reported experiences with speakers. The measure of ES and FS based on the African American Women's voices were couched within women's voices in Englishes from around the world, with the hope to create least bias possible for participants with respect to the AAE voices. Questions for exposure had to do more with places that people had been and people they've interacted with in their lives. Familiarity questions differed in that they were more focused on comprehensibility and understanding of the speech. An alternative would be to ask different questions relating to familiarity and experience, or even to investigate other experiential measures, such as schooling or occupation. Still, researchers must keep thinking about how to pin down exposure and familiarity with language

beyond self-report, and while this study offered a more implicit measure to access that based on audio samples, there is more work to be done regarding pinpointing how to precisely measure these factors.

The Usage Measure was determined based on a novel yet simple concept of counting features of AAE within five minutes of a sociolinguistic interview with each participant. The method was straightforward: take the middle five minutes of audio from each participant, separate each phrase with a phrase boundary in Praat, and auditorily listen for morphosyntactic and/or phonetic features from AAE. It is important to think critically about how an interviewer always influences interviewees, and how interviewer identity can impact participants' speech. Future work could explore listener judgements of the interviewer to quantitatively determine how the interviewer is perceived. As I did all the interviews myself, it's important to recognize that my positionality as a Black biracial woman could have impacted individual's ways of speaking.

This research, like Chapter 2, was in part based in the social perceptions of Black women through the Angry Black Woman Trope. The results indicate that in terms of emotional prosody, participants are mostly perceiving the speakers similarly, except for some difficulty discerning correctly the Angry Black voice, which follows the results seen in Chapter 2 where the Black voices were more difficult to get correct by participants. It was postulated in Chapter 2 that perhaps the reason that the ratings were lower for the Black voice was because of sociopolitical pressures to perform colorblindness (Bonilla-Silva 2006). However, the implicit results from the eye-tracking subvert that assumption. Again we see that participants are better at discerning emotion from White speakers than Black speakers. This once again calls into question a potential issue with experience influencing participants knowledge. Even despite the switch from individual words to full sentences, it is still the case that experimentally the voices are treated

pretty much identically with the exception of the angry Black voice being least correctly identified. This warrants further research into emotional speech of Black and White people in the United States, particularly with relation to anger, and also with relation to the sounds of the speech versus the language varieties' grammars respectively.

It's also important to think about the interview setting, which all took place on Zoom. The digital platform could be an additional barrier within the interview context, and could influence the flow of natural speech from the participants. Future work could replicate this experiment in person and consider whether or not Zoom interviews are a barrier. Still, it is fascinating to look at the individual differences and variation within the participants. The data show the wide range of experiential knowledge listeners have with AAE, and also variation in their participation in the eye-tracking task. Future work could benefit from looking closely at individual differences across the dataset.

6. Conclusion

The Angry Black Woman stereotype exists in our society and was the impetus for testing emotional prosody perception and processing depending on people's experiential linguistic knowledge of African American English. The results showed that there is a gradient in individuals' interactions with information regarding images of Black and White women and speech from AAE and SdAE speakers. Results indicate a trend toward more experiential knowledge resulting in less bias, with marginal significance for the Usage Score predicting level of bias. Correlations with respect to specific features were not evaluated for this study. Considering potential correlations with respect to features could illuminate specifically whether listeners are tapping into AAE versus "sounding Black." This study confirms that implicit

processing measures can illuminate aspects of bias that proved to be more difficult to discern in the explicit survey reported in Chapter 2. It also confirms that a theory of multidialectal processing is necessary for a model of language. Variability among participants across experience measures and eye-tracking responses is indicative of the bountiful variance which exists in individuals which is crucial to account for when theorizing perception and processing. Future work should consider other implicit processing measures which can help determine not only preconceived notions such as stereotype and prosody, as well as prediction during processing as it relates to other parts of grammatical systems.

As a step toward that goal, Chapter 4 investigates how using electroencephalography can show when predictions during processing are violated based on neural responses, specifically within the grammatical realm. It extends the notion from this chapter of multidialectal processing within participants to show that speakers are treated differently cognitively depending on the variety of American English they are using.

7. References

Ashley, Wendy, 2014. The Angry Black Woman: The Impact of Pejorative Stereotypes on Psychotherapy with Black Women. *Social Work in Public Health,* 29:1, 27-34.

Bonilla-Silva, Eduardo. 2006. Racism without racists: Color-blind racism and the persistence of racial inequality in the United States. *Rowman & Littlefield Publishers*, Lanham, Maryland.

Craft, Justin T., Kelly E. Wright, Rachel Elizabeth Weissler, Robin M. Queen. 2020. Language and Discrimination: Generating Meaning, Percieving Identities, and Discriminating Outcomes. *Annual Review of Linguistics,* 6:18, 1-19.

Drager, Katie. 2010. Sociophonetic Variation in Speech Perception. *Language and Linguistics Compass,* 4/7, 473-480.

Eberhardt, Jennifer L, Valerie Purdie, Phillip Atiba Goff, and Paul G. Davies. 2004. *Seeing Black: Race, Crime, and Visual Processing.* Journal of Personality and Social Psychology. American Psychological Association.

Flores, Nelson and Jonathan Rosa. 2015, Undoing Appropriateness: Raciolinguistic Ideologies and Language Diversity in Education. *Harvard Educational Review,* 85-2: 149-172.

Gahl, Susanne and Alan C. L. Yu. 2006. Introduction to special issue on exemplar-based models in linguistics. *The Linguistic Review,* 23:213-216.

Hanuliková, A., Petra.M. van Alphen, Merel M. van Goch, Andrea Weber. 2012. "When one person's mistake is another's standard usage: The effect of foreign accent on syntactic processing." *Journal of Cognitive Neuroscience.* 24:4, pp. 878–887. Massachussets Institute of Technology.

Kutas, Marta, Kara D. Federmeier, Thomas P. Urbach. 2014. "The 'negatives' and 'positives' of prediction in language." *The Cognitive Neurosciences 5th Edition.*

Kim, S., Sumner M. 2017. *Beyond lexical meaning: The Effect of Emotional Prosody on Spoken Word Recognition*. United States: Journal of the Acoustical Society of America.

Liu, Pan, Simon Rigoulot, and Marc D. Pell. 2014. "Culture modulates the brain response to human expressions of emotion: Electrophysiological evidence." Neuropsychologia, 67(1): 1-13.

McGowan, Kevin. 2015. Social Expectation Imrpoves Speech Perception in Noise. *Language and Speech,* 58.4: 502-521.

Niedzielski, N. 1999. The Effect of Social Information on the Perception of Sociolinguistic Variables. *Journal of Language and Social Psychology*. United Kingdom: SAGE Publications.

Purnell, Tomas, William Idsardi, John Baugh. 1999. Perceptual and Phonetic Experiments on American English Dialect Identification. *Journal of Language and Social Psychology* 18: 10-30.

Rubin, D.L. 1992. Nonlanguage Factors Affecting Undergraduates' Judgments of Nonnative English-Speaking teaching assistants. New York: Springer Publications.

Van Berkum, Jos. J. A., Danielle van den Brink, Cathelijne M. J. Y. Tesink, Miriam Kos, and Peter Hagoort. 2008. "The neural integration of speaker and message." Journal of Cognitive Neuroscience, 20:4, pp. 580–591. Massachusetts Institute of Technology.

Weinberger, Steven. (2015). *Speech Accent Archive*. George Mason University. Retrieved from http://accent.gmu.edu

Weissler, Rachel Elizabeth, Boland, Julie. 2019. Sounding like a stereotype: The influence of emotional prosody on race perception. In Sasha Calhoun, Paola Escudero, Marija Tabain & Paul Warren (eds.) Proceedings of the 19th International Congress of Phonetic Sciences, Melbourne, Australia 2019 (pp. 2169-2173). Canberra, Australia: Australasian Speech Science and Technology Association Inc.

Zaharchuk, Holly, Adrianna Shevlin, Janet G. van Hell. 2021. Are our brains more prescriptive than our mouths? Experience with dialectal variation in syntax differentially impacts ERPs and behavior. *Brain and Language,* 218, 1-24.

8. Supplementary Materials

8.1 Email Recruitment Materials

Hey [Participant Name]!

Thanks for your interest in the study! This study is being conducted by me (Rachel Elizabeth Weissler, PhD Candidate in Linguistics) through Dr. Computational Neurolinguistics Lab at the University of Michigan : Participants must be at least 18 years old and have American English as one of their native languages. To take part in the study, you will need agree to do the following (all of which is noted on the consent form which is embedded in the first part of the study):

- You voluntarily agree to participate in **all four sections** of the experiment
- American English is one of your native languages
- You have access to a Google Chrome web browser
- You have a webcam
- You will use headphones/earphones to listen to the audio
- You are 18 years of age or older

This study has four parts. You will receive $15/hour for your completion of all four parts: The eye-tracking study, both qualtrics surveys, and the zoom interview with the lead researcher (me).

You will need to use your Subject ID throughout doing this study. Make sure you have access to this ID as it is what you will use throughout doing the different parts of the study

You're Subject ID is: [#]

This link should take you to Parts 1-3 of the experiment, and should take you around an hour to complete the whole thing. I ask that you try to complete Parts 1-3 of the study within a week from today.

Separately, we can set up a time for the short zoom interview (fourth part). Please tell me the timezone you're in as well to make scheduling easier. Within the week or so would be great! The meeting should take 15 minutes, and it's less of an interview and more of a casual conversation, so no need to prepare anything. In anticipation of the Zoom interview for my study (Part 4 of Study #HUM00150667), could you please read and fill out the attached consent form and send it back to me?

Please let me know if you have any questions for me, and in the meantime, please send me some time frames during which we can schedule our 15 minute zoom interview. Also, do let me know how you prefer to get paid (venmo, paypal, zelle, or another way), and the credentials (i.e. venmo username, email associated with paypal etc). Thanks!

8.2 Consent Form for Sociolinguistic Interview

Consent
Listening and Looking Study: Part 4

Principal Investigator: Rachel Elizabeth Weissler, PhD Student, University of Michigan
IRB #: HUM00150667

Thank you for participating in this study. In order to participate, you must be above 18 years old. You also need to have completed Parts 1-3 of this study before doing this final Zoom interview. Your participation is voluntary. We expect this research to provide information about how people understand speech. There are two benefits of the study. The first benefit is the data you contribute through your participation. The second benefit is that you learn about how research is conducted in linguistics and cognitive psychology.

Before you begin, it is important for you to understand what will be expected of you as a subject in this experiment and what you should do if you decide you no longer wish to participate. By indicating consent, you are letting us know that you understand what is being asked of you in this task, and that you are ready to proceed.

If you choose to participate, you will be interviewed by the principal investigator for 10-15 minutes. This interview will be recorded, but only the audio (not video) will be used for analysis. Your audio interview will not be shared with anyone; only the principal investigator will have access to your audio recordings. As a reminder, you will receive $15/hour for your completion of the eye-tracking study, both listening surveys, and the zoom interview with the lead researcher. The time taken to complete each task is saved upon completion. This survey should take approximately 15 minutes to complete.

Only your subject ID will be attached to the recording. There is no identifying information linking you to this experiment other than your subject ID. Records will be kept confidential to the extent provided by federal, state, and local law, although the Institutional Review Board, or university and government officials responsible for monitoring this study, may inspect these records.

Your performance in no way reflects your intellectual abilities or language skills. This study meets the definition of "minimal risk", whereby the probability and magnitude of anticipated discomfort or harm is no greater than that ordinarily encountered in daily life or during the performance of routine psychological tests.

Your participation in this project is voluntary. You may decide to end the interview at any time, including after you have confirmed consent. You will receive payment upon completion of the entire experiment (should you choose to withdraw early, any data collected will be destroyed).

After the experiment, feel free to contact me, racheliw@umich.edu, if you have further questions. Should you have questions regarding your rights as a research participant, please

contact the Institutional Review Board 2800 Plymouth Road Bldg. 520, Rm. 1169 Ann Arbor, MI 48109-2800, (734) 936-0933, email: irbhsbs@umich.edu.

Subject ID: _____

I consent

I do not consent

8.3 Debrief

Thanks again so much!

In case you were curious what the study was about:

This study was looking at emotional prosody perception of Standardized (White) American English and African American English, and how people's experiences with African American English (AAE) modulate their eye-tracking results (an implicit measure). Virtual Eye-tracking captures proportion of looking time at each side of the screen. Operationalizing the Angry Black Woman trope, it's hypothesized that people who have less experience with AAE will look more at the Black angry-faced images when the AAE-speakers are talking (no matter what the tone of the speech was). I am triangulating experience by looking at exposure, familiarity, and usage. Exposure to and Familiarity with AAE are determined through your responses to those two qualtrics surveys. Obviously you listened to many women in those surveys, but in both, there was a Black AAE-speaking woman mixed in there, for which we care most about your response to. Finally, the Usage measure is based on the interview we had. I will look back at your speech and look for the amount of AAE features employed by you (since we also know that not all Black people speak AAE and also that some Non-Black people grow up in communities where they are surrounded by AAE-speaking people, so they might integrate some of those features into their speech). So, looking at all these measures, per person, and seeing their eye-tracking results, can give us some insight into how experience, familiary, usage, a mix of them etc can mitigate stereotypical looking patterns based on the emotion used in speech , or perceived emotion based language variety employed.

Let me know if you have further questions, and thanks so much again for helping me out with this study!

If you have friends that you think would be interested, please pass my email along to them! Thanks again for your participation!

8.4 List of Stimuli Sentences

Table 3.4: Stimuli Sentences

Sentences
1. Alex will choose the movie tomorrow.
□ Charlie applied for the restaurant job.
□ Sam adopted a pet salamander.
□ Taylor travels for work monthly.
□ Avery is reading a school book.
□ Sage keeps a guitar in the back.
□ Quinn has three flowering plants.
□ Lee cooks every Sunday after church.
□ Andy has a college prep course this week.
□ Dakota scheduled an appointment for this Monday.
□ Danny brought a coat for cold weather.
□ Devon went to check on the babies.
□ Steven walked the dog before work.
□ Carrie waits for the bus in the morning.
□ Damon read a book before going to bed.
□ Frank inquired about making progress in class.
□ Beth moved the couch closer to the tv.
□ MariLou lives next to the pet hospital.

□ Judy clicked through movie options on Netflix.
□ Thomas signed up for recreational sports.
□ Ryan recorded the morning cartoons.
□ Sally downloaded five albums to the iPod.
□ Bonnie wrote down a list of hobbies.
□ Caroline reviewed the family tree.
□ Deedee turned on the news station.
□ Lauren charged the laptop at work.
□ Monique laid out the clothes last night.
□ Dexter changed the locks on the door.
□ Angelo practices everyday for the race.
□ Marcus counts the even numbers.
□ Darius saw a blue truck.
□ Patrick checked the time on the clock.
□ Grant emailed the group about bowling.
□ Josh remodeled the kitchen in June.
□ Zach wrote a letter to the organization.
□ Bailey discussed the candidate yesterday.
□ Hunter parked the car in the garage.
□ Adele has six model planes.
□ Ricky walked to the transportation center.

□ Stephanie looked for the house with the red door.
□ Elle signed up for the talent show.
□ Bryan wrote down all of the names.
□ Dominick holds the roster for the children.
□ Colin contacted the adult on duty.
□ Ben knows the age of the cat.
□ Anna keeps a memory box under the bed.
□ Joan walked down the appliances aisle.
□ Jordan cleans pools in the area.
□ Sarah ran cold water in the sink.
□ Corey sat with a blanket in nature.
□ Kristin went to the furniture store.
□ Michelle bought a book on dog breeds.
□ Helen added some puzzle pieces.
□ Alexis owns a few card decks.
□ Annie sits the records on the shelf.
□ Lindsey noticed the ancient architecture.
□ Linda went to the mall on Friday.
□ Eileen dug a hole in the garden.
□ Ellen counted the zoo animals.
□ Jenny collects modern art.
□ Jimmy made a cup in pottery class.
□ Shirley is knitting on the sofa.

□ Miles sewed a button on the jacket.
□ Mike went to the DMV on Thursday.
□ Nick walked into the grocery store.
□ Amy got the car inspected today.
□ Irene took up needlepoint this summer.
□ Emma put on the scuba gear.
□ Megan hikes in the hills by the house.
□ Noah works at the rock climbing center.
□ Norah locked the canoe in the shed.
□ Camille put away the painting tools.
□ David signed up for ballroom dance classes.
□ Theo and Monicca play catch.
□ Katherine restrung the tennis racket.
□ Margaret updated the photography website.
□ Lori has a rose and tulip garden.
□ Matt planted seeds last summer.
□ Kenny watched the snow fall outside.
□ Lilian plays the lead in the show.
□ Galen ironed the dress clothes.
□ Luke applied for a job at the airport.
□ Max plays the piano at work.
□ Charlotte roasted all the pumpkin seeds.
□ Veronica went to the beach this summer.
□ Simon buys cars to refurbish.
□ Paul looked at the sky and clouds.

□ Leah's alarm rung at 3pm.
□ Hope went inside when the weather changed.
□ Emily began the lecture promptly on the hour.
□ Cassie took a walk in the park.
□ Phil read the cardinal directions.
□ Jessica sauteed the vegetables for dinner.
□ Robert studies how the seasons change.
□ Carla wiped the counter in the kitchen.
□ Jeremy set up the computer in the office.
□ Candace recycled the fruit trays.
□ Jack cleaned the dishes after lunch.
□ Dan organized the silverware.
□ John turned on the coffee maker.
□ Chloe put the pots of herbs on the porch.
□ Molly stacked the red chairs.
□ Lydia folded the plastic tablecloths.
□ Victoria owns brown flannel sheets.
□ Tristan looked for tea in the cabinet.
□ Francesca sees Kylie packing lunch.
□ Angelina hears the next door neighbor.
□ Claire felt the air conditioning come on.
□ Henry tastes the cinnamon in the cake.
□ Ashley rode a bike to the coffee shop.
□ Sandra answered the house phone.
□ Naomi called the closest bakery.

□ Isabelle packed the skis in the car.
□ Grace looked up at the stars.
□ Jason made a cheeseburger for lunch.
□ Andrew saw fish at the lake.
□ Joyce took the bread out of the oven.
□ Tina waters the plants in the morning.
□ Christina keeps the football in the mantel.
□ Malian read a dinosaur book.
□ You have to cream the butter and sugar, first.
□ Add flour to absorb the excess liquid.
□ A tendon connects muscle to bone.
□ A ligament connects bone to bone.
□ Skin is the largest organ in the body.
□ Functional MRIs are primarily used in research.
□ Proper nouns begin with capital letters.
□ A traffic circle has multiple exits.
□ Heirloom plants are often shared between neighbors.
□ There are twelve months in a year.
□ Leap years occur every four years.
□ I wondered what the name of the street was.
□ The office was one mile from my apartment.
□ We had lunch at noon and then went downtown.
□ I was babysitting my niece when you called.

□ Lily's cousin has bright red hair and freckles.
□ I keep my winter clothes under the bed.
□ She told me to look for markers in the desk.
□ Most of my friends' birthdays are in the winter.
□ The waitress wore a grey shirt and black apron.
□ Parker left me a note on the counter.
□ Stan laughed at my joke about the blonde nurse.
□ The green chair sat facing the brown sofa.
□ The sidewalk was littered with crisp, brown leaves.
□ This morning I went for a run through the park.
□ We ordered a dozen cupcakes on Sunday.
□ The farm on Elm Street sells organic eggs.
□ The charity bake sale sold chocolate chip cookies.
□ My best friend wanted to study math in college.
□ I wore a red jacket to the baseball game.
□ I went to the supermarket to buy milk.
□ John had a physics exam earlier this week.

□ Samantha went to the salon for a haircut.
□ Each summer we rent a cabin on the lake.
□ The bakery on the corner sells apple pie.
□ There are three shoe stores in the mall.
□ My aunt has three daughters and one son.
□ Their dog gave birth to six puppies last spring.
□ We left ten minutes early for the show.
□ The couple bought a house in our neighborhood.
□ She was hired as a new teacher at the school.
□ A recent graduate was hired at the firm.
□ The young sparrow landed on the bird feeder.
□ The cat had been sleeping under our porch.
□ All the waiters wore black pants and white shirts.
□ The leaves on the oak tree change color in the fall.
□ The plane was scheduled to board at noon.
□ The white snow turned to slush in the streets.
□ Peter bought a small candle at the store.

The bumble bee flew through the garden.

8.5 Exposure Score (ES) Questions

I often encounter people who speak this way.
I have teachers who speak this way.
I encounter people speaking this way on a weekly basis.
I do not often encounter people speaking this way.
I grew up around people who speak this way.
I do not now, but once did know people who speak this way
I hear people speak this way in movies and tv.
I do not know anyone who speaks this way.
People in my hometown speak this way.
I have met few people who speak this way.
I live around people who speak this way.
I work/have worked with people who speak this way.
I go to school with/have gone to school with people who speak this way.
I have family members who speak this way.
I have friends who speak this way.
I have friends with relatives who speak this way.
I have had professors/bosses who speak this way.
I have heard people in public speak this way.
I have heard people in my city speak this way.
I have heard people in other cities speak this way.
I have recently heard people speaking this way.
I haven't heard anyone speak this way in quite some time.
I have not been around people who speak this way.

8.6 Familiarity Score (FS) Questions

I am well accustomed to this way of speaking.
I speak this way.
I grew up speaking this way.
I have spoken this way in the past.
This way of speaking sounds ungrammatical to me.
This way of speaking is uncommon where I am from.
This is how my family and I speak.
This way of speaking is common where I'm from.
I speak this way with my friends.
Some people speak this way where I am from.
I can understand most but not all of what this person is saying.
I cannot understand what this person is saying.
I grew up hearing people speak this way.
I can understand little of what this person is saying.
I can understand some of what this person is saying.
I can understand much or all of what this person is saying.
I have heard people speak this way for most of my life.
I have never heard people speak this way in my life.
I have sometimes heard people speak this way in my life.
I am often around people who speak this way.
I am sometimes around people who speak this way.
I am never around people who speak this way.
I easily understand what this person is saying.
This accent sounds very familiar to me.
This accent sounds vaguely familiar to me.
I do not recognize this accent.

8.7 Image Norming for Race and Emotion

(Q3 / Q4) Black Happy 1:
80% responded Black/African American (80/100 people)
15% responded Native American (15/100 people)
5% responded South Asian (5/100 people)
80% responded happy (80/100 people)
15% responded content (15/100 people)
4% responded neutral (5/100 people)
1% responded angrier than all hell (1/100 people)

(Q33 / Q5) Black Angry 1:
89.1% responded Black/African American (90/101 people)
0.99% responded "brown" (1/101 people)
0.99% responded Ethiopian (1/101 people)
0.99% responded south Asian (1/101 people
0.99% responded Asian (1/101 people)

Anger-Associated Words For Angry Black 1 (0%)

Happy-Associated Words For Angry Black 1 (53.46%)
1.98% responded Amused (2/101 people)
0.99% responded Blissful (1/101 people)
1.98% responded Calm (2/101 people)
1.98% responded Cheerful (2/101 people)
4.95% responded Content (5/101 people)
0.99% responded Eager (1/101 people)
0.99% responded Enjoyment (1/101 people)
0.99% responded Excited (1/1oo people)
0.99% responded Friendly (1/1oo people)
29.7% responded Happy (30/101 people)
2.97% responded Hopeful (3/101 people)
0.99% responded Impressed (1/101 people)
0.99% responded Not Sad (1/101 people)
0.99% responded Sanguine (1/101 people)
0.99% responded Serene (1/101 people)
0.99% responded Smile (1/101 people)

Neutral Words (42.57%)
0.99% responded Contemplative (1/101 people)
0.99% responded Aware (1/101 people)
6.93% responded Curious (7/101 people)
0.99% responded "Deep in Thought" (1/101 people)
0.99% responded Alert (1/101 people)
0.99% responded Attentive (1/101 1people)
0.99% responded Awe Struck (1/101 people)

1.98% responded Confusion (2/101 people)
1.98% responded Doubt (2/101 people)
1.98% responded Engaged (2/101 people)
1.98% responded Focused (2/101 people)
1.98% responded Indifferent (2/101 people)
0.99% responded Inquisitive (1/101 people)
5.94% responded Interested (6/101 people)
1.98% responded Intrigued (2/101 people)
0.99% responded Mixed Feelings (1/101 people)
2.97% responded Neutral (3/101 people)
0.99% responded Pensive (1/101 people)
0.99% responded Serious (1/101 people)
0.99% responded Shy (1/101 people)
0.99% responded Studying (1/101 people)
0.99% responded Surprise (1/101 people)
0.99% responded Thoughtful (1/101 people)
0.99% responded Unsure (1/101 people)

10/202 yellow highlighted boxes

(Q6 / Q8) White Angry 1:
2.97% responded Biracial/Multiracial (3/101 people)
77.22% responded White/Caucasian (78/101 people)
0.99% responded European (1/101 people)
4.95% responded Latinx/Hispanic (5/101 people)
0.99% responded “Tan” (1/101 people)

Anger-Associated Words For Angry White 1 (92.07%)
54.45% responded Angry (55/101 people)
2.97% responded Annoyed (3/101 people)
0.99% responded Contempt (1/101 people)
1.98% responded Bothered (2/101 people)
0.99% responded Discontentment (1/101 people)
15.84% responded Disgust (16/101 people)
0.99% responded Displeased(1/101 people)
0.99% responded Extremely Angry (1/101 people)
0.99% responded Frustration (1/101 people)
0.99% responded Furious (1/101 people)
0.99% responded Hatred (1/101 people)
4.95% responded Mad (5/101 people)
0.99% responded Moody (1/101 people)
0.99% responded Peeved (1/101 people)
0.99% responded Pissed (1/101 people)
0.99% responded Sad (1/101 people)
0.99% responded Unhappy (1/101 people)

Happy-Associated Words For Angry White 1 (0%)

Neutral Words (4.95%)
0.99% responded Focused (1/101 people)
0.99% responded Not Sure (1/101 people)
0.99% responded Smug (1/101 people)
0.99% responded Snotty (1/101 people)
0.99% responded Skepticism (1/101 people)

15/202 yellow highlighted boxes

(Q7 / Q10) White Happy 1:
3.96% responded Biracial/Multiracial (4/101 people)
82.17% responded White/Caucasian (83/101 people)
3.96% responded Latinx/Hispanic (4/101 people)

Anger-Associated Words For Happy White 1 (0.99%)
0.99% responded Judgemental (1/101 people)

Happy-Associated Words For Happy White 1 (94.05%)
0.99% responded Content (1/101 people)
0.99% responded Delighted (1/101 people)
83.16% responded Happy (84/101 people)
4.95% responded Joy (5/101 people)
0.99% responded Mirth (1/101 people)
1.98% responded Pleased (2/101 people)
0.99% responded Relaxed (1/101 people)

Neutral Words (0.99%)
0.99% responded Nervous (1/101 people)

14/202 yellow highlighted

(Q11 / Q13) Black Angry 2:
84.15% responded Black/African American (85/101 people)
0.99% responded Asian (1/101 people)
0.99% responded Biracial (1/101 people)
0.99% responded Brown (1/101 people)
0.99% responded Hispanic (1/101 people)

Anger-Associated Words For Angry Black 1 (84.15%)
0.99% responded Aggravated (1/101 people)
47.52% responded Anger (48/101 people)
6.93% responded Annoyed (7/101 people)
0.99% responded Disappointed (1/101 people)

0.99% responded Disapproving (1/1o1 people)
0.99% responded Displeased (1/1o1 people)
0.99% responded Dissatisfaction (1/101 people)
1.98% responded Frustration (2/101 people)
1.98% responded Irritated (2/101 people)
4.95% responded Mad (5/101 people)
0.99% responded Peeved (1/101 people)
0.99% responded Perturbed (1/101 people)
0.99% responded Skeptical (1/101 people)
2.97% responded Unhappy (3/101 people)
0.99% responded Unimpressed (1/101 people)
8.91% responded Upset (9/101 people)

Happy-Associated Words For Angry Black 1 (0%)

Neutral Words (8.91%)
1.98% responded Concerned (2/101 people)
0.99% responded Confusion (1/101 people)
0.99% responded Dubious (1/101 people)
0.99% responded Focus (1/101 people)
0.99% responded Natural (1/101 people)
0.99% responded Pensive (1/101 people)
0.99% responded Questioning (1/101 people)
0.99% responded Serious (1/101 people)

19/202 yellow highlighted

(Q12 / Q14) Black Happy 2:
86.13% responded Black/African American (87/101 people)
0.99% responded Biracial (1/101 people)
0.99% responded Brown (1/101 people)
1.98% responded Hispanic (2/101 people)
Anger-Associated Words For Happy Black 2 (0%)

Happy-Associated Words For Happy Black 2 (96.03%)
0.99% responded Blissful (1/101 people)
3.96% responded Excited (4/101 people)
77.22% responded Happy (78/101 people)
2.97% responded Interested (3/101 people)
7.92% responded Joy (8/101 people)
0.99% responded Proud (1/101 people)
1.98% responded Smile/Smiling (2/101 people)

Neutral Words (0.99%)
0.99% responded Nervous (1/101 people)

13/202 yellow highlighted

(Q15 / Q17) Black Angry 3:
85.14% responded Black/African American (86/101 people)
0.99% responded Brown (1/101 people)
1.98% responded Latinx/Hispanic (2/101 people)
0.99% responded Jamaican (1/101 people)

Anger-Associated Words For Angry Black 3 (55.44%)
0.99% responded Aggravated (1/101 people)
14.85% responded Anger (15/101 people)
7.92% responded Annoyance (8/101 people)
0.99% responded Consternation (1/101 people)
0.99% responded Disappointment (1/101 people)
0.99% responded Disgusted (1/101 people)
0.99% responded Disinterest (1/101 people)
0.99% responded Displeased (1/101 people)
0.99% responded Dissatisfaction (1/101 people)
0.99% responded Doubt (1/101 people)
0.99% responded Dubious (1/101 people)
0.99% responded Frown (1/101 people)
1.98% responded Frustration (2/101 people)
0.99% responded Intimidating (1/101 people)
1.98% responded Irritated (2/101 people)
0.99% responded Judgement (1/101 people)
1.98% responded Mad (2/101 people)
0.99% responded Mischievous (1/101 people)
0.99% responded Offended (1/101 people)
0.99% responded Perturbed (1/101 people)
0.99% responded Sad (1/101 people)
0.99% responded Skeptical (1/101 people)
0.99% responded Stern (1/101 people)
0.99% responded Straight Face (1/101 people)
0.99% responded Suspicious (1/101 people)
6.93% responded Upset (7/101 people)

Happy-Associated Words For Angry Black 3 (6.93%)
0.99% responded Content (1/101 people)
0.99% responded Grin (1/101 people)
0.99% responded Happy (1/101 people)
0.99% responded Romantic (1/101 people)
0.99% responded Slightly annoyed (1/101 people)
1.98% responded Unhappy (2/101 people)

Neutral Words (26.73%)
0.99% responded Calm (1/101 people)

0.99% responded Relaxed (1/101 people)
0.99% responded Cautious (1/101 people)
4.95% responded Concerned (5/101 people)
0.99% responded Determined (1/101 people)
0.99% responded Focused (1/101 people)
0.99% responded Impassive (1/101 people)
1.98% responded Indifference (2/101 people)
0.99% responded Intrigued (1/101 people)
6.93% responded Neutral (7/101 people)
0.99% responded Not Sure (1/101 people)
0.99% responded Pensive (1/101 people)
0.99% responded Questioning (1/101 people)
0.99% responded Sassy (1/101 people)
1.98% responded Serious (2/101 people)
0.99% responded Undecided (1/101 people)
0.99% responded Unmoved (1/101 people)

20/202 yellow highlighted

(Q16 / Q18) Black Happy 3:
85.15% responded Black/African American (86/101 people)
0.99% responded Brown (1/101 people)

Anger-Associated Words For Happy Black 3 (0%)

Happy-Associated Words For Happy Black 3 (96.03%)
0.99% responded Blissful (1/101 people)
0.99% responded Cheerful (1/101 people)
0.99% responded Elated (1/101 people)
0.99% responded Glad (1/101 people)
87.12% responded Happy (88/101 people)
2.97% responded Joyful (3/101 people)
0.99% responded Proud (1/101 people)
0.99% responded Smile (1/101 people)

Neutral Words (0%)

18/202 yellow highlighted

(Q19 / Q21) White Angry 2:
0.99% responded Asian (1/101 people)
82.18% responded White/Caucasian (83/101 people)
0.99% responded Swedish (1/101 people)

Anger-Associated Words For Angry White 2 (81.09%)
0.99% responded Aggravated (1/101 people)

20.7% responded Anger (21/101 people)
7.92% responded Annoyance (8/101 people)
0.99% responded Arrogance (1/101 people)
0.99% responded Bitter (1/101 people)
3.96% responded Contempt (4/101 people)
2.97% responded Disappointed (3/101 people)
0.99% responded Discontent (1/101 people)
0.99% responded Disgruntled (1/101 people)
2.97% responded Disgust (3/101 people)
2.97% responded Displeased (3/101 people)
0.99% responded Doubtful (1/101 people)
0.99% responded Frown (1/101 people)
1.98% responded Frustration (2/101 people)
0.99% responded Impatient (1/101 people)
2.97% responded Irritated (3/101 people)
4.95% responded Mad (5/101 people)
0.99% responded Perturbed (1/101 people)
0.99% responded Pissed (1/101 people)
1.98% responded Sad (2/101 people)
7.92% responded Skeptical (8/101 people)
0.99% responded Slightly Annoyed (1/101 people)
2.97% responded Suspicion (3/101 people)
1.98% responded Unhappy (2/101 people)
0.99% responded Uninterested (1/101 people)
2.97% responded Upset (3/101 people)

Happy-Associated Words For Angry White 2 (0.99%)
0.99% responded Proud (1/101 people)

Neutral Words (12.87%)
0.99% responded Bewildered (1/101 people)
1.98% responded Bored (2/101 people)
2.97% responded Confused (3/101 people)
0.99% responded Curious (1/101 people)
0.99% responded Nervous (1/101 people)
0.99% responded Smug (1/101 people)
0.99% responded Surprise (1/101 people)
0.99% responded Thoughtful (1/101 people)
0.99% responded Unsure (1/101 people)
0.99% responded Concerned (1/101 people)

21/202 yellow highlighted

(Q20 / Q22) White Happy 2:
0.99% responded Asian (1/101 people)
0.99% responded Biracial (1/101 people)

89.11% responded White/Caucasian (90/101)
0.99% responded European (1/101 people)

Anger-Associated Words For Happy White 2 (0.99%)
0.99% responded Arrogant (1/101 people)

Happy-Associated Words For Happy White 2 (82.17%)
1.98% responded Amused (2/101 people)
0.99% responded Cheerful (1/101 people)
6.93% responded Content (7/101 people)
0.99% responded Delighted (1/101 people)
47.52% responded Happy (48/101 people)
4.95% responded Interested (5/101 people)
2.97% responded Joyful (3/101 people)
0.99% responded Lively (1/101 people)
0.99% responded Mildly amused (1/101 people)
0.99% responded Not Sad (1/101 people)
0.99% responded Pleasantly Surprised (1/101 people)
3.96% responded Pleased (4/101 people)
0.99% responded Proud (1/101 people)
0.99% responded Relaxed (1/101 people)
0.99% responded Relieved (1/101 people)
0.99% responded Semi Happy (1/101 people)
0.99% responded Serene (1/101 people)
0.99% responded Slight Happiness (1/101 people)
1.98% responded Smile (2/101 people)

Neutral Words (11.88%)
0.99% responded Bemused (1/101 people)
0.99% responded Incredulous (1/101 people)
1.98% responded Indifferent (2/101 people)
3.96% responded Neutral (4/101 people)
1.98% responded Smirk (2/101 people)
1.98% responded Smug (2/101 people)

13 yellow highlighted

(Q23 / Q25) White Angry 3:
88.12% responded White/Caucasian (89/101 people)
0.99% responded Latinx (1/101 people)

Anger-Associated Words For Angry White 3 (86.14%)
50.5% responded Angry (51/101 people)
1.98% responded Annoyed (2/101 people)
0.99% responded Concern (1/101 people)
0.99% responded Contempt (1/101 people)

0.99% responded Discontentment (1/101 people)
0.99% responded Disgust (1/101 people)
0.99% responded Displeased (1/101 people)
0.99% responded Frown (1/101 people)
4.95% responded Frustration (5/101 people)
1.98% responded Irritated (2/101 people)
5.94% responded Mad (6/101 people)
1.98% responded Peeved (2/101 people)
1.98% responded Rage (2/101 people)
1.98% responded Sad (2/101 people)
0.99% responded Stern (1/101 people)
0.99% responded Stressed (1/101 people)
1.98% responded Unhappy (2/101 people)
4.95% responded Upset (5/101 people)

Happy-Associated Words For Angry White 3(0%)

Neutral Words (8.91%)
0.99% responded Confused (1/101 people)
0.99% responded Deep Thinking (1/101 people)
0.99% responded Focused (1/101 people)
2.97% responded Neutral (3/101 people)
0.99% responded Pensive (1/101 people)
0.99% responded Smirked (1/101 people)
0.99% responded Bored (1/101 people)

15/202 yellow highlighted

(Q24 / Q26) White Happy 3:
90.1% responded White/Caucasian (91/101 people)

Anger-Associated Words For (17.82%)
0.99% responded Angry (1/101 people)
0.99% responded Annoyance (1/101 people)
1.98% responded Anxious (2/101 people)
0.99% responded Apprehensive (1/101 people)
0.99% responded Discomfort (1/101 people)
0.99% responded Frown (1/101 people)
0.99% responded Impatient (1/101 people)
0.99% responded Irritated (1/101 people)
0.99% responded Mixed Feelings (1/101 people)
2.97% responded Sad (3/101 people)
0.99% responded Straight face (1/101 people)
0.99% responded Suspicious (1/101 people)
0.99% responded Uncomfortable (1/101 people)
0.99% responded Uneasy (1/101 people)

0.99% responded Unsure (1/101 people)

Happy-Associated Words For (41.58%)
1.98% responded Amused (2/101 people)
14.85% responded Content (15/101 people)
0.99% responded Delighted (1/101 people)
18.81% responded Happy (19/101 people)
0.99% responded Joy (1/101 people)
1.98% responded Nervous (2/101 people)
1.98% responded Pleased (2/101 people)

Neutral Words (34.65%)
0.99% responded "An awkward bizarre stare" (1/101 people)
0.99% responded Bored (1/101 people)
0.99% responded Calm (1/101 people)
0.99% responded Concerned (1/101 people)
6.93% responded Confused (7/101 people)
0.99% responded Coy (1/101 people)
0.99% responded Curious (1/101 people)
0.99% responded Driven (1/101 people)
1.98% responded Focused (2/101 people)
0.99% responded Gas (1/101 people)
2.97% responded Interested (3/101 people)
0.99% responded Intrigued (1/101 people)
4.95% responded Neutral (5/101 people)
0.99% responded Okay (1/101 people)
1.98% responded Puzzled (2/101 people)
0.99% responded Shy (1/101 people)
0.99% responded Skeptical (1/101 people)
0.99% responded Sneaky (1/101 people)
0.99% responded Startled (1/101 people)
0.99% responded Thinking (1/101 people)
0.99% responded Thoughtful (1/101 people)

16/202 yellow highlighted

Chapter 4 How Do Listeners Form Grammatical Expectations to African American Language?[1]

KEYWORDS: EEG, neurolinguistcs, event-related potentials, African American English

Abstract

Ideologies about standard language in the United States often posit Standardized American English (SdAE) as a morally superior variety (Hill 2008). Previous research has shown that this kind of hierarchical treatment of language varieties leads to negative perceptions of non-standard languages, which in turn makes them stigmatized, and ultimately perpetuates dialect discrimination. This kind of discrimination results in the mistreatment of users of non-standard varieties, which negatively affects the way those speakers can move through the U.S. context (Rickford 1999, Eckert and Rickford 2001, Schilling 2004, Rickford and King 2016). This research investigates how listeners alter their linguistic expectations when hearing SdAE and African American English (AAE) through two Electroencephalography (EEG) experiments. The research question is whether listeners have specific knowledge of the dialect that is not their own (dialect-specific hypothesis), or whether listeners more generally reduce expectations across the board when listening to a dialect or variant that they themselves do not speak (dialect non-specific hypothesis). Experimental sentences were constructed in order to reflect a variant that are grammatical in SdAE, that are grammatical uniquely to AAE, and a grammatical variant that is ungrammatical in all varieties of English. Experiment 1 includes stimuli from a so-called

[1] This chapter is adapted from: Weissler, Rachel Elizabeth and Brennan, Jonathan R. (2020) "How do Listeners Form Grammatical Expectations to African American Language?," University of Pennsylvania Working Papers in Linguistics: Vol. 25 : Iss. 2 , Article 16.

bidialectal Midwestern black speaker of both SdAE and AAE. Experiment 2 includes stimuli from one AAE speaker and one SdAE speaker, both male from the Mid-West. The results do not neately tease apart the hypotheses, but may reflect a nuanced combination of both perspectives: Listeners show differential processing depending on the guise used by the bidialectal male, and also show processing results in alignment with SdAE grammar in Experiment 2 only. These studies indicate that a speaker's identity and language variety may both be taken into account during processing. They also indicate the potential that listeners aren't interacting with or processing SdAE when they interact with it coming from an African American person; though standard features may be evoked, the speaker still "Sounds Black." Through analysis of American Englishes, this work contributes to further understanding of how social information interfaces with online processing, and expectations that may be formed depending on the perceived identity of a voice. Future work seeks to ask how listeners of varied linguistic knowledges of AAE specifically process this syntactic variation, and also disentangling grammatical processing of AAE versus perceiving "Sounding Black."

1. Introduction

Continuing the aims of Chapters 2 and 3 looking at perception and processing within a multidialectal frame, the current study investigates syntactic processing and perception of AAE and SdAE through two EEG experiments. EEG is a method through which researchers can probe how social information influences linguistic processing. The research investigates if and how American English-speaking participants form grammatical expectations during processing that reflect dialect-specific knowledge about Sdae and AAE. This research has theoretical implications for psycholinguistics, syntactic theory, sociolinguistics, as well as direct social implications. With respect to psycholinguistic literature, this research expands the frame through which we understand how languages are processed, investigating two distinct English varieties and ideologies associated with them. This work calls upon psychologists to consider the presence of multiple grammars being accessed during cognition, and how that is borne out and represented during processing. Syntactic theory, the study of mental representations of grammar, can benefit from this research's implications for the possibility of multiple grammars being held by individuals. This study introduces a new method through which to investigate socially meaningful variation and difference that is relevant to questions in sociolinguistics. It offers a concrete online processing tool through which prediction during processing happens, illuminating expectations on behalf of listeners. Using EEG to study issues of language processing, perception, and social identity is beneficial for sociolinguists as it helps us gain better insight into online processing, allowing us to see neural responses at each instantiation of speech produced or processed, which helps us in turn to address central questions about the language faculty itself (e.g. How do we represent grammatical knowledge of dialects that we do or do not speak?).

Additionally, this research delves into the social expectations of listeners, which are particularly stratified in the context of American Englishest. Ideologies about standard language in the United States often posit SdAE as a morally superior variety (Hill 2008). Previous research has shown that this kind of hierarchical treatment of language varieties leads to negative perceptions of non-standard languages, which in turn makes them stigmatized, and ultimately perpetuates dialect discrimination. This kind of discrimination results in the mistreatment of users of non-standard varieties, which negatively affects the way those speakers can move through the U.S. context (Rickford 1999, Eckert and Rickford 2001, Schilling 2004, Rickford and King 2016). Thus, neurolinguistic investigation of these two American Englishes can give insight into how negatively-indexed varieties are associated with overall related expectations, while neutral or positively-indexed varieties may be processed in a dialect specific way.

The chapter is organized as follows: In Section 2, I review the literature that motivates the current research and methods, including research on perception, prediction, and processing. Seconds 3 and 4 concern experiments 1 and 2, respectively. Here, I explain the methods, participants, materials, experimental procedure, analyses, and results of each experiment. Section 5 compares results from both experiments and Section 6 summarizes my conclusions. References are listed in Section 7, followed by supplementary materials in Section 8.

2. Background

2.1 Perception, Prediction, and Processing

Neurolinguistic evidence shows that people invoke prediction during sentence processing (Nieuwland et al. 2019). Electroencephalography (EEG) is one method used by neurolinguists to study this processing. EEG measures electric potentials that are generated by tens of thousands of cortical neurons using electrodes placed on the scalp. Averaging the EEG signal that is

recorded to multiple instances of a specific perceptual event reveals systematic voltage changes associated with the cognitive processes elicited by that event, called the Event-Related Potential (ERP). EEG is useful to linguists because it allows researchers to passively monitor neural activity which reflects implicit and on-line linguistic judgements, including the social expectations of listeners. It also illuminates for researchers when, in real time, expectations on the part of the listener are violated during processing, indicating that prediction is taking place. A great deal of prior work has revealed ERP signatures for semantic and syntactic violations (Swaab et al. 2011). For example, if something is semantically unexpected in a sentence string, a listener will exhibit an increase of negative voltages over the central scalp that peaks around 400 milliseconds after word onset (the "N400"). This has been taken to indicate that the speech signal was processed as a semantic anomaly within 400ms of the onset of the stimulus (Kutas and Hillyard 1980). When a particular morpheme of a sentence violates a syntactic or grammatical expectation, studies reveal a positive voltage spike over the posterior scalp peaking around 600ms (the "P600"), although this late component can be variable in both onset latency and duration (Luck 2005).

2.2 The Influence of Speaker Identity in ERPs

Van Berkum et al. (2008) used the N400 response to investigate the influence of speaker identity and semantic anomalies in Dutch. They included semantic anomaly and speaker-inconsistency sentences to discern if an N400 response would be elicited from both of these sentence types, indicating the influence of speaker identity in ERPs. Semantic anomaly sentences included a word that made the sentence syntactically well-formed but semantically implausible (e.g. "Dutch trains are sour and blue." vs. "Dutch trains are yellow and blue."). Speaker inconsistency sentences were otherwise well-formed sentences that were produced by unexpected actors, e.g. a

male saying something coded as female, someone who sounds upper-class saying something that was coded as lower middle class, and a young child saying something that would be coded as only appropriate for adults to say. An example of this kind of sentence is, “I like a glass of wine before bed,” spoken in a child’s voice (unexpectedly) versus spoken in an adult voice (more expectedly). They found that Dutch listeners showed N400s for semantic anomalies and also speaker inconsistencies, albeit smaller ones for the latter. These results show that speaker identity can be taken into account as early as 200-300 milliseconds after the beginning of the anomalous word. This research supports the hypothesis that people take in perceived speaker information rapidly when processing sentences.

Hanulikova et al. (2012) built on this work by testing how listeners process grammatical errors that are frequent in foreign-accented speech. They found a P600 effect for grammatical violations made by the Dutch-Accented Dutch speaker but did not find such an effect for those same grammatical violations spoken by the Turkish-Accented Dutch speaker. The researchers attributed this result to listeners altering their grammatical expectations depending on how native they perceived the speaker to be of the language that they are using. In addition to using syntactically anomalous stimuli, Hanulikova and colleagues also included semantic anomalous sentences which showed that the N400 effect was present and equal for both accent conditions. This indicates that the semantic content of the foreign-accented speech conditions was processed on par with the native-accented speech. In this case, the grammatical expectations of listeners seemed to be altered based on speaker.

Previous research from Seifeldin et al. (2015) extends findings from Hanulikova et al. (2012) to speakers of non-standard varieties of English. Listeners heard sentences with auxiliaries present and absent in three varieties of American English: SdAE, AAE, and Indian

English (IE). This grammatical phenomenon of auxiliary presence was the feature of focus. Researchers focused on the auxiliary verb "to be" as it appears in sentences like, "My brother, he is working today") that 'is' is the auxiliary. Importantly, the auxiliary must be phonologically overt in SdAE, but may be phonologically covert, i.e. nonexistent, in AAE (e.g. "My brother, he __ working today,")[2]. Like many features of AAE, this aforementioned structure is often stigmatized by listeners. American listeners showed a P600 response to the non-standard utterance from the SdAE speaker, but not for the AAE speaker or for the speaker of IE, which is a non-standard variety that does not share the stigmatized grammatical feature. Listeners altered their expectations for both non-standard varieties, even though covert auxiliary is only grammatical in one of them (AAE).

3. Research Questions and Hypotheses

While there is evidence that listeners modulate their expectations with respect to the grammar of other speakers, prior research does not indicate whether listeners have specific knowledge of a dialect that is not their own, or whether listeners more generally reduce expectations across the board when listening to a dialect or variant that they themselves do not speak. The following EEG studies were designed to test between these hypotheses. To preview our results, we do not see evidence cleanly favoring one, or the other view. Rather, the evidence points to a nuanced version of a mixture of both hypotheses.

[2] It should be noted that auxiliary omission and contraction can happen in SdAE i.e. "You seeing Jane?" to ask if someone is seeing Jane (Hendrick 1982).

4. Experiment 1: Varied Neural Responses to a Single, So-Called Bidialectal Speaker

4.1 Motivation for the study

This experiment was motivated based on Seifeldin et al. (2015) which extends the findings from Hanulikova et al. 2012 to speakers of different varieties of American Englishes showing this same sensitivity to who is talking (in terms of grammar). Following Seifeldin et al. (2015), the grammatical feature of focus in both Experiment 1 and Experiment 2 is the auxiliary verb "to be". The current study includes three conditions; one where this verb is overt, which is typically grammatical in SdAE and in AAE, another where the auxiliary is covert, i.e. nonexistent, which is typically ungrammatical in AAE but not SdAE, and a novel condition in which the auxiliary is overt but ungrammatical in both AAE and SdAE; see Table 4.1 for example stimuli from each of these three conditions.

In this work, I underscore a feature of AAE that happens to be typically ungrammatical in SdAE (save question-formation sentences). While I discuss the cases in which absence of the 'to be' verb is evident, it's important to note that the overt auxiliary BE is also very much part of AAE. Most work on AAE takes the approach that AAE is a compilation of features that are ungrammatical in standardized English. I want to be clear that while I test listener perception of this feature as potentially non-standard and 'ungrammatical' in SdAE, I do considerate to be a valuable aspect of AAE that warrents future study in fuller form beyond that presented here.

4.2 Methods

4.2.1 Participants

31 Ann Arbor residents (17 female, mean age = 22 years, range 18-45 years) participated in the current study. All participants were right-handed based on a Handedness Survey (Oldfield 1971),

had normal or corrected-to-normal vision, and no history of any neurological disorders. Participants were all native speakers of American English language varieties. All participants gave their informed consent and were compensated fifteen dollars per hour for their time and participation. All experimental protocols are in compliance with and underwent review by the Institutional Review Board at the University of Michigan, IRB # HUM00075912.

4.2.2 Materials, Stimuli Construction, and Creation

In order to test the interaction between language variety and auxiliary usage, experimental sentences were constructed to reflect a variant that is grammatical in SdAE, a variant that is grammatical uniquely to AAE, and a variant that is ungrammatical in all varieties of English. The grammatical auxiliary "be," must be overt in combination with the progressive aspect in SdAE but may be omitted in AAE. Alternative auxiliaries like "will" are disallowed in both varieties. Thus, three conditions were created: (1) Auxiliary Present, (2) Auxiliary Absent, and (3) Ungrammatical Variant "will." Examples are shown in the right-hand column of Table 4.1.

All experimental sentences were produced by a bidialectal Midwestern African American male who speaks both SdAE and AAE. The choice to use one speaker was motivated by previous research indicating that multidialectal speakers can be assigned different racial, regional, and even attitudinal impressions depending on the guise or language variety employed (Purnell, Baugh, Idsardi 1999, Lambert et al. 1960). However, as the results will indicate, given Lanehart's (1996) view that all African Americans speak AAE (or as she calls it, AAL), the results are not so cut and dry as to multidialectal speakers getting assigned different impressions depending on guise – their racial identity also influences how they are perceived, such that Black speakers still get recognized as Black, even when using SdAE.

The stimulus creation process is schematized in Table 4.1. The leftmost column shows examples of three sentences that the speaker actually produced, the middle column illustrates how the recordings were spliced together, and the rightmost column displays the result audio file which corresponds to the three conditions described above. The speaker recorded a total of 658 sentences, with 108 sentences produced in both AAE and SdAE, in both the auxiliary present condition and the auxiliary absent condition. Importantly, to create the ungrammatical condition, the speaker was not asked to produce ungrammatical sentences, as this may yield incongruent prosody. Thus, he produced 108 grammatical sentences with the "will" construction across both varieties (i.e. "The clown we hired, he'll blow up balloons tomorrow"). These sentences were then spliced into the critical region of the host sentences, to create the ungrammatical condition sentences. In order to construct carefully controlled sentences with similar acoustic contexts and every stimulus was spliced. Each of the "will" construction sentences included a voiced or voiceless bilabial, alveolar, or velar stop that followed the "will" construction region, which then resulted in sentences that sounded seamless in prosody, despite being ungrammatical. Each sentence had the critical region an average of six words into the sentence.

Table 4.1: Stimulus Creation Process

	Sentences Produced	Sentence-Splicing	Result Sentences
(1)	He got sick, so he's coughing a lot.	"He got sick, so he's" from (2) spliced into (1) before "coughing"	He got sick, so he's coughing a lot.
(2)	He got sick, so he's coughing a lot.	"He got sick, so he" from (2) spliced into (1) before "coughing"	He got sick, so he coughing a lot.
(3)	He got sick, so he'll cough all day most likely.	"He got sick, so he'll" from sentence (3) spliced into (1) before "coughing"	He got sick, so he'll coughing a lot.

The speaker was recorded in a sound-attenuated booth at the University of Michigan, using an AKG C4000B condenser microphone and an Edirol UA-25 audio interface, at a sampling rate of 44,100 Hz. The speaker was paid $20 per hour for his time and participation. Experimental sentences were distributed across two lists, each with 108 sentences, resulting in 216 sentences across all conditions, distributed using a Latin Square design.

4.2.3 Procedure

Upon arrival in the lab, participants signed a consent form and took a Handedness Survey. After being fit with the EEG cap (BrainProducts GmbH)[2], participants were seated about 100 cm in front of a computer screen. The cap was comprised of 61 actively amplified electrodes distributed equidistantly (Easycap "M10" layout) and was centered so that the central sensor (Cz) was evenly positioned between the participant's inion and nasion points on the sagittal plane, and between left and right preauricular points on the coronal plane. Scalp voltages were amplified and digitized using AchiCHamp amplifier at 500 Hz with a low-pass filter at 200 Hz and a high-pass filter at 0.1 Hz. Electrolyte gel was applied to each electrode to minimize impedances (reduce to 25 KOhms) between each electrode and the participant's scalp. Electrodes were also placed on the inside of the right wrist, and above and below the left eye, though only eyeblinks were recorded; the electrode on the wrist, "ground," was for EOG recording. Partiicpants were then fitted with two in-ear earphones (Etymotic Inc. EA-2). Sound levels were set to 45 dB above each individual's hearing threshold, assessed using 1000 Hz tones (300 ms, 100 ms fade in/out). This was followed by a two-minute quality check test, in which the

[2] There is an overarching adequacy of data issue that is paramount to resolve to learn about people with different backgrounds and dimensions in the investigation of multidialectalism. There is a need to develop an electrode system that can collect data matched in quality in service of my scientific goals to look at diverse populations and processing. Etienne et al. (2020) is the only research group that has attempted to approach this issue, offering solutions involving cornrowing hair, which in turn lowers impedances by 10x.

participant was instructed to sit still and stare at a fixation cross on the screen while listening to 120 1000 Hz tones. EEG data were visually inspected to ensure low noise in the data before moving on to the main experiment.

Participants were seated in an isolated booth for the task. The experiment began by looking at a computer screen displaying a black fixation cross on a white field. Participants were told that they would be listening to sentences spoken by a few different people for 15-20 minutes, answering occasional yes/no comprehension questions, and they would have periodic breaks. The stimuli were presented with E-Prime software with an inter-stimulus interval that varied between 900 and 1000 ms.. After each stimulus, there was a one in four chance of seeing a comprehension question. For example, if the stimulus sentence was, “The clown we hired, he blowing up balloons for the kids,” the following question might appear on the screen: “Did the clown blow up balloons for the kids?” The participant would click “y” for yes or “n” for no on the keyboard depending on the answer. Fingers that were used to press y and n were not specified. This was to keep their mind on a task and keep them actively awake. Participants listened to 216 items across all conditions. After the task, they were asked to fill out a Post Experiment Questionnaire which details parts of their language exposure history, although those results are not included in this paper. The total time from start up to clean up took around 1-1.5 hours per participant.

5. Analyses and Predictions

EEG data were analyzed using the Fieldtrip toolbox in MATLAB (Oostenveld et al., 2011). Recordings were divided into epochs around the target point in each sentence. Epochs containing artifacts were visually identified and removed from further analysis. Noisy electrodes were removed by replacing their signal with a weighted average of the signals from adjacent

electrodes. The ERP analysis was time-locked to the onset of the verbal in/ing suffix. Independent component analysis was applied to attenuate artifacts due to blinks and eye-movements (Jung et al., 2000). Averages of each individual's responses at the target point of interest were then submitted to a 2-way ANOVA. Statistical analyses were completed in R.

Predictions for the study are shown in Table 4.2. If listeners form dialect-specific expectations, the presence of the ungrammatical "ll" feature (row 3) should elicit a P600 response when hearing both SdAE and AAE, whereas auxiliary deletion (row 2) should elicit a P600 in SdAE, but not in AAE. Alternatively, if listeners form non-specific predictions, meaning that listeners group all non-standard dialects into an "other" category with relaxed grammatical expectations, neither row 2 or 3 should show a P600 for AAE speech.

Table 4.2: Predictions for Experiment 1

	Example	Acceptability	dialect-specific prediction	non-specific prediction
1	I don't know why she is blushing so hard.	SdAE, AAE	No P600	No P600
2	I don't know why she __ blushing so hard.	AAE	P600 for SdAE	P600 for SdAE
3	I don't know why she'll blushing so hard.	None	P600 for both	No P600 for AAE

6. Results

Figure 4.1 shows the grand average of ERPs across the scalp at the time-locked point which was at the end of the progressive -ing, at 600-900ms. The x axis is time, and the y axis is amplitude in microvolts. The green line is for auxiliary present stimuli such as "she got sick so she [is] coughing a lot," orange is for auxiliary absent stimuli, "She got sick, so she [_] coughing a lot,"

and lavender is for ungrammatical ‘ll stimuli , e.g. “She got sick so she[’ll] coughing a lot.” The central electrodes were where the analysis was conducted, averaged across all 31 participants. The SdAE results show the auxiliary present and absent conditions do not elicit a P600, but the ungrammatical auxiliary does elicit a P600 of about 1 microvolt. There is not any evidence for a P600 in the AAE condition; this is shown in the right-hand panel of Figure 4.1.

A 2-way repeated measures ANOVA showed a main effect of language variety, SdAE versus AAE, $F(1,30) = 15.7$, $p < 0.01$, but no main effect of auxiliary, $F(2, 60) = 7.7$, $p = 0.6$, and no significant interaction, $F(2,60) = 1.0$, $p = 0.3$.

This replicates the AAE result from the pilot work in the CNL lab which did not show an effect for varied auxiliaries across AAE or IE. While the pattern for AAE is consistent with “non-specific” dialect predictions, the SdAE results present a more nuanced picture. These are explained in more detail below. These results are consistent with the ‘relaxed expectations’ theory which is also discussed below.

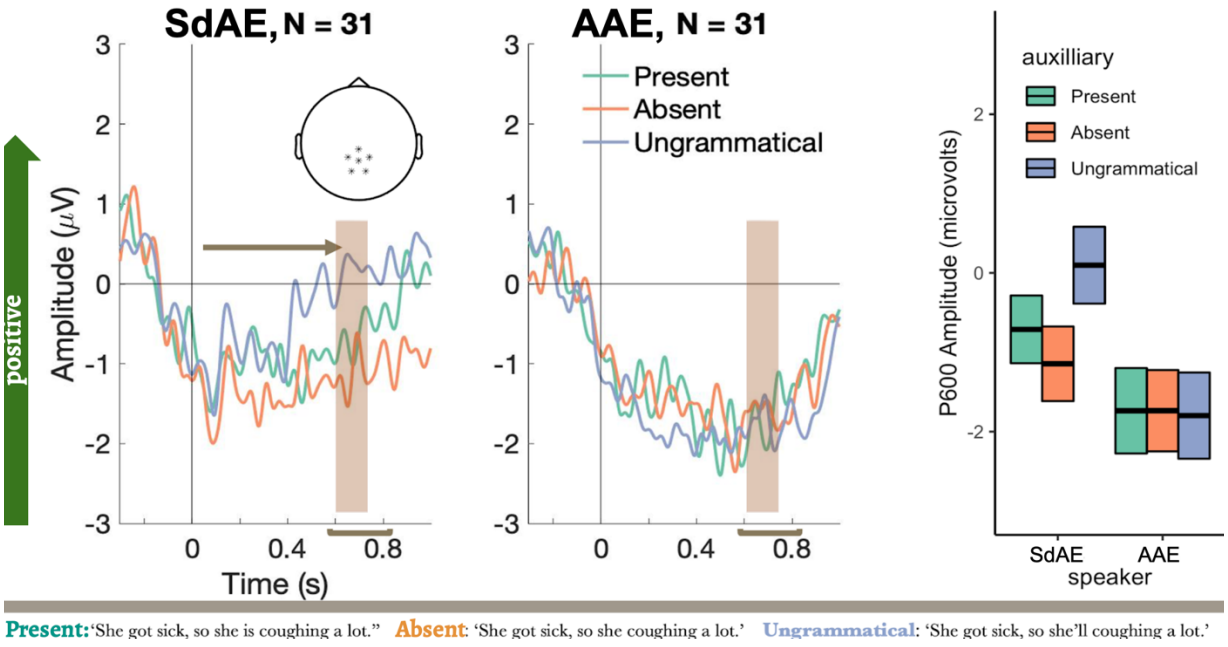

Figure 4.1: Event-related potentials from the centro-posterior electrodes for Experiment 1, time-locked to the onset of the "-ing/-in" segment, are shown separately for the SdAE stimuli (left) and the AAE stimuli (right).

For the SdAE results, the data show an increased positivity for the "ungrammatical" condition, relative to the "auxiliary present" condition, and an increased negativity for the "auxiliary absent" condition. The 2-way ANOVA indicates that participants are processing these two dialects differently, but the statistics do not support connecting this difference in processing to the auxiliary variation; although, there is a visually-apparent pattern such that the SdAE results show a P600 when listeners heard an ungrammatical stimulus (e.g. "The clown, he['ll] blowing up balloons at the party."), no P600 was observed for either of the other auxiliary conditions (e.g. "The clown, he['s] blowing up balloons at the party," and, "The clown, he [_] blowing up balloons at the party.").

One explanation for the results is that listeners are hearing multiple conflicting aspects of grammar coming from the bidialectal individual. It is possible that the use of one speaker across both language varieties might have caused some confusion for the listeners. Though the stimuli from the bidialectal speaker were not phonetically nor prosodically analyzed, auditory confirmation from the researcher and their PI confirms that the prosody of the speaker in both conditions indexBlackness, which could have made the identity of the speaker ambiguous or unclear to participants.

While the AAE results do not show a difference in effect across the auxiliaries, the SdAE speech does show a classic P600 for the ungrammatical auxiliary. It seems as though listeners grant acceptability for the sentences without phonological content in the auxiliary position, while still recognizing that the ungrammatical condition was unallowable. This leads to the likelihood of different varieties of AAE being present, such as a "Black-Accented Standard" variety. Middle-class speakers of AAE may use intonational features of AAE more than the morphosyntactic ones (Holliday & Villarreal 2020, Weldon 2021). Thus, it is likely that when listeners heard the SdAE stimuli from this speaker, they did not hear a White SdAE speaker which resulted in no surprisal to auxiliary absent, but rather could perceive a Black individual using SdAE. This is interesting implications for what listeners assume about speaker identities. The results from this study are consistent with the specific result from Hanulikova et al. (2012) which showed that listeners altered their expectations based on "foreign-soundingness," and in the case of this Experiment 1, "non-standard-soundingness." A comparative follow-up study (Section 5) was run to compare participant responses to the SdAE speech from the bidialectal individual to SdAE speech from a monolingual Midwestern White man.

7. Experiment 2: Varied Neural Responses to SdAE Speaker and AAE Speaker

7.1 Motivation for the study

This experiment was motivated by results from Experiment 1, wherein listeners did not show on average a P600 to auxiliary absence in SdAE. This could be due to the fact that stimuli came from a Black bidialectal male, which could have been recognized by listeners during processing. In Experiment 2, AAE stimuli from the same bidialectal individual were used. SdAE stimuli came from a monodialectal Midwestern American man.

7.2 Methods

7.2.1 Materials, Procedure, and Participants

All materials and procedures remained identical to those used in Experiment 1, with the exception of the SdAE stimuli, which were recorded by a monodialectal white male from the Mid-West. All new stimuli were spliced in the same way as Experiment 1. 24 Ann Arbor residents participated in Experiment 2. All participants were right-handed based on a Handedness Survey (Oldfield 1971), had normal or corrected-to-normal vision, and no history of any neurological disorders. Participants were all native speakers of American English varieties. All participants gave their informed consent and were compensated fifteen dollars per hour for their time and participation. All experimental protocols are in compliance with and underwent review by the Institutional Review Board at the University of Michigan, IRB # HUM00075912.

7.2.2 Analyses and Predictions

Individuals' responses to both varieties were submitted to EEG processing in MatLab. The same predictions for Experiment 1 were held for Experiment 2, shown in Table 4.2. It was predicted

that if listeners form dialect-specific expectations, the presence of the ungrammatical "ll" feature (row 3) should elicit a P600 response when hearing both SdAE and AAE, whereas auxiliary deletion (row 2) should elicit a P600 in SdAE, but not in AAE. Alternatively, if listeners form non-specific predictions, meaning that they group all non-standard dialects into an "other" category with relaxed grammatical expectations, neither row 2 or 3 should show a P600 for AAE speech.

8. Results

Figure 4.2 shows the grand average of ERPs across the scalp at the time-locked point, at 600-900ms.

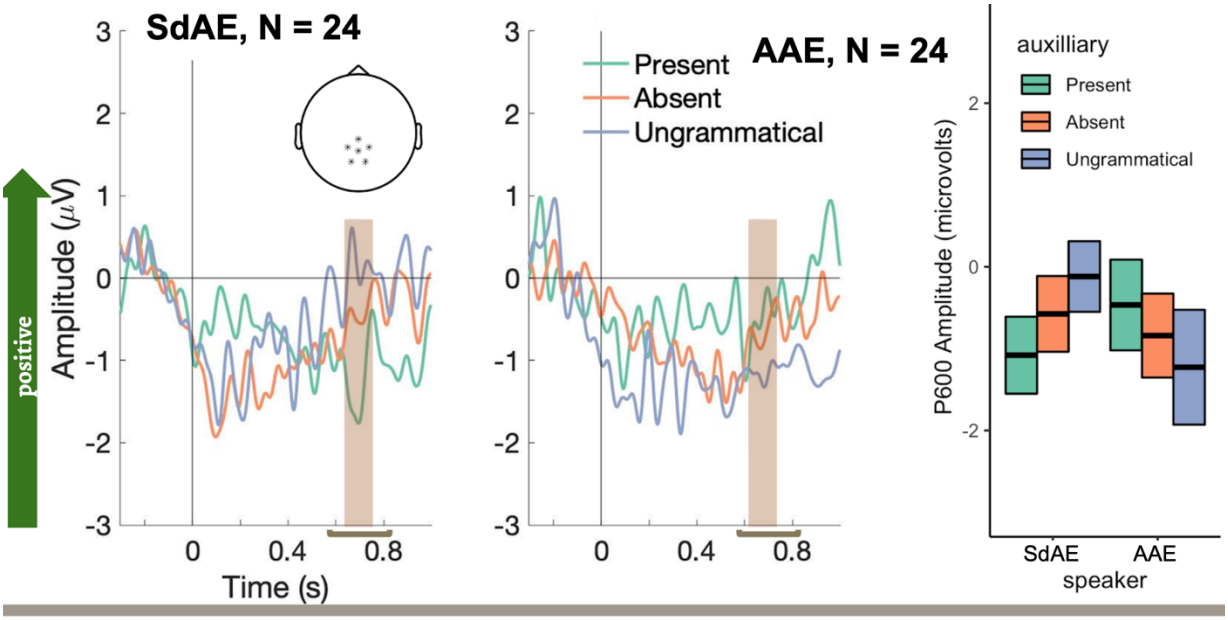

Figure 4.2: Event-related potentials from the centro-posterior electrodes for Experiment 2, time-locked to the onset of the "-ing/-in" segment, are shown separately for the SdAE stimuli (left) and the AAE stimuli (right).

In this study, participants treated the SdAE stimuli in alignment with the predictions in Table 4.2, where auxiliary present sentences do not show unexpectedness, but auxiliary absent sentences and ungrammatical ‘ll sentences do. For the AAE condition listeners again did not show P600s for the auxiliary present, absent, or ungrammatical conditions. As with Experiment 1, these results indicate that listeners are treating our two speakers differently. By bringing in the monodialectal speaker of SdAE, expected neural responses based on the grammaticality of SdAE are borne out as it relates to auxiliaries. The AAE condition, however, does not show any systematic differences in neural response across condition. Noticeable spikes on the graphs in Figure 4.2 may look differentiated, but they are not statistically reliable. A 2-way repeated measures ANOVA showed no statistically reliable interaction, $F(2,46) = 1.2$, $p > 0.25$, and a post hoc test looking at differences with respect to auxiliary in SdAE also did not show an effect of auxiliary, $F(2,46) = 1.1$, $p > 0.25$. Thus, the results here are to be taken with caution as they relate beyond this sample. The topography map in Figure 4.3 looks closer at each 200 ms interval side by side during processing.

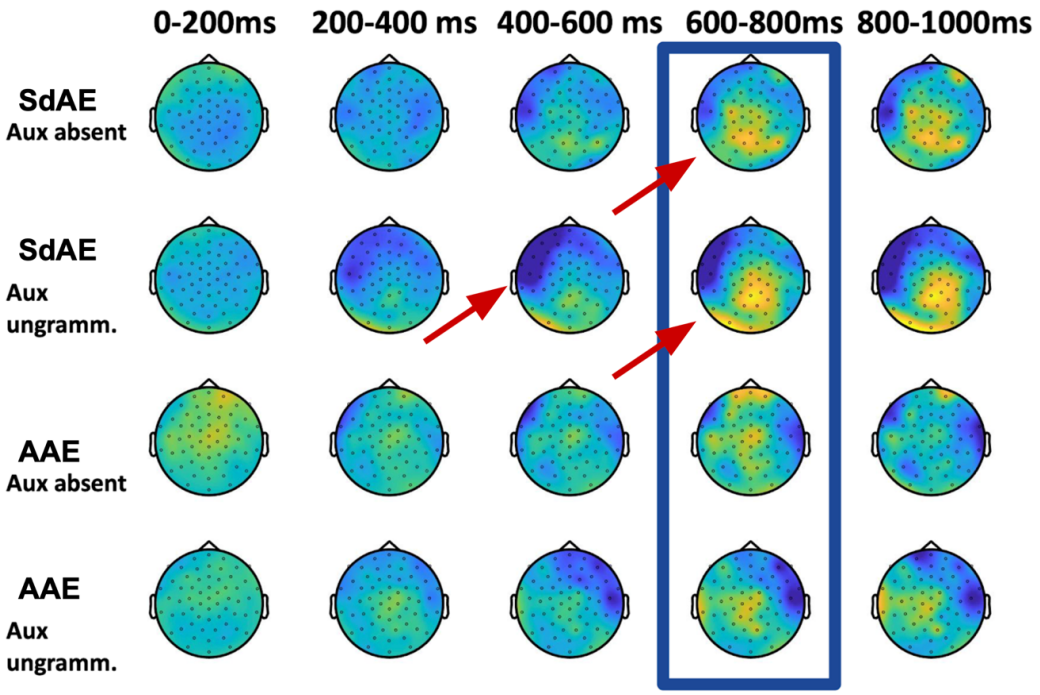

Figure 4.3: This topography map shows the average across all 24 listeners around the trigger point of interest for the P600. This is a composite of all participants averaged over time and at these time points. The color blue indicates negativity and yellow indicates positivity. Looking at this graph in the boxed area of interest, there is evident positive activity in the SdAE absent and ungrammatical conditions which is indicated by yellow for positivity, as indicated with red arrows. The AAE conditions do not share this vivid positive activity. Additionally, the SdAE ungrammatical condition includes a left anterior negatively (or the LAN), indicated by a red arrow. The LAN is indicated by the big blue negativity splotch on the left side of the head. This is a familiar effect for these types of violations (Hoen & Dominey 2000).

As the analysis for Experiment 2 was focused on the P600 effect, so there is ongoing work looking at the LAN to figure out what it might mean as a result of this incidental finding. Overall, this research results in a kind of replication like Hanulikova et al. (2012) when dealing with multiple varieties of the same language, one of which is more stigmatized.

Results from Experiments 1 and 2 indicate that listeners treat speech differently depending on the identity of the speaker and presumptions made about those various identities both with speech from within one bidialectal individual and across two speakers. Differences

with respect to identity of participant was not considered for this analysis, but should be considered for future work along with their experience with AAE.

9. Discussion

It is clear from Experiments 1 and 2 that listeners pay attention to who is speaking, and that information guides them in some way during processing. Experiment 1 showed that a single speaker's speech can be processed differently based on neural responses, while also evidencing that an AAE-speaking bidialectal individual is not likely being perceived as a white SdAE speaker when using SdAE but likely as a Black person using SdAE. Experiment 2 shows that a monolingual white SdAE-speaking man and Black AAE-speaking man's speech are processed differently, which could be based on variety of English or on individual speaker. Multiple speakers of each variety included in the stimuli would help clarify these findings.

Results from these experiments again illuminate the normativity of SdAE for American English-speaking listeners. The way in which the participants processed SdAE speech differently from AAE speech based on expectations exemplifies an ideological association with SdAE forms as 'normative.' In turn, AAE speech is treated cognitively differently with respect to this feature, and also different from SdAE speech coming from a Black individual versus a white individual.

These two experiments indicate that American listeners reduce syntactic expectations across the board to the minoritized speaker in general (Experiment 1) and minoritized variety (Experiment 2), meaning that they do not show any differential discernment neurally between grammatical and ungrammatical forms, in this case with respect to auxiliary. When listeners process "anomalies," we see disruptions in that normativity, evidencing the cognitive expistence of unmarked norm.

Results of these studies evidence two kinds of violations. First, there is a clear difference in how listeners process SdAE and AAE produced by a diglossic speaker, which suggests that people can discern language varieties even intralinguistically i.e., from the same speaker. Second, it seems that when normative expectations for a Black voice are violated (Black speaker with many features at their disposal, particularly some associated with SdAE), listeners may not grant fluidity between language varieties to the speaker. This again points to how speaker identity and a speaker's language variety considered in tandem during processing.

There are still many questions about the results of this study. For example, whether or not individuals have specific knowledge of AAE or whether they bin it into an "other" category in which they choose not to engage or process is still up for debate. It once again calls into question this idea of sounding Black versus hearing AAE. This gets at some theoretical questions of the scope of AAE in general i.e. what constitutes AAE? Is it just the syntactic, phonological, and morphological features? What about prosody indicates Blackness to listeners? Much more work needs to be done to clarify differences between AAE grammar and Sounding Black

The previous chapters look specifically at prosody, and it is possible here that although prosody was not considered for analysis, it is a relevant factor that indicates differences to listeners within the so-called 'bidialectal speaker.' The framing of the experiment originally conceptualized the speaker as bidialectal, switching from AAE to SdAE. Building on the findings from Chapter 2 and 3, the current study finds that Black speakers are recognized as Black, even when they employ standard forms.

Tano (2021) used this project's so-called 'bidialectal speaker' stimuli in her undergraduate thesis and found that participants perceived the speaker as 'Blacker' and warmer when he used AAE, but more competent when using SdAE forms. She also found that native

AAE speakers and Latinx participants provided the most positive evaluations. This is indicative of cognitively processing the two speech patterns differently, and still, the open question of specifically processing two different varieties of English remains open. Tano (2021) is just one example of working critically with a speaker with variable speech patterns and looking at perceptions of those.

Research presented in this chapter opens the doors to some issues that are not agreed upon in the African American English literature: it has been widely accepted that a speaker can switch their speech and somehow their racial identity is erased. However, the findings from this and the previous chapters, along with the theoretical claim from Lanehart (1996) that every African American speaks a version of AAE (or AAL as she calls it) by virtue of being a Black person, these findings provide space for further research to be done that probes this and other claims which are blatantly accepted about African American English and perception.

Future work could benefit from looking at an overt feature of AAE i.e., stressed remote past BIN rather than auxiliaries which don't always have phonological content in their grammatical context. Given that learning happens over time in EEG studies, it could also be beneficial to make predictions about varied responses between the first half and second half of the study as it relates to habituation. Additionally, a researcher could include another English variety, such as British English, to clarify whether or not people are tuning into grammatical knowledge or if they tune out unfamiliar speech. This body of work would benefit from atten to listeners' sociolinguistic knowledge, which facilitates varied processing from individual to individual. Finally, using multiple speakers of each variety of English would be beneficial in the experimental setting to help determine the extent to which the results are reflective of participants' responses to the variety vs. to the individual speaker themselves.

10. Conclusion

This chapter shows that people use their linguistic and social knowledge to make decisions during language processing. The two experiments provide evidence that American English varieties are treated differently cognitively by listeners. As evidenced here and in Chapter 3, implicit processing models have the potential to illuminate fine-tuned understanding of variation in processing, such as the theoretical implication that including multiple dialects within a model of language is paramount to capture a model of language, and a frame that assumes monolingualism is insufficient. Here, EEG was incorporated as a chosen method to show not only how individuals process multidialectal linguistic input, but also how the human language faculty accommodates diversity across a range of individuals. This type of research brings a more representative lens of the human population within the cognitive sciences. In the pursuit of a cognitive model with dialect-rich speakers and communities, this multi-method neurolinguistic and sociolinguistic approach furthers our understanding of how the human language faculty is capable of recognizing and processing language within a multidialectal frame.

11. References

Eckert, Penelope, and John R. Rickford. 2001. *Style and sociolinguistic variation*. New York: Cambridge University Press.

Etienne, Arnelle, Tarana Laroia, Harper Weigle, Amber Afelin, Shawn K Kelly, Ashwati Krishnan, Pulkit Grover. 2020. Novel Electrodes for Reliable EEG Recordings on Coarse and Curly Hair. *Preprint Server for Biology, not yet certified by peer review.*

Hanuliková, Adriana., Petra.M. van Alphen, Merel M. van Goch, Andrea Weber. 2012. When one person's mistake is another's standard usage: The effect of foreign accent on syntactic processing. *Journal of Cognitive Neuroscience* 24: 878–887.

Hendrick, Randall. 1982. Reduced Questions and Their Theoretical Implications. *Language,* 58:4, 800-819.

Hill, Jane. 2008. *The Everyday Language of White Racism*. Massachusetts: Wiley-Blackwell Publishing.

Jung, T. P., Makeig, S., Humphries, C., Lee, T. W., McKeown, M. J., Iragui, V., & Sejnowski, T. J. (2000). Removing electroencephalographic artifacts by blind source separation. Psychophysiology, 37(2), 163–78.

Sejnowski. 2000. Removal of eye activity artifacts from visual event-related potentials in normal and clinical subjects. *Clinical Neurophysiology* 111:1745–1758.

Kutas Marta, Hillyard SA. 1980. Reading senseless sentences: Brain potentials reflect semantic incongruity. *Science*, 207:203–5.

Kutas, Marta, Kara D. Federmeier, Thomas P. Urbach. 2014. The 'negatives' and 'positives' of prediction in language. *The Cognitive Neurosciences* 5: 649-656.

Lambert, William R., Richard Corrin Hodgson, Richard C. Gardner, Samuel Fillenbaum. 1960. Evaluational reactions to spoken languages. *The Journal of Abnormal and Social Psychology* 60: 44-51.

Luck, Steven. J. 2005. *An introduction to the event-related potential technique.* Massachusetts: MIT Press.

Nieuwland, Mante S.,Dale J. Barr, Federica Bartolozzi, Simon Busch-Moreno, Emily Darley, David I. Donaldson, Heather J. Ferguson, Xiao Fu, Evelien Heyselaar, Falk Huettig, E. Matthew Husband, Aine Ito, Nina Kazanina, Vita Kogan, Zdenko Kohút, Eugenia Kulakova, Diane Mézière, Stephen Politzer-Ahles, Guillaume Rousselet, Shirley-Ann Rueschemeyer, Katrien Segaert, Jyrki Tuomainen, Sarah Von Grebmer Zu Wolfsthurn. 2019. Dissociable effects of prediction and integration during language comprehension: Evidence from a large-scale study using brain potentials. Philosophical Transactions of the Royal Society B: Biological Sciences.

Oldfield, R. C. 1971. The assessment and analysis of handedness: the edinburgh inventory. *Neuropsychologia* 9:97–113.

Oostenveld, Robert, Pascal Fries, Eric Maris, Jan-Mathijs Schoffelen. 2011. Fieldtrip: Open source software for advanced analysis of MEG, EEG, and invasive electrophysiological data. *Computational Intelligence and Neuroscience* 1(1-9).

Perrin, F., J. Pernier, Oliver Bertrand, Marie-Hélene Giard, J.F. Echallier. 1987. Mapping of scalp potentials by surface spline interpolation. *Electroencephalography Clinical Neurophysiology* 66: 75–81.

Purnell, Tomas, William Idsardi, John Baugh. 1999. Perceptual and Phonetic Experiments on American English Dialect Identification. *Journal of Language and Social Psychology* 18:

10-30.

Rickford, John R. and Sharese King. 2016. Language and linguistics on trial: Hearing Rachel Jeantel (and other vernacular speakers) in the courtroom and beyond. *Language* 92: 948-988.
Rickford, John. 1999. The Ebonics controversy in my backyard: A sociolinguist's experiences and reflections. *Journal of Sociolinguistics* 3: 257-266.

Seifeldin, M., Cantor, M., Boland, J., & Brennan, J. (2015) They dropping copulas: salient cues in the integration of speaker identity and syntax. Poster presented at the 28th annual CUNY Conference on Human Sentence Processing, Los Angeles, CA, March 2015.

Schieffelin, Bambi, Kathryn Ann Woolard, Paul V Kroskrity. 1998. *Language ideologies : practice and theory*. New York: Oxford University Press.

Schilling, Natalie. 2004. Constructing Ethnicity in Interaction. *Journal of Sociolinguistics* 8: 163-195

Swaab, Tamara Y., Kerry Ledoux, C. Christine Camblin, and Megan A. Boudewyn. 2011. Language-Related ERP Components. The Oxford Handbook of Event-Related Potential Components, 1-73.

Tano, Marie. 2021. Does Blackness have a Sound? Raciolinguistic Expectations of a Bidialectal Speaker. *An undergraduate thesis submitted to Pomona College.*

Van Berkum, Jos. J. A., Danielle van den Brink, Cathelijne M. J. Y. Tesink, Miriam Kos, and Peter Hagoort. 2008. The neural integration of speaker and message. *Journal of Cognitive Neuroscience* 20: 580–591.

Weldon, Tracy. 2021. "Middle Class African American English." Cambridge: *Cambridge University Press*.

12. Supplementary Materials

12.1 Stimuli Sentence List

1. The clown we hired, he (is) blowing up balloons for the kids.
2. I don't know why she (is) blushing so hard.
3. We made the salad, and she (is) boiling water for the pasta.
4. I like the teacher, but class, (is) boring me to death.
5. He moves to Maine next month, so he (is) breaking up with his girlfriend.
6. She doesn't feel well, so she (is) brewing some chamomile tea.
7. We will be up all night, so he (is) brewing coffee for all of us.
8. You bring the stuffing because she (is) bringing the turkey.
9. My little sister, she (is) brushing her teeth right now.
10. He went to the bathroom; he (is) brushing his teeth.
11. Her old hairbrush broke so she (is) buying a new one today.
12. Tell her if you found your tablet because she (is) buying you a new one online right now.
13. We need extra help, so he (is) calling his brother to see if he can come.
14. He just arrived so he (is) calling his mother to tell her he landed safely.
15. She went to park the car and he (is) checking in to the hotel.
16. He spilled some sauce, so he (is) cleaning the counter now.
17. My cousin from New York, he (is) competing in the big race next week.
18. The computer came in, and he (is) connecting the Wi-Fi now.
19. The woman in the corner, she (is) cooking with her daughter.
20. She leaves for college soon so she (is) counting the days until she leaves.
21. She fried the bacon, and he (is) cracking eggs for his omelet.
22. They want to make posters, so he (is) cutting big sheet of paper for them.
23. It's down to the wire and she (is) debating which college is best.
24. It's almost Christmas time so she (is) decorating the house.
25. He forgot his box so she (is) delivering it.
26. She went to the kitchen and she (is) dicing onions now.
27. The chocolate melted and she (is) dipping the marshmallows in it.
28. Look for her in the basement; she (is) doing the laundry.
29. The due date is soon, so he (is) doing his term paper all of today.
30. She can't hear you because she (is) doing laundry in the basement.
31. She wants to play later, so she (is) doing her homework now.
32. He doesn't know her well, so he (is) doubting the truth of what she said.
33. The girl who owns that shop, she (is) drinking coffee down the street.
34. I don't know how she (is) drinking tea in this weather.
35. Tell me what car she (is) driving so I can look out for her.
36. You scared her so no wonder she (is) gasping for air.
37. We didn't eat today, so she (is) getting lunch for the whole office.
38. The race starts soon, so he (is) getting ready to go.

39. He went to the library since he (is) getting ready for a research project.
40. She did summer school and she (is) getting good grades now.
41. The baby is crying and she (is) giving mom a really bad headache.
42. Don't bother Sarah, she (is) giving herself the day off today.
43. Say goodbye, because he (is) going to Chicago next week.
44. She has to pack for her trip; she (is) going out of town tomorrow.
45. Nobody can believe she (is) going to Harvard in the fall.
46. The boy over there, he (is) good-looking, but I don't trust him.
47. I look over and she (is) grinning like she just won the lottery.
48. In anticipation of her travels, she (is) keeping a diary.
49. She got engaged but she (is) keeping it a secret.
50. We got locked out so he (is) keying in the passcode.
51. See that baby fussing? She (is) kicking and screaming!
52. We want to dance but he (is) killing the vibe.
53. Rachel can't come because she (is) packing today until past seven.
54. They leave for Boston soon, so he (is) packing the trunk of the car.
55. She bought new brushes because she (is) painting the deck today.
56. I paid last time, so he (is) paying the electricity bill this month.
57. He spilled rice everywhere so he (is) picking up the grains off the floor.
58. Classes start next week, so she (is) picking out a first day outfit.
59. They just got engaged and she (is) picking out the ring with him right now.
60. She ordered the cake and now she (is) picking out her wedding dress.
61. She has the baby so she (is) piling her suitcase with diapers.
62. Over there in the field, he (is) pitching the big tent.
63. When she looks like that, I know she (is) placing judgment.
64. She needs more forks because she (is) planning a party for a lot of people.
65. She started campaigning; she (is) planning to run for city council.
66. He wants to get better at chess, so he (is) playing against himself right now.
67. My best friend Bobby, he (is) playing in the back yard.
68. My little sister Lauren, she (is) playing with a red pony.
69. Don't turn off the Xbox, he (is) playing his game and he didn't save.
70. He got a great photo so he (is) posting the picture online.
71. My teenage brother, he (is) practicing driving.
72. She went out for more bread because she (is) preparing dinner for everyone.
73. He wrote a speech because he (is) presenting at the banquet tonight.
74. Her mother knows she (is) pretending to have a cough.
75. She has fair skin so she (is) protecting herself from the sun.
76. I want that silver dress she (is) purchasing because it would go with my new shoes.
77. She has a big date tonight, so she (is) putting on her makeup in the bathroom.
78. It got cold outside, so she (is) putting on a hat.
79. I can't tell what he (is) putting up on the chalkboard.
80. Your mother wants you in the kitchen; She (is) putting together a salad.
81. The birthday cake, she (is) putting icing on it now.
82. The party starts soon, so she (is) putting the stereo outside.
83. The button fell off, so she (is) tacking it back on to my shirt.
84. Her car broke down so she (is) taking the train today.

85. She wants a souvenir so he (is) taking her picture by the water.
86. Today is garbage day so he (is) taking the trash out to the curb.
87. She went to pack because she (is) taking a trip to Miami tomorrow.
88. He broke his leg last week so he (is) taking the elevator.
89. She wants to learn to draw so she (is) taking a class at the art center.
90. It's sunny outside so she (is) taking a walk in the park.
91. I didn't ask her to, but she (is) taking the trash out.
92. We ran into our friend; he (is) taking the apartment upstairs.
93. He needed a tutor so she (is) taking him to the after school program
94. He got sick so he (is) taking the day off today.
95. She wants to bake cookies, so she (is) talking about getting supplies from the store.
96. The Internet went out, so she (is) talking to the cable company.
97. He made a gourmet meal while she (is) talking on the phone.
98. She wants new high heels so she (is) talking to the sales rep.
99. Sorry, sir, but he (is) taller than the maximum height to ride the coaster.
100. She used to waitress, but she (is) teaching now.
101. Just so you know, she (is) testing out cars today.
102. Bring him a step stool please; He (is) testing my patience.
103. Something happened at school so she (is) texting her mom to let her know.
104. Since the tent is up, she (is) toasting all of the marshmallows.
105. She came from California so she (is) toughing out this winter.
106. He gets up early because he (is) training for the marathon.
107. She really wants to win, so she (is) training hard for the big race.
108. He used to be scared to fly, but he (is) traveling all over now.
109. At the hospital she (is) treating her burn.
110. She pulled an all-nighter and she (is) trying to stay awake.
111. He failed the last exam but he (is) trying hard to do better.
112. He had a cancer scare, so he (is) trying to quit smoking.
113. Her soap opera ended, so she (is) trying to find another show.
114. I need the password; she (is) trying to connect to the Wi-Fi.
115. Working out? No, he (is) trying to though.
116. She ran out of room, so she (is) trying to wipe the chalkboard clean.
117. He fell onto the couch and he (is) turning on the television.
118. Don't worry about the sink knob, it (is) twisting fine now.
119. The paper is due soon, so he (is) typing as fast as he possibly can.
120. He sits in court right there when he (is) typing the official transcript.

Future Tense ('ll) Suffix Stimuli

1. The clown we hired, he'll blow up balloons tomorrow.
2. I don't know why she'll blush every time she sees him.
3. We made the salad, and she'll boil some water soon.
4. I like the teacher, but class'll bore me half to death.
5. He moves to Maine next month, so he'll break up with her soon.
6. She doesn't feel well, so she'll brew some tea later.

7. We will be up all night, so he'll brew some tea soon.
8. You bring the stuffing because she'll bring the turkey later.
9. My little sister, she'll brush her teeth as soon as she's done cleaning.
10. He went to the bathroom; he'll brush his hair in the mirror.
11. Her old hairbrush broke so she'll buy a new one soon.
12. Tell her if you found your tablet because she'll buy another one otherwise.
13. We need extra help, so he'll call his brother other.
14. He just arrived so he'll call his mom soon.
15. She went to park the car and he'll check on her in a few minutes.
16. He spilled some sauce, so he'll clean that up in no time.
17. My cousin from New York, he'll compete in the meet next week.
18. The computer came in, and he'll connect it to Wi-Fi in the morning.
19. The woman in the corner, she'll cook with her daughter every Sunday.
20. She leaves for college soon so she'll count the days until then.
21. She fried the bacon, and he'll crack the eggs when he gets back.
22. They want to make posters, so he'll cut poster board later.
23. It's down to the wire and she'll debate with him for hours.
24. It's almost Christmas time so she'll decorate the house this weekend.
25. He forgot his box so she'll deliver it tomorrow.
26. She went to the kitchen and she'll dice tomatoes if the mood strikes her.
27. The chocolate melted and she'll dip pretzels in it once she buys some.
28. Look for her in the basement; she'll do laundry down there sometimes.
29. The due date is soon, so he'll do everything in his power to finish on time.
30. She can't hear you because she'll do anything to tune you out.
31. She wants to play later, so she'll do whatever she can to see you.
32. He doesn't know her well, so he'll doubt anything she says.
33. The girl who owns that shop, she'll drink one coffee a day.
34. I don't know how she'll drink all that iced tea.
35. Tell me what car she'll drive in California.
36. You scared her so no wonder she'll gasp every time she sees you.
37. We didn't eat today, so she'll get hungry soon no doubt.
38. The race starts soon, so he'll get ready soon.
39. He went to the library since he'll get a prize each time he goes.
40. She did summer school and she'll get a certificate in the mail.
41. The baby is crying and she'll give her a bottle if he doesn't stop.
42. Don't bother Sarah, she'll give you a call when she can.
43. Say goodbye, because he'll go away and not tell anyone.
44. She has to pack for her trip; she'll go crazy if she forgets something.
45. Nobody can believe that she'll go out of town with no suitcases.
46. The boy over there, he'll get what's coming to him.
47. I look over and she'll grin like she has a secret.
48. In anticipation of her travels, she'll keep a diary.
49. She got engaged but she'll keep it a secret.
50. We got locked out so he'll key in the passcode when he gets home.
51. See that baby fussing? She'll kick and scream forever if you don't get her a bottle!
52. We want to dance but he'll kill me if I drag him onto the dance floor.

53. Rachel can’t come because she’ll pack more than we can fit into the car.
54. They leave for Boston soon, so he’ll pack his bag tonight.
55. She bought new brushes because she’ll paint with her protégé tomorrow.
56. I paid last time, so he’ll pay for me I’m sure.
57. He spilled rice everywhere so he’ll pick it up when he gets back.
58. Classes start next week, so she’ll pick out a nice outfit tonight.
59. They just got engaged and she’ll pick out the ring soon.
60. She ordered the cake and now she’ll pick the dress.
61. She has the baby so she’ll pile as much as she can fit into her car.
62. Over there in the field, he’ll pitch the tent.
63. I forgot I have her my hat but I know she’ll place it back on the shelf when she’s done.
64. Denise isn’t good with money, she’ll plan a whole trip with money she does not have.
65. I have no doubt that she’ll plan a strategy before she starts campaigning.
66. He wants to get better at chess, so he’ll play against himself until he gets tired.
67. My best friend Bobby, he’ll play guitar for you anytime you’d like.
68. My little sister Lauren, she’ll play with the pony if you let her.
69. Don’t turn off the Xbox, he’ll play when he comes home.
70. He got a great photo so he’ll post it tonight.
71. My teenage brother, he’ll practice piano for five minutes and then stop.
72. My sister is funny because she’ll prepare a meal a week in advance.
73. He wrote a speech because he’ll present at graduation.
74. Her mother knows she’ll pretend to be sick to get out of going to school.
75. She has fair skin so she’ll protect herself with five different sunscreens.
76. I hope that she’ll purchase the dress she was considering.
77. She has a big date tonight, so she’ll put on makeup after she does her hair.
78. It got cold outside, so she’ll put the heat on when she gets home.
79. I can’t tell what he’ll put out next but I’m sure it will be great.
80. Your mother wants you in the kitchen; She’ll put you to work, too.
81. The birthday cake, she’ll put icing on it when she gets back.
82. The party starts soon, so she’ll put everything out within the next hour.
83. The button fell off, so she’ll tack on a new one tonight.
84. Her car broke down so she’ll take it to the shop tomorrow.
85. She wants a souvenir so he’ll take a picture of her by the water.
86. Today is garbage day so he’ll take out the trash on his way to the bus.
87. She went to pack because she’ll take forever to find what she wants to wear.
88. He broke his leg last week so he’ll take the elevator.
89. She wants to learn to draw so she’ll take a class at the community center.
90. It’s sunny outside so she’ll take a walk after work.
91. I didn’t ask her to, but she’ll take you to dance if you ask nicely.
92. We ran into our friend; he’ll take the car if you’re still selling it.
93. If you need a ride to tutoring, she’ll take you anytime.
94. He got sick so he’ll take the day off work.
95. She wants to bake cookies, so she’ll talk to Jon and see if he is also interested.
96. The Internet went out, so she’ll talk to you after she calls the company.
97. If you want to work here she’ll talk to the manager.
98. She wants new high heels so she’ll talk to the sales rep.

99. Sorry, sir, but he’ll talk for hours if you don't stop him.
100. She used to waitress and she’ll teach you anything you wanna know.
101. Just so you know, she’ll test your knowledge.
102. Bring him a step stool please; He’ll test your pateience.
103. Something happened at school so she’ll text you about it later.
104. Since the tent is up, she’ll toast marshmallows now.
105. She came from California so she’ll tough out the winter as long as she can.
106. In order to get ready for the race he’ll train a whole year ahead of time.
107. She really wants to win, so she’ll train twice a day all year.
108. He used to be scared to fly, but he’ll travel anywhere now.
109. At the hospital she’ll treat her burn.
110. She pulled an all-nighter and she’ll try to stay awake today.
111. He failed the last exam but he’ll try to better next time.
112. He had a cancer scare, so he’ll try to see the doctor more.
113. Her soap opera ended, so she’ll try to get into a new show this weekend.
114. I spoke to Liz who said she’ll try to call you when she can.
115. Working out? No, he’ll try to go tomorrow though.
116. She ran out of room, so she’ll try to catch her next time.
117. He fell onto the couch and he’ll turn over and fall asleep in a minute.
118. Leave the sink knob alone or it’ll twist right off.
119. The paper is due soon, so he’ll type it up tonight.
120. He sits in court right there and he’ll type everything that is said.

12.2 Comprehension Questions

1. Is the clown juggling for the kids? - no
2. Is the girl blushing so hard? - yes
3. Is the girl cutting up fruit for the salad? - no
4. Does the speaker like the teacher? - yes
5. Is the boy moving to Maine? - yes
6. Is the girl brewing some earl grey tea? - yes
7. Is the boy brewing tea for everyone? - no
8. Is the girl bringing turkey? - yes
9. Is the little brother brushing his teeth? - no
10. Is the boy brushing his hair? - no
11. Is the girl buying a new hairbrush because her old one broke? - yes
12. Is the girl buying the boy a new tablet in the store? - no
13. Is the boy calling his sister for extra help? - no
14. Will the boy be calling his mother? - no
15. Did the girl go to check into the hotel? - no
16. Did the boy spill some sauce? - yes
17. Is his cousin from New York? - yes
18. Did the boy connect his cellphone to the Wi-fi? - no
19. Is the woman in the corner cooking with her son? - no
20. Is the girl leaving for college soon? - yes
21. Did the girl try bacon? - yes
22. Did the group want to make posters? - yes
23. Is the girl debating which job is best? - yes
24. Is the girl decorating the tree for Christmas? - no
25. Did the boy forget his suitcase, which the girl is delivering to him? - no
26. Is the girl dicing onions? - yes
27. Is the girl dipping strawberries in the melted chocolate? - no
28. Is the girl doing laundry in the living room? - no
29. Is the boy working on his term paper today? - yes
30. Is the girl vacuuming in the basement? Yes
31. Does the girl want to sleep later? - no
32. Does the boy believes what the girl says? - no
33. Is the girl who owns the shop drinking tea down the street? - no
34. Is the girl drinking tea in this weather? - yes
35. Does the boy know what car the girl is driving? - yes
36. Did the girl get scared? - yes
37. Did the whole office eat today? - no
38. Is the race starting later? - no
39. Did the boy go to the library because he is helping someone with their homework? - no
40. Is the girl getting good grades now because she got a tutor? - no
41. Is the crying baby giving his mom a bad headache? - yes
42. Is Sarah giving herself the day off? - yes
43. Is the boy going to New York next week? - no
44. Does the girl have to pack for her trip out of town tomorrow? - yes
45. Is the girl going to Yale in the fall? - yes

46. Is the boy over-there attractive? - yes
47. Is the girl over there frowning? - no
48. Is the girl going to keep a diary on her travels? - yes
49. Is the girl publicizing her engagement? - no
50. Are they keying in the passcode to get in? - yes
51. Is the baby over there laughing? - yes
52. Is the vibe right for dancing? - yes
53. Is Rachel packing today until midnight? - no
54. Are they leaving for Connecticut soon? - no
55. Did the girl buy new brushes so she could paint her room today? - no
56. Did the speaker pay last time for the electricity bill? - yes
57. Is the boy picking up rice grains of the floor? - yes
58. Is the girl picking out a first day outfit for the first day of work? - no
59. Did the boy pick out the ring before they got engaged? - no
60. Did the bride order the cake yet? - yes
61. Is the girl piling her suitcase with tissues? - no
62. Is the boy pitching a tent in a field? - yes
63. Does the boy know the girl is placing judgement by her expression? - yes
64. Is the girl planning a party for a small group of people? - no
65. Is the girl planning on running for senator? - no
66. Does the boy want to improve this chess skills? - yes
67. Is the speaker's best friend named Bobby? - yes
68. Is the little sister playing with a pink pony? - no
69. Did the boy save his game on his Xbox? - no
70. Is the boy posting a great picture online? - yes
71. His the teenage brother practicing swimming? - no
72. Did the girl go out to buy more bread? - yes
73. Is the boy presenting a speech at a banquet? - yes?
74. Is the girl truly sick? - no
75. Is the girl protecting her skin from the sun? - yes
76. Is the girl purchasing a new gold dress? - no
77. Does the girl have a big date tonight? - yes
78. Did the girl put on a scarf because it got cold outside? - no
79. Can the speaker read what's on the chalkboard? - no
80. Is the mother making a salad? - yes
81. Is the girl putting icing on a wedding cake? - no
82. Is the girl putting the stereo outside for a party? - yes
83. Is the girl stitching up a tear in the shirt? - no
84. Is the girl taking the train today because her car broke down? - yes
85. Is the girl taking a picture by a monument as a souvenir? - no
86. Is today garbage day? - yes
87. Is the girl going to Orlando on a trip? - no
88. Is the boy taking the elevator because he is tired? - no
89. Is the girl taking art classes because she wants to learn how to draw? - yes
90. Is the girl taking a walk in the park? - yes
91. Is the girl taking the recycling out? - no
92. Is the speaker's friend taking an apartment below them? - no
93. Is the girl is taking the boy to the afternoon program because he needed a tutor? - yes
94. Is the boy taking the day off because he is sick? - yes
95. Is the girl going to buy supplies for chicken at the store? - no
96. Is the girl talking to the cable company being the internet is down? - yes

97. Is the boy making a snack while the girl is talking on the phone? - no
98. Is the girl talking to a sales rep because she wants new boots? - no
99. --not used
100. Did the girl used to waitress before she started teaching? - yes
101. Is the girl testing out new cars today? - yes
102. Did the speaker ask for a step stool? - yes
103. Is the girl texting her mom about something that happened at work? - no
104. Is the girl toasting marshmallows? - yes
105. Is the girl from California? - yes
106. Does the boy get up early because he is training for a triathlon? - no
107. Is the girl training for a race? - yes
108. Did the boy used to be scared to fly? - yes
109. Is the girl treating an infection at the hospital? - no
110. Did the girl pull an all-nighter? - yes
111. Did the boy pass his last exam? - no
112. Is the boy trying to quit smoking because he had a cancer scare? - yes
113. Is the girl trying to find a new show because she did not like her old one? - no
114. Is the speaker trying to help someone connect to the WiFi? - no
115. --not used
116. Is the girl wiping the chalkboard so she could write more? - yes
117. Is the boy going to use his computer now? - no
118. Was the sink knob not working before? - yes
119. Is the boy working quickly because the paper's due date is coming up? -yes
120. Is the boy typing of a transcript of the court proceedings? - yes

12.3 List of Trigger Points, Study 1

Table 4.3: Trigger Points, Study 1

SoundFileName	Trigger	TriggerOnset	TriggerOffset (calculated)
DENstimuli\C2condition1\C2MP1.wav	Present	4653	4663
DENstimuli\C2condition1\C2MP2.wav	Present	1721	1731
DENstimuli\C2condition1\C2MP3.wav	Present	2211	2221
DENstimuli\C2condition1\C2MP4.wav	Present	1373	1383
DENstimuli\C2condition1\C2MP5.wav	Present	2011	2021
DENstimuli\C2condition1\C2MP6.wav	Present	2238	2248
DENstimuli\C2condition1\C2MP7.wav	Present	1630	1640
DENstimuli\C2condition1\C2MP8.wav	Present	2481	2491
DENstimuli\C2condition1\C2MP9.wav	Present	2406	2416
DENstimuli\C2condition1\C2MP10.wav	Present	1795	1805
DENstimuli\C2condition1\C2MP11.wav	Present	2313	2323
DENstimuli\C2condition1\C2MP12.wav	Present	2314	2324
DENstimuli\C2condition1\C2MP13.wav	Present	2267	2277
DENstimuli\C2condition1\C2MP14.wav	Present	2264	2274
DENstimuli\C2condition1\C2MP15.wav	Present	2231	2241
DENstimuli\C2condition1\C2MP16.wav	Present	1545	1555
DENstimuli\C2condition1\C2MP17.wav	Present	2230	2240
DENstimuli\C2condition1\C2MP18.wav	Present	2390	2400
DENstimuli\C2condition1\C2MP19.wav	Present	2287	2297
DENstimuli\C2condition1\C2MP20.wav	Present	2446	2456
DENstimuli\C2condition1\C2MP21.wav	Present	1998	2008
DENstimuli\C2condition1\C2MP22.wav	Present	1865	1875
DENstimuli\C2condition1\C2MP23.wav	Present	2200	2210
DENstimuli\C2condition1\C2MP24.wav	Present	2292	2302
DENstimuli\C2condition1\C2MP25.wav	Present	2028	2038
DENstimuli\C2condition1\C2MP26.wav	Present	1837	1847
DENstimuli\C2condition1\C2MP27.wav	Present	2172	2182
DENstimuli\C2condition1\C2MP28.wav	Present	2399	2409
DENstimuli\C2condition1\C2MP29.wav	Present	1937	1947

DENstimuli\C2condition1\C2MP30.wav	Present	2294	2304
DENstimuli\C2condition1\C2MP31.wav	Present	2723	2733
DENstimuli\C2condition1\C2MP32.wav	Present	1921	1931
DENstimuli\C2condition1\C2MP33.wav	Present	2154	2164
DENstimuli\C2condition1\C2MP34.wav	Present	1642	1652
DENstimuli\C2condition1\C2MP35.wav	Present	2136	2146
DENstimuli\C2condition1\C2MP36.wav	Present	2379	2389
DENstimuli\C2condition1\C2MP37.wav	Present	2298	2308
DENstimuli\C2condition1\C2MP38.wav	Present	2240	2250
DENstimuli\C2condition1\C2MP39.wav	Present	2046	2056
DENstimuli\C2condition1\C2MP40.wav	Present	1918	1928
DENstimuli\C2condition1\C2MP41.wav	Present	1939	1949
DENstimuli\C2condition1\C2MP42.wav	Present	1660	1670
DENstimuli\C2condition1\C2MP43.wav	Present	2675	2685
DENstimuli\C2condition1\C2MP44.wav	Present	2731	2741
DENstimuli\C2condition1\C2MP45.wav	Present	1695	1705
DENstimuli\C2condition1\C2MP46.wav	Present	1740	1750
DENstimuli\C2condition1\C2MP47.wav	Present	2284	2294
DENstimuli\C2condition1\C2MP48.wav	Present	4181	4191
DENstimuli\C2condition1\C2MP49.wav	Present	3363	3373
DENstimuli\C2condition1\C2MP50.wav	Present	2167	2177
DENstimuli\C2condition1\C2MP51.wav	Present	1720	1730
DENstimuli\C2condition1\C2MP52.wav	Present	2831	2841
DENstimuli\C2condition1\C2MP53.wav	Present	2777	2787
DENstimuli\C2condition1\C2MP54.wav	Present	2387	2397
DENstimuli\C2condition1\C2MP55.wav	Present	1676	1686
DENstimuli\C2condition1\C2MP56.wav	Present	1586	1596
DENstimuli\C2condition1\C2MP57.wav	Present	2050	2060
DENstimuli\C2condition1\C2MP58.wav	Present	1902	1912
DENstimuli\C2condition1\C2MP59.wav	Present	1993	2003
DENstimuli\C2condition1\C2MP60.wav	Present	2172	2182
DENstimuli\C2condition1\C2MP61.wav	Present	2314	2324
DENstimuli\C2condition1\C2MP62.wav	Present	2349	2359

DENstimuli\C2condition1\C2MP63.wav	Present	1618	1628
DENstimuli\C2condition1\C2MP64.wav	Present	1815	1825
DENstimuli\C2condition1\C2MP65.wav	Present	1779	1789
DENstimuli\C2condition1\C2MP66.wav	Present	2153	2163
DENstimuli\C2condition1\C2MP67.wav	Present	2092	2102
DENstimuli\C2condition1\C2MP68.wav	Present	1960	1970
DENstimuli\C2condition1\C2MP69.wav	Present	2120	2130
DENstimuli\C2condition1\C2MP70.wav	Present	2253	2263
DENstimuli\C2condition1\C2MP71.wav	Present	2443	2453
DENstimuli\C2condition1\C2MP72.wav	Present	2225	2235
DENstimuli\C2condition1\C2MP73.wav	Present	1550	1560
DENstimuli\C2condition1\C2MP74.wav	Present	2052	2062
DENstimuli\C2condition1\C2MP75.wav	Present	2031	2041
DENstimuli\C2condition1\C2MP76.wav	Present	1684	1694
DENstimuli\C2condition1\C2MP77.wav	Present	1590	1600
DENstimuli\C2condition1\C2MP78.wav	Present	2300	2310
DENstimuli\C2condition1\C2MP79.wav	Present	2151	2161
DENstimuli\C2condition1\C2MP80.wav	Present	1780	1790
DENstimuli\C2condition1\C2MP81.wav	Present	1438	1448
DENstimuli\C2condition1\C2MP82.wav	Present	1942	1952
DENstimuli\C2condition1\C2MP83.wav	Present	1269	1279
DENstimuli\C2condition1\C2MP84.wav	Present	2150	2160
DENstimuli\C2condition1\C2MP85.wav	Present	1872	1882
DENstimuli\C2condition1\C2MP86.wav	Present	1683	1693
DENstimuli\C2condition1\C2MP87.wav	Present	2013	2023
DENstimuli\C2condition1\C2MP88.wav	Present	1652	1662
DENstimuli\C2condition1\C2MP89.wav	Present	1950	1960
DENstimuli\C2condition1\C2MP90.wav	Present	2288	2298
DENstimuli\C2condition1\C2MP91.wav	Present	1826	1836
DENstimuli\C2condition1\C2MP92.wav	Present	1852	1862
DENstimuli\C2condition1\C2MP93.wav	Present	2365	2375
DENstimuli\C2condition1\C2MP94.wav	Present	2890	2900
DENstimuli\C2condition1\C2MP95.wav	Present	2219	2229

DENstimuli\C2condition1\C2MP96.wav	Present	2461	2471
DENstimuli\C2condition1\C2MP97.wav	Present	2506	2516
DENstimuli\C2condition1\C2MP98.wav	Present	2440	2450
DENstimuli\C2condition1\C2MP99.wav	Present	2056	2066
DENstimuli\C2condition1\C2MP100.wav	Present	2118	2128
DENstimuli\C2condition1\C2MP101.wav	Present	2021	2031
DENstimuli\C2condition1\C2MP102.wav	Present	2189	2199
DENstimuli\C2condition1\C2MP103.wav	Present	1772	1782
DENstimuli\C2condition1\C2MP104.wav	Present	1896	1906
DENstimuli\C2condition1\C2MP105.wav	Present	2099	2109
DENstimuli\C2condition1\C2MP106.wav	Present	1892	1902
DENstimuli\C2condition1\C2MP107.wav	Present	2346	2356
DENstimuli\C2condition1\C2MP108.wav	Present	2260	2270
DENstimuli\C2condition1\C2MP109.wav	Present	1367	1377
DENstimuli\C2condition1\C2MP110.wav	Present	1468	1478
DENstimuli\C2condition1\C2MP111.wav	Present	1938	1948
DENstimuli\C2condition1\C2MP112.wav	Present	1961	1971
DENstimuli\C2condition1\C2MP113.wav	Present	2140	2150
DENstimuli\C2condition2\C2MA1.wav	absent	3771	3781
DENstimuli\C2condition2\C2MA2.wav	absent	1738	1748
DENstimuli\C2condition2\C2MA3.wav	absent	2626	2636
DENstimuli\C2condition2\C2MA4.wav	absent	1498	1508
DENstimuli\C2condition2\C2MA5.wav	absent	1967	1977
DENstimuli\C2condition2\C2MA6.wav	absent	2046	2056
DENstimuli\C2condition2\C2MA7.wav	absent	1770	1780
DENstimuli\C2condition2\C2MA8.wav	absent	1744	1754
DENstimuli\C2condition2\C2MA9.wav	absent	1939	1949
DENstimuli\C2condition2\C2MA10.wav	absent	1646	1656
DENstimuli\C2condition2\C2MA11.wav	absent	2125	2135
DENstimuli\C2condition2\C2MA12.wav	absent	2222	2232
DENstimuli\C2condition2\C2MA13.wav	absent	2076	2086
DENstimuli\C2condition2\C2MA14.wav	absent	2371	2381
DENstimuli\C2condition2\C2MA15.wav	absent	1962	1972

DENstimuli\C2condition2\C2MA16.wav	absent	1451	1461
DENstimuli\C2condition2\C2MA17.wav	absent	2121	2131
DENstimuli\C2condition2\C2MA18.wav	absent	1956	1966
DENstimuli\C2condition2\C2MA19.wav	absent	1848	1858
DENstimuli\C2condition2\C2MA20.wav	absent	1934	1944
DENstimuli\C2condition2\C2MA21.wav	absent	2060	2070
DENstimuli\C2condition2\C2MA22.wav	absent	2109	2119
DENstimuli\C2condition2\C2MA23.wav	absent	2433	2443
DENstimuli\C2condition2\C2MA24.wav	absent	2011	2021
DENstimuli\C2condition2\C2MA25.wav	absent	1677	1687
DENstimuli\C2condition2\C2MA26.wav	absent	1855	1865
DENstimuli\C2condition2\C2MA27.wav	absent	1809	1819
DENstimuli\C2condition2\C2MA28.wav	absent	2094	2104
DENstimuli\C2condition2\C2MA29.wav	absent	1648	1658
DENstimuli\C2condition2\C2MA30.wav	absent	2156	2166
DENstimuli\C2condition2\C2MA31.wav	absent	2587	2597
DENstimuli\C2condition2\C2MA32.wav	absent	2082	2092
DENstimuli\C2condition2\C2MA33.wav	absent	2202	2212
DENstimuli\C2condition2\C2MA34.wav	absent	1678	1688
DENstimuli\C2condition2\C2MA35.wav	absent	2201	2211
DENstimuli\C2condition2\C2MA36.wav	absent	2269	2279
DENstimuli\C2condition2\C2MA37.wav	absent	1876	1886
DENstimuli\C2condition2\C2MA38.wav	absent	2371	2381
DENstimuli\C2condition2\C2MA39.wav	absent	2043	2053
DENstimuli\C2condition2\C2MA40.wav	absent	1719	1729
DENstimuli\C2condition2\C2MA41.wav	absent	1704	1714
DENstimuli\C2condition2\C2MA42.wav	absent	1741	1751
DENstimuli\C2condition2\C2MA43.wav	absent	2162	2172
DENstimuli\C2condition2\C2MA44.wav	absent	1963	1973
DENstimuli\C2condition2\C2MA45.wav	absent	1401	1411
DENstimuli\C2condition2\C2MA46.wav	absent	1398	1408
DENstimuli\C2condition2\C2MA47.wav	absent	1891	1901
DENstimuli\C2condition2\C2MA48.wav	absent	3527	3537

DENstimuli\C2condition2\C2MA49.wav	absent	2428	2438
DENstimuli\C2condition2\C2MA50.wav	absent	2095	2105
DENstimuli\C2condition2\C2MA51.wav	absent	1530	1540
DENstimuli\C2condition2\C2MA52.wav	absent	2371	2381
DENstimuli\C2condition2\C2MA53.wav	absent	2175	2185
DENstimuli\C2condition2\C2MA54.wav	absent	1939	1949
DENstimuli\C2condition2\C2MA55.wav	absent	1540	1550
DENstimuli\C2condition2\C2MA56.wav	absent	1290	1300
DENstimuli\C2condition2\C2MA57.wav	absent	1792	1802
DENstimuli\C2condition2\C2MA58.wav	absent	1793	1803
DENstimuli\C2condition2\C2MA59.wav	absent	2388	2398
DENstimuli\C2condition2\C2MA60.wav	absent	2308	2318
DENstimuli\C2condition2\C2MA61.wav	absent	2034	2044
DENstimuli\C2condition2\C2MA62.wav	absent	2206	2216
DENstimuli\C2condition2\C2MA63.wav	absent	1784	1794
DENstimuli\C2condition2\C2MA64.wav	absent	1926	1936
DENstimuli\C2condition2\C2MA65.wav	absent	1999	2009
DENstimuli\C2condition2\C2MA66.wav	absent	2222	2232
DENstimuli\C2condition2\C2MA67.wav	absent	2076	2086
DENstimuli\C2condition2\C2MA68.wav	absent	1893	1903
DENstimuli\C2condition2\C2MA69.wav	absent	1762	1772
DENstimuli\C2condition2\C2MA70.wav	absent	1927	1937
DENstimuli\C2condition2\C2MA71.wav	absent	2054	2064
DENstimuli\C2condition2\C2MA72.wav	absent	2143	2153
DENstimuli\C2condition2\C2MA73.wav	absent	1723	1733
DENstimuli\C2condition2\C2MA74.wav	absent	2090	2100
DENstimuli\C2condition2\C2MA75.wav	absent	1839	1849
DENstimuli\C2condition2\C2MA76.wav	absent	1936	1946
DENstimuli\C2condition2\C2MA77.wav	absent	1774	1784
DENstimuli\C2condition2\C2MA78.wav	absent	2892	2902
DENstimuli\C2condition2\C2MA79.wav	absent	2257	2267
DENstimuli\C2condition2\C2MA80.wav	absent	1680	1690
DENstimuli\C2condition2\C2MA81.wav	absent	1297	1307

DENstimuli\C2condition2\C2MA82.wav	absent	1833	1843
DENstimuli\C2condition2\C2MA83.wav	absent	1487	1497
DENstimuli\C2condition2\C2MA84.wav	absent	2097	2107
DENstimuli\C2condition2\C2MA85.wav	absent	3000	3010
DENstimuli\C2condition2\C2MA86.wav	absent	1693	1703
DENstimuli\C2condition2\C2MA87.wav	absent	2366	2376
DENstimuli\C2condition2\C2MA88.wav	absent	1950	1960
DENstimuli\C2condition2\C2MA89.wav	absent	1988	1998
DENstimuli\C2condition2\C2MA90.wav	absent	2166	2176
DENstimuli\C2condition2\C2MA91.wav	absent	2218	2228
DENstimuli\C2condition2\C2MA92.wav	absent	2237	2247
DENstimuli\C2condition2\C2MA93.wav	absent	2484	2494
DENstimuli\C2condition2\C2MA94.wav	absent	2630	2640
DENstimuli\C2condition2\C2MA95.wav	absent	2392	2402
DENstimuli\C2condition2\C2MA96.wav	absent	2563	2573
DENstimuli\C2condition2\C2MA97.wav	absent	2373	2383
DENstimuli\C2condition2\C2MA98.wav	absent	2678	2688
DENstimuli\C2condition2\C2MA99.wav	absent	2073	2083
DENstimuli\C2condition2\C2MA100.wav	absent	2417	2427
DENstimuli\C2condition2\C2MA101.wav	absent	2460	2470
DENstimuli\C2condition2\C2MA102.wav	absent	1932	1942
DENstimuli\C2condition2\C2MA103.wav	absent	2236	2246
DENstimuli\C2condition2\C2MA104.wav	absent	1638	1648
DENstimuli\C2condition2\C2MA105.wav	absent	2017	2027
DENstimuli\C2condition2\C2MA106.wav	absent	2531	2541
DENstimuli\C2condition2\C2MA107.wav	absent	2526	2536
DENstimuli\C2condition2\C2MA108.wav	absent	2065	2075
DENstimuli\C2condition2\C2MA109.wav	absent	1619	1629
DENstimuli\C2condition2\C2MA110.wav	absent	2025	2035
DENstimuli\C2condition2\C2MA111.wav	absent	2060	2070
DENstimuli\C2condition2\C2MA112.wav	absent	2038	2048
DENstimuli\C2condition2\C2MA113.wav	absent	2045	2055
DENstimuli\C2condition3\C2MU1.wav	Ungrammatical	4263	4273

DENstimuli\C2condition3\C2MU2.wav	Ungrammatical	1751	1761
DENstimuli\C2condition3\C2MU3.wav	Ungrammatical	2240	2250
DENstimuli\C2condition3\C2MU4.wav	Ungrammatical	1285	1295
DENstimuli\C2condition3\C2MU5.wav	Ungrammatical	2017	2027
DENstimuli\C2condition3\C2MU6.wav	Ungrammatical	2491	2501
DENstimuli\C2condition3\C2MU7.wav	Ungrammatical	1580	1590
DENstimuli\C2condition3\C2MU8.wav	Ungrammatical	1971	1981
DENstimuli\C2condition3\C2MU9.wav	Ungrammatical	1780	1790
DENstimuli\C2condition3\C2MU10.wav	Ungrammatical	1640	1650
DENstimuli\C2condition3\C2MU11.wav	Ungrammatical	1912	1922
DENstimuli\C2condition3\C2MU12.wav	Ungrammatical	2095	2105
DENstimuli\C2condition3\C2MU13.wav	Ungrammatical	2282	2292
DENstimuli\C2condition3\C2MU14.wav	Ungrammatical	2120	2130
DENstimuli\C2condition3\C2MU15.wav	Ungrammatical	1994	2004
DENstimuli\C2condition3\C2MU16.wav	Ungrammatical	1488	1498
DENstimuli\C2condition3\C2MU17.wav	Ungrammatical	2205	2215
DENstimuli\C2condition3\C2MU18.wav	Ungrammatical	2235	2245
DENstimuli\C2condition3\C2MU19.wav	Ungrammatical	2024	2034
DENstimuli\C2condition3\C2MU20.wav	Ungrammatical	2212	2222
DENstimuli\C2condition3\C2MU21.wav	Ungrammatical	1965	1975
DENstimuli\C2condition3\C2MU22.wav	Ungrammatical	1893	1903
DENstimuli\C2condition3\C2MU23.wav	Ungrammatical	2220	2230
DENstimuli\C2condition3\C2MU24.wav	Ungrammatical	2158	2168
DENstimuli\C2condition3\C2MU25.wav	Ungrammatical	1965	1975
DENstimuli\C2condition3\C2MU26.wav	Ungrammatical	1830	1840
DENstimuli\C2condition3\C2MU27.wav	Ungrammatical	2050	2060
DENstimuli\C2condition3\C2MU28.wav	Ungrammatical	2285	2295
DENstimuli\C2condition3\C2MU29.wav	Ungrammatical	1835	1845
DENstimuli\C2condition3\C2MU30.wav	Ungrammatical	2247	2257
DENstimuli\C2condition3\C2MU31.wav	Ungrammatical	2555	2565
DENstimuli\C2condition3\C2MU32.wav	Ungrammatical	1814	1824
DENstimuli\C2condition3\C2MU33.wav	Ungrammatical	1940	1950
DENstimuli\C2condition3\C2MU34.wav	Ungrammatical	1453	1463

DENstimuli\C2condition3\C2MU35.wav	Ungrammatical	1970	1980
DENstimuli\C2condition3\C2MU36.wav	Ungrammatical	2316	2326
DENstimuli\C2condition3\C2MU37.wav	Ungrammatical	2219	2229
DENstimuli\C2condition3\C2MU38.wav	Ungrammatical	2257	2267
DENstimuli\C2condition3\C2MU39.wav	Ungrammatical	1984	1994
DENstimuli\C2condition3\C2MU40.wav	Ungrammatical	1888	1898
DENstimuli\C2condition3\C2MU41.wav	Ungrammatical	1945	1955
DENstimuli\C2condition3\C2MU42.wav	Ungrammatical	1668	1678
DENstimuli\C2condition3\C2MU43.wav	Ungrammatical	2405	2415
DENstimuli\C2condition3\C2MU44.wav	Ungrammatical	2555	2565
DENstimuli\C2condition3\C2MU45.wav	Ungrammatical	1697	1707
DENstimuli\C2condition3\C2MU46.wav	Ungrammatical	1748	1758
DENstimuli\C2condition3\C2MU47.wav	Ungrammatical	2201	2211
DENstimuli\C2condition3\C2MU48.wav	Ungrammatical	4207	4217
DENstimuli\C2condition3\C2MU49.wav	Ungrammatical	3230	3240
DENstimuli\C2condition3\C2MU50.wav	Ungrammatical	2140	2150
DENstimuli\C2condition3\C2MU51.wav	Ungrammatical	1682	1692
DENstimuli\C2condition3\C2MU52.wav	Ungrammatical	2879	2889
DENstimuli\C2condition3\C2MU53.wav	Ungrammatical	2250	2260
DENstimuli\C2condition3\C2MU54.wav	Ungrammatical	2148	2158
DENstimuli\C2condition3\C2MU55.wav	Ungrammatical	1644	1654
DENstimuli\C2condition3\C2MU56.wav	Ungrammatical	1470	1480
DENstimuli\C2condition3\C2MU57.wav	Ungrammatical	2084	2094
DENstimuli\C2condition3\C2MU58.wav	Ungrammatical	1881	1891
DENstimuli\C2condition3\C2MU59.wav	Ungrammatical	1892	1902
DENstimuli\C2condition3\C2MU60.wav	Ungrammatical	2022	2032
DENstimuli\C2condition3\C2MU61.wav	Ungrammatical	1777	1787
DENstimuli\C2condition3\C2MU62.wav	Ungrammatical	2129	2139
DENstimuli\C2condition3\C2MU63.wav	Ungrammatical	1563	1573
DENstimuli\C2condition3\C2MU64.wav	Ungrammatical	1774	1784
DENstimuli\C2condition3\C2MU65.wav	Ungrammatical	1615	1625
DENstimuli\C2condition3\C2MU66.wav	Ungrammatical	2056	2066
DENstimuli\C2condition3\C2MU67.wav	Ungrammatical	1974	1984

DENstimuli\C2condition3\C2MU68.wav	Ungrammatical	1565	1575
DENstimuli\C2condition3\C2MU69.wav	Ungrammatical	1940	1950
DENstimuli\C2condition3\C2MU70.wav	Ungrammatical	1946	1956
DENstimuli\C2condition3\C2MU71.wav	Ungrammatical	1804	1814
DENstimuli\C2condition3\C2MU72.wav	Ungrammatical	2118	2128
DENstimuli\C2condition3\C2MU73.wav	Ungrammatical	1620	1630
DENstimuli\C2condition3\C2MU74.wav	Ungrammatical	2025	2035
DENstimuli\C2condition3\C2MU75.wav	Ungrammatical	1896	1906
DENstimuli\C2condition3\C2MU76.wav	Ungrammatical	1605	1615
DENstimuli\C2condition3\C2MU77.wav	Ungrammatical	1521	1531
DENstimuli\C2condition3\C2MU78.wav	Ungrammatical	2208	2218
DENstimuli\C2condition3\C2MU79.wav	Ungrammatical	2064	2074
DENstimuli\C2condition3\C2MU80.wav	Ungrammatical	1674	1684
DENstimuli\C2condition3\C2MU81.wav	Ungrammatical	1275	1285
DENstimuli\C2condition3\C2MU82.wav	Ungrammatical	1896	1906
DENstimuli\C2condition3\C2MU83.wav	Ungrammatical	1255	1265
DENstimuli\C2condition3\C2MU84.wav	Ungrammatical	1999	2009
DENstimuli\C2condition3\C2MU85.wav	Ungrammatical	1781	1791
DENstimuli\C2condition3\C2MU86.wav	Ungrammatical	1593	1603
DENstimuli\C2condition3\C2MU87.wav	Ungrammatical	1926	1936
DENstimuli\C2condition3\C2MU88.wav	Ungrammatical	1640	1650
DENstimuli\C2condition3\C2MU89.wav	Ungrammatical	1742	1752
DENstimuli\C2condition3\C2MU90.wav	Ungrammatical	2154	2164
DENstimuli\C2condition3\C2MU91.wav	Ungrammatical	1728	1738
DENstimuli\C2condition3\C2MU92.wav	Ungrammatical	1905	1915
DENstimuli\C2condition3\C2MU93.wav	Ungrammatical	2243	2253
DENstimuli\C2condition3\C2MU94.wav	Ungrammatical	2233	2243
DENstimuli\C2condition3\C2MU95.wav	Ungrammatical	2154	2164
DENstimuli\C2condition3\C2MU96.wav	Ungrammatical	2073	2083
DENstimuli\C2condition3\C2MU97.wav	Ungrammatical	2446	2456
DENstimuli\C2condition3\C2MU98.wav	Ungrammatical	2378	2388
DENstimuli\C2condition3\C2MU99.wav	Ungrammatical	2041	2051
DENstimuli\C2condition3\C2MU100.wav	Ungrammatical	1951	1961

DENstimuli\C2condition3\C2MU101.wav	Ungrammatical	1924	1934
DENstimuli\C2condition3\C2MU102.wav	Ungrammatical	2055	2065
DENstimuli\C2condition3\C2MU103.wav	Ungrammatical	1646	1656
DENstimuli\C2condition3\C2MU104.wav	Ungrammatical	1710	1720
DENstimuli\C2condition3\C2MU105.wav	Ungrammatical	2085	2095
DENstimuli\C2condition3\C2MU106.wav	Ungrammatical	1790	1800
DENstimuli\C2condition3\C2MU107.wav	Ungrammatical	2229	2239
DENstimuli\C2condition3\C2MU108.wav	Ungrammatical	1765	1775
DENstimuli\C2condition3\C2MU109.wav	Ungrammatical	1356	1366
DENstimuli\C2condition3\C2MU110.wav	Ungrammatical	1498	1508
DENstimuli\C2condition3\C2MU111.wav	Ungrammatical	1895	1905
DENstimuli\C2condition3\C2MU112.wav	Ungrammatical	1952	1962
DENstimuli\C2condition3\C2MU113.wav	Ungrammatical	1966	1976
DENstimuli\C2condition4\C2AP1.wav	present	3499	3509
DENstimuli\C2condition4\C2AP2.wav	present	1385	1395
DENstimuli\C2condition4\C2AP3.wav	present	1824	1834
DENstimuli\C2condition4\C2AP4.wav	present	1475	1485
DENstimuli\C2condition4\C2AP5.wav	present	1810	1820
DENstimuli\C2condition4\C2AP6.wav	present	1992	2002
DENstimuli\C2condition4\C2AP7.wav	present	1626	1636
DENstimuli\C2condition4\C2AP8.wav	present	1784	1794
DENstimuli\C2condition4\C2AP9.wav	present	2263	2273
DENstimuli\C2condition4\C2AP10.wav	present	2195	2205
DENstimuli\C2condition4\C2AP11.wav	present	1922	1932
DENstimuli\C2condition4\C2AP12.wav	present	2093	2103
DENstimuli\C2condition4\C2AP13.wav	present	2202	2212
DENstimuli\C2condition4\C2AP14.wav	present	1858	1868
DENstimuli\C2condition4\C2AP15.wav	present	2053	2063
DENstimuli\C2condition4\C2AP16.wav	present	1517	1527
DENstimuli\C2condition4\C2AP17.wav	present	1871	1881
DENstimuli\C2condition4\C2AP18.wav	present	2056	2066
DENstimuli\C2condition4\C2AP19.wav	present	2024	2034
DENstimuli\C2condition4\C2AP20.wav	present	1527	1537

DENstimuli\C2condition4\C2AP21.wav	present	1783	1793
DENstimuli\C2condition4\C2AP22.wav	present	2129	2139
DENstimuli\C2condition4\C2AP23.wav	present	2143	2153
DENstimuli\C2condition4\C2AP24.wav	present	1761	1771
DENstimuli\C2condition4\C2AP25.wav	present	1589	1599
DENstimuli\C2condition4\C2AP26.wav	present	1776	1786
DENstimuli\C2condition4\C2AP27.wav	present	1823	1833
DENstimuli\C2condition4\C2AP28.wav	present	1661	1671
DENstimuli\C2condition4\C2AP29.wav	present	1773	1783
DENstimuli\C2condition4\C2AP30.wav	present	2093	2103
DENstimuli\C2condition4\C2AP31.wav	present	2092	2102
DENstimuli\C2condition4\C2AP32.wav	present	1725	1735
DENstimuli\C2condition4\C2AP33.wav	present	2137	2147
DENstimuli\C2condition4\C2AP34.wav	present	1578	1588
DENstimuli\C2condition4\C2AP35.wav	present	2100	2110
DENstimuli\C2condition4\C2AP36.wav	present	1713	1723
DENstimuli\C2condition4\C2AP37.wav	present	1924	1934
DENstimuli\C2condition4\C2AP38.wav	present	2080	2090
DENstimuli\C2condition4\C2AP39.wav	present	1868	1878
DENstimuli\C2condition4\C2AP40.wav	present	1610	1620
DENstimuli\C2condition4\C2AP41.wav	present	1577	1587
DENstimuli\C2condition4\C2AP42.wav	present	1116	1126
DENstimuli\C2condition4\C2AP43.wav	present	2120	2130
DENstimuli\C2condition4\C2AP44.wav	present	2193	2203
DENstimuli\C2condition4\C2AP45.wav	present	1766	1776
DENstimuli\C2condition4\C2AP46.wav	present	1470	1480
DENstimuli\C2condition4\C2AP47.wav	present	1990	2000
DENstimuli\C2condition4\C2AP48.wav	present	3877	3887
DENstimuli\C2condition4\C2AP49.wav	present	2526	2536
DENstimuli\C2condition4\C2AP50.wav	present	2018	2028
DENstimuli\C2condition4\C2AP51.wav	present	1566	1576
DENstimuli\C2condition4\C2AP52.wav	present	2600	2610
DENstimuli\C2condition4\C2AP53.wav	present	1897	1907

DENstimuli\C2condition4\C2AP54.wav	present	2120	2130
DENstimuli\C2condition4\C2AP55.wav	present	1515	1525
DENstimuli\C2condition4\C2AP56.wav	present	1480	1490
DENstimuli\C2condition4\C2AP57.wav	present	1708	1718
DENstimuli\C2condition4\C2AP58.wav	present	1981	1991
DENstimuli\C2condition4\C2AP59.wav	present	1928	1938
DENstimuli\C2condition4\C2AP60.wav	present	2265	2275
DENstimuli\C2condition4\C2AP61.wav	present	1903	1913
DENstimuli\C2condition4\C2AP62.wav	present	1985	1995
DENstimuli\C2condition4\C2AP63.wav	present	1651	1661
DENstimuli\C2condition4\C2AP64.wav	present	1995	2005
DENstimuli\C2condition4\C2AP65.wav	present	1684	1694
DENstimuli\C2condition4\C2AP66.wav	present	2591	2601
DENstimuli\C2condition4\C2AP67.wav	present	1997	2007
DENstimuli\C2condition4\C2AP68.wav	present	1785	1795
DENstimuli\C2condition4\C2AP69.wav	present	1839	1849
DENstimuli\C2condition4\C2AP70.wav	present	1707	1717
DENstimuli\C2condition4\C2AP71.wav	present	1905	1915
DENstimuli\C2condition4\C2AP72.wav	present	2880	2890
DENstimuli\C2condition4\C2AP73.wav	present	1605	1615
DENstimuli\C2condition4\C2AP74.wav	present	1886	1896
DENstimuli\C2condition4\C2AP75.wav	present	2161	2171
DENstimuli\C2condition4\C2AP76.wav	present	1615	1625
DENstimuli\C2condition4\C2AP77.wav	present	1429	1439
DENstimuli\C2condition4\C2AP78.wav	present	2505	2515
DENstimuli\C2condition4\C2AP79.wav	present	2017	2027
DENstimuli\C2condition4\C2AP80.wav	present	1661	1671
DENstimuli\C2condition4\C2AP81.wav	present	1643	1653
DENstimuli\C2condition4\C2AP82.wav	present	1755	1765
DENstimuli\C2condition4\C2AP83.wav	present	1447	1457
DENstimuli\C2condition4\C2AP84.wav	present	2129	2139
DENstimuli\C2condition4\C2AP85.wav	present	1908	1918
DENstimuli\C2condition4\C2AP86.wav	present	1629	1639

DENstimuli\C2condition4\C2AP87.wav	present	2086	2096
DENstimuli\C2condition4\C2AP88.wav	present	1596	1606
DENstimuli\C2condition4\C2AP89.wav	present	1652	1662
DENstimuli\C2condition4\C2AP90.wav	present	1809	1819
DENstimuli\C2condition4\C2AP91.wav	present	1768	1778
DENstimuli\C2condition4\C2AP92.wav	present	1774	1784
DENstimuli\C2condition4\C2AP93.wav	present	2295	2305
DENstimuli\C2condition4\C2AP94.wav	present	2381	2391
DENstimuli\C2condition4\C2AP95.wav	present	2231	2241
DENstimuli\C2condition4\C2AP96.wav	present	2145	2155
DENstimuli\C2condition4\C2AP97.wav	present	2366	2376
DENstimuli\C2condition4\C2AP98.wav	present	2625	2635
DENstimuli\C2condition4\C2AP99.wav	present	1860	1870
DENstimuli\C2condition4\C2AP100.wav	present	2424	2434
DENstimuli\C2condition4\C2AP101.wav	present	2285	2295
DENstimuli\C2condition4\C2AP102.wav	present	1710	1720
DENstimuli\C2condition4\C2AP103.wav	present	1735	1745
DENstimuli\C2condition4\C2AP104.wav	present	1761	1771
DENstimuli\C2condition4\C2AP105.wav	present	1882	1892
DENstimuli\C2condition4\C2AP106.wav	present	1922	1932
DENstimuli\C2condition4\C2AP107.wav	present	2103	2113
DENstimuli\C2condition4\C2AP108.wav	present	2015	2025
DENstimuli\C2condition4\C2AP109.wav	present	1345	1355
DENstimuli\C2condition4\C2AP110.wav	present	1417	1427
DENstimuli\C2condition4\C2AP111.wav	present	1906	1916
DENstimuli\C2condition4\C2AP112.wav	present	1831	1841
DENstimuli\C2condition4\C2AP113.wav	present	1402	1412
DENstimuli\C2condition5\C2AA1.wav	absent	4210	4220
DENstimuli\C2condition5\C2AA2.wav	absent	1637	1647
DENstimuli\C2condition5\C2AA3.wav	absent	3013	3023
DENstimuli\C2condition5\C2AA4.wav	absent	1495	1505
DENstimuli\C2condition5\C2AA5.wav	absent	1872	1882
DENstimuli\C2condition5\C2AA6.wav	absent	2151	2161

DENstimuli\C2condition5\C2AA7.wav	absent	2073	2083
DENstimuli\C2condition5\C2AA8.wav	absent	2292	2302
DENstimuli\C2condition5\C2AA9.wav	absent	1655	1665
DENstimuli\C2condition5\C2AA10.wav	absent	1788	1798
DENstimuli\C2condition5\C2AA11.wav	absent	2036	2046
DENstimuli\C2condition5\C2AA12.wav	absent	1802	1812
DENstimuli\C2condition5\C2AA13.wav	absent	1782	1792
DENstimuli\C2condition5\C2AA14.wav	absent	2560	2570
DENstimuli\C2condition5\C2AA15.wav	absent	2180	2190
DENstimuli\C2condition5\C2AA16.wav	absent	1682	1692
DENstimuli\C2condition5\C2AA17.wav	absent	1832	1842
DENstimuli\C2condition5\C2AA18.wav	absent	1951	1961
DENstimuli\C2condition5\C2AA19.wav	absent	1658	1668
DENstimuli\C2condition5\C2AA20.wav	absent	1657	1667
DENstimuli\C2condition5\C2AA21.wav	absent	1464	1474
DENstimuli\C2condition5\C2AA22.wav	absent	1791	1801
DENstimuli\C2condition5\C2AA23.wav	absent	2242	2252
DENstimuli\C2condition5\C2AA24.wav	absent	2135	2145
DENstimuli\C2condition5\C2AA25.wav	absent	1415	1425
DENstimuli\C2condition5\C2AA26.wav	absent	2009	2019
DENstimuli\C2condition5\C2AA27.wav	absent	1672	1682
DENstimuli\C2condition5\C2AA28.wav	absent	1656	1666
DENstimuli\C2condition5\C2AA29.wav	absent	1797	1807
DENstimuli\C2condition5\C2AA30.wav	absent	1560	1570
DENstimuli\C2condition5\C2AA31.wav	absent	2048	2058
DENstimuli\C2condition5\C2AA32.wav	absent	1804	1814
DENstimuli\C2condition5\C2AA33.wav	absent	1871	1881
DENstimuli\C2condition5\C2AA34.wav	absent	1410	1420
DENstimuli\C2condition5\C2AA35.wav	absent	1773	1783
DENstimuli\C2condition5\C2AA36.wav	absent	1721	1731
DENstimuli\C2condition5\C2AA37.wav	absent	1484	1494
DENstimuli\C2condition5\C2AA38.wav	absent	2216	2226
DENstimuli\C2condition5\C2AA39.wav	absent	1450	1460

DENstimuli\C2condition5\C2AA40.wav	absent	1603	1613
DENstimuli\C2condition5\C2AA41.wav	absent	1877	1887
DENstimuli\C2condition5\C2AA42.wav	absent	1899	1909
DENstimuli\C2condition5\C2AA43.wav	absent	1926	1936
DENstimuli\C2condition5\C2AA44.wav	absent	1944	1954
DENstimuli\C2condition5\C2AA45.wav	absent	1777	1787
DENstimuli\C2condition5\C2AA46.wav	absent	1450	1460
DENstimuli\C2condition5\C2AA47.wav	absent	2089	2099
DENstimuli\C2condition5\C2AA48.wav	absent	3561	3571
DENstimuli\C2condition5\C2AA49.wav	absent	2728	2738
DENstimuli\C2condition5\C2AA50.wav	absent	1749	1759
DENstimuli\C2condition5\C2AA51.wav	absent	1458	1468
DENstimuli\C2condition5\C2AA52.wav	absent	2266	2276
DENstimuli\C2condition5\C2AA53.wav	absent	2052	2062
DENstimuli\C2condition5\C2AA54.wav	absent	1854	1864
DENstimuli\C2condition5\C2AA55.wav	absent	1526	1536
DENstimuli\C2condition5\C2AA56.wav	absent	1181	1191
DENstimuli\C2condition5\C2AA57.wav	absent	1824	1834
DENstimuli\C2condition5\C2AA58.wav	absent	1493	1503
DENstimuli\C2condition5\C2AA59.wav	absent	2664	2674
DENstimuli\C2condition5\C2AA60.wav	absent	2336	2346
DENstimuli\C2condition5\C2AA61.wav	absent	1892	1902
DENstimuli\C2condition5\C2AA62.wav	absent	1748	1758
DENstimuli\C2condition5\C2AA63.wav	absent	1863	1873
DENstimuli\C2condition5\C2AA64.wav	absent	1910	1920
DENstimuli\C2condition5\C2AA65.wav	absent	1987	1997
DENstimuli\C2condition5\C2AA66.wav	absent	2147	2157
DENstimuli\C2condition5\C2AA67.wav	absent	2312	2322
DENstimuli\C2condition5\C2AA68.wav	absent	1924	1934
DENstimuli\C2condition5\C2AA69.wav	absent	1963	1973
DENstimuli\C2condition5\C2AA70.wav	absent	2148	2158
DENstimuli\C2condition5\C2AA71.wav	absent	2091	2101
DENstimuli\C2condition5\C2AA72.wav	absent	1989	1999

DENstimuli\C2condition5\C2AA73.wav	absent	1595	1605
DENstimuli\C2condition5\C2AA74.wav	absent	1993	2003
DENstimuli\C2condition5\C2AA75.wav	absent	1919	1929
DENstimuli\C2condition5\C2AA76.wav	absent	1810	1820
DENstimuli\C2condition5\C2AA77.wav	absent	1703	1713
DENstimuli\C2condition5\C2AA78.wav	absent	2877	2887
DENstimuli\C2condition5\C2AA79.wav	absent	2232	2242
DENstimuli\C2condition5\C2AA80.wav	absent	1983	1993
DENstimuli\C2condition5\C2AA81.wav	absent	1285	1295
DENstimuli\C2condition5\C2AA82.wav	absent	1853	1863
DENstimuli\C2condition5\C2AA83.wav	absent	1335	1345
DENstimuli\C2condition5\C2AA84.wav	absent	1938	1948
DENstimuli\C2condition5\C2AA85.wav	absent	2000	2010
DENstimuli\C2condition5\C2AA86.wav	absent	1418	1428
DENstimuli\C2condition5\C2AA87.wav	absent	1755	1765
DENstimuli\C2condition5\C2AA88.wav	absent	2304	2314
DENstimuli\C2condition5\C2AA89.wav	absent	1797	1807
DENstimuli\C2condition5\C2AA90.wav	absent	2035	2045
DENstimuli\C2condition5\C2AA91.wav	absent	2098	2108
DENstimuli\C2condition5\C2AA92.wav	absent	1667	1677
DENstimuli\C2condition5\C2AA93.wav	absent	2165	2175
DENstimuli\C2condition5\C2AA94.wav	absent	2289	2299
DENstimuli\C2condition5\C2AA95.wav	absent	2330	2340
DENstimuli\C2condition5\C2AA96.wav	absent	2053	2063
DENstimuli\C2condition5\C2AA97.wav	absent	2294	2304
DENstimuli\C2condition5\C2AA98.wav	absent	2719	2729
DENstimuli\C2condition5\C2AA99.wav	absent	2238	2248
DENstimuli\C2condition5\C2AA100.wav	absent	2291	2301
DENstimuli\C2condition5\C2AA101.wav	absent	2928	2938
DENstimuli\C2condition5\C2AA102.wav	absent	1679	1689
DENstimuli\C2condition5\C2AA103.wav	absent	1739	1749
DENstimuli\C2condition5\C2AA104.wav	absent	1472	1482
DENstimuli\C2condition5\C2AA105.wav	absent	2532	2542

DENstimuli\C2condition5\C2AA106.wav	absent	2108	2118
DENstimuli\C2condition5\C2AA107.wav	absent	2061	2071
DENstimuli\C2condition5\C2AA108.wav	absent	1848	1858
DENstimuli\C2condition5\C2AA109.wav	absent	1306	1316
DENstimuli\C2condition5\C2AA110.wav	absent	1985	1995
DENstimuli\C2condition5\C2AA111.wav	absent	1754	1764
DENstimuli\C2condition5\C2AA112.wav	absent	1783	1793
DENstimuli\C2condition5\C2AA113.wav	absent	1565	1575
DENstimuli\C2condition6\C2AU1.wav	ungrammatical	3270	3280
DENstimuli\C2condition6\C2AU2.wav	ungrammatical	1217	1227
DENstimuli\C2condition6\C2AU3.wav	ungrammatical	1817	1827
DENstimuli\C2condition6\C2AU4.wav	ungrammatical	1344	1354
DENstimuli\C2condition6\C2AU5.wav	ungrammatical	1746	1756
DENstimuli\C2condition6\C2AU6.wav	ungrammatical	1964	1974
DENstimuli\C2condition6\C2AU7.wav	ungrammatical	1627	1637
DENstimuli\C2condition6\C2AU8.wav	ungrammatical	1426	1436
DENstimuli\C2condition6\C2AU9.wav	ungrammatical	2075	2085
DENstimuli\C2condition6\C2AU10.wav	ungrammatical	1923	1933
DENstimuli\C2condition6\C2AU11.wav	ungrammatical	1851	1861
DENstimuli\C2condition6\C2AU12.wav	ungrammatical	2066	2076
DENstimuli\C2condition6\C2AU13.wav	ungrammatical	1963	1973
DENstimuli\C2condition6\C2AU14.wav	ungrammatical	1950	1960
DENstimuli\C2condition6\C2AU15.wav	ungrammatical	1845	1855
DENstimuli\C2condition6\C2AU16.wav	ungrammatical	1322	1332
DENstimuli\C2condition6\C2AU17.wav	ungrammatical	1657	1667
DENstimuli\C2condition6\C2AU18.wav	ungrammatical	1814	1824
DENstimuli\C2condition6\C2AU19.wav	ungrammatical	1731	1741
DENstimuli\C2condition6\C2AU20.wav	ungrammatical	1528	1538
DENstimuli\C2condition6\C2AU21.wav	ungrammatical	1618	1628
DENstimuli\C2condition6\C2AU22.wav	ungrammatical	1882	1892
DENstimuli\C2condition6\C2AU23.wav	ungrammatical	1948	1958
DENstimuli\C2condition6\C2AU24.wav	ungrammatical	1774	1784
DENstimuli\C2condition6\C2AU25.wav	ungrammatical	1329	1339

DENstimuli\C2condition6\C2AU26.wav	ungrammatical	1711	1721
DENstimuli\C2condition6\C2AU27.wav	ungrammatical	1532	1542
DENstimuli\C2condition6\C2AU28.wav	ungrammatical	1546	1556
DENstimuli\C2condition6\C2AU29.wav	ungrammatical	1643	1653
DENstimuli\C2condition6\C2AU30.wav	ungrammatical	2058	2068
DENstimuli\C2condition6\C2AU31.wav	ungrammatical	1985	1995
DENstimuli\C2condition6\C2AU32.wav	ungrammatical	1716	1726
DENstimuli\C2condition6\C2AU33.wav	ungrammatical	2073	2083
DENstimuli\C2condition6\C2AU34.wav	ungrammatical	1059	1069
DENstimuli\C2condition6\C2AU35.wav	ungrammatical	1968	1978
DENstimuli\C2condition6\C2AU36.wav	ungrammatical	1711	1721
DENstimuli\C2condition6\C2AU37.wav	ungrammatical	1856	1866
DENstimuli\C2condition6\C2AU38.wav	ungrammatical	1877	1887
DENstimuli\C2condition6\C2AU39.wav	ungrammatical	1814	1824
DENstimuli\C2condition6\C2AU40.wav	ungrammatical	1610	1620
DENstimuli\C2condition6\C2AU41.wav	ungrammatical	1529	1539
DENstimuli\C2condition6\C2AU42.wav	ungrammatical	1939	1949
DENstimuli\C2condition6\C2AU43.wav	ungrammatical	1919	1929
DENstimuli\C2condition6\C2AU44.wav	ungrammatical	1962	1972
DENstimuli\C2condition6\C2AU45.wav	ungrammatical	1617	1627
DENstimuli\C2condition6\C2AU46.wav	ungrammatical	1473	1483
DENstimuli\C2condition6\C2AU47.wav	ungrammatical	1784	1794
DENstimuli\C2condition6\C2AU48.wav	ungrammatical	3735	3745
DENstimuli\C2condition6\C2AU49.wav	ungrammatical	2469	2479
DENstimuli\C2condition6\C2AU50.wav	ungrammatical	1980	1990
DENstimuli\C2condition6\C2AU51.wav	ungrammatical	1438	1448
DENstimuli\C2condition6\C2AU52.wav	ungrammatical	2591	2601
DENstimuli\C2condition6\C2AU53.wav	ungrammatical	1878	1888
DENstimuli\C2condition6\C2AU54.wav	ungrammatical	1723	1733
DENstimuli\C2condition6\C2AU55.wav	ungrammatical	1437	1447
DENstimuli\C2condition6\C2AU56.wav	ungrammatical	1347	1357
DENstimuli\C2condition6\C2AU57.wav	ungrammatical	1780	1790
DENstimuli\C2condition6\C2AU58.wav	ungrammatical	1684	1694

DENstimuli\C2condition6\C2AU59.wav	ungrammatical	1678	1688
DENstimuli\C2condition6\C2AU60.wav	ungrammatical	1942	1952
DENstimuli\C2condition6\C2AU61.wav	ungrammatical	1645	1655
DENstimuli\C2condition6\C2AU62.wav	ungrammatical	1974	1984
DENstimuli\C2condition6\C2AU63.wav	ungrammatical	1667	1677
DENstimuli\C2condition6\C2AU64.wav	ungrammatical	1894	1904
DENstimuli\C2condition6\C2AU65.wav	ungrammatical	1519	1529
DENstimuli\C2condition6\C2AU66.wav	ungrammatical	2405	2415
DENstimuli\C2condition6\C2AU67.wav	ungrammatical	1844	1854
DENstimuli\C2condition6\C2AU68.wav	ungrammatical	1471	1481
DENstimuli\C2condition6\C2AU69.wav	ungrammatical	1732	1742
DENstimuli\C2condition6\C2AU70.wav	ungrammatical	1560	1570
DENstimuli\C2condition6\C2AU71.wav	ungrammatical	1743	1753
DENstimuli\C2condition6\C2AU72.wav	ungrammatical	2792	2802
DENstimuli\C2condition6\C2AU73.wav	ungrammatical	1523	1533
DENstimuli\C2condition6\C2AU74.wav	ungrammatical	1753	1763
DENstimuli\C2condition6\C2AU75.wav	ungrammatical	1922	1932
DENstimuli\C2condition6\C2AU76.wav	ungrammatical	1642	1652
DENstimuli\C2condition6\C2AU77.wav	ungrammatical	1268	1278
DENstimuli\C2condition6\C2AU78.wav	ungrammatical	2440	2450
DENstimuli\C2condition6\C2AU79.wav	ungrammatical	1891	1901
DENstimuli\C2condition6\C2AU80.wav	ungrammatical	1501	1511
DENstimuli\C2condition6\C2AU81.wav	ungrammatical	1514	1524
DENstimuli\C2condition6\C2AU82.wav	ungrammatical	1567	1577
DENstimuli\C2condition6\C2AU83.wav	ungrammatical	1298	1308
DENstimuli\C2condition6\C2AU84.wav	ungrammatical	1901	1911
DENstimuli\C2condition6\C2AU85.wav	ungrammatical	1881	1891
DENstimuli\C2condition6\C2AU86.wav	ungrammatical	1559	1569
DENstimuli\C2condition6\C2AU87.wav	ungrammatical	1846	1856
DENstimuli\C2condition6\C2AU88.wav	ungrammatical	1566	1576
DENstimuli\C2condition6\C2AU89.wav	ungrammatical	1505	1515
DENstimuli\C2condition6\C2AU90.wav	ungrammatical	1785	1795
DENstimuli\C2condition6\C2AU91.wav	ungrammatical	1677	1687

DENstimuli\C2condition6\C2AU92.wav	ungrammatical	1696	1706
DENstimuli\C2condition6\C2AU93.wav	ungrammatical	1934	1944
DENstimuli\C2condition6\C2AU94.wav	ungrammatical	2085	2095
DENstimuli\C2condition6\C2AU95.wav	ungrammatical	2032	2042
DENstimuli\C2condition6\C2AU96.wav	ungrammatical	1855	1865
DENstimuli\C2condition6\C2AU97.wav	ungrammatical	2321	2331
DENstimuli\C2condition6\C2AU98.wav	ungrammatical	2540	2550
DENstimuli\C2condition6\C2AU99.wav	ungrammatical	1781	1791
DENstimuli\C2condition6\C2AU100.wav	ungrammatical	2432	2442
DENstimuli\C2condition6\C2AU101.wav	ungrammatical	1969	1979
DENstimuli\C2condition6\C2AU102.wav	ungrammatical	1652	1662
DENstimuli\C2condition6\C2AU103.wav	ungrammatical	1637	1647
DENstimuli\C2condition6\C2AU104.wav	ungrammatical	1698	1708
DENstimuli\C2condition6\C2AU105.wav	ungrammatical	1902	1912
DENstimuli\C2condition6\C2AU106.wav	ungrammatical	1848	1858
DENstimuli\C2condition6\C2AU107.wav	ungrammatical	1966	1976
DENstimuli\C2condition6\C2AU108.wav	ungrammatical	1853	1863
DENstimuli\C2condition6\C2AU109.wav	ungrammatical	1253	1263
DENstimuli\C2condition6\C2AU110.wav	ungrammatical	1404	1414
DENstimuli\C2condition6\C2AU111.wav	ungrammatical	1844	1854
DENstimuli\C2condition6\C2AU112.wav	ungrammatical	1611	1621
DENstimuli\C2condition6\C2AU113.wav	ungrammatical	1299	1309

a. Trigger Points, Study 2

SoundFileName	Trigger	TriggerOnset	TriggerOffset (calculated)
DEN2stimuli\C3condition1\C3MP1.wav	Present	4430	4440
DEN2stimuli\C3condition1\C3MP2.wav	Present	1880	1890
DEN2stimuli\C3condition1\C3MP3.wav	Present	2420	2430
DEN2stimuli\C3condition1\C3MP4.wav	Present	1850	1860
DEN2stimuli\C3condition1\C3MP5.wav	Present	2210	2220
DEN2stimuli\C3condition1\C3MP6.wav	Present	2320	2330
DEN2stimuli\C3condition1\C3MP7.wav	Present	2410	2420
DEN2stimuli\C3condition1\C3MP8.wav	Present	2640	2650
DEN2stimuli\C3condition1\C3MP9.wav	Present	2300	2310
DEN2stimuli\C3condition1\C3MP10.wav	Present	2380	2390
DEN2stimuli\C3condition1\C3MP11.wav	Present	2550	2560
DEN2stimuli\C3condition1\C3MP12.wav	Present	2100	2110
DEN2stimuli\C3condition1\C3MP13.wav	Present	2450	2460
DEN2stimuli\C3condition1\C3MP14.wav	Present	2680	2690
DEN2stimuli\C3condition1\C3MP15.wav	Present	2420	2430
DEN2stimuli\C3condition1\C3MP16.wav	Present	1590	1600

DEN2stimuli\C3condition1\C3MP17.wav	Present	2390	2400
DEN2stimuli\C3condition1\C3MP18.wav	Present	2540	2550
DEN2stimuli\C3condition1\C3MP110.wav	Present	1760	1770
DEN2stimuli\C3condition1\C3MP20.wav	Present	2030	2040
DEN2stimuli\C3condition1\C3MP21.wav	Present	2790	2800
DEN2stimuli\C3condition1\C3MP22.wav	Present	2130	2140
DEN2stimuli\C3condition1\C3MP23.wav	Present	2420	2430
DEN2stimuli\C3condition1\C3MP24.wav	Present	2650	2660
DEN2stimuli\C3condition1\C3MP25.wav	Present	2230	2240
DEN2stimuli\C3condition1\C3MP26.wav	Present	2800	2810
DEN2stimuli\C3condition1\C3MP27.wav	Present	1980	1990
DEN2stimuli\C3condition1\C3MP28.wav	Present	2440	2450
DEN2stimuli\C3condition1\C3MP29.wav	Present	1840	1850
DEN2stimuli\C3condition1\C3MP30.wav	Present	2310	2320
DEN2stimuli\C3condition1\C3MP31.wav	Present	2830	2840
DEN2stimuli\C3condition1\C3MP32.wav	Present	2060	2070
DEN2stimuli\C3condition1\C3MP33.wav	Present	2050	2060
DEN2stimuli\C3condition1\C3MP34.wav	Present	1980	1990
DEN2stimuli\C3condition1\C3MP35.wav	Present	2890	2900
DEN2stimuli\C3condition1\C3MP36.wav	Present	2440	2450
DEN2stimuli\C3condition1\C3MP37.wav	Present	1820	1830
DEN2stimuli\C3condition1\C3MP38.wav	Present	2300	2310
DEN2stimuli\C3condition1\C3MP39.wav	Present	2070	2080
DEN2stimuli\C3condition1\C3MP40.wav	Present	1900	1910
DEN2stimuli\C3condition1\C3MP41.wav	Present	1720	1730
DEN2stimuli\C3condition1\C3MP42.wav	Present	1900	1910
DEN2stimuli\C3condition1\C3MP43.wav	Present	2490	2500
DEN2stimuli\C3condition1\C3MP44.wav	Present	2650	2660
DEN2stimuli\C3condition1\C3MP45.wav	Present	2110	2120
DEN2stimuli\C3condition1\C3MP46.wav	Present	2010	2020
DEN2stimuli\C3condition1\C3MP47.wav	Present	2400	2410
DEN2stimuli\C3condition1\C3MP48.wav	Present	2740	2750
DEN2stimuli\C3condition1\C3MP49.wav	Present	2470	2480

DEN2stimuli\C3condition1\C3MP50.wav	Present	2620	2630
DEN2stimuli\C3condition1\C3MP51.wav	Present	1830	1840
DEN2stimuli\C3condition1\C3MP52.wav	Present	2910	2920
DEN2stimuli\C3condition1\C3MP53.wav	Present	2790	2800
DEN2stimuli\C3condition1\C3MP54.wav	Present	2060	2070
DEN2stimuli\C3condition1\C3MP55.wav	Present	1660	1670
DEN2stimuli\C3condition1\C3MP56.wav	Present	1720	1730
DEN2stimuli\C3condition1\C3MP57.wav	Present	2450	2460
DEN2stimuli\C3condition1\C3MP58.wav	Present	2610	2620
DEN2stimuli\C3condition1\C3MP59.wav	Present	2250	2260
DEN2stimuli\C3condition1\C3MP60.wav	Present	2470	2480
DEN2stimuli\C3condition1\C3MP61.wav	Present	2550	2560
DEN2stimuli\C3condition1\C3MP62.wav	Present	2360	2370
DEN2stimuli\C3condition1\C3MP63.wav	Present	2430	2440
DEN2stimuli\C3condition1\C3MP64.wav	Present	2310	2320
DEN2stimuli\C3condition1\C3MP65.wav	Present	2020	2030
DEN2stimuli\C3condition1\C3MP66.wav	Present	2750	2760
DEN2stimuli\C3condition1\C3MP67.wav	Present	2980	2990
DEN2stimuli\C3condition1\C3MP68.wav	Present	2090	2100
DEN2stimuli\C3condition1\C3MP69.wav	Present	2720	2730
DEN2stimuli\C3condition1\C3MP70.wav	Present	2500	2510
DEN2stimuli\C3condition1\C3MP71.wav	Present	3120	3130
DEN2stimuli\C3condition1\C3MP72.wav	Present	2370	2380
DEN2stimuli\C3condition1\C3MP73.wav	Present	1840	1850
DEN2stimuli\C3condition1\C3MP74.wav	Present	2180	2190
DEN2stimuli\C3condition1\C3MP75.wav	Present	2370	2380
DEN2stimuli\C3condition1\C3MP76.wav	Present	2040	2050
DEN2stimuli\C3condition1\C3MP77.wav	Present	1690	1700
DEN2stimuli\C3condition1\C3MP78.wav	Present	3090	3100
DEN2stimuli\C3condition1\C3MP79.wav	Present	2210	2220
DEN2stimuli\C3condition1\C3MP80.wav	Present	2330	2340
DEN2stimuli\C3condition1\C3MP81.wav	Present	1400	1410
DEN2stimuli\C3condition1\C3MP82.wav	Present	2040	2050

DEN2stimuli\C3condition1\C3MP83.wav	Present	1420	1430
DEN2stimuli\C3condition1\C3MP84.wav	Present	2490	2500
DEN2stimuli\C3condition1\C3MP85.wav	Present	2950	2960
DEN2stimuli\C3condition1\C3MP86.wav	Present	2460	2470
DEN2stimuli\C3condition1\C3MP87.wav	Present	2410	2420
DEN2stimuli\C3condition1\C3MP88.wav	Present	1940	1950
DEN2stimuli\C3condition1\C3MP89.wav	Present	2410	2420
DEN2stimuli\C3condition1\C3MP90.wav	Present	2400	2410
DEN2stimuli\C3condition1\C3MP91.wav	Present	2690	2700
DEN2stimuli\C3condition1\C3MP92.wav	Present	2350	2360
DEN2stimuli\C3condition1\C3MP93.wav	Present	2450	2460
DEN2stimuli\C3condition1\C3MP94.wav	Present	2420	2430
DEN2stimuli\C3condition1\C3MP95.wav	Present	2980	2990
DEN2stimuli\C3condition1\C3MP96.wav	Present	2810	2820
DEN2stimuli\C3condition1\C3MP97.wav	Present	2580	2590
DEN2stimuli\C3condition1\C3MP98.wav	Present	2840	2850
DEN2stimuli\C3condition1\C3MP99.wav	Present	2260	2270
DEN2stimuli\C3condition1\C3MP100.wav	Present	2720	2730
DEN2stimuli\C3condition1\C3MP101.wav	Present	2160	2170
DEN2stimuli\C3condition1\C3MP102.wav	Present	2370	2380
DEN2stimuli\C3condition1\C3MP103.wav	Present	2200	2210
DEN2stimuli\C3condition1\C3MP104.wav	Present	2780	2790
DEN2stimuli\C3condition1\C3MP105.wav	Present	2440	2450
DEN2stimuli\C3condition1\C3MP106.wav	Present	1950	1960
DEN2stimuli\C3condition1\C3MP107.wav	Present	2710	2720
DEN2stimuli\C3condition1\C3MP108.wav	Present	1810	1820
DEN2stimuli\C3condition1\C3MP109.wav	Present	1420	1430
DEN2stimuli\C3condition1\C3MP110.wav	Present	1760	1770
DEN2stimuli\C3condition1\C3MP111.wav	Present	2410	2420
DEN2stimuli\C3condition1\C3MP112.wav	Present	2420	2430
DEN2stimuli\C3condition1\C3MP113.wav	Present	2420	2430
DEN2stimuli\C3condition2\C3MA1.wav	absent	4200	4210
DEN2stimuli\C3condition2\C3MA2.wav	absent	1920	1930

DEN2stimuli\C3condition2\C3MA3.wav	absent	2710	2720
DEN2stimuli\C3condition2\C3MA4.wav	absent	1962	1972
DEN2stimuli\C3condition2\C3MA5.wav	absent	1810	1820
DEN2stimuli\C3condition2\C3MA6.wav	absent	2420	2430
DEN2stimuli\C3condition2\C3MA7.wav	absent	2150	2160
DEN2stimuli\C3condition2\C3MA8.wav	absent	2190	2200
DEN2stimuli\C3condition2\C3MA9.wav	absent	2080	2090
DEN2stimuli\C3condition2\C3MA10.wav	absent	2180	2190
DEN2stimuli\C3condition2\C3MA11.wav	absent	2330	2340
DEN2stimuli\C3condition2\C3MA12.wav	absent	1920	1930
DEN2stimuli\C3condition2\C3MA13.wav	absent	2260	2270
DEN2stimuli\C3condition2\C3MA14.wav	absent	2550	2560
DEN2stimuli\C3condition2\C3MA15.wav	absent	2510	2520
DEN2stimuli\C3condition2\C3MA16.wav	absent	1320	1330
DEN2stimuli\C3condition2\C3MA17.wav	absent	2420	2430
DEN2stimuli\C3condition2\C3MA18.wav	absent	2200	2210
DEN2stimuli\C3condition2\C3MA110.wav	absent	1550	1560
DEN2stimuli\C3condition2\C3MA20.wav	absent	1840	1850
DEN2stimuli\C3condition2\C3MA21.wav	absent	2410	2420
DEN2stimuli\C3condition2\C3MA22.wav	absent	1900	1910
DEN2stimuli\C3condition2\C3MA23.wav	absent	2150	2160
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DEN2stimuli\C3condition2\C3MA62.wav	absent	2080	2090
DEN2stimuli\C3condition2\C3MA63.wav	absent	1980	1990
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DEN2stimuli\C3condition2\C3MA89.wav	absent	2150	2160
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DEN2stimuli\C3condition3\C3MU65.wav	Ungrammatical	1740	1750
DEN2stimuli\C3condition3\C3MU66.wav	Ungrammatical	2390	2400
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DEN2stimuli\C3condition3\C3MU70.wav	Ungrammatical	2310	2320
DEN2stimuli\C3condition3\C3MU71.wav	Ungrammatical	2020	2030
DEN2stimuli\C3condition3\C3MU72.wav	Ungrammatical	2180	2190
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DEN2stimuli\C3condition3\C3MU81.wav	Ungrammatical	1330	1340
DEN2stimuli\C3condition3\C3MU82.wav	Ungrammatical	1950	1960
DEN2stimuli\C3condition3\C3MU83.wav	Ungrammatical	1330	1340
DEN2stimuli\C3condition3\C3MU84.wav	Ungrammatical	2030	2040
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DEN2stimuli\C3condition3\C3MU87.wav	Ungrammatical	2130	2140

DEN2stimuli\C3condition3\C3MU88.wav	Ungrammatical	1930	1940
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DEN2stimuli\C3condition3\C3MU100.wav	Ungrammatical	2650	2660
DEN2stimuli\C3condition3\C3MU101.wav	Ungrammatical	2020	2030
DEN2stimuli\C3condition3\C3MU102.wav	Ungrammatical	2390	2400
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DEN2stimuli\C3condition3\C3MU108.wav	Ungrammatical	1690	1700
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DEN2stimuli\C3condition3\C3MU111.wav	Ungrammatical	2430	2440
DEN2stimuli\C3condition3\C3MU112.wav	Ungrammatical	2290	2300
DEN2stimuli\C3condition3\C3MU113.wav	Ungrammatical	1820	1830
DEN2stimuli\C3condition3\C3MU114.wav	Ungrammatical	1650	1660

Chapter 5 Conclusion

This dissertation was designed to provide a broader look at linguistic processing and perception of multiple English varieties. It explored intersectionality as tied to processing emotional prosody. The experiments across Chapters 2, 3, and 4 taken together show support and a need for a theory of processing that accounts for multifaceted individuals with intersecting identities, all of which influence language practices.

The concluding chapter discusses the themes and questions that remain to be answered based on this dissertation's findings. Through a critical look into practical versus theoretical decision-making, I illuminate potential pitfalls and reasons for why the results came to be. I expand upon the benefits and limitations of looking at Englishes on a continuum. I will also speak on the conflation of AAE and "sounding Black" which came up a number of times in this work, and I make recommendations to researchers moving forward with this line of inquiry. Finally, I describe a theory of language modeling that is inclusive of multidialectal and multilingual knowledge.

5.1 Practical vs. Theoretical Decision-Making

In experimental design, researchers have to make decisions of all kinds; the stimuli that are used, methods of inquiry, etc. This dissertation, comprised of three different studies across the three chapters, required a mix of practical and theoretical decision-making. In each case, explicit and implicit tasks were chosen to address research questions, and both have implications for multilinguistic cognitive modeling. Together, these studies show that while there is some

variability across perception and processing of AAE and SdAE, the explicit and implicit measures presented in this dissertation do not prove that one approach is better than the other.

Chapter 2 shows that explicit measures give a window into participant decision-making when asked to identify race and emotion from single tokens. Based on the results, there is plenty to consider about whether the single words were not enough or if the participants were driven to maintain a sort of colorblind position (e.g., "I don't hear race, I don't see race concept" (Bonilla-Silva 2006)). However, the takeaway is that while there was more percent correct for the white voice than the Black voice, across the board accuracy was low. Implicit measures were employed in Chapters 3 & 4. In Chapter 3, exposure and familiarity metrics were overt while usage metric was covert. Here, results show that individual variation is broad, and within that, there are overarching patterns and trends regarding experiential AAE linguistic knowledge of listeners treating AAE and SdAE differently with respect to emotional prosody perception. Finally, Chapter 4 results indicate that there were not any statistically significant differences across processing of the white speaker vs the Black speaker, though there was a main effect of language variety employed in Study 1, where the so-called bidialectal speaker was cognitively processed differently when he used standard forms (SdAE) than when he spoke AAE. Decisions about explicit versus implicit measures were carefully chosen to address the research questions at hand. The results of the study give ground to even more questions to be asked, and further practical and theoretical decisions.

In Chapter 2, I made a decision to include one Black female and one White female in accordance with the previous work by Kim & Sumner (2017) that also had two women, though without a racial component. The decision to have the speakers be from San Diego was a practical and decision based on availability of speakers at the stimuli-recording time process, and also in

attempt to keep all things constant except for race between the speakers. The initial choice to run the study online was a practical decision for ease of participant base. However, after getting the muddied results with low base-rate correctness, the study was then conducted in-person as well, in attempt to bypass any online bots or participants who were not paying attention. As shown in the results, though the Black voice was most correctly identified as Black in the angry condition and the white voice was most correctly identified as white in the happy condition in both studies, the in-person study also showed a low-base rate correctness, indicating that there are potentially other things at play to be reckoned with. Both studies suggest that there are acoustic differences within emotional speech and across speakers, which could contribute to the variation in processing of these respective tokens. However, it is important to acknowledge that acoustic analyses in Chapter 2 cannot be disentangled from the individual speakers themselves within this dissertation, and further exploration into acoustic differences across emotions and English varieties will be investigated further in future work. However, it is not clear from this dissertation, nor from previous research, the distinction between identifying AAE versus identifying someone "sounds Black." Finally, it is crucial to acknowledge that the theoretical implications of looking at emotional prosody was founded in the research on the Angry Black Woman trope, which informed the methodology and creation of studies in Chapters 2 and 3.

Decisions for Chapter 3 were largely informed by pitfalls from Chapter 2. Here, multiple speakers were included for each variety ; a theoretical choice aimed at making more generalizable claims about perceptions of each variety. Additionally, the experiment in Chapter 3 was originally meant to be an EEG study, but had to ve moved to an online virtual study due to the COVID-19 Pandemic. While initially a setback, this provided me the opportunity to be one of the first researchers ever to test eye-tracking technology through Gorilla WebGazer. Virtual

eye-tracking provided a method through which to investigate preferential looking, and future work on this eye-tracker (which is in beta) and virtual psycholinguistic behavioral studies opens up possibilities for researchers to work with populations that are not easily accessible in traditional laboratory settings. This also provides opportunity to learn about what the virtual eye-tracker can tell researchers that could by-pass the set up and stress required in setting up a regular in-person eye-tracker in the lab. This brings me to another practicality decision. The variables in questions, that is, percent correct looking at images related to the voice, were based on the limitations of the eye-tracker, which are analogous to the first eye-trackers in existence which can only track percent of time spent on the left , right, or across four quadrants on the screen. Finally, the decisions for the experience measures were all theoretically motivated. Familiarity and exposure questionnaires were created based on statements that could categorically distinguish each individual's level of familiarity and exposure to the AAE variety. The usage variable was theoretically motivated with the simple idea that the more AAE grammatical or phonetic items you use, the higher your usage is of the variety in general.

Chapter 4 is a compilation of practical and theoretical decisions that build off of one another, and I continue to refine the ideas and conclusions. Firstly, there were practical decisions made regarding the variable of focus; the 'to be' verb, considered in a very unidimensional way that juxtaposes omission of 'to be' in AAE with overtness of 'to be' in SdAE. As described above, there are exceptions to this claim, i.e., AAE can have 'to be' in the auxiliary position in the kinds of sentences described, and in other settings, auxiliary be is necessarily overt with respect to the grammar. There are also structures, such as questions, where SdAE omits the 'to be' auxiliary (Hendrick 1982). Thus, it's important to recognize the scope considered here, and further research looking at AAE apart from its relation to SdAE is necessary.

There is another theoretical decision that was made regarding Study 1 in Chapter 4: to record stimuli from a so-called bidialectal speaker of AAE and SdAE. This decision was founded in the claim made by Purnell et al. (1999) that a single individual can be given multiple impressions based on language variety employed. While variation with respect to different speakers is found in all chapters of this dissertation, the claim from Purnell et al. (1999) does not hold. This is likely because of the theory from Lanehart (1996) that African Americans are speakers of some version of AAE (or AAL as she calls it). Thus, a reconceptualization of the notion of a bidialectal speaker is in order, and the EEG results reflect that as a necessity, Study 1 resulting in the SdAE speech from the speaker not being processed as predicted, while in Study 2, SdAE was in aggregate processed as predicted when listening to the white speaker.

Lnguistic features work in tandem rather than work individually. This is at odds with the general psycholinguistic experimental frame, where it is most straightforward to examine one variable at a time in order to account for change and variation. Of course the sociolinguistic literature of course opposes this, instead arguing that multiple linguistic variables work in tandem to make up a variety or persona (Eckert 2008, Podesva 2007, Mendoza-Denton 2011, Slobe 2018).

Using EEG for the studies in Chapter 4 was a theoretical decision informed by previous research indicating that ERPs can be elicited based on speaker identity. However, EEG has limitations in that researchers can only look at the processing of one structure at a time, since the ERP focuses on single events. All of these considerations are worth keeping in mind when incorporating psycholinguistic methods into sociolinguistic conceptualizations. In sum, all of the chapters in this dissertation show that interdisciplinary work allows more nuanced investigation of language but can have costs.

5.2 AAE versus Being and Sounding Black

Throughout this dissertation there is an omnipresent issue: how do we disentangle AAE from 'Sounding Black'? These two concepts are often conflated in research, and my dissertation is no exception. It is a difficult issue to work with, which explains why researchers have been grappling with this for a long time, and why they sometimes accept claims made about the variety without empirically testing and replicating the findings (Wolfram 2007). It is also important to consider how AAE is processed with respect to how Black people are treated every day. Understanding social justice as it relates to linguistic variation requires a consideration of the production and perception of language, whether that's "Sounding Black" or AAE. Language does not live in a vacuum devoid of social factors and influence. Results in this dissertation show that people use their knowledge of multiple language varieties, consciously or not, to make decisions about grammar and emotional prosody during processing. Nonetheless, it is important to be specific and clear on when the variety is being studied versus the concept of sounding a certain way.

Chapter 2 investigates the stereotype of the Angry Black Woman as an impetus for studying explicit perceptions of emotional prosody processing across two different speakers, who were self-identified as a Black speaker of AAE and a white speaker of SdAE. However, the results of the study based on the one-word stimuli posed many questions. Indeed, it is difficult here to disentangle language variety from speaker, but it is also difficult to disentangle AAE perception versus sounding Black perception from this paradigm.

These questions are also relevant in Chapter 3, which considers experience when looking at speech perception by quantifying listeners' experiential linguistic knowledge of AAE to investigate if higher levels of experience could predict biased looking preferences. Three

speakers of each variety were employed for stimuli creation in order to make more generalizable claims about the variety. This may have been a success, but the results show wide variability in terms of participant perception of each variety, each speaker, and even each side of the screen looked at. Though the Angry Black voices were least-correctly identified with the image on the screen, the margins were small. These results that racialized emotional prosody, tested in this way, does not completely align with theories of the Angry Black Woman trope or theories pertaining to perceptions of Black versus White speech, or AAE vs SdAE. More needs to be done in this realm to tease apart and get closer to these questions.

Finally, Chapter 4 builds on the emotional prosody studies by incorporating grammatical expectation during processing, Here I show that grammatical expectations couched in social stigma result in participants cognitively treating AAE differently than SdAE when both are spoken by a Black person. This points to the theory that all African Americans are speakers of some variety of African American English, which I discuss in more detail in Section 5.3: Lanehart Model versus Speaker-Centered Model.

Future research goals include making more generalizable claims about syntactic processing of Englishes and designing experiments that can account for AAE specifically. This requires researchers to discern features that stand alone in AAE. It also may also require further and extensive analyses of AAE speech. For example, what is happening in the speech signal at all levels? When one of those pieces is manipulated, do we notice a change in perception?

Future work building from Chapter 4, which focuses on the phonological expression of auxiliaries, can incorporate other morphosyntactic features of AAE, such as stressed BIN and other features with overt phonological content. This would provide more analysis of the acoustic differences among Happy and Angry prosody across both varieties. Another goal is to include

multiple varieties of Standardized English, particularly Received Pronunciation (RP) English, which has a positive social valence. Including RP English could help determine if neural responses to structures have to do with lack of familiarity and/or stereotypes about otherness. By doing experimental research on AAE, we contend with conflicting literature as well as conflations regarding AAE grammar versus "sounding Black," and thus further experimental work in AAE would greatly benefit this variety which is widely studied, for a minoritized variety, and yet still not completely cognitively understood[1].

5.3 Lanehart Model versus Speaker-Centered Model

Another question that arises in this dissertation is who speaks AAE? Again, there are conflicting notions suggested throughout the study of AAE, evidenced in the history of the ever-evolving names used to refer to the variety i.e., Ebonics, Black English, African American English, African American Language (Purnell et al. 1999, Wolfram 2007). Insights from my dissertation suggest that AAE may be more in line with the Lanehart Model of AAL than the Speaker-Centered Model, which argues hat if speakers are reacting to AAE then it's AAE.

Evidence for Lanehart's model of AAL is most clear in Chapter 4, which shows that within a so-called bidialectal speaker, listeners' perceptions of him change when he employs standard forms. Crucially, their perceptions of him were not analogous with perceiving a white person who used standard forms. Listeners found lack of phonological content in the auxiliary position permissible in the SdAE condition from the Black speaker but did not allow this grammatical structure in Experiment 2 with SdAE speech from a monodialectal white speaker. Seeing that

[1] Check out this PBS Digital Series episode of *Otherwords,* titled, "What People Get Wrong About African American English," ft. Dr. Erica Brozovsky & me. https://www.youtube.com/watch?v=1YxH43Cw6tI&t=2s

SdAE speech from the Black man was not treated the same as the SdAE-speaking white man presents an important subversion of previously accepted notions from Purnell et al. (1999) that listeners can separate person from their speech depending on language variety employed: Blackness is signaled when a Black person speaks despite the employment of a standard grammar. Overall, more research operationalizing stereotypes is necessary in linguistics, as their ideological salience can lead people to believe them to be true and affect speakers.

Additionally, it is important to say that Black people are racialized subjects who are discriminated against in a world plagued by anti-Black racism and prejudice. Listeners' judgement of language use is of the least-acknowledged aspects of discrimination, but results from this dissertation illuminate how crucial linguistic production and perception are in influencing our daily interaction. Even when employing standard forms, a person's racial identity is not necessarily hidden. Linguistic justice requires more knowledge of how people perceive and process racialized varieties in real time. Chapter 3 shows that usage can lower and mitigate biased looking preferences, and Chapter 4 showed that on the plane of syntactic perception, AAE and SdAE are treated cognitively differently. Despite the variation amongst listeners' knowledge and experience, stereotypes and raciolinguistic ideologies about personhood nonetheless influence linguistic processing, and that is why it is crucial to consider the frame in which Lanehart (1996) proposes.

5.4 Language Models Inclusive of Multidialectal & Multilingual Knowledge

Moving from thinking about AAE on its own and panning out more broadly, this dissertation wrestles with the notions of including multiple dialects in an experimental space. This in turn was a theoretical motivation based in thinking about a cognitive model of language that is

inclusive of multidialectal and multilingual knowledge. We mifght wonder how theories of bilingualism potentially help multidialectal processing. This can be incorporated into future research, as this work did not engage with the bilingualism literature. However, this is an exciting direction for sociolinguists and linguistics researchers interested in pursuing theories about potential relationships between multilingualism and multiple linguistic varieties. Still, it is important to consider that we still don't know if Black people *cannot* be AAE users, as discussed above with respect to Lanehart's model. Thus, a previously so-called bidialectal speaker, or one that codeswitches, might need to be re-referred to as an AAE speaker who uses standard forms.

This dissertation has theoretical implications for a model of language because it makes concrete the idea that characterizing individuals as monolingual or monodialectal is limiting and does not fully capture humans' complex linguistic makeup. Also, the innovation of looking at intersectional identities within the emotional prosody processing frame opens the door for other researchers to consider intersectional identities that are stereotypically perceived with regard to emotion.

As the dissertation predominantly dealt with emotional prosody processing, it's a fair question to ask what exactly is the role of prosody in multidialectal processing. Prosody seems to be the magical featural component that, at least for Black speakers, distinguishes them from speakers of other racialized backgrounds, even if all other linguistic features are aligned with ideologies of standardness, i.e. grammar, lexical items, and phones. Further investigation into emotional prosody processing within multidialectal processing could illuminate and even answer some of the questions surrounding what it means to "sound Black." The dissertation shows that the cognitive science research community benefits from examining the nuances of general speech phenomena when looking at languages as a functioning and variable entity in

society. The findings implicate a theory of a model of language that necessitates looking at not only languages and varieties that individuals speak, but also those that are in their proximity. In conceptualizing a model of language, including multilingual knowledge provides opportunity for a more accurate account of how language exists within the world and within individuals.

5.5 Conclusion

This dissertation employs a multitude of methods to ask questions about perception and processing. Spanning behavior survey research, virtual eye-tracking, electroencephalography (EEG), and sociolinguistic interviews, it seeks to bring together psycholinguistic and sociolinguistic methods which are both necessary when investigating perception and processing in a frame that considers multiple linguistic systems existing in a given space. I introduce innovative ways to look at variation within and across individuals, and also quantitative methods to measure linguistic experience. By operationalizing the Angry Black Woman trope to look a perceptions of the intersectional Black Woman identity (Crenshaw 1989), this work paves the way for research on other intersectional identities and their impact within a linguistic landscape.

The research in these chapters has focused on perception and processing of speech from Black and White individuals, who are often tied to the two varieties of American English: AAE & SdAE. This work therefore contributes to a greater understanding of how American listeners interact with multiple socially stratified varieties. My work has also shown positive implications for participant-focused methods, which have the potential to illuminate fine-tuned evidence of variation in processing. Taken together, I show not only how individuals process multidialectal linguistic input, but also how the human language faculty accommodates diversity across a range of individuals.

The dissertation is also a call to action for linguists to empirically test ideological claims about linguistic varieties that are passively accepted, strengthen replicability, and broaden approaches to the study of African American English. Through this work, I contribute to a broader, more representative understanding of the human population within the cognitive and language sciences. Future research will build upon these findings to investigate broader claims about languages as they exist and vary in context, from person to person, further contributing to a multidialectal cognitive model of language.

5.6 References

Bonilla-Silva, Eduardo. 2006. Racism without racists: Color-blind racism and the persistence of racial inequality in the United States. *Rowman & Littlefield Publishers*, Lanham, Maryland.

Crenshaw, Kimberle. 1989. Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics. *University of Chicago Legal Forum,* 1:8.

Drager, Katie. 2010. Sociophonetic Variation in Speech Perception. *Language and Linguistics Compass,* 4/7, 473-480.

Eckert, Penelope. 2008. Variation and the Indexical Field. Journal of Sociolinguistics 12/4, 2008: 453–476

Hanuliková, A., Petra.M. van Alphen, Merel M. van Goch, Andrea Weber. 2012. "When one person's mistake is another's standard usage: The effect of foreign accent on syntactic processing." *Journal of Cognitive Neuroscience.* 24:4, pp. 878–887. Massachusetts Institute of Technology.

Hendrick, Randall. 1982. Reduced Questions and Their Theoretical Implications. *Language,* 58:4, 800-819.

Hill, Jane. 2008. *The Everyday Language of White Racism*. Massachusetts: Wiley-Blackwell Publishing.

Kim, S., Sumner Meghan. 2017. *Beyond lexical meaning: The Effect of Emotional Prosody on Spoken Word Recognition*. United States: Journal of the Acoustical Society of America.

Lanehart, Sonja. 1996. The Language of Identity. *Journal of English Linguistics,* 24:322.

Mendoza-Denton, Norma. 2011. The semiotic hitchhiker's guide to creaky voice: Circulation and gendered hardcore in a Chicana/o gang persona. *Journal of Linguistic Anthropology*, 21:2, 261-280.

McGowan, Kevin. 2015. Social Expectation Imrpoves Speech Perception in Noise. *Language and Speech,* 58.4: 502-521.

Podesva, Robert J. 2007. Phonation type as a stylistic variable: The use of falsetto in constructing a persona 1.*Journal of Sociolinguistics*, 11:4, 478-504.

Purnell, Tomas, William Idsardi, John Baugh. 1999. Perceptual and Phonetic Experiments on American English Dialect Identification. Journal of Language and Social Psychology 18: 10-30.

Slobe, Tyanna. 2018. Style, stance, and social meaning in mock white girl. *Language in Society* 47:4, 541-567.

Van Berkum, Jos. J. A., Danielle van den Brink, Cathelijne M. J. Y. Tesink, Miriam Kos, and Peter Hagoort. 2008. “The neural integration of speaker and message.” Journal of Cognitive Neuroscience, 20:4, pp. 580–591. Massachusetts Institute of Technology.

Wolfram, Walt. 2007. Sociolinguistic Folklore in the Study of African American English. Language And Linguistic Compass, 1:4, 292-313.