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Regional Relocation and Phonetic Dialect Markers: Longitudinal Tracking of the (ING) Vowels in Two YouTube Personalities

Victoria Kuo

This paper tracks phonological change in the (ING) morpheme in two YouTube personalities over time. Both participants relocated to a different dialect region than their hometowns over the course of their careers, motivating the hypothesis of this paper: geographic relocation is a catalyst for adult accent change. With a longitudinal study method, I selected audio clips from different periods in each YouTuber's life and collected formant measurements of the targeted words. Based on a Pearson's correlation analysis and hypothesis testing models, the participants showed statistically significant progression in their speech over time. Additionally, the speakers exhibited audible shifts most likely as an effect of aging. It is inconclusive whether this study's observations are influenced by the difference in dialect or societal pressures of the relocated locations without further research in the other variables of each regional dialect.

1 Introduction

It has been observed that early childhood (Cummins 1979, Ali et al. 2020, Clark 2000) and adolescence (Singleton and Ryan 2004:55–56) are critical periods of development when there is a relationship between age and the quantifiable amount of learning a subject is capable of doing (Newport et al. 2001). The effects of brain plasticity at the age of acquisition differ from individual to individual, and conflicting literature is finding the age of acquisition hypothesis less robust than previously thought (Birdsong 2005, Birdsong 2006), having documented phonetic variations in individuals beyond these critical periods (Gahl and Baayen 2019). For instance, Gahl and Baayen (2019) documented shifts over time in the F1/F2 vowels' pace across speech samples taken from a documentary series. This newly closing gap in inquiry inspires the question of this paper: what motivates adult speech to change as individuals move through different life experiences — increasing age (maturation), migration (geographical relocation), and style (intended speaking perspective).

The differences in speech between individuals, such as differences in pronunciation, lexicon, or syntax, are called linguistic variation, and they can be attributed to many social factors, such as a person's age (Singleton and Ryan 2004, Anderson 2014), sex and gender (Eckert 1989), race (Holliday 2019), and hometown (Wolfram and Schilling 2015). However, variationist linguistic research has demonstrated conflicting evidence for the association between vowel change and life factors such as geographical relocation and generational language (Barker 2016, Stuart-Smith et al. 2017). When assessing previous literature on adult speech evolution and dialectal variation, it is uncommon to find regional migration, outside of the East Coast and California (Labov 1986, Arvaniti and Garding 2007), as a primary catalyst for change (Munro et al. 1999, Foreman 2003, Evans 2004, Nycz 2013). In the Munro et al. (1999) study, the observed speech changes are hypothesized to be correlated with the migrant group's attitude towards the host culture and socially motivated need to acquire new dialect tokens, rather than an automatic effect of migrating to a new environment. In another study, accommodation is only exhibited in certain vowels over others when accommodation for all features would be expected as exposure to the new dialect increases (Nycz 2013). One complication in this study is the difficulty in isolating the more automatic aspects of migration-motivated speech change from the less automatic ones.

An established variable in the linguistic world is the (ING) variable. The (ING) variable is most commonly recognized as variation between the variants *-ing* and *-in*; phonological variation in the (ING) suffix (as in *walking* versus *walkin'*) involves variation in the nasal consonant ([ŋ] and [n]) as well as its preceding vowel ([i] and [ɪ]). It was one of the first linguistic variables to have been quantitatively studied (Fischer 1958) and is considered to be stable across English-speaking communities and not undergoing change. As established in the Fischer (1958) study, use of socio-symbolic variation is a consequence of a speaker's idiolectological reaction to social situations differentiated as the time to use formal versus informal speech, or vice versa. Historically, the *-in* variant is seen as a sociolinguistic indicator for lower working class people in North America (Huspek 1986). The *-in* variant is now commonly associated with less education, lower socioeconomic status, casual speech style, Southern dialects, African American dialects, and youth from English-speaking countries (Schleef et al. 2011).

In this study I chose to examine the two vowel variants, rather than the nasal variants: the [i] vowel preceding the velar nasal [ŋ], as in *waiting*, and the [ɪ] vowel preceding the alveolar nasal [n], as in *waitin'* (Hazen 2006). The result of articulatory differences for the vowel and consonant is a change in the vowel's first and second formants (F1 and F2), which are the measurable acoustic traits that distinguish different vowels.

Variation in (ING) has been investigated through social perception studies finding that listeners will often shift their connotation of the speaker or the word's meaning based on whether *-ing* or *-in* is used. Studies have found that changing the suffix caused the university student listeners, who were from California (Campbell-Kibler 2008) and Ohio (Campbell-Kibler 2012), to shift their opinions on the social meaning of the voiced text and/or the social information of the speaker in aspects such as intention or demographics (Campbell-Kibler 2008, Campbell-Kibler 2012). Campbell-Kibler (2008) used the Matched Guise Technique of re-synthesizing recorded audio of the *-ing/-in* variant to assess the immediate reactions of her student listeners and their anecdotal perception of the presented speaker. After the 2008 study, Campbell-Kibler (2012) performed Implicit Association Tests that further established a formality index for the tested variants. Both studies resulted in a general understanding that the audience compares the presented speaker's linguistic qualities to their own personal and linguistic backgrounds. The social associations connected to the tested linguistic profiles also vary based on the listeners' own connotations of *-ing* and *-in*. This study considers the possibility that a shift in dialect of the (ING) variant could be the result of audience perception, as investigated in the Campbell-Kibler study in (ING) social perception.

When faced with criticisms of their original dialect, speakers may feel societal pressure to accommodate to the speakers of their new environment, whether that be changing their use of the *-ing* and *-in* or shifting their dialects towards the dialect of the relocated region. In such cases, speakers may face stigma, prejudice, and difficulty communicating with others in private and professional settings, which in turn affects work performance, quality of life, mental health, economic stability, and social status (Hunt 1994). Speakers who find themselves marginalized due to their different speaking styles may actively try to hide or manipulate their regional accent to better assimilate with the accents of their peers. Accommodation that involves dialect acquisition in the attempt to be bidialectal is a way of closing the social distance between individuals by modifying linguistic behavior to fit in with the target audience without being considered fluent in the acquired accent (Hazen 2001, Giles and Ogay 2007).

The current study aims to demonstrate change in the [i] and [ɪ] vowels used in the (ING) morpheme as a result of geographic relocation to a new dialect region. In contrast to Gahl and Baayen (2019), participants are chosen from YouTube due to easy accessibility to a variety of adult speech styles. Participants were matched based on whether they relocated from a region with a dialect different from the relocated dialect, and if they were comfortable in front of a large audience after amassing years of videos available for analysis. I hypothesize that the speakers' original accents will shift towards the benchmarks of their relocated region. Even without the need for active accommodation, the speakers are likely to adapt their behaviors (e.g., linguistic, paralinguistic, and nonverbal communication) as a result of passive accommodation over the course of multiple conversations with native dialect speakers of the relocated region, which would also prompt an accent shift. A null result, meaning no change in formant values over time, would suggest a lack of need or desire to accommodate the relocated dialect region or that aging had no effect on speech change, and a significant result would suggest otherwise.

2 Methodology

Methods of conducting longitudinal studies have only recently been updated with the help of media sources like YouTube, motivating more linguists to pursue this method of data collection (Chun 2013, Lei and Liu 2016, Schneider 2016, Hall-Lew et al. 2017, Lee 2017). YouTubers tend to make varied content even if their channel has a central theme, and this variety in video style (e.g., vlog, rant, tutorial, etc.) brings forth the notion of stylistic meaning. When I mention style in this paper, I will be referring to Labov's (1972) attention paid to speech approach when it comes to the intended formality of the videos. For example, the YouTuber may speak in casual style when vlogging but speak in a more formal tone when making a serious announcement. With this data collection method, I have access to the voices of speakers from varied demographics and different speech styles, as well as access to the specific participants that fit the criteria of this study. However, as YouTube is an international web of social communication, features like comments, social media marketing, and culturally specific prejudice also factor into how much information a speaker is willing to divulge to the public. A reluctance to be "real" and hyperawareness of a global audience could affect the validity of the study since I am interested in the accent shifts of everyday adults. I account for this by choosing participants who appeared comfortable in front of the camera even before fame and who are known in the entertainment industry for being true to themselves despite a critical audience.

In addition to finding YouTubers who are "real" with their audience, I looked for two vloggers to further establish a database primarily based on unscripted speech. To better understand the effect of relocation on accent shifts across different demographics of adults, I chose two vloggers with different early life backgrounds that would affect their accent development. They must have relocated from a part of the United States (US) with a distinct dialect region to another part of the US with its own distinct dialect.

2.1 Participants

2.1.1 Participant 1

Participant 1, anonymized as YouTuber R, was born in 1990 in Hilo, Hawaii, and is of Okinawan descent. He started his first YouTube channel in 2006 at 16 years old in high school and then moved to Las Vegas, Nevada.

R hoped to pursue a career in engineering when he moved to Las Vegas but dropped out to do YouTube full-time. His residence is now in Nevada as a professional YouTuber. Boasting over 21 million subscribers, R's genre of YouTube video is mostly comedic skits, rants, discussions, "challenge videos", and podcasts.

From his geographical background, I assume that R originally spoke Hawaiian English (Drager et al. 2013) and then moved to a location primarily made up of Western US English speakers (Labov et al. 2008). Note that linguists expect Hawaiian English speakers to have similar [i] and [ɪ] pronunciations due to the historical language evolution of the island. The diversity of the island complicates the analysis of Hawaiian English speakers due to the presence of pidgin and creole languages. This influence has also contributed to common patterns found in their pronunciation of the vowels [i] and [ɪ] and the consonants [n] and [ŋ]. Although previously investigated speakers have developed the lax vowel [ɪ], the speakers often substitute it with the vowel [i] for no nasal variant in particular (Carr 1972:39). The [ɪ] vowel is particularly susceptible to fronting and raising due to influence from the phonological systems of the many other languages spoken in Hawaii (including Hawaiian), which has led some researchers to assume that the formant values for the two vowels will have similar characteristics (Carr 1972:64). However, as there has been limited recent research on this subject matter, this information may not be relevant to millennial speakers like R. Also, Western US English has acoustically different pronunciations of the vowels as compared to Hawaiian English (Labov et al. 2008).

2.1.2 Participant 2

Participant 2, anonymized as YouTuber J, was born in 1986 in Rochester, New York, and is white. She started her YouTube channel in 2010 at the age of 24. She moved from New York to Massachusetts in 2004, where she finished college and earned a master's degree. J then moved to Los Angeles, California, in 2011 and has not relocated since. With over 20 million subscribers on her YouTube channel, J posts comedic "challenge videos", discussions, rants, and "day-in-the-life" vlogs.

From her geographical background, I assume that J originally spoke Inland Northern US English and then moved to a location primarily made up of New England US English speakers. Following that relocation, she then moved to a location primarily made up of Western US English speakers. Note that Inland Northern US English speakers have acoustically different pronunciations of the investigated vowels as compared to Western US English (Labov et al. 2008). I will also only focus on her accent change from Inland Northern US English to Western US English, even though her time in Massachusetts may have also resulted in accent change.

2.2 Data Resources and Collection

Using a longitudinal panel study method — an observational study in which various samples of audio are taken at different time points throughout the speakers' lives — I selected video clips from the start of both R and J's YouTube careers to the present day. For R, 266 vowel tokens were evaluated from multiple time points between February 24, 2008, to October 12, 2019, from age 17 to 29 years old. To represent his past accent, I took 104 vowel tokens from February 24, 2008, to May 23, 2014, and 162 vowel tokens from October 17, 2014, to October 12, 2019, to represent his present accent. For J, 397 vowel tokens were evaluated from multiple time points between May 24, 2010, to June 10, 2020, from age 23 to 33 years old. To represent her past accent, I took 232 vowel tokens from May 24, 2010, to April 9, 2015, and 165 vowel tokens from May 7, 2015, to June 10, 2020, to represent her present accent. It is not public information exactly what time period the two relocated, but we can assume it was sometime early in their YouTube careers and within the time period I selected vowel tokens from. I divided the amount of vowel tokens collected per analyzed video (sorted by ascending date: earliest to most recent) by half, to categorize the speaker's past accent versus present accent. Audio clips from their YouTube videos were selected for their acoustic quality on a subjective scale of audibility (e.g., little to no background music, lack of sound effects, and no overlapping speech with other talkers). All clips were taken from their respective public YouTube channels and tagged with speaker, video title, date published, video style (e.g., vlog, rant, tutorial, etc.), start and end time, and duration. The total duration of the collected samples from both speakers was 2 hours and 19 seconds. Each video was downloaded as a .wav file for acoustic analysis and transcribed by ear; every word ending in *-ing* or *-in* was selected for analysis and categorized according to the morphological variant heard. Some morphemes were excluded due to their contextual grammatical usage as pronouns and one noun (e.g., *anything*, *something*, *thing*, etc.) On the other hand, I included nouns (e.g., *beginning*, *warning*, etc.), verbs (e.g., *vlogging*, *growing*, *saying*, etc.), adjectives (e.g., *disgusting*, *wondering*, *interesting*, etc.), and adverbs (e.g., *freaking*).

2.3 Data Analysis

Formant measurements were extracted using Praat (Boersma and Weenink 2021). F1 and F2 were calculated and logged for each vowel by taking the average formant value throughout the entire duration of the vowel. For statistical analysis, linear regression models were fit to the data, with age as the independent variable and F1 and F2 of each vowel as dependent variables (each formant set was modeled separately). In addition, Pearson Correlation tests were run to determine the strength of the formant vowel change over time. I also ran one-tailed hypothesis tests for each of the formant sets to test for significance of the correlation coefficient. In this study, increasing age represents both speaker maturation and time spent in the relocated dialectal region. Vowel charts

were also made in order to have a method of verification and comparison for the statistical models. The more recent averages of the participants' accents were also compared to chosen benchmark formant values of Western US English (here, California; cf., Kennedy and Grama 2012).

3 Results

I hypothesized that both speakers' initial accents would shift towards the accent of their relocated region. I expected both Participants R and J to lower F1and raise F2 for both [i] and [ɪ] as a move towards benchmark values of Western US English (Kennedy and Grama 2012). No change in formant values over time would mean we cannot reject the null hypothesis, and a significant result would suggest an accent shift was recorded.

Table 1: Identifying the *R*- and *p*- values of the vowel formant values of each morpheme (*-ing* and *-in*) per speaker over time. * = significance at $p < 0.05$, ** at $p < 0.01$, *** at $p < 0.001$

Participant	Variant	*R*-values *-ing*	*p*-values *-ing*	*R*-values *-in*	*p*-values *-in*
YouTuber R	Vowel F1	0.08	0.1218	-0.23	0.0640
	Vowel F2	-0.24	***0.0004	0.01	0.4627
YouTuber J	Vowel F1	-0.14	**0.0097	-0.22	*0.0171
	Vowel F2	-0.16	**0.0033	0.03	0.3780

As shown in Table 1, I ran a Pearson's correlation coefficient test to determine the statistical significance of each relationship between speaker, vowel, and vowel formant. In general, a +/-1.0 to +/-0.70 is associated with a strong correlation, +/- 0.60 to +/- 0.40 a moderate correlation, and < +/- 0.30 a weak correlation. Both YouTubers displayed weak correlations for all tested vowels and tested formants (Table 1). However, the *p*-values calculated show a significant likelihood that some of the data sets reject the null hypothesis (that the participants exhibited no accent shift at all). In general, if the *p*-value is less than 0.05 then we reject the null hypothesis. The following significant correlations were found: there is sufficient evidence to conclude that there is a significant linear relationship between YouTuber R's [i] F2 values and aging (p=0.0004), between YouTuber J's [i] F1 values and aging (p=0.0097), between YouTuber J's [ɪ] F1 values and aging (p=0.0171), and between YouTuber J's [i] F2 values and aging (p=0.0033), because the correlation coefficients are significantly different from zero. At three of four axes of variation, YouTuber J varies as respect to time; in comparison, YouTuber R only varies at one axis but the correlation is more robust. YouTuber R shows a positive direction for two of four of his axes of variation (Vowel F1 for *-ing* and Vowel F2 for *-in*) and negative directionality for the other two of four of his axes (Vowel F2 for *-ing* and Vowel F1 for *-in*). YouTuber J shows a negative directionality for three of four of her axes of variation (Vowel F1 for *-ing*, Vowel F2 for *-ing*, and Vowel F1 for *-in*) and one positive correlation (Vowel F2 for *-in*).

3.1 Participant R Results

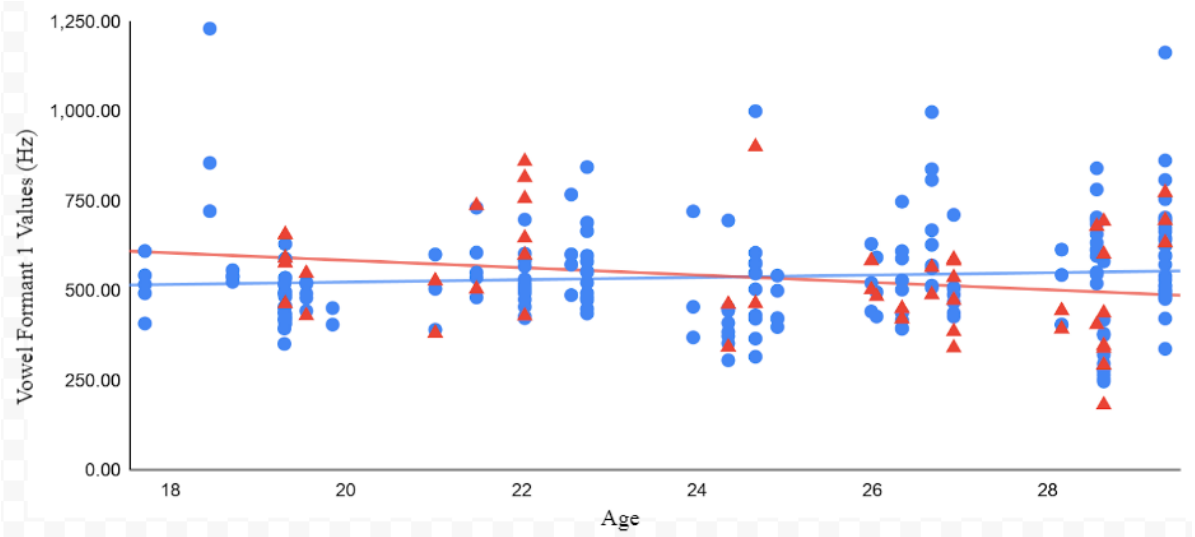

Figure 1: R's F1 values (Hz) over time. The vowel in *-ing* is blue and the vowel in *-in* is red.

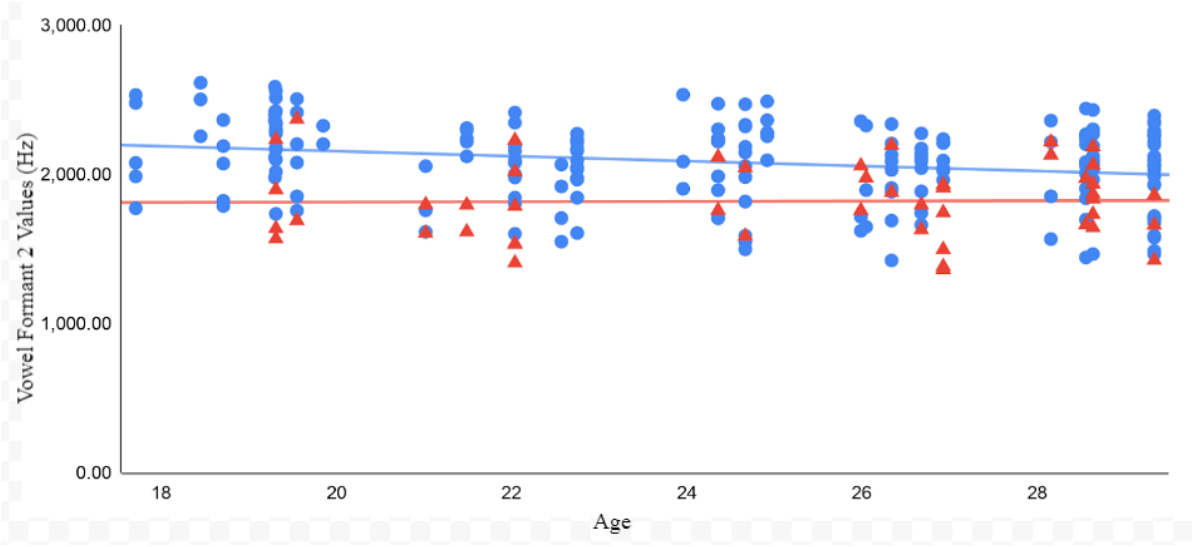

Figure 2: R's vowel F2 values (Hz) over time. The vowel in *-ing* is blue and the vowel in *-in* is red.

Table 2: A comparison of the Western US English benchmark formant values and Participant R's past and present accent formant averages*

	-ing F1	*-ing* F2	*-in* F1	*-in* F2
Western US English benchmark (Kennedy and Grama 2012)	400	2400	600	2000
Participant R formant average from 2008/02/24 to 2014/05/23 (*n*=104 words; represents the past accent)	534	2134	595	1795
Participant R formant average from 2014/10/17 to 2019/10/12 (*n*=162 words; represents the present accent)	543	2040	500	1833

*The date divisions are generalizations and were made by splitting the years recorded for R in half as evenly as possible.

In all four formant sets, (ING) showed a nonzero association with R's increasing age. Figure 1 shows R's F1 for [i] increase over time, whereas R's F1for [ɪ] decreased over time. Figure 2 shows R's F2 for [i] decrease over time and his F2 for [ɪ] increase over time. R's articulation of the [i] vowel lowered and moved farther back as he aged. Contrastingly, R's articulation of the [ɪ] vowel rose and moved forward as he aged. Table 2 also shows a general increase in R's [i] F1 and a decrease in his [i] F2, deviating away from the benchmark. His [ɪ] F1 decreases past the benchmark and his [ɪ] F2 increases towards the benchmark (Table 2).

3.2 Participant J Results

In all four formant sets, (ING) showed a nonzero association with increasing age. Figure 3 shows J's F1 for [i] decrease over time. Similarly, J's F1for [ɪ] also decreased over time. Figure 4 shows J's F2 for [i] decrease over time and her F2 for [ɪ] increase over time. J's articulation of the [i] vowel rose and moved farther back as she aged. Additionally, J's articulation of the [ɪ] vowel rose and moved farther back as she aged. Table 3 also shows a general decrease in J's [i] F1, moving towards the benchmark, and a decrease in her [i] F2, deviating away from the benchmark. Her [ɪ] F1 decreased past the benchmark and her [ɪ] F2 decreased towards the benchmark (Table 3).

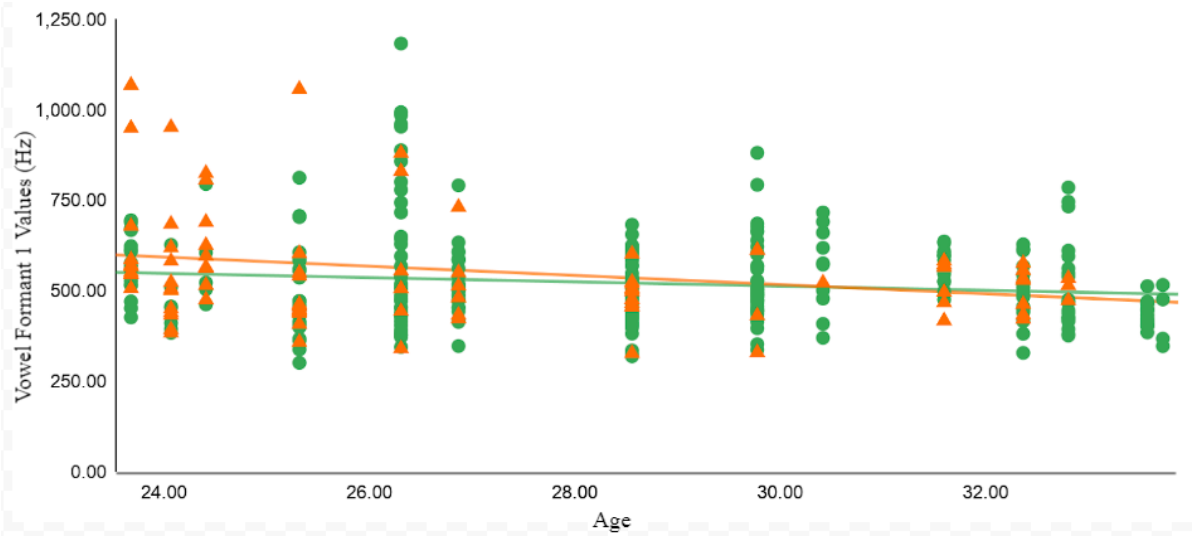

Figure 3: J's vowel F1 values (Hz) over. The vowel in *-ing* is orange and the vowel in *-in* is green.

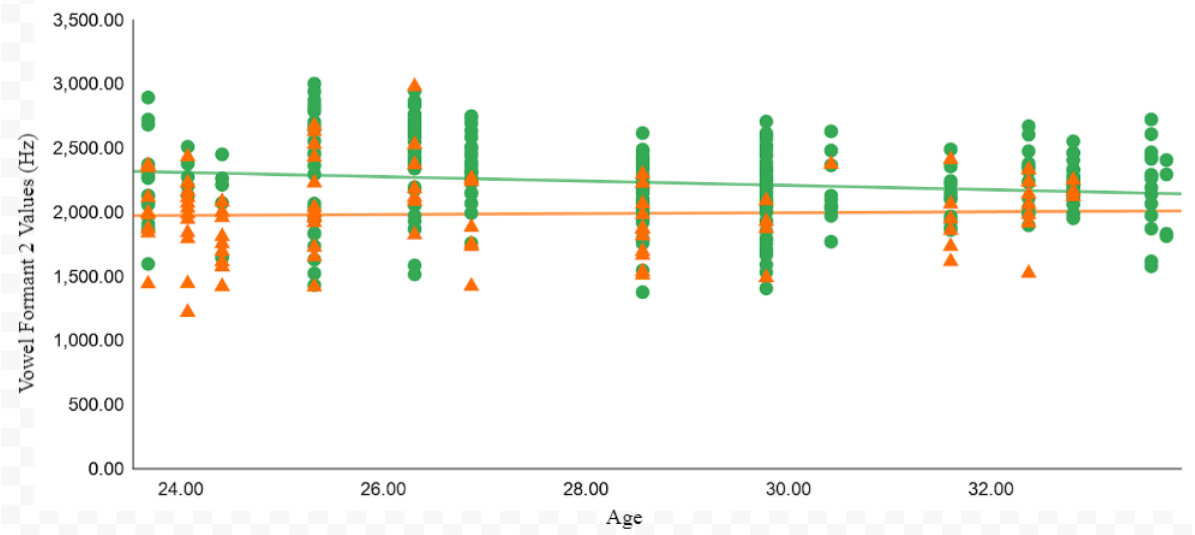

Figure 4: J's vowel F2 values (Hz) over. The vowel in *-ing* is orange and the vowel in *-in* is green.

Table 3: A comparison of the Western US English benchmark formant values and Participant J's past and present accent formant averages*

	-ing F1	*-ing* F2	*-in* F1	*-in* F2
Western US English benchmark (Kennedy and Grama 2012)	400	2400	600	2000
Participant J formant average from 2010/05/24 to 2015/04/09 (*n*=232 words; represents the past accent)	534	2290	580	1997
Participant J formant average from 2015/05/07 to 2020/06/10 (*n*=165 words; represents the present accent)	507	2164	498	1962

*The date divisions are generalizations and were made by splitting the years recorded for J in half as evenly as possible.

4 Discussion

I hypothesized that as speakers move through adulthood after relocation, they would exhibit an accent shift from their initial accent towards that of their relocated region. The modeling results are inconsistent with the hypothesis: some formant sets are evidence for the alternative hypothesis and other formant sets align with the

null hypothesis. I found that F1 and F2 of the vowels in the (ING) variant showed an overall change in the participants. However, the fact is that the results were inconsistent with respect to change within the individual. R's F1 for the vowel in *-ing* and his F2 for the vowel in *-in* moved towards the Californian benchmark, but his *-ing* F2 and *-in* F1 moved away from it. J's *-ing* F1 also moved towards the Californian benchmark, but all other dimensions of variation moved away from it. (Note also that, in moving towards the California benchmark, R's *-ing* vowel lowered, while J's *-ing* vowel raised.) To reject the null hypothesis, an accent shift should have affected all aspects of the speaker's accent for it to have changed towards the relocated accent.

Although inconsistent, it is shown in some of the formant sets that a significant change occurred. Much like the Canadians in Munro et al.'s (1999) Alabama study, this suggests that adults who relocate from one dialect region to another begin to acquire some of the variants of the relocated dialect. The Munro et al. (1999) study inspired the question guiding this research of whether relocation affects dialect acquisition in adults. They discovered that Canadian speakers living in Alabama exhibited an intermediate form of the "American accent" from the anecdotal standpoint suggested by their interviewees. I sought to discover the same degree of intermediate change on a quantifiable scale between participants with existing "American accents", which led to mixed results. Further research into whether this intermediate stage was acquired by the study's participants would be necessary for comparison with previous literature on perceptual dialect acquisition.

If not for relocation, then increasing age could have also played a factor in the change. Past longitudinal studies focusing on the changes in adult formant values observed a falling F1 over time as their participants, who spoke Received Pronunciation, aged (Reubold et al. 2010, Reubold and Harrington 2017). Their participants exhibited this trend especially in the F1 values of high vowels (which includes [i] and [ɪ]) over time) (Reubold and Harrington 2017). This trend is also evident in J's F1 values for the vowels in *-ing* and *-in* mapped over time (Figure 3), as well as R's F1 values for the vowel in *-in* over time (Figure 1). There are a few possibilities that could cause this decrease in F1 trend due to biological aging: it may be caused by physiological changes in the vocal tract, such as lengthening. However, this interpretation is not clearly relevant for the present analysis. First, these speakers are in their late 20s/early 30s at the oldest analyzed, as opposed to the elderly speech studied by Reubold and Harrington (2017). Furthermore, if the change were due to physiological changes, we might have expected a similar trend in both vowels for both R and J, and the other formants (including F2) would change in accordance, which was not observed in the F2 values of the vowel in *-in* over time for both R and J (Figure 2 and Figure 4).

Another interpretation of the results would be active versus passive accommodation. It is possible that when R relocated to Nevada, he could have been perceived as a nonnative English speaker due to his ethnicity and use of a salient and lesser-known regional dialect. The shift in accent for speaker R's case could be due to social stigma or prejudice against his race, or his social status in his relocated community: both are factors that strongly influence the need to modify one's accent in order to fit in. Assuming that this would be the case, it is surprising that R's accent did not vary much, which could be due to the large immigrant population and possible social inclusivity of Las Vegas. The same theories can be applied to speaker J, whose accent also changed in favor of her relocated accent's benchmark. Her desire to assimilate to her relocated environment could have catalyzed her accommodation to her new audience. When full bidialectism is acquired, speakers may feel more comfortable communicating in both their home and relocated settings, and may elicit less social prejudice against their accents because they are speaking the accepted dialect in a public setting (Hunt 1994). I believe further investigation into accommodation theory in adults after relocation could lead to discoveries in the role of linguistic similarity in developing new social connections.

The following limitations could have impacted the lack of consistency in results: the decision to use YouTube as a source and the difficulty in differentiating the effects of age versus relocation. Possible effects of evaluating adult YouTubers could be a difference in adult vocabulary: YouTuber R was more likely to keep his content parent-friendly, whereas YouTuber J enjoyed cursing frequently, so the lexical items analyzed differed between the two. Using YouTubers as participants could also have possible effects on the results, as it is difficult to know whether publicized backgrounds on the individuals were accurate or how much of their videos were intended to be unscripted or otherwise. Additionally, the difficulty in isolating the variables of increasing age and dialect exposure would mean that the results could reflect either factor.

5 Conclusion

In this paper, I observed that two speakers showed an audible and statistically significant shift from their original regional accents to the accent of their relocated region, at least according to the vowel in the variable (ING). Both speakers also showed evidence of formant changes with the falling of their F1 values (vowel raising). The experimental hypothesis was that geographical relocation was a prime catalyst for formant change over time, which means I expected to see change in all investigated vowel formant comparisons. I was unable to conclude that the changes observed are truly due to the geographical migration, but it was interesting to discover that, unlike previously hypothesized, adult speech is continuingly changing. Even the slightest change in accent

that persists over time could mean a life experience trigger (i.e., relocation) was influential enough to affect the speaker to their present day. Social influence and assimilation pressure on accent change is also an important topic to investigate due to the social perception of perceived "bad" English from immigrants. Further research is necessary in the category of adult accent shift after inter-country relocation with a larger sample size that encompasses people of varied life experiences. Additionally, I chose to only look at the vowels related to the (ING) variant, which could mean there are statistically significant differences that could be found when investigating other variables in the complete data set. This research would have to look at other vowel variables that are salient parts of California English, Hawaii English, and Western US English.

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References

Anderson, Elaine. 2014. Speaking With Style: The Sociolinguistics Skills of Children. London: Routledge.

Arvaniti, Amalia, and Gina Garding. 2007. Dialectal variation in the rising accents of American English. *Papers in Laboratory Phonology* 9:547–576.

Atma, Mohamad, Mohd Azmi, and Isyaku Hassan. 2020. The influence of modern video games on children's second language acquisition. *International Journal of Scientific & Technology Research* 9(8):319–323. https://dx.doi.org/10.2139/ssrn.3680020

Barker, Hollie. 2016. Does geographic relocation induce the loss of features from a single speaker's native dialect? *Lifespans and Styles* 2(1):27–34. https://doi.org/10.2218/ls.v2i1.2016.1428

Birdsong, David. 2005. Interpreting age effects in second language acquisition. *Handbook of Bilingualism: Psycholinguistic Approaches*, ed. J. Kroll and A. De Groot, 109–127. New York, NY: Oxford University Press.

Birdsong, David. 2006. Age and second language acquisition and processing: A selective overview. *Language Learning* 56: 9–49. https://doi.org/10.1111/j.1467-9922.2006.00353.x

Boersma, Paul and David Weenink. 2021. Praat: Doing phonetics by computer [Computer program]. Version 6.1.39. Accessed 27 February 2021, http://www.praat.org/

Campbell-Kibler, Kathryn. 2008. I'll be the judge of that: Diversity in social perceptions of (ING). *Language in Society* 37(5): 637–659. https://doi.org/10.1017/s0047404508080974

Campbell-Kibler, Kathryn. 2012. The implicit association test and sociolinguistic meaning. *Lingua* 122(7):753–763. https://doi.org/10.1016/j.lingua.2012.01.002

Carr, Elizabeth B. 1972. *Da Kine Talk: From Pidgin to Standard English in Hawaii*. The University Press of Hawaii. https://doi.org/10.2307/j.ctv9zckfd

Chun, Elaine W. 2013. Ironic blackness as masculine cool: Asian American language and authenticity on YouTube. *Applied Linguistics* 34(5):592–612. https://doi.org/10.1093/applin/amt023

Clark, Beverly A. 2000. First- and Second-Language Acquisition in Early Childhood. In *Issues in Early Childhood Education: Curriculum, Teacher Education, & Dissemination of Information. Proceedings of the Lilian Katz Symposium*, ed. D. Rothenberg, 181–188. ECAP: Champaign, IL. http://ecap.crc.illinois.edu/pubs/katzsym/katzsym.pdf

Cummins, Jim. 1979. Cognitive/academic language proficiency, linguistic interdependence, the optimum age question and some other matters. *Working Papers on Bilingualism*, No 19. Toronto, Canada: The Ontario Institute for Studies in Education.

Drager, Katie, Joelle M. Kirtley, James Grama, and Sean Simpson. 2013. Language variation and change in Hawai'i English: KIT, DRESS, and TRAP. *University of Pennsylvania Working Papers in Linguistics* 19(2):Article 6. https://repository.upenn.edu/pwpl/vol19/iss2/6

Eckert, Penelope. 1989. The whole woman: Sex and gender differences in variation. *Language Variation and Change* 1(3): 245–267. doi:10.1017/S095439450000017X

Evans, Betsy. 2004. The role of social network in the acquisition of local dialect norms by Appalachian migrants in Ypsilanti, Michigan. *Language Variation and Change* 16(2):153–167. doi:10.1017/S0954394504162042

Fischer, John L. 1958. Social influences on the choice of a linguistic variant. *WORD* 14(1):47–56. https://doi.org/10.1080/00437956.1958.11659655

Foreman, Annik. 2003. Pretending to be someone you're not: A study of second dialect acquisition in Australia. Doctoral dissertation, Monash University. https://doi.org/10.4225/03/59c9f2bfcdc9b

Gahl, Susanne, and Harald R. Baayen. 2019. Twenty-eight years of vowels: Tracking phonetic variation through young to middle age adulthood. *Journal of Phonetics* 74:42–54. https://doi.org/10.1016/j.wocn.2019.02.001

Giles, Howard, and Tania Ogay. 2007. Communication Accommodation Theory. In *Explaining Communication: Contemporary Theories and Exemplars*, ed. B. B. Whaley and W. Samter, 293–310 Mahwah, NJ: Lawrence Eribaum.

Hall-Lew, Lauren, and Zac Boyd. 2017. Phonetic variation and self-recorded data. *University of Pennsylvania Working Papers in Linguistics* 23(2):Article 11. https://repository.upenn.edu/pwpl/vol23/iss2/11

Hazen, Kirk. 2001. An introductory investigation into bidialectalism. *University of Pennsylvania Working Papers in Linguistics*, 7(3):Article 8. https://repository.upenn.edu/pwpl/vol7/iss3/8

Hazen, Kirk. 2006. IN/ING Variable. In *Encyclopedia of Language and Linguistics Second Edition*, ed. K. Brown, 5:581–584. Boston: Elsevier.

Holliday, Nicole R. 2018. Variation, race, and multiracial identity in linguistic research. *Wiley Interdisciplinary Reviews: Cognitive Science* 10(1):e1480. https://doi.org/10.1002/wcs.1480

Hunt, Jesse P. 1994. *Black English and Standard English: A study of bidialectalism*. Doctoral dissertation, Texas Tech University. http://hdl.handle.net/2346/23080

Huspek, Michael. 1986. Linguistic variation, context, and meaning: A case of *-ing/in'* variation in North American workers' speech. *Language in Society* 15(2):149–163. https://doi.org/10.1017/s0047404500000166

Kennedy, Robert, and James Grama. 2012. Chain shifting and centralization in California vowels: An acoustic analysis. *American Speech* 87(1):39–56. doi: 10.1215/00031283-1599950

Labov, William. 1972. *Sociolinguistic Patterns*. Philadelphia, PA: University of Pennsylvania Press.

Labov, William. 1986. The social stratification of (r) in New York City department stores. In *Dialect and Language Variation*, 304–329. Orlando, Florida: Academic Press.

Labov, William, Sharon Ash, and Charles Boberg. 2008. *The Atlas of North American English*. Berlin, Boston: De Gruyter Mouton. https://doi.org/10.1515/9783110167467

Lee, Sarah. 2017. Style-shifting in vlogging: An acoustic analysis of "YouTube Voice". *Lifespans and Styles* 3(1):28–39. https://doi.org/10.2218/ls.v3i1.2017.1826

Lei, Xinyun, and Siqi Liu. 2016. Has Barack Obama changed his language in later life? A case study of -ing/-in variation and the MOUTH vowel. *Lifespans and Styles* 2(2):2–9. doi:10.2218/ls.v2i2.2016.1608

Munro, Murray J., Tracey M. Derwing, and James E. Flege. 1999. Canadians in Alabama: A perceptual study of dialect acquisition in adults. *Journal of Phonetics* 27(4):385–403. doi:10.1006/jpho.1999.0101

Newport, Elissa L., Daphne Bavelier, and Helen J. Neville. 2001. Critical thinking about critical periods: Perspectives on a critical period for language acquisition. In *Language, Brain, and Cognitive Development*, ed. E. Dupoux, 481–502. Cambridge, MA: The MIT Press.

Nycz, Jennifer. 2013. Changing words or changing rules? Second dialect acquisition and phonological representation. *Journal of Pragmatics* 52:49–62. https://doi.org/10.1016/j.pragma.2012.12.014

Reubold, Ulrich, and Jonathan Harrington. 2017. The influence of age on estimating sound change acoustically from longitudinal data. In *Panel Studies of Variation and Change*, 129–151. New York: Routledge.

Reubold, Ulrich, Jonathan Harrington, and Felicitas Kleber. 2010. Vocal aging effects on F0 and the first formant: A longitudinal analysis in adult speakers. *Speech Communication* 52(7–8):638–651. http://dx.doi.org/10.1016/j.specom.2010.02.012

Schleef, Erik, Miriam Meyerhoff, and Lynn Clark. 2011. Teenagers' acquisition of variation: A comparison of locally-born and migrant teens' realisation of English (ing) in Edinburgh and London. *English World-Wide* 32(2):206–236. https://doi.org/10.1075/eww.32.2.04sch

Schneider, Edgar W. 2016. World Englishes on YouTube: Treasure trove or nightmare? In *World Englishes: New Theoretical and Methodological Considerations*, ed. E. Seoane and C. Suárez-Gómez, 253–282. Amsterdam: John Benjamins. https://doi.org/10.1075/veaw.g57

Singleton, David M., and Lisa Ryan. 2004. *Language Acquisition: The Age Factor*. Bristol: Multilingual Matters. https://doi.org/10.21832/9781853597596

Stuart-Smith, Jane, Brian Jose, Tamara V. Rathcke, Rachel Macdonald, and Eleanor Lawson. 2017. Changing sounds in a changing city: An acoustic phonetic investigation of real-time change over a century of Glaswegian. In *Language and a Sense of Place: Studies in Language and Region*, ed. C. Montgomery and E. Moore, 38–64. Cambridge: Cambridge University Press.

Wolfram, Walt, and Natalie Schilling. 2015. *American English: Dialects and Variation*. Malden, MA: John Wiley & Sons.

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