AGE OF ARRIVAL DOES NOT AFFECT CHILDHOOD IMMIGRANTS' ACQUISITION OF ONGOING SOUND CHANGE: EVIDENCE FROM KOREAN AMERICANS

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ABSTRACT

Age of arrival (AOA) has been shown to predict successful L2 phonological acquisition among transnational bilinguals: the earlier acquisition begins, the more native-like the L2 phonology. AOA studies have been submitted as evidence for the Critical Period Hypothesis. However, recent research explains the AOA effect through other sociolinguistic factors that may be correlated, such as quality of L2 input.

This study examines a population of Korean-English bilinguals, grouped by AOA and generational status. It is hypothesized that the earlier the AOA, the more likely a speaker is to participate in back vowel fronting, part of the California Vowel Shift. Natural speech data taken from bilingual interviews shows that AOA has, in fact, no effect on back vowel fronting, although gender does. Second generation Korean Americans (L1 English) and early childhood immigrant Korean Americans (L2 English) behave almost the same with respect to this sound change of California English.

Keywords: L2 acquisition, California Vowel Shift, age of arrival

1. INTRODUCTION

When it comes to learning a second language by moving to a new country, many studies have shown that the age of arrival (AOA) plays a crucial role in successful phonological acquisition. The earlier acquisition begins, the more native-like the L2 phonology will be (see [4], [6], and [15], among others).

Some interpret this as evidence for a critical period of L2 acquisition, after which children or young adolescents lose the ability to "natively" acquire a second language. However, even [4] originally acknowledged that AOA alone cannot always account for the linguistic behaviors observed, in particular when confounding factors such as amount and quality of L2 input are controlled for (see [10] and [3]). In light of more nuanced approaches to childhood L2 acquisition, AOA has not held up so well.

Among some populations of recent immigrants to the United States, such as Korean Americans, there is a social category that distinguishes childhood immigrants from those who were born and raised in the United States. Native-born Korean Americans are considered to be "second generation", while those who were born abroad but moved with their families when they were young are called "1.5 generation". According to [12], the cultural differences between second and 1.5 Korean Americans (KAs) can be very pronounced. As for English acquisition, 1.5 generation Korean Americans have a reputation for speaking with a perceptible accent, but this is in part because the category itself is rather broad, encompassing childhood and adolescent arrivals ([15]).

This study samples the demographic of young bilingual Korean Americans who were raised in California. California English is known for an ongoing vowel shift described in [2] as including fronting of high back vowels /u/ and /oʊ/ (GOOSE and GOAT, respectively). Although these sociophonetic variables are most strongly associated with White speakers, non-White Californians do make use of them. In [7], for example, Chinese American English speakers in San Francisco are at least equal to their white counterparts in rates of GOOSE-fronting, and could possibly be leading the change.

In addition, while [8] found that gender plays a small role in the propagation of the California Vowel Shift, which corroborates the generally accepted phenomenon of females leading sound changes from below (see [9, 14], but also [1]), it is not known whether this gender effect extends to sound change acquisition in L2 speakers. L2 acquisition studies such as [15] do not normally consider gender as a relevant variable, but with this specific population and the sound change in question, a sociolinguistic lens becomes necessary. Given that gender and ethnicity do play a role in sound change, while generational status plays a role in language acquisition, the current study tests Korean Americans' speech to see whether there is any influence of AOA, generational status, or gender on back vowel fronting.

2. METHODS

Twenty-three Korean Americans were recruited to participate in an hour-long bilingual interview, which took place on the campus of a Northern California university. Speakers who were born and raised in the United States were categorized as "second generation (2G)", with a default AOA of 0. Speakers who were born in South Korea and moved to the United states between the ages of 3 and 10 were categorized as "1.5 generation (1.5G)". All the interviews were transcribed and automatically aligned using the Penn Forced Aligner [16]; data from twenty-one speakers (14 female) are presented.

Table 1: Subjects by gender and AOA

Gender	2G	1.5G
Female	7	7
Male	5	2

Following the procedure in [13], all vowel formant measurements were normalized as in [11]; then, tokens of GOOSE and GOAT vowels were extracted from their speech. The second formant (F2) of each token was measured, then subtracted from the per-subject mean F2 of the anchor vowel /i/ (as in FLEECE) to obtain a "fronting score" for each lexical item for every subject (totaling about 100-150 tokens per vowel per subject). Higher scores indicate a greater distance between FLEECE and the back vowel (i.e., less fronting), while lower scores indicate a closer distance between FLEECE and the back vowel (more fronting).

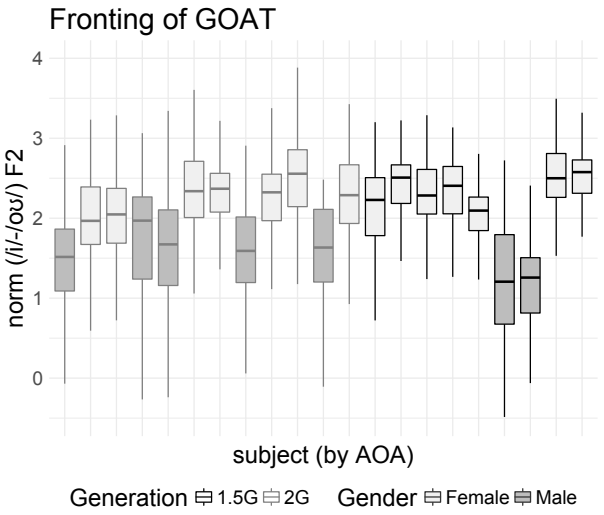
Figure 1 shows each subject's fronting score for GOAT. The subjects are ordered on the x-axis in increasing AOA, with 0 on the left and 10 on the right. It is immediately clear that there is no significant pattern to the data based on AOA. However, it is also apparent that the male speakers (darker boxes) had lower scores than the females (lighter boxes).

Thus, an analysis of variance with a random effect for subject was run to test the effects of AOA and gender on GOAT-fronting. The results are in Table 2.

Table 2: ANOVA of AOA (labeled as "Age.imm") and gender for /oʊ/ (GOAT)

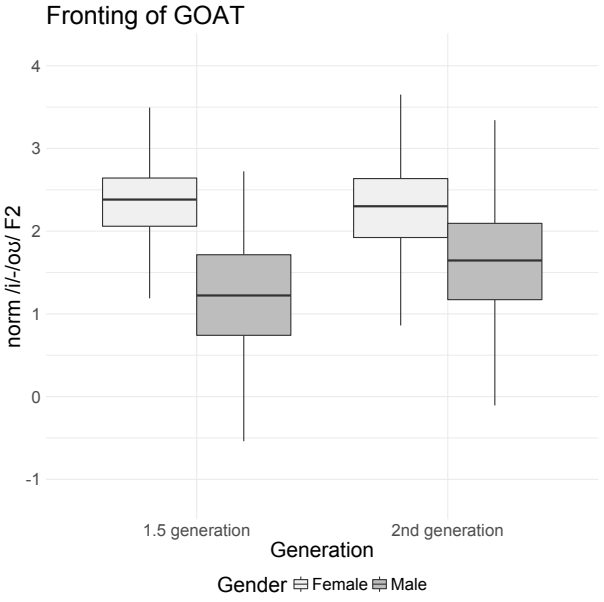
	Df	F	p
Age.imm	1	0.239	0.63119
Gender	1	136.211	1.54e-09 ***
Age.imm:Gender	1	15.083	0.00119 **
Residuals	17		

Figure 1: Fronting scores for all subjects, ordered by AOA. On the left are US-born second generation KAs; on the right are "1.5 generation" KAs. No significant effect of AOA was found.



Gender has a significant effect on GOAT-fronting ($F(1,17)=136.211$, $p<0.001$). However, contrary to the hypothesis, AOA had no effect on GOAT-fronting ($F(1,17)=0.239$, $p=0.63$). There were similar null results for AOA for GOOSE: $F(1,17)=1.828$, $p=0.19$.

Figure 2: Fronting scores for GOAT, subjects grouped by generation.



To test for a possible effect of generational group, another analysis of variance was run to test Generation and gender. The data is demonstrated in Figure 2, and test results are in Table 3. As with AOA, gen-

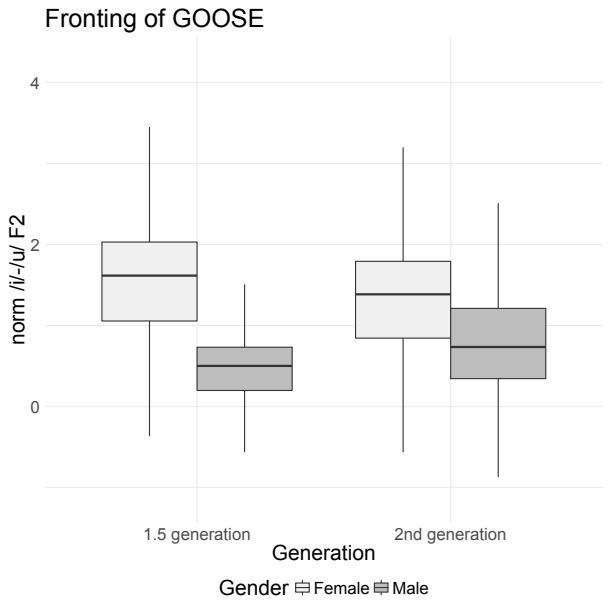
erational group did not have a significant effect on GOAT-fronting, while gender remained a significant factor.

Table 3: ANOVA: Generation, Gender, /oʊ/ (GOAT)

	Df	F	p
Generation	1	1.766	0.2014
Gender	1	99.884	1.56e-08 ***
Generation:Gender	1	6.753	0.0187 *
Residuals	17		

This pattern was the same for GOOSE, albeit slightly less significant, as seen in Figure 3. In addition, the interaction effect observed between gender and generation for GOAT was not observed for GOOSE. For GOAT, it would seem that 1.5 generation males led in fronting, followed by second generation males, then second generation females, and finally 1.5 generation females. However, given the small sample size for 1.5 generation males, it would be unwise to draw generalizations from the interaction effect. It is safest to conclude that for GOAT and GOOSE, males participate in fronting more than females (Table 4).

Figure 3: Fronting scores for GOOSE, subjects grouped by generation.



3. DISCUSSION

The hypothesis that an earlier AOA would correspond to increased rates of back vowel fronting among early childhood immigrants was not supported. Not only was AOA not a significant predictor of back vowel fronting, generational status as second generation or 1.5 generation was also not a significant predictor. In sum, compared to one another, second and 1.5 generation Korean Americans behaved almost exactly the same with respect to this part of the California Vowel Shift.

Table 4: ANOVA: Generation, Gender /u/ (GOOSE)

	Df	F	p
Generation	1	4.598	0.046752 *
Gender	1	17.606	0.000607 ***
Generation:Gender	1	4.365	0.052033
Residuals	17		

It is important to note that the speakers categorized as 1.5 generation were all early childhood immigrants with AOA of 10 or earlier. Without data from speakers who immigrated in early or late adolescence (who would still be socially categorized as 1.5 generation), these findings neither directly support nor refute the findings of [4] and others that AOA is correlated with L2 phonological ability.

However, earlier studies of Korean Americans have chosen different methods of grouping and analysis. [15], for example, found that when judged on their accent by native monolingual English speakers, Korean-English bilinguals clustered in four age groups: AOA 1-5, AOA 6-9, AOA 10-13, and AOA 14-23. The current study finds no significant difference between second generation (AOA 0) and 1.5 (AOA 3-10, which overlaps with several of the groups in [15]). More importantly, past studies of Korean-English bilinguals either focus on metalinguistic judgments of accent or prosodic variables in carefully produced laboratory speech, rather than segmental variables extracted from natural speech, which is the focus of this study.

As noted before, second language acquisition studies also tend not to factor in speaker gender as an explanatory variable for linguistic phenomena. But from the purview of sociolinguistics, it is unsurprising that speaker gender was the most (and sometimes only) significant factor for back vowel fronting. However, the directionality of the effect raises some questions. The expectation is for sound changes in progress to be led by younger female speakers; in this case, it was always the male speakers who showed greater back vowel fronting. It is possible that the relatively low number of male participants in the study has led to this result. More

research must be done to determine if the female speakers in this demographic are slightly resisting the sound change or if the male speakers are advancing it, and, either way, what social and linguistic factors are behind this unexpected behavior.

What can we make of the slight disparity between /u/ and /oʊ/ in the data? Generational status was a predictor of GOOSE-fronting, with second generation females participating more, but not of GOAT-fronting. However, the effect size, as determined by the F-value, is small. Some studies of the California Vowel Shift such as [8] have indicated that GOOSE-fronting is a better-established characteristic of the region, compared to the in-progress GOAT-fronting, and thus it is plausible that the generational difference is related to the robustness of the sound change in progress. That said, the data do show that speakers as a whole did demonstrate back vowel fronting (for both GOOSE and GOAT), and the generational difference was in degree of fronting, not binary acquisition of fronting. No known production studies of the California Vowel Shift have found significant differences between the vowels, so perhaps a study of the perceptual salience of fronted tokens of both vowels for speakers of both generations could help us discern whether this weak trend actually supports a distinction between GOOSE and GOAT.

Finally, in [5] and [7], the proposal that ethnic minorities may tend not to participate in the sound changes of the majority (White) language community was rejected with evidence from Chicano English speakers and Chinese Americans in California. Now, once again, we find evidence that a minority ethnic group, Korean Americans, are participating in back vowel fronting, albeit with clear gender differences and no obvious effect of age of arrival on non-native speakers who immigrated in early childhood.

Since back vowel fronting is only one of several characteristics of the California Vowel Shift, these findings do not imply that Korean Americans are fully participating in the entire shift. In addition, there are likely many other acoustic characteristics of Korean Americans' speech (whether second or 1.5 generation) that mark or index their ethnic identity or language background more saliently than vowels, such as variable use of fricative fortition or prosody.

4. CONCLUSION

The current study analyzes the natural speech of young bilingual Korean Americans and concludes that irrespective of age of arrival or generational status, Korean Americans participate in the back vowel fronting phenomenon of the California Vowel Shift, with men demonstrating greater fronting than women.

More research is suggested in the domain of other acoustic characteristics of L1 Korean-influenced English that may be found in childhood arrivals, such as the properties of stops and fricatives. Only with a fuller picture of 1.5 generation speakers' phonology will we be able to make definitive conclusions about the linguistic behaviors of 1.5 generation immigrants and childhood arrivals, and their impact on community-level sound change.

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