

## **Using the Audio-Articulation Method to Improve EFL Learners' Pronunciation of the English /v/ Sound**

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### **Abstract**

This study examines variants of the English /v/ sound among Thai EFL learners and tests the effectiveness of the Audio-Articulation Method (AAM) in improving the learners' pronunciation of the /v/ sound in word-initial, medial, and final positions. Sixty second-year English majors, classified into high and low groups based on their relative English proficiency, digitally recorded their oral reading of thirty sentences each of which contains one word with the /v/ sound before and after the integration of the AAM. The results reveal that the /v/ sound was produced in five variants: [v], [w], [b], [f], and [Ø]. The high group used [v] most frequently in all positions during the pre-test while the low group used [w] and [b] most often in word-initial and word-final positions, respectively. After exposure to the AAM, the use of the target [v] increased significantly in both groups. The rates for [w] and [b] reduced at a statistically significant level. Conversely, the use of [f] increased in all positions, suggesting that the learners were attempting to use the right point of articulation in order to approximate the target [v]. The results of the study show that the Audio-Articulation Method had a positive effect in improving the students' pronunciation of the English /v/ sound.

**Keywords:** Fricatives, consonants, segmentals, /v/ variants, intelligible pronunciation

## Introduction

Since English has been widely accepted as the language for international communication, it is vital that speakers of English, whether native or non-native, are able to exchange meanings effectively. Although the controversial issue on adopting native-like pronunciation may have lost its merit in recent years, it is still a concern for teachers that learners of English learn to speak as intelligibly and comprehensibly as possible. One of the key requirements for effective language teaching is for the teacher to help their learners achieve 'comfortably intelligible pronunciation,' i.e. pronunciation that can be understood with little or no conscious effort on the part of the listener (Abercrombie, 1991:93, cited in Rajadurai, 2001:10).

Pronunciation includes features at the segmental and supra-segmental levels. Segmental aspects of the sound system consist of individual consonants and vowels. Sounds beyond the level of individual sounds such as stress, rhythm, intonation and linking are referred to as supra-segmentals or prosody. Some researchers assert that supra-segmental features are more important in improving learners' speech intelligibility than segmental features. A contender of this view, Rajadurai (2001), found in her study that students overwhelmingly rated segmentals more useful than supra-segmentals. In addition, responses from instructors in Rajadurai's study indicated that learners' pronunciation of consonant and vowel sounds were more easily modified and improved in a relatively shorter period of time than supra-segmental aspects.

The fact that each language has a phonological system which differs from others often causes learners of a second language to face problems when having to pronounce sounds that do not exist in their native language (Hui-Ling & Radant, 2009). The English and Thai consonant systems are different in many ways. Among consonant sounds, English fricatives impose great challenges for Thai students to pronounce them correctly (Chunsuvimol & Ronnakiat, 2001; Imamesup, 2011; Wongs-Nguan, 2013). English is rich in fricative sounds compared to Thai which has only three. These fricatives are: /f/, /s/ and /h/, which occur only initially in Thai syllables. Because Thai does not have final fricatives, Thai learners of English often face much difficulty pronouncing these three sounds when they occur in a word-final position. In addition, all other English fricatives, which do not exist at all in Thai, are a constant challenge for Thai learners to pronounce irrespective of the position they occur in an English word. One way that learners deal with difficult L2 sounds is to replace those sounds with the nearest L1 equivalents (Chunsuvimol & Ronnakiat, 2001; Hui-Ling & Radant, 2009; Khirin, 2009; Wongs-Nguan, 2013).

With regards to the above-mentioned problem, the goal of the present study is to investigate Thai learners' variability in the pronunciation of the English /v/ sound in word-initial, medial, and final positions. It also aims to use the Audio-Articulation Method as a remedy for learners' errors in pronouncing the /v/ sound and to observe the effectiveness of the method used in the experiment. The hope is that the findings may be used to offer guidelines for teachers

of English in helping their students pronounce problematic English consonant sounds correctly and therefore achieve “comfortably intelligible pronunciation”.

## Relevant Research Studies

There have been a few studies investigating variations of /v/ among Thai learners. Chunsuvimol and Ronnakiat (2001), for instance, examined phonetic realizations of /v/ in word-initial and final positions of Thai undergraduate students majoring in English in three speaking genres: conversation (informal), reading text (formal), and minimal pairs (very formal). Their results showed that the /v/ sound in an initial position was less problematic. Most of the syllable-initial /v/ sounds occurred as [v] in each style (i.e. 63.5% for conversation, 81.4% for passage reading, and 93% for minimal pairs), followed by [w]. The frequency of [w] was high in the most informal style, i.e. that of conversation (36.5%), which decreased to 17.6% for more formal passage reading, and even lower to 6% for the most formal minimal pairs. On the contrary, in word-final position, [f] occurred most frequently, (i.e. 62.9% for conversation, 49% for passage reading, and 54% for minimal pairs), followed by [v] at 36.2%, 49%, and 46% respectively. Chunsuvimol and Ronnakiat argued that this could be due to the fact that learners were familiar with the initial fricative /f/, which exists in the Thai language. This probably explains why many learners resorted to /f/, which is the voiceless counterpart of /v/, in word-final position. A notable point observed in the study was that while the variant [f] occurred most frequently in word-final position in conversation, it was used minimally in word-initial position (1% for minimal pairs, 0.7% for passage reading, and Ø for conversation). One possible explanation could be that learners were aware, from their learning experience, that [f] was most probably not the right sound for the initial /v/.

Wongsa-Nguan (2013) investigated variability in the production of word initial, medial and final /v/ sound of Thai IT officers with high and low English language experience. The results showed that /v/ was produced in five variants: [w], [v], [f], [p], and [Ø] while [v] was produced correctly by the highly experienced group in the initial, medial, and final positions at 49.5%, 44.5%, and 29% respectively, and did not occur at all in any syllable positions in the group with low English language experience. It was found that the participants in both groups substituted /w/ for /v/ most frequently in the word-initial and medial positions. In the word-final position, however, the high group used /f/ for /v/ most frequently, while the low group substituted /p/ for /v/ at the highest percentage. Statistical testing results showed significant differences in the production of the /v/ sound between the two groups in all word positions except [f] in the medial position and [w] in the final position.

It should be noted that the participants in Chunsuvimol and Ronnakiat's (2001) study were English majors in a top-ranking public university, who had to outperform a few hundred students in order to be admitted into the English program and were therefore considered to rank highly in terms of English proficiency. Chunsuvimol and Ronnakiat recommended comparing their results to similar studies with other groups of English majors at other Thai universities. In Wongsan-Nguan's study, on the other hand, the participants were IT officers, who graduated in fields other than English or language studies. Thus, the sample group was assumed to be a more heterogeneous group whose average English proficiency appeared to be at a lower level than students in Chunsuvimol and Ronnakiat's (2001) study. Taking a more diverse sample into account as recommended in earlier research, this study examines students at one private university, who are enrolled as English majors, but are not from a top-ranking university as were those in Chunsuvimol and Ronnakiat's study. The objectives of the present paper are then specifically to:

- (1) examine the variants of /v/ in initial, medial and final positions in English words of Thai students enrolled as second-year English majors at one private university before and after the integration of the Audio-Articulation method (AAM);
- (2) compare and contrast similarities and differences in the production of /v/ variants of these Thai learners with relatively high and low English proficiency levels;
- (3) observe the effectiveness of the AAM in helping these Thai learners improve their pronunciation of the English /v/ sound.

## **Audio-Articulation Method**

The Audio-Articulation method (AAM) was designed by Demirezen in 2004 to remedy pronunciation errors of adult learners at the segmental level within one class hour. The method combines the audiovisual technique, the articulatory gestures, and the interaction technique into one model by including sound recognition and production activities such as listening, imitating, phonetic training, minimal pairs, minimal sentences, visual aids, tongue twisters and reading aloud. Samples of AAM activities are provided in the Appendix. The following represents the application of the method in five basic steps as described by Demirezen (2005; 2010).

- (1) Identify the problematic sound of the target language using a diagnostic test;
- (2) Prepare a corpus of at least 50 words;
- (3) Single out minimal pairs from the corpus for practice;
- (4) Develop proper tongue twisters, idioms, and mottos in chunks for practice;
- (5) Stimulate further awareness and experiential practices within a suitable methodology.

## Research methodology

### Research Instrument

This quasi-experimental research utilized a pre-test / post-test design to elicit phonetic realizations of the English /v/ sound produced by students and noted the effectiveness of AAM. The test was developed according to the following processes:

(1) Thirty English words with the /v/ sound in initial, medial, and final positions were selected based on three main criteria: (a) they are frequently-used words; (b) they are at an appropriate level for learners of both English proficiency groups; and (c) they are not English words directly borrowed by the Thai language. The first and second requirements were justified on the basis that these words can be found in seen passages of the reading materials used in previous English reading courses. The last criterion was based on the assumption that English words borrowed into Thai are usually influenced by the Thai phonological system and are normally pronounced in “Thai ways” (Wei & Zhou, 2002). Examples of frequently-used English loanwords that are adapted to fit into the Thai system are: van, vote, view, wave (microwave). Since these words are usually spoken based on the speaker’s familiarity with the Thai pronunciation, they were excluded from the study.

The selected words contain 10 words with the /v/ sound in each position as shown:

(a) Initial position:

|        |      |         |       |         |
|--------|------|---------|-------|---------|
| very   | vent | visit   | valid | various |
| victim | vest | violent | voice | version |

(b) Medial position:

|       |         |         |        |         |
|-------|---------|---------|--------|---------|
| never | private | obvious | avoid  | devote  |
| heavy | advice  | leaving | clever | evening |

(c) Final position:

|        |         |         |         |        |
|--------|---------|---------|---------|--------|
| arrive | drive   | save    | above   | five   |
| give   | believe | improve | receive | active |

(2) Each of the 30 target words was put in a sentence of 5 to 10 words. These sentences were simple so students of both English proficiency groups could read them without difficulty. The 30 sentences were sorted randomly so that the target words could not be easily recognized by the participants.

Examples of the sentences are as follows:

- There is a small air vent in the ceiling. (initial /v/)
- They are leaving for Rome in the morning. (medial /v/)
- Mark is an active member of the club. (final /v/)

(3) To obtain validity and reliability, these sentences were checked by a native English-speaking teacher for acceptable language. Adjustments were then made based on comments and suggestions.

(4) Prior to the actual administration, a test-run process was carried out with the participation of two students, one with high English ability and the other with low English ability. The process of the test-run was identical to the actual test administration. The purpose was to anticipate potential problems and to approximate the time needed to complete the task. It was found that both participants had no difficulty reading all thirty sentences, and the average time used in completing the task was 25 minutes.

### ***Participants***

Out of a pool of 94 second-year English majors, 60 students were selected and divided into two groups based on their scores on an in-house test of English proficiency. The thirty students who scored highest and the thirty students who scored lowest were placed in the relatively high and low English proficiency groups, respectively. These students were asked to participate in the study, but were not informed of the target sound to be investigated prior to the experiment.

### ***Data Collection***

#### ***I. Pre-Test***

(a) Participants were asked to perform the oral-reading task individually in a language laboratory. They were informed of the process to complete the task and that their speech would be recorded using the Sound Forge 9 Software Program.

(b) After the task introduction, the participants were given a copy of the reading text and were instructed to read the 30 sentences for themselves silently with no time constraint. They were instructed not to ask any questions about the pronunciation of the words in the text.

(c) Following the familiarization period, the participants digitally recorded their oral-reading of the sentences at a normal speaking rate by stopping for a few seconds after each sentence.

(d) Audio files of these 60 students were collected for analysis.

#### ***II. Classroom Instruction***

After the pre-test, the participants received two class hours of pronunciation lessons (approximately 50 minutes per class), focusing on the target sound by using the Audio-Articulation method (AAM). Videos, minimal pairs, minimal sentences, tongue twisters, audio-

visuals, power-point presentations, sound discrimination activities, and dialogue performances were included in the lesson plan. Mirrors were used during the practices to serve as a visual feedback for the students.

### III. Post-Test

Following the two-session instruction, the participants took the post-test.

### **Data Analysis**

The variants of /v/ in the pre-test and post-test were transcribed by a native-English speaking teacher (NEST). To attain the reliability in the identification of variants, 4 out of 30 recordings of the pre-test were randomly selected from each group as representative samples. These randomly selected samples, representing 13.3% of the students in each group, were transcribed by the NEST and the researcher. Disagreements were resolved through extensive discussions, and clarifications were made through the support of the PRAAT sound analyzing software program. The percentage of agreement of the sound identification between the two raters was 99.5% for the high group and 99.0% for the low group. The Kappa coefficient of the randomly selected samples was calculated and the values attained were .992 and .985 for the high and low groups respectively. This was considered as a sufficient degree of agreement between the two raters for the present study. The remaining recordings of the pre-test and the post-test were transcribed by the NEST based on the system agreed upon by the two raters during the inter-rater discussion.

Descriptive statistics was used to obtain percentages, mean values, and standard deviation. Independent-Samples t-test with 95% confidence interval ( $p < 0.05$ ) was applied to analyze the difference of means between the two tests.

## **Results and Discussion**

### **Variants of /v/**

In examining the data set of both participant groups in pronouncing the 30 /v/ words in the pre-test and post-test, five variants of /v/ were found:

- (a) the voiced labio-dental fricative [v]
- (b) the voiced bilabial approximant [w]
- (c) the voiceless labio-dental fricative [f]

- (d) the voiced bilabial stop [b]
- (e) the non-occurrence of sound [Ø].

### **Frequency of Variants**

With 60 participants having pronounced 30 target words, there were altogether 1,800 occurrences of variants in the data for each test. As shown in Table 1, the increase in production of the target [v] from 45% on the pre-test to 74% on the post-test indicates a remarkable improvement. The use of [w], which was found to be the second highest percentage in the pre-test, reduced substantially from 26% to 3%, while the occurrence of [f] increased from 10.9% to 16.4%. The results suggest that after the instruction, learners became aware that [w] was not an equivalent sound to [v] and could not be used to replace the phoneme /v/. They also learned that /v/ shares the same articulators as /f/, which is a phoneme in the Thai language, with the only differentiating feature being the voicing quality. That [f] was used more often in the post-test could be due to the fact that while the participants attempted to approximate the target [v] by using the right point of articulation, they still had difficulty voicing a feature of the /v/ phoneme correctly. Consequently, the target [v] was devoiced to become [f]. It is also noticeable that the rates for the non-target variants [b] and [Ø] decreased significantly during the post-instruction test. Statistical testing results show significant differences in the pronunciation of all five variants between the two tests as shown.

**Table 1** /v/ Variants in All Positions.

|   |      | <b>Freq.</b> | <b>%</b>    | <b><math>\bar{x}</math></b> | <b>SD</b> | <b>t</b> | <b>Sig.</b>  |
|---|------|--------------|-------------|-----------------------------|-----------|----------|--------------|
| v | Pre  | <b>813</b>   | <b>45.2</b> | 13.55                       | 4.14      | 15.850   | <b>.000*</b> |
|   | Post | <b>1335</b>  | <b>74.2</b> | 22.25                       | 4.45      |          |              |
| w | Pre  | 468          | 26.0        | 7.80                        | 3.07      | -17.242  | <b>.000*</b> |
|   | Post | 55           | 3.1         | 0.92                        | 1.94      |          |              |
| f | Pre  | 197          | 10.9        | 3.28                        | 2.41      | 3.146    | <b>.003*</b> |
|   | Post | 295          | 16.4        | 4.95                        | 3.95      |          |              |
| b | Pre  | 243          | 13.5        | 4.05                        | 2.02      | -7.014   | <b>.000*</b> |
|   | Post | 89           | 4.9         | 1.45                        | 1.98      |          |              |
| Ø | Pre  | 79           | 4.4         | 1.32                        | 1.04      | -6.273   | <b>.000*</b> |
|   | Post | 26           | 1.4         | 0.43                        | 0.85      |          |              |

Sig. (2-tailed)  $p < 0.05$

Further analyses of /v/ variants at word-initial, medial and final positions were conducted. The results shown in Tables 2, 3, and 4 below indicate that the position of /v/ in words plays a crucial role in the distributional patterns of different realizations of the English /v/ phoneme, particularly prior to the participants' exposure to the AAM. Comparatively, during the



pre-instruction test, only the rate of the target [v] in medial position was higher than 50%, while the rate was always lower than 50%, word-initially at 47.8% and word-finally at 34.2%. As shown in Table 2, the initial /v/ during the pre-test was most often realized as [w], whereas the final /v/ was most frequently realized as [b]. The fact that learners resorted to /w/ and /b/ in the initial and final positions in English words probably results from L1 transfer in which /w/ occurs initially, and the bilabial stop /b/ occurs finally in Thai words. The results are consistent with earlier research (Chunsuvimol & Ronnakiat, 2001; Hui-Ling & Radant, 2009; Khirin, 2009; Wongsan-Nguan, 2013), stating that learners tend to replace consonants which do not exist in L1 with the closest consonants in their L1 phonological system. It should be noted that in the Thai language there is no phoneme opposition between voiced and voiceless sounds in word-final position. As a result, there is sometimes no clear distinction in Thai speakers' pronunciation of the voiced and voiceless bilabial stop phonemes occurring word-finally. That is why the bilabial stop used to replace the English /v/ sound among Thai speakers was transcribed in earlier studies either as the voiced stop [b] or the un-aspirated stop [p].

During the post-instruction test, the rate of the target [v] was higher than 50% for /v/ in all word-positions at 82.8% in word-initial position, 82.7 % in word-medial position, and 57% in word-final position. The increases in the production of the target [v] between the two tests in all three positions were statistically significant at the specified level of 0.05,  $p=0.000$ . Conversely, the rates of non-target variants reduced significantly. For instance, the rate for [w] in the initial and medial positions dropped from 48% and 28% at the pre-instruction test to 7.7% and 1.5% after the pronunciation lessons. In addition, the use of [b] for the final /v/ reduced from 34.5% during the pre-test to 12.6% during the post-test. In these cases the differences in the mean values between the two tests are statistically significant ( $p=0.000$ ). Interestingly, while the rate for [b] in the final position dropped significantly, the rate for [f], which is the voiceless counterpart of /v/, increased significantly during the post-instruction test ( $p=0.006$ ). As mentioned earlier, the use of /f/ in Thai words is restricted to the syllable-initial position only. The more frequent use of [f] in final position during the post-instruction test could, therefore, be regarded as a developmental stage in which learners are attempting to approximate the target sound.

**Table 2** /v/ Variants in the Initial Position.

|   |      | <b>Freq.</b> | <b>%</b>    | <b><math>\bar{x}</math></b> | <b>SD</b> | <b>t</b> | <b>Sig.</b>  |
|---|------|--------------|-------------|-----------------------------|-----------|----------|--------------|
| v | Pre  | 287          | 47.8        | 4.78                        | 1.90      | 10.504   | <b>.000*</b> |
|   | Post | <b>497</b>   | <b>82.8</b> | 8.28                        | 2.15      |          |              |
| w | Pre  | <b>289</b>   | <b>48.2</b> | 4.83                        | 1.98      | -13.768  | <b>.000*</b> |
|   | Post | 46           | 7.7         | 0.67                        | 1.58      |          |              |
| f | Pre  | 17           | 2.8         | 0.28                        | 0.49      | 3.018    | <b>.004*</b> |
|   | Post | 49           | 8.2         | 0.92                        | 1.69      |          |              |
| b | Pre  | 5            | 0.8         | 0.08                        | 0.28      | .772     | .443         |
|   | Post | 8            | 1.3         | 0.13                        | 0.43      |          |              |
| Ø | Pre  | 2            | 0.3         | 0.03                        | 0.13      | -1.426   | .159         |
|   | Post | 0            | 0           | 0                           | 0         |          |              |

**Table 3** /v/ Variants in the Medial Position.

|   |      | <b>Freq.</b> | <b>%</b>    | <b><math>\bar{x}</math></b> | <b>SD</b> | <b>t</b> | <b>Sig.</b>  |
|---|------|--------------|-------------|-----------------------------|-----------|----------|--------------|
| v | Pre  | <b>321</b>   | <b>53.5</b> | 5.35                        | 1.99      | 11.529   | <b>.000*</b> |
|   | Post | <b>496</b>   | <b>82.7</b> | 8.27                        | 1.60      |          |              |
| w | Pre  | 169          | 28.2        | 2.82                        | 1.56      | -13.847  | <b>.000*</b> |
|   | Post | 9            | 1.5         | 0.12                        | 0.32      |          |              |
| f | Pre  | 76           | 12.7        | 1.27                        | 1.33      | 1.130    | .263         |
|   | Post | 89           | 14.8        | 1.5                         | 1.15      |          |              |
| b | Pre  | 31           | 5.2         | 0.52                        | 0.70      | -4.040   | <b>.000*</b> |
|   | Post | 5            | 0.8         | 0.1                         | 0.42      |          |              |
| Ø | Pre  | 3            | 0.5         | 0.05                        | 0.22      | -1.000   | .321         |
|   | Post | 1            | 0.2         | 0.02                        | 0.12      |          |              |

**Table 4** /v/ Variants in the Final Position.

|   |      | <b>Freq.</b> | <b>%</b>    | <b><math>\bar{x}</math></b> | <b>SD</b> | <b>t</b> | <b>Sig.</b>  |
|---|------|--------------|-------------|-----------------------------|-----------|----------|--------------|
| v | Pre  | 205          | 34.2        | 3.42                        | 1.98      | 6.628    | <b>.000*</b> |
|   | Post | <b>342</b>   | <b>57.0</b> | 5.70                        | 2.37      |          |              |
| w | Pre  | 10           | 1.7         | 0.17                        | 0.42      | -3.085   | <b>.003*</b> |
|   | Post | 0            | 0           | 0                           | 0         |          |              |
| f | Pre  | 104          | 17.3        | 1.73                        | 1.48      | 2.825    | <b>.006*</b> |
|   | Post | 157          | 26.2        | 2.62                        | 2.18      |          |              |
| b | Pre  | <b>207</b>   | <b>34.5</b> | 3.45                        | 1.79      | -6.934   | <b>.000*</b> |
|   | Post | 76           | 12.6        | 1.27                        | 1.64      |          |              |
| Ø | Pre  | 74           | 12.3        | 1.23                        | 1.03      | -6.327   | <b>.000*</b> |
|   | Post | 25           | 4.2         | 0.42                        | 0.80      |          |              |

Sig. (2-tailed)  $p < 0.05$

### Variants of /v/ Across Groups

In response to the second objective, realizations of /v/ during the pre-test and post-test of the high and low groups were compared.

**Table 5** /v/ Variants in All Positions by Group.

| High Group |      |       |      |         |       | Low Group |      |       |      |         |       |
|------------|------|-------|------|---------|-------|-----------|------|-------|------|---------|-------|
|            |      | Freq. | %    | t       | Sig.  |           |      | Freq. | %    | t       | Sig.  |
| v          | Pre  | 468   | 52.0 | 10.730  | .000* | v         | Pre  | 345   | 38.3 | 11.563  | .000* |
|            | Post | 719   | 79.9 |         |       |           | Post | 616   | 68.4 |         |       |
| w          | Pre  | 219   | 24.3 | -12.358 | .000* | w         | Pre  | 249   | 27.7 | -11.832 | .000* |
|            | Post | 11    | 1.2  |         |       |           | Post | 44    | 4.9  |         |       |
| f          | Pre  | 73    | 8.1  | 3.327   | .002* | f         | Pre  | 124   | 13.8 | 1.492   | .146  |
|            | Post | 133   | 14.8 |         |       |           | Post | 162   | 18.0 |         |       |
| b          | Pre  | 110   | 12.2 | -5.273  | .000* | b         | Pre  | 133   | 14.8 | -4.613  | .000* |
|            | Post | 32    | 3.6  |         |       |           | Post | 57    | 6.3  |         |       |
| Ø          | Pre  | 30    | 3.3  | -4.334  | .000* | Ø         | Pre  | 49    | 5.4  | -4.474  | .000* |
|            | Post | 5     | 0.6  |         |       |           | Post | 21    | 2.3  |         |       |

Sig. (2-tailed)  $p < 0.05$

The results presented in Table 5 reveal that both groups had a significant improvement in pronouncing the target [v] after receiving the instruction. The rate of [v] in the high group increased from 52% during the pre-test to 79.9% during the post-test. Similarly, the low-group rate of [v] soared from 38.3% to 68.4%. In both cases, differences in the use of [v] between the two tests are statistically significant,  $p = 0.000$ . On the other hand, the rates for non-target variants [w], [b], and [Ø] of both groups dropped significantly, with  $p = 0.000$ . This suggests that the pronunciation practices through various AAM techniques such as minimal pair drills, minimal sentences, and recognition/production tasks helped the students in both proficiency groups improve their pronunciation of the English /v/. Interestingly, however, the rate of [f] during the post-test increased in both groups. The difference in the use of [f] between the pre-test and the post-test in the high group was statistically significant, while the increase in the use of [f] in the low group did not reach statistical significance. This result probably suggests that with increasing English proficiency, learners tended to resort to [f] more frequently in order to approximate the target sound because /f/ is the closest consonant sound to the phoneme /v/ in terms of the point of articulation.

It can be seen from the data above that the rates of variants for each informant group during the pre-test and post-test display similar patterns, although at different degrees. The ordering of variants from the highest to lowest percentages tends to reflect the order of

acquisition of English /v/ among Thai learners of high and low English proficiency levels, as shown in Table 6.

**Table 6.** Ordering of /v/ Variants in All Positions.

| Pre-Test                          | Post-Test                         |
|-----------------------------------|-----------------------------------|
| High: [v] > [w] > [b] > [f] > [Ø] | High: [v] > [f] > [b] > [w] > [Ø] |
| Low: [v] > [w] > [b] > [f] > [Ø]  | Low: [v] > [f] > [b] > [w] > [Ø]  |

Further analysis was conducted to examine /v/ variants of each participant group based on the position of /v/ in a word. Table 7 shows /v/ variants in the initial position during the pre- and post-instruction tests.

**Table 7** /v/ Variants in the Initial Position by Group.

| High Group |      |       |      |       |       | Low Group |      |       |      |       |       |
|------------|------|-------|------|-------|-------|-----------|------|-------|------|-------|-------|
|            |      | Freq. | %    | t     | Sig.  |           |      | Freq. | %    | t     | Sig.  |
| v          | Pre  | 158   | 52.7 | 8.149 | .000* | v         | Pre  | 129   | 43.0 | 6.711 | .000* |
|            | Post | 267   | 89.0 |       |       |           | Post | 230   | 76.7 |       |       |
| w          | Pre  | 134   | 44.7 | 10.53 | .000* | w         | Pre  | 155   | 51.7 | 8.952 | .000* |
|            | Post | 9     | 3.0  |       |       |           | Post | 37    | 12.3 |       |       |
| f          | Pre  | 4     | 1.3  | 2.734 | .011* | f         | Pre  | 13    | 4.3  | 1.898 | .068  |
|            | Post | 21    | 7.0  |       |       |           | Post | 28    | 9.3  |       |       |
| b          | Pre  | 2     | 0.67 | .372  | .712  | b         | Pre  | 3     | 1.0  | .701  | .489  |
|            | Post | 3     | 1.0  |       |       |           | Post | 5     | 1.7  |       |       |
| Ø          | Pre  | 2     | 0.67 | 1.439 | .161  | Ø         | Pre  | 0     | 0    | -     | -     |
|            | Post | 0     | 0    |       |       |           | Post | 0     | 0    |       |       |

Sig. (2-tailed) p<0.05

In the high group, the target [v] was produced most frequently during both the pre- and post-instruction tests at 52.7% and 89% respectively. The difference between the two tests is statistically significant, p=0.000. The use of [w] at 44.7% during the pre-test dropped to 3% during the post-test, while [f] increased from 1.3% to 7%. The decrease of [w] and the increase of [f] are statistically significant. In the low group, the variant most frequently used in initial position during the pre-instruction test was [w] at 51.7%, followed by [v] at 43%. During the post-test, however, the target [v] increased significantly to 76.7%, whereas the rate for [w] dropped significantly to 12.3%. The low-group's use of [f] was much higher during the post-test, but the increase did not reach statistical significance. The results indicate that after the instruction, learners in both proficiency groups became aware that [w] was not the correct sound for the initial

/v/; and their attempt to use the right articulators resulted in devoicing the target [v] to the more familiar sound [f], which exists as a phoneme syllable-initially in the Thai phonological system.

It should be noted that comparison of initial /v/ between the high group and the low group shows different patterns for both tests, that is, the low-group use of [w] was most frequent in the pre-test, while the high group used [v] most often. During the post-test, the rate for [w] in the low group was still higher than the use of [f], whereas [f] was used more frequently than [w] in the high group, as shown in Table 8. Interestingly, however, it may be noted that the low-group pattern during the post-test followed the high-group pattern during the pre-test, suggesting the tendency for Thai learners' developmental pattern of the pronunciation of the English /v/ phoneme.

**Table 8** Ordering of /v/ Variants in Word-Initial Position.

| Pre-Test                          | Post-Test                         |
|-----------------------------------|-----------------------------------|
| High: [v] > [w] > [f] > [b] > [Ø] | High: [v] > [f] > [w] > [b] > [Ø] |
| Low: [w] > [v] > [f] > [b] > [Ø]  | Low: [v] > [w] > [f] > [b] > [Ø]  |

At the word-medial position (see Table 9), the target [v] was produced at the highest percentage during the pre- and post-tests by both groups at 58.3% and 87.3% respectively in the high group, and 48.7% and 78.0% respectively in the low group. The fact that the low group used [v] most frequently during the pre-instruction test suggests that the medial /v/ was less problematic than the initial-/v/.

**Table 9** /v/ Variants in the Medial Position by Group.

| High Group |      |       |      |       |       | Low Group |      |       |      |       |       |
|------------|------|-------|------|-------|-------|-----------|------|-------|------|-------|-------|
|            |      | Freq. | %    | t     | Sig.  |           |      | Freq. | %    | t     | Sig.  |
| v          | Pre  | 175   | 58.3 | 9.294 | .000* | v         | Pre  | 146   | 48.7 | 7.264 | .000* |
|            | Post | 262   | 87.3 |       |       |           | Post | 234   | 78.0 |       |       |
| w          | Pre  | 82    | 27.3 | 9.633 | .000* | w         | Pre  | 87    | 29.0 | 9.786 | .000* |
|            | Post | 2     | 0.7  |       |       |           | Post | 7     | 2.3  |       |       |
| f          | Pre  | 28    | 9.3  | .611  | .546  | f         | Pre  | 48    | 16   | .945  | .352  |
|            | Post | 32    | 10.7 |       |       |           | Post | 57    | 19.0 |       |       |
| b          | Pre  | 13    | 4.3  | 1.795 | .083  | b         | Pre  | 18    | 6.0  | 4.264 | .000* |
|            | Post | 4     | 1.3  |       |       |           | Post | 1     | 0.3  |       |       |
| Ø          | Pre  | 2     | 0.6  | 1.439 | .161  | Ø         | Pre  | 1     | 0.3  | .000  | 1.000 |
|            | Post | 0     | 0    |       |       |           | Post | 1     | 0.3  |       |       |

Sig. (2-tailed) p<0.05

After exposure to the AAM, the rates for [v] of both groups increased significantly,  $p=0.000$ . Again, the decrease in the use of [w] dropped from 27.3% to 0.7% in the high group, and from 29% to 2.3% in the low group. The decrease of [w] in both groups reached statistical significance,  $p=0.000$ . The use of [b] also dropped significantly in the low group ( $p=0.000$ ), but the reduction rate for [b] in the high group was not statistically significant. While the rate for the non-target variants [w], [b], and [Ø] dropped, the rate for [f] increased. However, as [f] was used at relatively low percentages, in neither case did the increase rate reach statistical significance at the specified level of 0.05.

From the data in Table 9, it is observable that the ordering of the medial /v/ variants produced by the two groups reveals the same patterns at the pre-test (see Table 10). This probably suggests that when /v/ occurs in the middle of a word, it is likely to be affected by the surrounding sounds, causing it to be less problematic to pronounce correctly than when it occurs word-initially. However, the ordering patterns of the two groups were not the same after exposure to the AAM. The data shows that although both groups resorted to [f] at the second-highest percentage during the post-test, the low-group rate for [w] was higher than the rate for [b]. This suggests that the erroneous use of [w] for the target [v] tended to be more persistent among Thai speakers, particularly for those with lower English proficiency.

**Table 10** Ordering of /v/ Variants in Word-Medial Position.

| Pre-Test                          | Post-Test                         |
|-----------------------------------|-----------------------------------|
| High: [v] > [w] > [f] > [b] > [Ø] | High: [v] > [f] > [b] > [w] > [Ø] |
| Low: [v] > [w] > [f] > [b] > [Ø]  | Low: [v] > [f] > [w] > [b] = [Ø]  |

Realizations of the final /v/ between the two groups offer yet another interesting pattern, totally different from those of the initial and final /v/ variants, as shown in Table 11.

**Table 11** /v/ Variants in the Final Position by Group.

| High Group |      |       |      |       |       | Low Group |      |       |      |       |       |
|------------|------|-------|------|-------|-------|-----------|------|-------|------|-------|-------|
|            |      | Freq. | %    | t     | Sig.  |           |      | Freq. | %    | t     | Sig.  |
| v          | Pre  | 135   | 45.0 | 4.121 | .000* | v         | Pre  | 70    | 23.3 | 5.250 | .000* |
|            | Post | 190   | 63.3 |       |       |           | Post | 152   | 50.7 |       |       |
| w          | Pre  | 3     | 1.0  | -     | .083  | w         | Pre  | 7     | 2.3  | -     | .017* |
|            | Post | 0     | 0    | 1.795 |       |           | Post | 0     | 0    | 2.536 |       |
| f          | Pre  | 41    | 13.7 | 2.921 | .007* | f         | Pre  | 63    | 21   | 1.077 | .291  |
|            | Post | 80    | 26.7 |       |       |           | Post | 77    | 25.7 |       |       |
| b          | Pre  | 95    | 31.7 | -     | .000* | b         | Pre  | 112   | 37.3 | -     | .000* |
|            | Post | 25    | 8.3  | 5.845 |       |           | Post | 51    | 17.0 | 4.129 |       |
| Ø          | Pre  | 26    | 8.6  | -     | .000* | Ø         | Pre  | 48    | 16   | -     | .000* |
|            | Post | 5     | 1.7  | 4.188 |       |           | Post | 20    | 6.7  | 4.731 |       |

Sig. (2-tailed)  $p < 0.05$

The results in Table 11 show that high-group rate for the target [v] at the pre-test was lower than 50%, indicating that the final /v/ is most challenging to pronounce. This is due to the fact that final fricatives are lacking in the Thai phonological system. One may also observe that the low-group rate for [v] dropped to only 23.3% during the pre-test. The low-group use of [b] was most frequent in final position (37.3%). As a matter of fact, the high-group rate for [b] during the pre-test was also high (i.e. 31.7%). The frequent use of [b] word-finally in both groups could be hypothesized to result from L1 transfer. As final fricatives are lacking in Thai and /b/ occurs in Thai words, when many Thais pronounce the final /v/ in English, it is often heard as [b].

During the post-instruction test, the rates for the target [v] of both groups increased significantly,  $p = 0.000$ , while the use of [b] decreased to a significant level in both groups,  $p = 0.000$ . The omission of sound [Ø], which occurred more frequently in final position than in initial and medial positions, also decreased significantly in both groups,  $p = 0.000$ . The variant [w], which was minimally used at the pre-test, dropped to zero during the post-test. Conversely, the rates for [f] increased in both groups during the post-test, but only the increased rate in the high group reached statistical significance,  $p = 0.007$ .

Table 12 below shows the ordering of the final /v/ variants of the two groups, which displays different patterns during the pre-test. One can see that, before the instruction, [b] took a dominant role in replacing the final /v/ among learners in the low group, and it was used at the second-highest rate by the high-group participants. It could be hypothesized that since the bilabial stop [b] exists word-finally in the Thai language, and it at least shares the labial point of articulation with [v], many Thai learners tend to resort to [b] to replace the final /v/.

Comparison of final /v/ for the high group and the low group during the post-test displays the same patterns. The low group successfully used the target [v] most frequently, followed by

the devoiced counterpart [f]. The frequent use of [b] during the pre-test dropped to the third rank after the instruction. This is also the case for learners in the high group, who resorted to the voiceless [f] more often than the bilabial stop [b] during the post-test. This suggests that the participants attempted to use the right point of articulation of the target sound, but obviously still had difficulty voicing it correctly. As discussed earlier, Thai learners often have problems with the voicing feature of English sounds, particularly at the word-final position. This is because there is no phoneme opposition between voiced and voiceless sounds at the word-final position in Thai, resulting in Thai learners' difficulties in pronouncing or even identifying pairs of words such as *tap* vs. *tab*, *back* vs. *bag*, *wet* vs. *wed*. Such difficulties are exacerbated for sounds that are non-existent in the Thai system in words like *safe* vs. *save*, *fife* vs. *five*, *bus* vs. *buzz*. The result thus implies that when dealing with difficult L2 sounds, Thai learners normally resort to L1 equivalents which are nearest in terms of points of articulation. The voicing feature tends to pose a substantial problem to learners, especially at the word-final position.

**Table 12** Ordering of /v/ Variants in Word-Final Position.

| Pre-Test                          | Post-Test                         |
|-----------------------------------|-----------------------------------|
| High: [v] > [b] > [f] > [Ø] > [w] | High: [v] > [f] > [b] > [Ø] > [w] |
| Low: [b] > [v] > [f] > [Ø] > [w]  | Low: [v] > [f] > [b] > [Ø] > [w]  |



### Conclusion

It can be concluded that the English /v/ causes problems for Thai learners, especially those with lower English proficiency. In response to the first and second objectives, the findings of the present study show that different proficiency levels correlate with variations in the production of /v/. In addition, L1 transfer has played an important role in the distributional patterns for phonetic realizations of /v/ when it occurs at different positions in English words. The patterns of realizations in initial and final positions differed between learners in the two English proficiency groups. Of the five variants: [v], [w], [b], [f], and [Ø], learners with higher English proficiency were more capable of producing the correct [v] at the highest percentage in all positions even during the pre-instruction test. The low-group learners, on the contrary, used [v] most frequently only when it occurred in word-medial position. These learners most frequently substituted [w] for the initial /v/ and replaced [b] for the final /v/. Their problem can be hypothesized to result from the fact that /v/ is not part of the Thai phonological system. Thus, the variant [w], which shares two phonetic similarities with [v] in the use of the lips and the voicing feature, was most often used



word-initially. On the other hand, the unreleased stop [b], which occurs in Thai words with a different voicing quality than the English /b/, was frequently used to replace the final /v/. This is probably because the Thai [b] at least shares the labial point of articulation with [v]. The analysis also shows that [w] and [b] were the second most frequently used variants in initial and final positions respectively among the high-group learners. The results thus support earlier findings that learners usually resort to L1 equivalents when having to pronounce sounds that do not exist in their native language.

Of the three positions, the results show that word-final position is most problematic. The findings are consistent with the studies of Chunsuvimol and Ronnakiat (2001) and Wongsan-Nguan (2013), asserting that the pronunciation of /v/ in final position is even more difficult for Thai speakers to pronounce due to the non-existence of final fricatives in Thai. Thai speakers, particularly those with lower English proficiency, tend to resort to sounds that they are more familiar with in their L1 and that share some phonological similarity with the target sound. As a result, the final /v/ is usually realized as the unreleased [b] in the speech of many Thai speakers.

The findings also show that after both groups of participants received two-scheduled sessions in the use of the AAM, they produced the target [v] sound in all positions in English words at substantially higher rates than they did in the pre-instruction test. The rates of using [w] to replace the initial and medial /v/ and the use of [b] to substitute the final /v/ decreased significantly once the participants were aware that these two sounds were not the right sounds to replace the phoneme /v/. These participants also learned that /f/ and /v/ share the same point of articulation, but have a different voicing quality. Therefore, while attempting to approximate the target [v] by using the right articulators, the participants sometimes failed to deal with the voicing difference. As a result, [v] was devoiced to become the voiceless counterpart [f]. It can be seen from the findings of this study that the rate for [f] increased substantially in both groups at the post-instruction test. The considerable increase in the use of [f] could possibly be regarded as a developmental stage in which the learners attempted to approximate the target sound but still struggled with the voicing aspect of the phoneme /v/. The results partly support the findings of Chunsuvimol and Ronnakiat (2001) who found [f] to be the most frequently-used variant in the final position among a select group of high-proficiency English majors in a high-ranking Thai university. Based on the significant increase of the target [v] among the participants in this study, the findings respond to the third objective by proving that the Audio-Articulation Method effectively solves students' pronunciation problems, helping them gain phonological awareness of the target sound and providing a remedy for their pronunciation errors.

## Pedagogical Implications

This study addressed the problems in producing the English /v/ sound among Thai learners with different proficiency levels in EFL contexts. The findings of this study have revealed variants in the learners' pronunciation of the /v/ sound at different positions in English words. A three-stage model may be offered to describe learners' developmental patterns in the production of the /v/ sound.

1. Based on the findings of the study, the target [v] was produced at the highest rate by the students in word-medial position, suggesting that it should be the first position to start with. As Thai learners often replace the target [v] with the variant [w], the first stage should therefore be to start explaining the differences between /v/ and /w/ in terms of place and manner of articulation. The teacher will have the students practice several AAM techniques such as using minimal pairs, sentences, tongue twisters, aural realization and sound discrimination activities.

2. Since the [f] variant also occurs frequently in the word-medial position, the second stage is to introduce the different voicing quality between the voiced and voiceless phonemes /v/ and /f/, using both sound recognition and production activities through AAM techniques. At this stage, the students will start to fully understand the differences in the pronunciation of /v/, /w/ and /f/. They will be ready to practice pronouncing words with the initial /v/ through the AAM.

3. The third stage is to elicit the target [v] sound in the word-final position. As Thai does not accommodate fricative sounds word-finally, producing the final /v/ sound is most challenging for Thai students. Based on the findings of this study, it can be expected that the bilabial [b] will occur frequently, particularly among less proficient learners. The teacher needs to describe how the two sounds /v/ and /b/ are produced in terms of the place and manner of articulation. Practice for the final /v/ may require longer time since the pronunciation of /v/ in final position is most problematic.

## Limitations of the Study and Suggestions for Further Research

The results of this study show a statistically significant difference in the students' pre-test and post-test scores, indicating a positive effect of the Audio-Articulation Method (AAM) in improving the students' pronunciation of the English /v/ sound. However, there are obviously some limitations.

Firstly, the participants in this study were limited to English majors at only one private university. It would be useful to compare the present results to similar studies with participants of different backgrounds.

Secondly, this study investigated only one fricative phoneme /v/. Regarding the number of problematic sounds for Thai learners of English, further research should be carried out to

examine the production of other phonemes which do not exist in the Thai language as well as English vowel sounds and consonant clusters.

Moreover, this study examined the students' oral reading of English sentences containing the target words. Future research may be conducted to study different genres of spoken language, from the most formal style such as minimal pairs, passage reading to the least formal style as in conversation.

Finally and most importantly, the present study compared the students' performance in the pre-test as opposed to that in the immediate post-test. Further investigation should be conducted to include a delayed post-test in order to measure the long-term effects of the experiment and to ensure that the treatment by using the AAM can truly result in learning.

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## Appendix

### Sample of AAM activities

1. Vocabulary list of /v/  
Listen and repeat

|              |               |                         |                |
|--------------|---------------|-------------------------|----------------|
| <u>v</u> et  | <u>v</u> ault | <u>v</u> ine            | <u>v</u> ivid  |
| <u>v</u> ain | <u>v</u> isor | <u>v</u> ow             | wa <u>v</u> e  |
| <u>v</u> ile | <u>v</u> end  | <u>v</u> el <u>v</u> et | ey <u>v</u> il |
| <u>v</u> ery | <u>v</u> ary  | o <u>v</u> er           | ev <u>v</u> er |

2. Minimal pairs /v/ and /w/ (initial position)  
Listen and circle the word you hear.

|                 |               |                  |               |
|-----------------|---------------|------------------|---------------|
| 1. <u>v</u> eal | <u>w</u> heel | 5. <u>v</u> end  | <u>w</u> end  |
| 2. <u>v</u> est | <u>w</u> est  | 6. <u>v</u> ary  | <u>w</u> ary  |
| 3. <u>v</u> ine | <u>w</u> ine  | 7. <u>v</u> ow   | <u>w</u> ow   |
| 4. <u>v</u> eil | <u>w</u> hale | 8. <u>v</u> iper | <u>w</u> iper |

3. Practice with sentences.

- a. What did **W**illiam and **V**irginia do on **W**ednesday?
- b. **W**hile he **w**as talking, he **w**as in a **v**ile mood.
- c. Don't be **w**ary **w**hen you **v**ary your route.
- d. His name **w**as on the **w**ane after he destroyed the **v**ane.
- e. Sorry I didn't go **w**ith you last night. My **v**an **w**as broken.

4. Minimal pairs /f/ and /v/ (initial, medial and final positions)  
Listen and circle the word you hear.

|                     |                  |                     |                  |
|---------------------|------------------|---------------------|------------------|
| 1. <u>f</u> at      | <u>v</u> at      | 6. in <u>f</u> est  | in <u>v</u> est  |
| 2. <u>f</u> ine     | <u>v</u> ine     | 7. sni <u>f</u> fle | sni <u>v</u> el  |
| 3. <u>f</u> ew      | <u>v</u> iew     | 8. wa <u>f</u> i    | wa <u>v</u> e    |
| 4. lea <u>f</u> ing | lea <u>v</u> ing | 9. belie <u>f</u>   | belie <u>v</u> e |
| 5. sa <u>f</u> er   | sa <u>v</u> er   | 10. proo <u>f</u>   | proo <u>v</u> e  |

5. Minimal sentences

- |    |                                  |                                  |
|----|----------------------------------|----------------------------------|
| a. | Did she say “fat”?               | Did she say “vat”?               |
| b. | I don’t think she said “duff”.   | I don’t think she said “dove”.   |
| c. | I see a fan.                     | I see a van.                     |
| d. | Does she know how to say “feel”? | Does she know how to say “veal”? |
| e. | It’s his face that bothers me.   | It’s his vase that bothers me.   |

6. Dialog practice

Dave: Hello Fred. How are you?  
Fred: Fine. Thank you. How are you?  
Dave: Fine. Where did you spend your vacation, Fred?  
Fred: At Fine View Valley. How was your trip, Dave?  
Dave: Fantastic! A lot of fun!  
Fred: Well, I’m afraid I’ve got to go. Vera’s waiting.  
Dave: So long, Fred.  
Fred: So long, Dave.

7. Tongue twisters

- a. The wine  
The vine wine  
I stow a bottle of vine wine into the store.  
I stow a bottle of vine wine into the store behind the stove.
- b. The vest  
The wet vest  
The vet puts on the wet vest.  
The vet puts on the wet vest and goes to the west.

8. Phonetic Training

Fricative sounds:

- active and passive articulators come close together, but not touching.
- air can flow through a *narrow passage*, causing *friction*.

Labio-dental Fricatives (lower lip + upper teeth)

- /f/      Voiceless labio-dental fricative
- /v/      Voiced labio-dental fricative