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Training Effect on Korean EFL Students' Perception and Production of English Grapheme <e>

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Abstract

Motivated by the fact that English vowel grapheme <e> is pronounced as 3 different vowel sounds, the current study purports to investigate how Korean EFL students perceive and produce English words with grapheme <e> and whether the difficulty associated with perceiving and producing <e> can be improved by training. To this end, perception and production tasks were conducted to 31 Korean EFL students in the forms of the pre-test and post-test. The overall results showed that participants' production abilities were significantly improved while the perception abilities were not. Thus, the effect of training was attested only in production. Significant improvement for individual target vowels was also found in the production domain but not in the perception domain, suggesting that acquisition patterns differ for perception and production. In order to account for the asymmetry in training effects, cross-participant correlational approach was adopted. Since no correlation between perception and production accuracy of the participants was found, it was concluded that perception and production abilities of the participants were developing independently and thus, different acquisition patterns were not surprising.

Keywords: English Grapheme <e>, Perception, Production, Training Effect

1. Introduction

Each vowel sound in English has various spellings. For instance, high front long vowel [i:] is represented by the diverse spellings as in evil, eel, sea, ceiling, belief, police, key and Aesop. Moreover, English vowel letters does not display a one-to-one correspondence between letter and sound since there are only 5 vowel letters <a>, <e>, <i>, <o>, and <u> while there are at least 11 monophthongal vowel phonemes in American English. For example, English grapheme <a> is pronounced as 5 different vowel sounds (e.g., card, bake, add, all, sofa), as observed[1]. Since written forms and spoken forms do not match each other[2,3], it is expected that EFL (English as a Foreign Language) learners have great difficulty acquiring English vowel sounds[4,5]. In spite of the mismatches between spelling and pronunciation for English vowels causing EFL learners communication problems, there are not many studies which deal with these matters in detail. Accordingly, this study purports to investigate how Korean EFL students perceive and produce English grapheme <e> and whether the perception and production abilities can be improved by training.

2. Materials and Methods

2.1 Test Materials

English grapheme <e> is sometimes realized as high front long vowel [i:] while sometimes as mid front vowel [e]. Further, the spelling <e> sometimes represents unstressed vowels such as schwa [ɨ] and high front short vowel [i]. In order to measure the participants' knowledge on the perception and production of English vowel grapheme <e>, a total of 16 words were chosen as in Table 1.

Table 1. Stimulus words

Target vowels	Stimuli
[i:]	feed, fever, illegal, prenatal, sneeze, senior
[e]	confess, vest, felony, gender, peg, estimate
Unstressed vowel	camel, harvest, resist, specific

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2.2 Participants

The participants of this study were 31 students (13 males and 18 females) enrolled in a university located in Seoul-Gyeonggi metropolitan area. The average age of the participants was 23.4 and the onset of English learning started when they were in the third grade in elementary school. The participants self-reported their English proficiency as either low-intermediate or intermediate in the questionnaire.

2.3 Procedures

For the production test the participants were asked to produce the stimulus words presented in a written form. The participants' pronunciation was recorded by using the sound editing software, Goldwave. The recordings were evaluated by 2 experts focusing on the vowel sound represented by <e>. The initial reliability between the experts was .92 and the discrepancy was resolved after joint-listening by the experts.

For the perception test the stimulus words were recorded by a male native speaker of American English. It was a multiple-choice test in which the participants were asked to choose the vowel sound they heard among 4 alternatives. For example, the native speaker produced the word "fever" as follows: 1. [fɛvɚ], 2. [fi:vɚ], 3. [fɪvɚ] and 4. [feivɚ].

After the pre-test, the participants were taught how to pronounce English words with grapheme <e>. The training was held for 2 weeks and after the training the post-test was conducted to measure the perception and production abilities of the participants for the target vowels.

3. Results

3.1 General Results

The mean rates of accuracy for perception and production in pre-test and post-test are provided in Figure 1. In the perception task the participants performed slightly better in the post-test (67.1%) than the pre-test (63.1%). In the production task, however, the participants' performance was conspicuously improved in the post-test (77.2%) compared to the pre-test (67.1%).

In order to find out whether the mean difference between the pre-test and post-test was significant, paired-samples t-tests were conducted.

Table 2. T-tests for the accuracy difference between the pre-test and post-test

Task	Mean difference	t	df	*p*
perception	-4.67	-1.927	30	0.064
production	-10.12	-4.237	30	0.000*

*$p<.05$

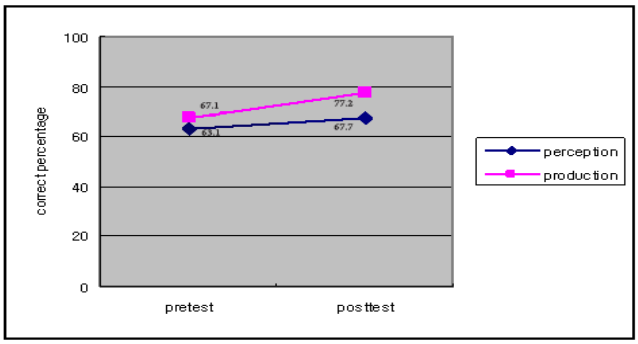

Figure 1. Overall perception and production results by pre-test and post-test.

Statistical analyses confirmed that there was a significant difference in the participants' production abilities but not perception abilities. The difference in production indicates that the participants performed much better after training. The participants, however, did not show any significant difference in perception. Consequently, training has a positive effect only on the improvement of producing words with <e> but not on the improvement of perceiving the same words. In the next section the results of perception tasks are presented in detail.

3.2 Perception Results

The mean rates of perception accuracy for each target vowel ([i:], [e], and unstressed vowels) in the pre-test and post-test are presented in Figure 2.

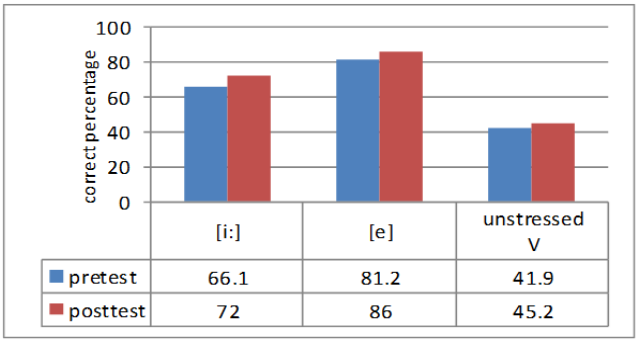

Figure 2. Mean perception accuracy of each target vowel in the pre-test and post-test.

Figure 2. shows discrepancies in the mean accuracy among the target vowels. Overall, the words associated with the target vowel [e] were perceived more accurately than words with the target [i:], which were in turn better perceived than the words with the target unstressed vowels.

In order to find out whether the participants' perception abilities were more accurate in the post-test than in the pre-test across the target vowels, the mean accuracy of each vowel was submitted to paired-samples t-tests.

Table 3. T-tests for the perception accuracy difference between the pre-test and post-test for each target vowel

Pair of comparison	Target vowels	Mean difference	t	df	*p*
pre-test vs. post-test	[i:]	-5.91	-1.544	30	0.133
	[e]	-4.84	-1.329	30	0.194
	unstressed V	-3.23	-.583	30	0.564

The results of a series of t-tests on the mean differences between the pre-test and post-test revealed that the participants' performance was not significantly better in the post-test than in the pre-test, regardless of the target vowels. Thus, significant improvement in the perception domain was not found for each target vowel, similar to the overall results.

3.3 Production Results

The correct percentages of each target vowel for perception and production in pre-test and post-test are provided in Figure 3.

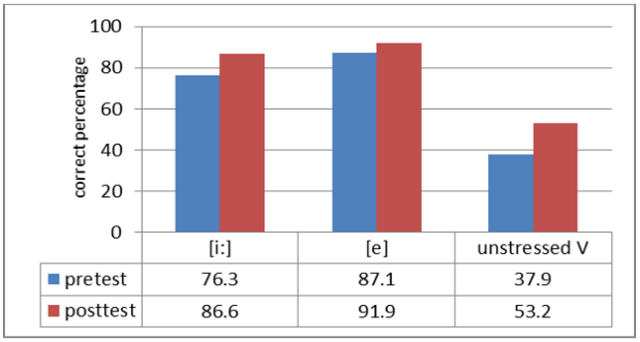

Figure 3. Mean production accuracy of each target vowel in the pre-test and post-test.

Along the same line to the perception results, the participants performed best in producing words with the mid front vowel [e] while worst in producing words with the unstressed vowels. The difficulty acquiring unstressed vowels in English is well-know so that EFL students have to be taught explicitly to reduce unstressed vowels[6].

Comparing the pre-test and post-test of the 3 target vowels, a series of paired-samples t-tests confirmed that there were significant differences for the target vowels, [i:] and unstressed vowels.

Table 4. T-tests for the perception accuracy difference between the pre-test and post-test for each target vowel

Pair of comparison	Target vowels	Mean difference	t	df	*p*
pre-test vs. post-test	[i:]	-10.22	-3.341	30	0.002*
	[e]	-4.85	-1.795	30	0.083
	unstressed V	-15.32	-2.839	30	0.008*

*$p<.05$

Thus, unlike the perception domain, significant improvements were found for the targets [i:] and unstressed vowels in the production domain. Also, an improvement tendency was found for the target vowel [e], although this improvement did not reach the level of significance. No significant improvement of the target [e] may be accounted for by the fact that the production accuracy of [e] was already high in the pre-test (87.1%) whereby the possibility of measuring further improvement is reduced. Similar ceiling effects have been frequently reported[7,8].

3.4 The Relationship between Perception and Production

Given that the participants' production abilities were improved while perception abilities were not, the relationship between perception and production needs further investigation. Traditionally, it has been assumed that good perception is a prerequisite to good pronunciation. This assumption stems from the observation that infants' perception abilities precede production abilities in first language acquisition[9–11]. Although there may be a close link between perception and production in first language acquisition, the correlation between perception and production seems not to be always born out. That is, no correlation between perception and production was found in some acquisition studies of Korean EFL learners[12–15], which suggest good perception does not necessarily imply good production, and vice versa. Hence, it is examined in the

current study whether the Korean participants' ability to produce English grapheme <e> correlates with the ability to produce the same target.

The correlation across the participants in the pre-test is plotted in Figure 4. The x-axis is perception accuracy for each participant, whereas the y-axis is the production accuracy. The diagonal line (y=x) shows a perfect correlation.

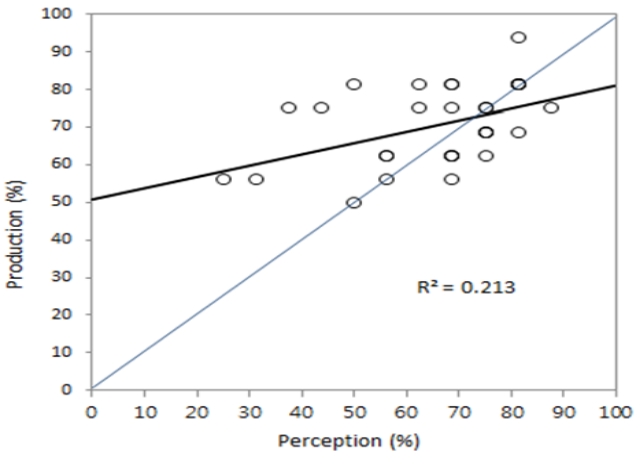

Figure 4. Accuracy rates of production plotted against rates of perception in the pre-test. Each circle represents one participant.

As shown in Figure 4., the correlation is rather low (R^2 = .213). There are some participants who were good at both perceiving and producing the targets and some who are bad at both. There are, however, participants who are good at one but bad at the other, indicating that perception accuracy does not entail the production accuracy, and vice versa.

Figure 5 plots production accuracy against perception accuracy in the post-test.

Similar to the pre-test result, we cannot find a strong correlation (R^2=.253). However, rather differently from the pre-test result, it is apparent that most of the participants are better at producing the targets than perceiving them, as is obvious in the large offset of the majorities of the data points above the diagonal, thus showing the tendency of higher production accuracy than perception accuracy. To sum, no significant correlation between perception and production was found both in the pre-test and post-test and this indicates that perception is not on a par with production, and accordingly perception and production abilities seem to be developing independently. This is understandable given that perception involves auditory perceptual skills whereas production relies on speech motor skills[16,17].

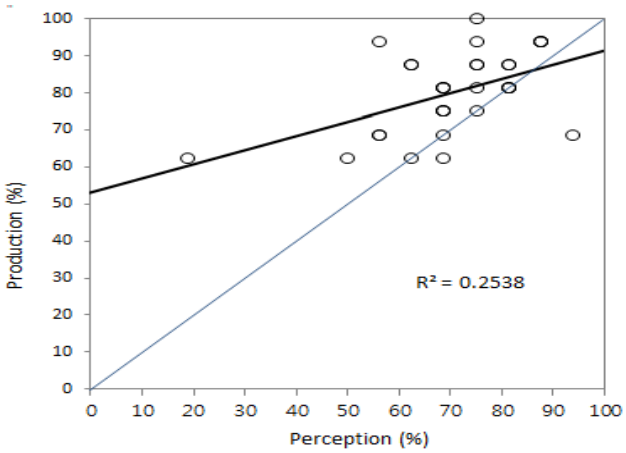

Figure 5. Accuracy rates of production plotted against rates of perception in the post-test. Each circle represents one participant.

4. Conclusion

The results of the current study showed that traing effects were attested only in the domain of production but not in the domain of perception since significant improvements from the pre-test to the post-test were found only in production. This results lead to the question of why training effect was found only in production but not in perception. To explore the question, cross-participants correlational approach was adopted. Since there was no necessary correlation between perception accuracy and production accuracy of the participants, it was revealed that perception abilities of the participants bore no relationship to the production abilities, and vice versa. Therefore, it was concluded that the participants' perception abilities and production abilities were not developing in a parallel fashion. Rather, perception and production abilities were learned independently and this caused the asymmetry in training effects.

5. Acknowledgment

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