



## **How do We Help Learners Comprehend Various Englishes? Shadowing for Perceptual Adaptation**

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### **Introduction**

In recent decades, the number of both native and non-native English speakers has increased rapidly, and English is now widely used as a Lingua Franca (ELF). In this situation, people who have different first language (L1) backgrounds encounter multiple variations of English and negotiate meanings using their own English. Though speakers can still be intelligible and comprehensible even when they are perceived as having a strong accent (Munro & Derwing, 1995a), prior research has also demonstrated that accent is a salient factor that can make listening difficult. The results of multiple case studies that examined whether accents affected listeners' comprehension indicate that a strong accent impedes comprehension for both native and non-native listeners (e.g., Anderson-Hsieh & Koehler, 1988; Major et al., 2005). Unfamiliar accent initially negatively affects listeners with respect to both word recognition and sentence processing speed (see Cristia et al., 2012 for more details). Thus, listeners need to undergo auditory training with unfamiliar accent to understand this type of speech.

### **Literature Review**

In order to improve EFL learners' listening comprehension skills, a teaching technique called shadowing has become popular in Asian EFL teaching contexts. Shadowing is "a paced, auditory tracking task which involves the immediate vocalization of auditorily presented stimuli" (Lambert, 1992, p. 266), and it is gradually recognized as an effective language teaching technique internationally (e.g., Foote, & McDonough, 2017; Murphey, 2001). In particular, it is one of the most effective techniques for improving English learners' speech perception skills (Kadota, 2019), and research has demonstrated that shadowing enhances EFL learners' listening comprehension (e.g., Kato, 2009; Mochizuki, 2006; Tamai, 1997).

In the example below, when the shadower hears the first word *when*, the shadower replicates the word as accurately and as simultaneously as possible and continues this action until the target stimuli finish.



Example:

Audio: When shadowing, one repeats what they hear simultaneously.

Shadower: When shadowing, one repeats what they hear simultaneously.

It is theorized that when L2 learners shadow, most of their attention is directed at speech perception, with few cognitive resources remaining (Kadota, 2007); when shadowing, learners may not be able to think about the meaning of the words they are shadowing. In order to imitate the model's audio stimuli as accurately as possible, L2 learners are likely to pay exclusive attention to the phonological features of what they are shadowing; therefore, repeated practice of this procedure would improve their speech perception skills, and consequently their overall listening comprehension skills would improve (Kadota, 2007).

In order to understand unfamiliar English, listeners must adapt their perceptions to the unfamiliar English variation; among dozens of language teaching techniques and methodologies, shadowing has great potential for helping this adaptation. The advantage of shadowing, improvement of speech perception, is considered to contribute to comprehension when listening to unfamiliar English variations. In shadowing case studies, Japanese English learners who speak Japanese-accented English practiced shadowing with American English stimuli and improved their speech perception skills of American English (e.g., Hamada, 2016). It is hypothesized that if they practice shadowing with audio stimuli of another English variation, they may also improve their perception skills toward the English variation. This means that after the shadowing exercise, they will be able to recognize the phonological features of the unfamiliar English better, so more phonological matches between the audio signals and their expectation will occur, which will promote better perceptual adaptation when listening.

To explore a further possibility of shadowing and help EFL learners' listening on unfamiliar English accent, Hamada (2019) investigated the efficacy of shadowing in helping Asian EFL learners understand and listen to other Asian EFL learners' English. After four days of shadowing or listening to conversation spoken in Chinese accented English, a shadowing group outperformed a listening group on the post-test. Despite the positive result, the question of the appropriate amount of exposure to the accent has arisen and the study asks for more research on the topic.

## **Purpose of the Study**

While English variations are embraced (e.g., Jenkins, 2009), research has found that an accented speech hinders even L1 listeners' linguistic processing and requires listening effort. Still, listeners can adapt their perception of unfamiliar Englishes through exposure. The work of Hamada (2019), which compared the effect of shadowing and listening on Japanese students' perceptual adaptation, was a four-day study in a classroom setting. This leaves a question; what is the effect of a short-period of shadowing practice on accent listening? Therefore, the research question in this study simply asks whether a brief shadowing practice helps Japanese English learners adapt to Chinese-accented English.

## **Methods**

### **Participants**

A total of 53 Japanese private university sophomores participated in this study. One group of 27 students (19 majoring in Chinese and 11 majoring in English) was set as the experimental group and the other, consisting of 26 students (23 majoring in Earth Science and three majoring in Physical Education), was set as the control group. Judging from their in-house test results and the instructors' observations, their English proficiency was lower-intermediate in general. To control the deviance of the target accent

from the participants' own accent, we collected only Japanese English learners and did not include other students who had a first language that was not Japanese.

None of the participants had any hearing problems. Prior to the start of the experiments, the participants received an oral explanation and provided their written consent. They were informed that all the processes of the experiments were voluntary and that there would be no penalty for non-participation or withdrawal, even during the experiments. They agreed that the data could be used for the research on the condition that the data would remain anonymous.

## Materials

### Pre- and post-tests

Pre- and post-tests and materials for the shadowing exercise were prepared for the experiment. To create the materials and audio files, the two authors discussed and referred to the results of a pilot study and the theory established in related research.

The pre- and post-tests consisted of two sections. While only six sentences with 10 words were used in Hamada (2019), in this study, the participants were first asked to listen to 20 words and transcribe them. Then, they were asked to transcribe six sentences. To examine the effect of shadowing more precisely, the first 10 words of the 20 (section A), which appeared in the training materials, were presented to examine the direct effect of the training, while the second 10 words (section B), which did not appear in the training session, were presented to examine whether the training would affect the general perceptual adaptation skills of the participants. As for the sentence transcription (section C), 10 words that did not appear in the training materials were rated.

The 20 words were selected from the initial 40 words in the pilot study, which belonged to the first 2,000-word list in the General Service List (GSL, West, 1953). The GSL is a classic list of high-frequency words that contains approximately 2,000-word families (i.e., 2,000 different words, Nation, 2001, p. 11). The initial 40 words were selected because they were basic enough for the students. The vocabulary level was checked in Cobb (2021) and Heatley et al. (2002). The guidelines proposed by the Ministry of Education, Culture, Sports, Science and Technology in Japan (MEXT, 2009) require that high school students learn at least 3,000 words, and the first 2,000 GSL lists are considered to be basic level for university students. In the process of eliminating unreliable or invalid items, the items with quite high or low mean scores in the pilot study were excluded first because they clearly showed a ceiling effect or floor effect. Also, GSL lists are widely used but are not specifically designed for Japanese English learners; therefore some words may appear easier or more difficult for them than others. After the screening process, the authors decided to exclude six and arrived at a final 20.

Regarding the sentence transcription (section C), seven sentences were initially selected from the 40 sentence lists from Munro and Derwing (1995b). The original sentences were used for a sentence verification task in their study on listeners' perceptual adaptation. We chose the sentences because they required the participants to listen to each word accurately and prevented them from using their top-down skills, such as guessing from the contexts. For example, we chose 'the sun always sets in the north,' because the statement is not true and the participants could not rely on their common sense but only on what they heard. All 40 sentences were screened by the GSL 1,000 and 2,000 lists, and seven sentences consisting of words that were all GSL 2,000 level or under were selected. The vocabulary level was checked in Cobb (2021) and Heatley et al. (2002). However, one of the seven sentences was excluded as the pilot study demonstrated that it was not valid because of its low mean score. Although the participants were asked to transcribe everything, 10 words from the six sentences were rated. To choose the 10, in addition to the same screening process as the 20 words above, the two authors discussed the difficulty of the items that could not be measured by data alone, such as strongly accented items and words with pronunciations that are relatively unfamiliar to Japanese university students, referring to the authors' experience in teaching English to Japanese students.

## **Training material**

Next, unlike Hamada (2019), which used conversation, in order to examine the effect of shadowing precisely, the 20 sentences used in the training were selected from Harvard Sentences (Institute of Electrical and Electronics Engineers, 1969). Harvard Sentences are collections of phonetically balanced sentences that are used for testing speech and have been used in other pronunciation studies (e.g., Bent et al., 2009). Among the first 120 lists from Harvard Sentences, the 20 sentences were chosen on the basis of the following criteria: all the vocabulary used in each sentence was within the first 2,000 words of the GSL; none of the vocabulary items overlapped with the ones used in the pre- and post-tests or appeared twice in the sentences in the shadowing practice material; and the authors discussed the difficulty for the candidates based on their teaching experience.

## **The accent used in the tests and training**

We chose to use Chinese-accented English audio for the tests and treatment to examine non-native speakers' (Japanese in this study) perceptual adaptation to another non-native accent (Chinese), because the overarching purpose of this study is to develop a methodology to help Asian English learners understand other Asian English learners better. To examine perceptual adaptation to one speaker who speaks a different accented English from the participants simply, all the words and sentences used in the tests and the training materials were read by a Chinese 20-year-old from Shenyang (a city in northeastern China) alone. In compensation for his cooperation, he was paid 2,000 yen (approximately 19 U.S. dollars). Chinese English was used because of its lower familiarity for the participants. To ensure that no participant had prior major exposure to any type of Chinese-accented English, the participants were asked in the questionnaire whether they were familiar with Chinese-accented English with the intention to exclude any participant who reported prior familiarity. However, none of the participants reported being familiar with Chinese-accented English.

## **Procedure**

Prior to the treatment, both experimental and control groups took the pre-test. The procedure was then explained to the experimental group, who practiced one sample set of two sentences. After making sure that they understood the procedure, shadowing practice was imparted to the experimental group, following the procedure in Table 1. After the experiment, they took the post-test, which was the same as the pre-test. The entire procedure took approximately 30 minutes.

In the training, the participants in the experimental group worked on shadowing using the 20 sentences (two sentences as a pair x 10 sets) in total, spending approximately eight minutes (Table 1), while the control group took the first test, and after a five-minute break they took the same test again. On each set, they shadowed twice. First, the instructor told them to read the first two sentences for 10 seconds. Next, the instructor played the audio of the two sentences, and the participants shadowed the two sentences without the script. They repeated this procedure on the same two sentences. Then, they proceeded to the next pair. In the end, they shadowed 20 different sentences twice. They repeated this for each set and shadowed 20 sentences (40 times in total) to provide them with enough exposure in consideration of past studies on the perceptual adaptation of L1 listeners. Such research has demonstrated that perceptual adaptation on native speakers of English was observed, but it did not yield a large outcome. As perceptual adaptation is not easy for even native speakers of English, a certain amount of exposure was necessary for non-native speakers.

As there is no standard for the appropriate amount of exposure even from past L1 studies on perceptual adaptation, we needed to develop original criterion. For example, in Munro and Derwing (1995b), a list of 25 true and 25 false sentences were used; in Bradlow and Bent (2008), 64 declarative sentences were used; Clarke (2002) used only 16 declarative sentences; and in Baese-Berk et al. (2013), participants

repeated a set of 16 sentences five times. Given this disparity, we decided to stay within the range of 16 and 80 sentences that were used in past L1 studies. Second, the past L2 shadowing research mentioned that the fatigue of the participants needs careful consideration. Shadowing is a cognitively demanding task (Kadota, 2007; Hamada, 2016), so exposing the participants too much and for too long would easily preclude them from sustaining their concentration. To reflect L2 learners' direct voices, in the initial process of preparing the material, one of the authors demonstrated a few examples and asked three proficient L2 learners how many sentences they could work on with full concentration. They stated that 100 would be too many and suggested it should be around 40 or 50. On the basis of this feedback, we chose 20 sentences that were each repeated twice.

TABLE 1  
*Procedure of the Experiments for Both Groups*

Experimental Group	Control Group
	Pre-test
Read the two sentences*1 for 10 seconds	Rest for five minutes
Shadow the two sentences	
Read the two sentences for 10 seconds again	
Shadow the two sentences again	
	Post-test

Note. \*1 in total two sentences x 10 sets (20 sentences) for the experimental group

## Analysis

The participants were tested on a total of 20 words and six sentences, and all 20 words and 10 selected words from the six sentences were rated. One point was given to each word. As the grading criteria, the principle suggested by total word phonemic match (TPM), which measures how much listener transcriptions match phonemically to the target audio, was used. TPM is a standard procedure in transcription intelligibility studies, and misspellings and homonyms were tolerated as long as all phonemes were correctly recognized (Hustad, 2006). For example, one point was given to both inside and in side and always and all ways. However, considering the participants' L1 Japanese, we made an exception regarding the misspelling of r and l, because the Japanese language has only one liquid sound between /r/ and /l/, and so to the participants' ears, right would sound like light and vice versa (Avery & Ehrich, 1992, p. 135; Ladefoged & Maddieson, 1996). Previous studies also found that Japanese speakers with little or no exposure to an English-speaking environment failed to identify /r/ and /l/ consistently and were unable to categorize them as different (Best & Strange, 1992; MacKain et al., 1981; Yamada & Tohkura, 1992), although more exposure to English increased identification and discrimination of /r/ and /l/ (Best & Strange, 1992; MacKain et al., 1981).

After grading, the data of the three sections (A, B, and C) were first calculated for their descriptive statistics. Then, to compare the differences in improvement between the two groups precisely, an analysis of covariance (ANCOVA) was employed with pre-score (all 30 items) being a covariate by removing the influence of the pre-test. All the assumptions to employ an ANCOVA, the independence of the covariate and dependent variable, and the homogeneity of regression slopes were met.

## Results

The descriptive statistics demonstrated that the experimental group gained 4.15 points in the 30 words, while the control group gained 1.35. In other words, after the shadowing practice, the participants recognized four words more than they did the first time, while the control group recognized only one word. A section-by-section observation (see Table 2) revealed that the shadowing group gained 1.63 points from 3.63 in section A (10 learned words), 1.26 points from 5.63 in section B (10 new words), and

1.26 from 4.48 in section C (10 words in the sentences). In contrast, the control group gained 0.30 points from 4.08 in section A, 0.35 points from 5.00 in section B, and 0.69 from 3.50 in section C. In short, the shadowing group gained scores in all three sections, while the control group gained little.

The ANCOVA demonstrated that there was a significant difference between the two groups in the post-test [ $F(1, 50) = 21.30, p = <. 01, \eta p^2 = .30$ ], and the results indicated that the shadowing group outperformed the listening group.

TABLE 2  
Pre-Post Test Results of the Two Groups

Group	Pretest		Posttest		Gain	Effect size ( <i>d</i> )
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Learned 10 words						
Experimental	3.63	1.50	5.26	1.70	1.63	1.02
Control	4.08	1.85	4.38	1.79	0.30	0.17
Unlearned 10						
Experimental	5.63	1.45	6.89	1.53	1.26	0.85
Control	5.00	1.70	5.35	1.32	0.35	0.23
10 selected words from 6 sentences						
Experimental	4.48	1.89	5.74	2.05	1.26	0.64
Control	3.50	1.58	4.19	1.90	0.69	0.40

## Discussion and Conclusion

The simple answer to the research question of whether perceptual adaptation occurs through shadowing practice is that the short period or less than 10 minutes of shadowing practice helped Japanese English learners' perceptual adaptation toward Chinese-accented English. Shadowing directs shadowers' attention to incoming auditory signals, and thus they improve their perceptual adaptation skills to unfamiliar English through a short period of shadowing practice.

Learners' perceptual expectations may explain the answer. When incoming auditory signals and listeners' expectations match, comprehension is smoothly processed, but when there is a mismatch, executive resources such as working memory, attention, and semantic integration need to be recruited, slowing processing and increasing the listening effort (Van Engen & Peelle, 2014). Through shadowing practice, the participants in the experimental group improved their perception skills toward Chinese-accented English, just as they did toward American English in other studies (e.g., Hamada, 2016). After the training, there was probably less mismatch between the incoming auditory signals and these listeners' expectations. Therefore, they did not have to recruit the unnecessary executive resources mentioned above, and the auditory process was smoother, enhancing their perceptual adaptation.

Still, two limitations of this study need to be acknowledged. In this study, perceptual adaptation to only one speaker was examined; we did not measure whether the skill applies to other speakers. As Bradlow and Bent (2008) examined in the case of native speakers, exposure to multiple different speakers in the same accent group is more effective for perceptual adaptation of the target accent group, so the use of multiple speakers would allow researchers to explore the interplay between shadowing and perceptual adaptation further. Second, there is a chance that the outcome observed in this study was a short-term effect because the post-test was employed immediately after the practice. Ideally, a delayed-post test was conducted to measure if the effect remained.

In summary, the study demonstrated that less than 10 minutes of shadowing practice improved Japanese lower-intermediate English learners' perceptual adaptation toward Chinese-accented English under a controlled situation. Combined with the findings of Hamada (2019), shadowing practice on accented English even for a short and limited time helps L2 learners' perceptual adaptation. These will ultimately contribute to communication among ELF speakers.

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