

# The Effect of Shadowing on Perception and Production of Function Words

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## Abstract

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This pilot study examines the effectiveness of shadowing to train learners' phonological memory to better perceive function words. It also examines whether or not the effect on perception has any impact on the production of function words over a short treatment period. Findings indicate potential for short-term gains in both productive and receptive proficiency with English function words for L1 Japanese learners.

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**Key words:** Shadowing, Function words, Readability, Cloze, learner attitude

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## Introduction

Function words are one of the most challenging elements of English for learners with different first languages. They rarely have strong semantic implications in sentences and are also unstressed in the stream of speech. These factors make them difficult to discern for listeners. L1 Japanese learners of English in particular have trouble both hearing and using function words accurately. The fundamental difference in the sound systems of the two languages is often cited as the biggest cause of this phenomenon (Avery & Ehrlich, 1992). Japanese, a syllable-timed language, gives equal stress to every syllable in a sentence. Unlike English, which is a stress-timed language, the importance of words to the overall meaning of the sentence do not stand out in sentence stress patterns. Thus, it might be necessary for learners to receive explicit aural training to be able to properly perceive English function words. Hamada (2012) and others have suggested that shadowing is a useful way to train learners to distinguish these less salient words in speech by training phonological memory. Whether or not this training has implications for the accuracy of production of function words, however, is largely unexplored in the literature.

This pilot study examined how to effectively implement shadowing to train learners' phonological memory to better perceive function words. It also examined the extent of impact this training might have on the production of function words over a short treatment period.

## Literature Review

### *Content words vs. function words*

All words in the English language fall into one of two categories: content words and function words. Content words are words that carry and express independent meaning in a sentence. These words include nouns, main verbs, adverbs, adjectives, question words, and demonstratives (Avery & Ehrlich, 1992). In spoken English, content words are stressed, which makes them salient to listeners. All other words are function words. Unlike content words, function words do not express much meaning alone and are usually used to express grammatical relationships. These words are generally unstressed unless the speaker wants to place special emphasis on them. This lack of stress, coupled with a lack of inherent meaning, make function words a very difficult element of English, which that requires significant effort to acquire.

### *Noticing and selective attention*

One reason that function words are so difficult for learners of English to acquire is that their low salience makes them difficult to notice in a stream of speech. Richard Schmidt (1990) proposed that in order to acquire a feature of a language, learners must first notice it in the input in a meaningful way. Gass (1988) added that a learner is only be able to make a conscious effort to acquire a linguistic feature if they realize that there is a gap between their interlanguage and the input. Both of these researchers agreed that the less salient a feature is in a language, the more difficult it is to acquire.

Rost (1990) suggested that the general act of noticing might not be enough to focus a learner on a new linguistic feature. He proposed that learners might need to concentrate their attention through 'selective attention' in order to be able to decode concepts in English that do not exist in the learner's L1. According to Rost (2005), there are three conditions necessary for learners to employ selective attention. First, the input must be at a reasonable speed for processing. Second, there must relatively few unknown items in the input compared to known items. Third, there must not be any strange or irregular uses of language in the input. If any of these three conditions are not met, learners will become distracted and unable to selectively attend to a

target feature. While these conditions are rarely present in authentic real-world input, they can be set up in the classroom to maximize the benefits of selective attention.

### *Working memory*

Baddeley (1986) proposed a theory of working memory to explain how short-term memory operates. In his model, he explained short-term memory of language with the concept of the phonological loop. The phonological loop has two parts: the phonological store and the articulatory rehearsal component. When a listener hears an utterance, it is stored immediately in the phonological store, but for an extremely limited time. Then, processes in the articulatory rehearsal component can work to refresh items stored in the phonological store on a loop, which keeps them from decaying. The stronger a listener's working phonological memory becomes, the greater the number and length of items they can store in working memory. Research into working memory in English language learning has found that a) learners with superior working memory also have better listening ability and b) that listen-and-repeat activities, such as dictation and shadowing are effective for strengthening phonological working memory over time (Onaha, 2004).

### *Shadowing*

Shadowing is an activity originally developed for the training of simultaneous interpreters (Lambert, 1992). Shadowing involves the continuous repetition of a text read aloud by a speaker after a short delay. The effect of this is as if the listener is chasing the speaker through the text. Shiki et al. (2010) suggested that shadowing differs from repeating in that shadowing is an on-line process, meaning that repetition of the text happens while listening for the next segment, whereas repeating is an off-line task, meaning that only one process (either listening or speaking) is engaged at one time. Murphy (2001) suggested that there are three types of shadowing: complete, selective and interactive. In complete shadowing, the listener shadows the speaker word for word. In selective shadowing, learners are instructed to shadow only select words or phrases. Interactive shadowing builds on selective shadowing by adding questions and comments to facilitate a natural conversational flow between speaker and listener.

In recent years, implications of shadowing with regard to listening comprehension have received a lot of attention from educators and researchers in Japan. Research by Tamai (1997), Suzuki (2007), and Hamada (2011b) has shown that shadowing can be effective for increasing learner listening comprehension of unseen texts as measured by text comprehension and cloze

questions. Furthermore, shadowing appears to have useful implications for all levels of learners of English. Tamai (2005), in a study of 45 mixed-level students, found that low to mid-level students' text comprehension improved significantly over 13-weeks. Suzuki's (2007) learners were similarly successful. In her study, learners at low, medium and high proficiencies all showed gains in reading comprehension. Hamada (2012) also found that learners at all levels increased listening comprehension through a curriculum with a shadowing focus. It also appears that considerable gains can be made over relatively short spans of time with shadowing. Tamai (1997) showed that learners who study shadowing for as little as 90 minutes a day over five days can improve their TOEFL test scores beyond the threshold of measurement error.

Shadowing has been shown to boost perception of less salient elements in the speech stream through bottom-up listening processing, facilitating strengthening of working memory (Shiki et al, 2010). Hamada's (2011b) learners showed an improvement in accuracy of function words in a cloze activity after shadowing. Shiki et al. (2010) also showed that after several shadowing sessions of the same text, learner perception and production of function words improved. In addition, Hamada (2011a) described how student's self-reflections on the process of shadowing indicated that they felt that in addition to noticing more function words, they were better able to recognize English phonemics and adjust to sound and pace changes of native speech streams. Though the literature provides extensive commentary on the benefits of shadowing for perception of function words and ability to repeat them while shadowing, there is little research on whether or not those benefits transfer to production in free speech.

The literature offers several guidelines for implementing shadowing successfully in the classroom. Kuramoto et al. (2010) suggested that when selecting texts for shadowing, teachers must careful not to choose texts that are above the students' reading level. They suggested that a large number of easy texts on a variety of interesting topics are best. Hamada (2011) suggested that more difficult texts might also be useful for students. He found that students still made significant gains in listening comprehension with texts that were outside of their comfortable readability range. Hamada (2012) further suggested that if learners shadow three texts in a lesson, and the second text is more difficult than the other two, learners make gains in both listening comprehension and self-efficacy. He suggested that warming up with an easy text, struggling through a difficult text and then finishing with an easy one raises learner opinion of the usefulness of shadowing as well as their motivation to do it in the future. Onaha (2004) suggested that a shadowing activity be preceded by a cloze-style dictation activity for two reasons. First, a cloze-style activity is useful for familiarizing learners to the text prior to

shadowing. Second, these activities focus learners on specific phonological features of the text at regular intervals. Shiki et al. (2010) found that students reach the maximum potential of production rate, as well as accurate production of content and function words, at 4 or 5 repetitions of a given text. Any more than this and students not only show little further gain, but might develop a negative affect towards shadowing.

The main purpose of this study was to confirm the effect that shadowing has on the perception and production of function words over a short period of time using materials and methods described in the literature. The research questions for this study were as follows:

1. Is a short shadowing curriculum effective for increasing an L1 Japanese learner of English's ability to perceive problematic function words in a stream of speech over a short period of time?
2. Do these lessons increase accuracy of controlled and free production of problematic function words?

## Methods

### *Participant*

The participant in this study was a 26-year-old Japanese woman named Miyuki [pseudonym]. She worked as a system engineer at a major airport in the Tokyo metropolitan area. Though she did not use English at her job on a daily basis, she regularly conferred with coworkers at a separate office in Germany through email and conference calls in English. Miyuki studied English formally for seven years in her compulsory education and took two further years of English courses at university. Prior to this study, the researcher had taught Miyuki English lessons privately once every two weeks for two hours per session over a period of one and a half years. These lessons were focused on developing vocabulary and reading skills for the TOEIC test, as well as speaking skills for traveling abroad. Before studying with the researcher, Miyuki's top TOEIC score was 420 and on the most recent test prior to the study she scored a 605. Section scores indicated she had lower ability in listening than in reading.

### *Materials*

The materials used in the treatment were adapted from news stories taken from the website [www.breakingnewsenglish.com](http://www.breakingnewsenglish.com). Texts from this site had been used for discussions in previous lessons and Miyuki found them interesting and appropriate for her level. There were three

stories used for each of four lessons, for a total of twelve total news stories. The vocabulary of these stories was profiled and modified using the GSL 1,000, GSL 2,000, and AWL. Stories were considered acceptable for this study when 95% of words fell within the GSL 1,000 and 2,000 lists. Some vocabulary on the AWL or off-list was included when the researcher felt it was necessary for the meaning of the text. Stories were further screened for readability using Flesch-Kincaid Reading Ease (FRE) and Flesch-Kincaid Grade Level (FKG) and then divided into easy and difficult texts. The 8 easy-texts had an average FRE of 72.87 and ranged from 65.3 to 84.6. The average FKG of easy texts was 6.31 and ranged from 4.7 to 7.2. The four difficult texts had an average FRE of 59.725 and ranged on 52.5 to 65.5. The average FKG of difficult texts was 8.65 and ranged from 8 to 9.5. Detailed readability scores for stories 1 through 12 can be found in Table 1 in the Results and Discussion section.

Following the suggestion of Onaha (2004), each text used in the treatment was modified into a cloze-style dictation activity to be completed prior to shadowing. This activity was labeled the pre-shadow cloze activity. Function words were deleted from the text at approximately seven word intervals. The purpose of this was to draw selective attention to the elements of the text most relevant to the treatment (Rost, 2005).

Multiple-choice questions about connected speech were also used. Each item stem was a sentence with a missing phrase and four options. The missing phrase highlighted an instance of connected speech, such as liaison, reduction or elision. These questions were drawn directly from the activities which accompany the news stories on the *Breaking News English* website. This activity was labeled sound questions. The purpose of these questions was to raise awareness of connected speech within the text. Here is an example of a sound question:

- 1) They found over 1,000 gold coins \_\_\_\_\_.
  - a. under the tree
  - b. under tree
  - c. under as tree
  - d. under rat tree

Each text was modified a second time to create a more challenging cloze-style dictation activity for the end of each treatment session. This activity was labeled the post-shadow cloze activity. For these activities, four words, including at least one function word, out of 30 were deleted. The purpose of this activity was to determine how well the learner was able to

perceive function words after studying each text, over each session. Also, the data from this activity were used to address the first research question because an instrument of similar design was not used for either the pre-treatment or post-treatment test.

### ***Instruments***

There were four instruments used on the pre-treatment and post-treatment tests. The first two instruments were news stories from *Breaking News English*, which were graded for vocabulary to ensure that the text contained less than 5% unfamiliar words. In addition, the FRE for each text was 70 and 80.9 and the FKG were 7.3 and 5.9 respectively. This is the shadowing task, and these texts are story A and story B.

The third instrument was an image taken from *Talk a Lot, Book 1* (Martin, 2003). The image showed a hectic scene at the beach. For this task Miyuki described this picture and was recorded. This recording was then transcribed and examined for errors in the use of function words. This activity was labeled the controlled-production task.

The fourth instrument was a list of discussion prompts for a 5-minute free conversation. The conversation was directed by the prompts, but not restrained by them. Miyuki's performance in this discussion was recorded, transcribed and examined for errors in the use of function words. This activity was the free-production task. The free-production task prompts used were the following:

- What do you do for fun?
- Describe some of your favorite things.
- Who do you respect most?
- Where is your favorite place? Why?
- What are your top 3 favorite foods? Why?

### ***Procedures***

Research was conducted over seven sessions. During the first session, Miyuki and the researcher discussed her learning goals and possible areas of research. In the second session, the pre-treatment test was administered. The research session was conducted in a coffee shop. It was the researcher's intention to begin the session with a dictation activity but the prepared material was not used in the session. Therefore, in the first activity in the test Miyuki shadowed the researcher through two consecutive passages. The passages were read at the rate of 135 and 144 words per minute respectively. Then, the researcher administered the controlled-

production task. Finally, Miyuki and the researcher performed the free-production task. All performances were recorded. After the results had been analyzed, the focus of the study was narrowed from function words in general to prepositions, the definite article *the*, and indefinite articles *a* and *an*, as they were the most problematic for Miyuki.

Sessions two through five were conducted over a two-week period, with an average of two days between sessions. These sessions were conducted at a private residence. Each session was 90-minutes long and followed the following procedure.

First, the researcher introduced the headlines of the three news stories used in the session. Miyuki was given a choice of which of the two easier stories would be first. Then, the researcher asked Miyuki if she understood specific vocabulary or multi-word expressions identified as potentially problematic by profiling the vocabulary of each text. These words were all either low frequency, off-list or idiomatic expressions which were necessary for comprehension of the text. Next, Miyuki listened to a dictation of the story and filled in the pre-shadow cloze activity. Following the dictation, Miyuki was asked to give her opinion of the story in order for the researcher to gauge her level of understanding after one listen. Following the discussion, Miyuki did complete-shadowing twice without looking at the text. Next, a sound questions worksheet was completed and checked. While Miyuki completed the sound questions, the researcher corrected the pre-shadow dictation sheet. After this, Miyuki highlighted all of the prepositions and articles in the story. Then, Miyuki did selective shadowing of the text twice. Miyuki was encouraged to mumble the sentence under her breath while she listened and speak clearly only when she reached a highlighted word. After this, Miyuki did one last complete shadow of the text without looking and was encouraged to mimic the researcher's stress pattern and intonation. This completed the fifth and final shadowing of the text, which Shiki et al. (2010) identified as the possible limit for improvement in a single session. Following the final shadow, Miyuki listened to the final dictation and filled out the post-shadow cloze activity. The materials for one story were covered in 30-minutes and the same procedure was repeated twice more for a total of 90-minutes. The first and third stories were easy texts and the second story was a difficult text. All shadowing and dictation was done live by the researcher at a rate of between 100 and 130 words per minute. In the sixth session, the post-treatment test was administered. The two shadowing texts were read at 104 and 112 words per minute respectively.



### ***Analysis***

The post-shadowing cloze activity from each news story in each session was evaluated based on the number of prepositions and articles correctly transcribed. These results were compared to determine the effect of the treatment on perception of function words. All activities from the pre-treatment and post-treatment tests were evaluated in terms of the number of prepositions and articles accurately produced. These results were compared to determine the effect of the treatment on production of function words.

## **Results and Discussion**

The research questions of this case study were:

1. Is a short shadowing curriculum effective for increasing an L1 Japanese learner of English's ability to perceive problematic function words in a stream of speech over a short period of time?
2. Do these lessons increase accuracy of controlled and free production of problematic function words?

All data were reported in terms of number of correct answers out of total number of items. These data were used to answer the research questions.

### ***Perception of Function Words***

The data in Table 1 indicate that the average accuracy of perception of prepositions and articles increased gradually from session to session. Furthermore, the accuracy of perception of both prepositions and articles in the final session was significantly higher than the first session. It should be noted that there were an inconsistent number of items from session to session, and that activities in Session. Three had significantly fewer prepositions than the other three sessions. It should also be noted that although the average readability of texts in each session was relatively consistent throughout the study (within 8.1 FRE and 1.1 FKG overall) the readings in the fourth session were easier than those in the first session (a difference of 3.6 FRE / 0.6 FKG). The researcher believed that this difference was negligible.

The learner's improved ability to perceive problematic phonetic elements in this study was in line with the theories of Schmidt (1990) and Gass (1988). It appears that Miyuki was able to learn to recognize function words in a stream of speech once they had been noticed and selectively attended to. It also appears that Miyuki was able to increase the capacity of her

Table 1 *Results of Post-Shadowing Cloze Activities*

	Readability (FRE / FKG)	Prepositions	Articles
Story 1	75.6 / 6.3	5 / 7 (71%)	5 / 6 (83%)
Story 2	65.5 / 8	2 / 4 (50%)	3 / 3 (100%)
Story 3	65.3 / 7.2	5 / 8 (63%)	2 / 5 (40%)
<b>Session 1 total</b>	<b>68.8 / 7.1</b>	<b>12 / 19 (63%)</b>	<b>10 / 14 (71%)</b>
Story 4	69.3 / 6.9	6 / 7 (86%)	5 / 6 (83%)
Story 5	64.1 / 8.2	5 / 6 (83%)	1 / 3 (33%)
Story 6	70.2 / 6.1	3 / 4 (75%)	3 / 4 (75%)
<b>Session 2 total</b>	<b>67.9 / 7.1</b>	<b>14 / 17 (82%)</b>	<b>9 / 13 (69%)</b>
Story 7	73.4 / 6.4	1 / 2 (50%)	2 / 4 (50%)
Story 8	52.5 / 9.5	4 / 5 (80%)	2 / 3 (67%)
Story 9	67.8 / 6.9	2 / 3 (66%)	6 / 6 (100%)
<b>Session 3 total</b>	<b>64.6 / 7.6</b>	<b>7 / 10 (70%)</b>	<b>10 / 13 (77%)</b>
Story 10	84.6 / 4.7	4 / 4 (100%)	4 / 6 (67%)
Story 11	56.8 / 8.9	5 / 6 (83%)	4 / 4 (100%)
Story 12	76.8 / 6	2 / 3 (66%)	5 / 6 (83%)
<b>Session 4 total</b>	<b>72.7 / 6.5</b>	<b>11 / 13 (84%)</b>	<b>13 / 16 (81%)</b>

phonological working memory through dictation and shadowing practice, which is in line with the claims of Onaha (2004). Furthermore, the fact that Miyuki, a mid-level learner, was able to make significant gains in listening ability through shadowing lessons was consistent with the findings of Tamai (2005), Suzuki (2007) and Hamada (2012). The fact that these gains were made after only four 90-minute sessions supported Tamai's (1997) finding that learners can make measurable gains in listening comprehension over a relatively short period of treatment.

### *Production of function words*

The data in Table 2 show a significant improvement in the production of both prepositions and articles on the shadowing task in both stories A and B on the post-treatment test compared to the pre-treatment test. These results, however, might not be valid because the speeds at which the two tests were delivered were significantly different.

The data in Table 3 indicate a significant decrease in the accuracy of preposition production and a significant increase in accuracy of article production between the pre-treatment and post-treatment tests. This discrepancy might be accounted for by difference in the complexity of the

**Table 2** *Results of Shadowing Task*

	Story A		Story B	
	Prepositions	Articles	Prepositions	Articles
Pre-treatment	17 / 22 (77%)	16 / 19 ( 84%)	17 / 24 (71%)	15 / 24 (63%)
Post-treatment	21 / 22 (95%)	19 / 19 (100%)	22 / 24 (92%)	22 / 24 (92%)

**Table 3** *Results of Controlled-Production Task*

	Total words	Prepositions	Articles
Pre-treatment	122	7 / 10 (70%)	25 / 30 (83%)
Post-treatment	150	4 / 8 (50%)	32 / 33 (97%)

two different types of function words. Celce-Murcia and Larsen-Freeman (1999) point out that both articles and prepositions are problematic for speakers of Asian languages because of the lack of equivalence in the L1. However, the total number of articles and prepositions in English differ greatly. Compared with only three possible definite and indefinite articles, there are at least 20 different prepositions (Celce-Murcia & Larsen-Freeman, 1999). The combination of the variety of semantic implications and the number of possible choices in a given instance leads to a higher probability of productive mistakes with prepositions than articles. In light of these facts, the difference in performance between the two categories of function words post-treatment might be due to the difference in the potential for mistake between articles and prepositions, rather than an increase in the productive accuracy of articles.

Large-scale English assessment in Japan might help explain the difference in the number of total prepositions and articles used, as well as the accuracy of article use. Miyuki had taken the *Eiken* English exam several times in primary and secondary school, most recently at the 3<sup>rd</sup> grade level. One task on this exam is a picture description activity in which a test taker must a scene with many people doing different things (Eiken Foundation of Japan, 2015). Thus, Miyuki had most likely done many similar activities in the past and was familiar with the format. This assumption is supported by the formulaic nature of responses. Of the 14 descriptive sentences spoken on the pre-treatment controlled task, 12 began with “a.” A similar trend was evident in the post-treatment task where 13 of 15 of the descriptive sentences began with “a.” Because of this unusual behavior, it is impossible to draw any meaningful conclusions from this data.

The data in Table 4 indicate that while Miyuki produced approximately the same approximate number of words in both the pre-treatment and post-treatment free-production

Table 4 *Results of Free-Production Task*

	Total words	Prepositions	Articles
Pre-treatment	174	8 / 13 (62%)	2 / 12 (17%)
Post-treatment	172	11 / 12 (92%)	9 / 16 (56%)

tasks, the accuracy of both preposition and article use increased significantly. These results indicate that shadowing might be effective for raising the accuracy of function words in free speech.

Other explanations for the performance are also plausible. At the pre-treatment stage, the focus of the study had not yet been decided. Therefore, Miyuki was not selectively attending to the target features yet. Following four intensive sessions with singular focus on selectively attending to prepositions and articles, Miyuki was likely primed for the post-treatment test. It is possible that the difference in awareness of the purpose of the study alone could account for gains in free-production.

Based on the data gathered, the researcher drew the following conclusions:

1. Shadowing is an effective activity for increasing the perception of function words in the stream of speech.
2. It is possible to see significant gains in the ability to perceive function words in a short period of time.
3. Learners might be able to improve their productive accuracy of function words through shadowing lessons, but results from this study are inconclusive.

## Conclusion

There were several successful aspects of this pilot study. First, the learner saw progress in her ability to perceive function words and this was motivating. After the conclusion of the study, Miyuki mentioned that she would like to continue to receive structured lessons in shadowing in the future. This comment suggests that the practice of shadowing gave Miyuki a boost of self-efficacy, which is in line with the findings of Hamada (2012). Second, this study showed that shadowing might have an effect on a learner's ability to accurately produce function words.

There were also several limitations to this study. The largest limitation was time. Although a short time span was built into the research model, a longer study would be necessary to

confirm whether gains in the ability to perceive function words through shadowing are temporary or permanent. A further limitation was the sample size. With an  $n$  size of 1, the results of this study are not generalizable to a larger population. Another limitation was the lack of a dedicated perception measure in the pre-treatment and post-treatment tests. Data from this instrument might provide a more accurate measure of the effect of the treatment. Furthermore, the setting for the pre-treatment and post-treatment tests was different. This could have affected the quality of the data collected. For further research, it might be useful to examine whether or not gains in productive accuracy of function words are sustainable over a long period of time.

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## 機能語の認識と産出：シャドーイングの効果

ローランド・ロバート・J. S.

### 抄 録

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本試験的研究は英語学習者が機能語をよりよく認識する為に、シャドーイングを導入して、音韻的記憶容量を鍛える為の有効性を検証することを目標とする。それに認識度の上昇があっても、短期間を渡って発話の中での正確さへの影響を検証する。

研究の結果は、日本語を母語とする英語学習者に短期間でも機能語の認識を発話の中での正確さに利得があることが明らかになった。

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キーワード：シャドーイング，機能語，可読性，穴埋め，学習者の態度