

Mispronunciation: Do They Really Think That We Eat Lice?

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When describing the difficulties of English pronunciation, learners in Japan often mention the distinction of the English sounds that are different from Japanese. However, even when segmental sounds are mispronounced, contextual messages in the utterance may offset the risk of misunderstandings. This study compares the results of two web-based tasks carried out in 2009 and 2011. Native speakers of different languages listened to 48 stimulus sentences, which were prepared based on eight pairs of segmentals that Japanese learners often have problems with. They were asked to indicate what they actually heard in the intelligibility task, and what they thought the speaker meant in the understandability task. As a result, responses from 631 participants showed the effects of context on intelligibility and understandability. It was also suggested that the effects vary among the participant groups with different native languages. The findings are discussed in relation to English education in Japanese classrooms.

英語発音の問題点として、日本語とは異なった音が英語に存在するという気にする学習者は多い。しかし、分節音の誤りは発話内の文脈によって補われるため、誤解のリスクは軽減すると考えられる。本研究では、2009年と2011年に実施されたオンライン調査の結果を比較する。学習者が苦手とする8ペアの分節音を元に作成された48の刺激文を提示し、母語の異なる聞き手が、実際に聞こえた語 (intelligibility) と話者が言おうとしたと思われる語 (understandability) を回答した。631人の回答を分析した結果、文脈が発音の誤りのintelligibilityとunderstandabilityに影響を及ぼすこと、影響の度合いは母語が異なる回答者群間で異なることが示された。これらの結果を元に、日本での英語教育における発音指導について考察する。

SEGMENTALS AND suprasegmentals are two aspects of concern when teaching English pronunciation. Segmentals are the individual sounds that make up speech, such as consonants and vowels, and suprasegmentals are the prosodic features of speech, such as stress, rhythm, and intonation. English learners are often worried about the distinction between certain English sounds such as l and r; therefore, English teachers have a tendency to emphasize the distinction among segmentals when giving pronunciation drills. Although many English pronunciation drill textbooks refer to the importance of the suprasegmentals, descriptions of the problems in segmentals are far more detailed and precise (Kenworthy, 1987; Avery & Ehrlich, 1992; Cook, 2000; and Lane, 2010).

The decisions concerning which aspect of pronunciation to put priority on should be made regarding the influence it has on actual communication. Kashiwagi, Snyder, and Craig (2006) is among the studies that compare the influence of segmental and suprasegmental L1 transfer errors on miscommunication. Moreover, they show evidences that “stronger accent does not



necessarily reduce intelligibility” (p. 53-4). Mispronounced segmental sounds may not always cause misunderstandings when listeners can interpret contextual messages in the utterance.

Literature Review

It is necessary to discuss what factors can affect the easiness of perceiving non-native speakers’ utterances, but what seems to be missing in recent literature is the influence of contextual messages derived from the utterance. Smith (1992) shows a rather surprising result that the listeners’ familiarity with the topic is not a major factor to determine the comprehension on the interactions. However, it is natural that listeners try to gather information from all possible resources, when they hear the sounds that they do not expect within the context.

Another factor to be discussed is related to the listeners’ English proficiency. Minematsu, Asakawa, Okabe, and Hirose (2005) describes differences in perceiving intelligibility of Japanese English between American and Japanese teachers. Likewise, Cutler, Weber, Smits, and Cooper (2004) compares the English phoneme identification performance between native speakers of English and Dutch. In these studies, the listeners with “sufficient” English proficiency are chosen as participants. However, when applying the results into practice in educational settings in Japan, the reaction of the English learners, who are yet to be the proficient international users of English, should also be taken into account.

Lastly, in the perception of English utterances, what kind of easiness to focus on should be also concerned. Examples are “intelligibility”, “perceived comprehensibility”, and “accentedness” in Munro and Derwing (1999), and “intelligibility”, “comprehensibility”, and “interpretability” in Smith (1992) and McKay (2002). Since the definitions of the terms are different among the studies, the term “intelligibility”

is redefined, and a new term, “understandability” is employed for the purpose of the current study as follows:

- Intelligibility: the extent that a pair of segmental sounds can be distinguished. Intelligibility is high when a listener can identify the phonological feature of “l” in a sentence such as “These chopsticks are for eating lice”.
- Understandability: the extent that the intention of the speaker can be conjectured. Understandability is high when the listener can refer to the clue words “chopsticks” and “eating” in the above sentence and replace “lice” with “rice”.

Research Questions

The present study focuses on the following two questions:

1. Do contextual messages influence intelligibility and understandability of L1 Japanese segmental transfer?
2. Are the effects of the context different among different types of English users and learners?

Method

Web-Based Tasks

Based on the eight minimal pair words shown in Table 1, 48 stimulus sentences were prepared, which are categorized into three sentence types, according to the following procedure.

No context (NC):

- Eight sets of minimal pair sentences focused on the listeners’ ability to identify the word in question from the segmental sounds. No contextual clues were given. For example, “I don’t want any lice.” and “I don’t want any rice.”

With Context (WC):

- Sixteen sentences provided information that would give listeners contextual clues to identify the word. For example, “This powder is for killing lice.” and “These chopsticks are for eating rice.”

Fake Context (FC):

- The last words in the WC sentences were altered, so that listeners would need to ignore either the contextual clue or the actual sound when indicating their answer. For example, “These chopsticks are for eating lice.” and “This powder is for killing rice.”

Table 1. The Segmentals and Minimal Pair Words Used in the Stimuli Sentences

Consonants		Vowels	
/l/ - /r/	lice - rice	/æ/ - /ʌ/	bag - bug
/s/ - /ʃ/	seat - sheet	/ɑ:ɾ/ - /ɔ:ɾ/	farm - firm
/s/ - /θ/	mouse - mouth	/ɔ:/ - /oo/	hall - hole
/b/ - /v/	boat - vote	/ɪ/ - /i:/	mill - meal

The sentences were read synthetically using Globalvoice English Professional, a Text-to-Speech (TTS) software, in order to control the factors such as tone of voice and pitch, and to focus on the differences in segmental features. The stimulus sentences were embedded in the 48 questions prepared on line. The participants were asked to click one of two words shown on the screen after listening to the stimulus sentences. This method was chosen because it has minimal burden on the participants and the collected data should be free from partly correct answers, such as misspellings. Figure 1 shows the sample pages from the intelligibility and understandability tasks. The only difference between the two tasks was the ways of asking

the participants what to answer: “The word at the end of the sentence was...” in the intelligibility task, and “What does the speaker mean?” in the understandability task.

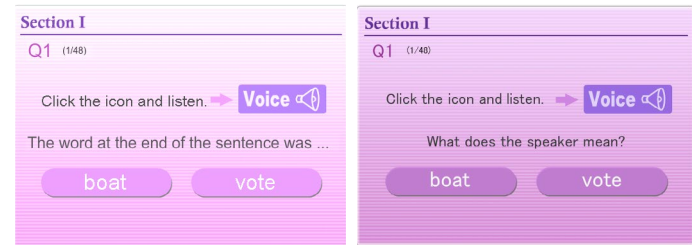


Figure 1. Examples of the Intelligibility and Understandability Questions

Two groups of participants were asked to do the tasks, international users of English, and English language learners in Japan. First, in order to gather responses from English users randomly from various regions of the world, the URLs of the web pages were distributed through e-mails and posted as inquiries in an internationally viewed web-page, the Linguist List, and also sent out through the JALT mailing list. The English user participants were later categorized into two groups according to their native language, that is, whether they are the native English speakers (L1) or non-native English speakers (L2). Secondly, Japanese university students were asked to do the tasks, by being provided with a brochure that showed how to access the web page. All the instructions were written in Japanese. The student participants were later categorized into two groups according to their major fields of study, that is, whether they were an English language major (EM) or non-English language major (nonEM).

Procedures

First, the number of correct answers for WC, NC, and FC were recorded as each participant's scores (full marks = 16×3). When marking the answers for FC sentences such as "These chopsticks are for eating lice", the answer choice "lice" was considered to be correct, in both intelligibility and understandability tasks. In other words, the participants who distinguished the segmental sound and ignored the context were given 1 point for each FC question item. Secondly, the Cronbach's alpha, used to measure internal reliability, was examined among the sentence groups, and the mean scores within the types of participants were calculated. Lastly, the two-way analysis of variance (ANOVA) and the tests of simple main effects were conducted. When statistically significant differences among the groups were indicated, multiple comparison tests with Bonferroni correction were given. These analyses were conducted in order to see if there are any differences in the participants' scores among the L1, L2, EM, and nonEM participant groups, as well as WC, NC, and FC sentence groups. The statistical analyses were conducted using IBM SPSS 18.0.

Results

Participants

Table 2 shows the number of the participants in the intelligibility task in 2009, and understandability task in 2011.

Table 2. Number of Participants

Participants	L1	L2	EM	NonEM	Total
Intelligibility task	77	74	100	86	337
Understandability task	52	63	56	123	294
Total	129	137	156	209	631

The L2 users spoke 36 different languages, and the largest percentage was German ($n = 24$), followed by Spanish (16), Chinese (11), Dutch (10), Russian (10), and Japanese (9). Among the Japanese participants, the ones who joined the research through the internationally viewed web pages were considered as L2 users, and the university students informed of the tasks in their English classes were considered as EM or nonEM learners. The English proficiency of the EM and nonEM learners who reported their TOEIC scores is shown in Table 3.

Table 3. Means and Sds of TOEIC Scores

Participants	EM			nonEM		
	<i>M</i>	<i>sd</i>	<i>n</i>	<i>M</i>	<i>sd</i>	<i>n</i>
Intelligibility task	630.2	115.3	24	374.2	97.7	65
Understandability task	752.8	83.4	20	350.4	62.9	80

The WC, NC, FC Mean Scores by Participant Groups

The Cronbach's alphas for each sentence category were WC = .75, NC = .82, FC = .85 in the intelligibility task, and WC = .80, NC = .73, FC = .85 in the understandability task. They indicate moderate reliability of the sentence categorization. Table 4 shows the mean scores in participant groups by different context types in the two tasks.

Ceiling Effects and Chance Level Answers

Interestingly the ceiling effects and chance level answers are both observed in the results of the identical tasks (See Table 4). The ceiling effect is a phenomenon found when the scores within the participant group do not vary much because most of them get full marks. As seen in table 4, the mean intelligibility scores of the L1 and L2 users show the ceiling effects, which

Table 4. Mean Scores in Participant Groups

Participants	Intelligibility task						Understandability task					
	WC		NC		FC		WC		NC		FC	
	M	(sd)	M	(sd)	M	(sd)	M	(sd)	M	(sd)	M	(sd)
L1	15.7	(0.5) ^a	15.7	(0.5) ^a	15.0	(1.2) ^a	15.9	(0.3) ^a	14.2	(2.3) ^a	8.8	(6.6)
L2	15.4	(1.0) ^a	14.9	(1.7) ^a	13.7	(2.6) ^a	14.8	(1.7) ^a	13.6	(2.2)	9.8	(5.2)
EM	12.5	(2.0)	11.0	(2.6)	9.0	(3.0)	12.1	(1.7)	9.9	(2.6)	6.7	(3.6)
NonEM	10.3	(2.2)	8.6	(1.9) ^b	7.2	(2.1) ^b	8.7	(2.1) ^b	8.4	(1.5) ^b	7.0	(2.1) ^b
All	13.3	(2.7)	12.3	(3.4)	10.9	(4.0)	11.9	(3.4)	10.8	(3.2)	7.9	(4.4)

Note: Full marks = 16.

^a Ceiling effects. ($M + sd > \text{full marks}$)

^b Chance level percentages of the correct answers.

suggests that the sound distinction task is so easy for them that few of them miss any questions. On the other hand, possibility of chance level answers is shown among nonEM learners, as their mean scores show that they missed approximately one out of two questions that have only two alternative answers. That is, the tasks are so hard for them that they can only make a random guess.

Distribution of FC Understandability Scores

As shown in Table 4, it is notable that the standard deviation (*sd*) for the L1 and L2 users' FC understandability mean scores is quite large (6.6 and 5.2), which suggests that there are wide ranges in individual participant's scores. To investigate this phenomenon further, the distribution of the FC scores in each participant group is shown in Figure 2.

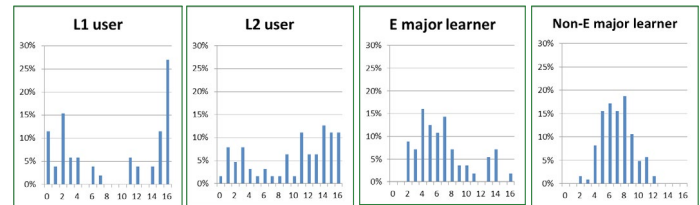


Figure 2. Distribution of FC Understandability Scores by Participant Groups

First, many of L1 users ($n = 14$, 26.9%) got full marks, that is, they took all the mispronounced words as the intended words. Originally, the participants in the understandability task were asked to indicate what they thought the speaker meant, but some of them may have simply chosen what they heard. In fact, six participants left messages indicating that they misunderstood the instruction. Taking this into account, the means of their FC understandability scores should be lower than they appear in Table 4.

Secondly, the distribution of the L1 user's FC understandability scores is U-shaped, which means that they tend to get either high or low scores. The U-shape tendency is less apparent with L2 user, but still the distribution is denser toward both ends of the scores. The higher FC score indicates priority on the sound, and the lower score indicates priority on the context. Thus, the U-shaped distribution suggests that L1 and L2 users tend to take decisive reaction to mispronunciation: those who focus on the phonological features score close to full marks, and those who focus on the contextual messages get very low scores in FC understandability.

Interaction

The results of the analysis of variance (ANOVA) shows that the interaction between the participant factor and the sentence factor is statistically significant, $F(5.1, 569.4) = 14.9$ in the intelligibility task, and $F(4.0, 394.6) = 18.3$ in the understandability task, $p < .01$ for both. For example, as shown in Figure 3, although L1 users' mean scores seem to be generally higher than others, it is not always the case. That is, L1 users can identify the sounds better than the participants in other groups in most of the cases, but when given fake contextual messages (FC) and asked to indicate the intention of the speaker (understandability), their FC understandability mean score is not necessarily higher than that of L2 users'.

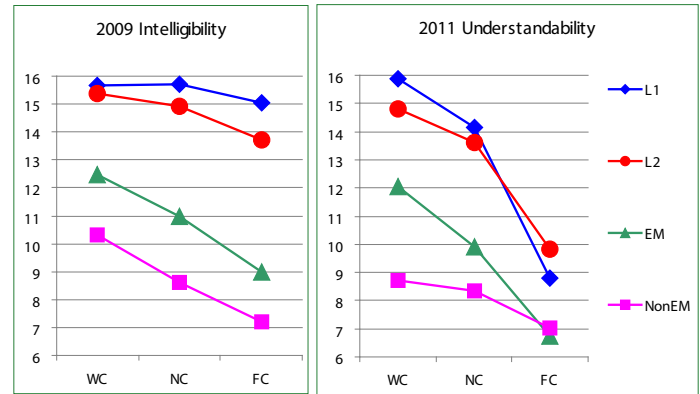


Figure 3. Mean Scores in the Participant Groups by Sentence Types

Differences Among the Sentence Types and the Participant Groups

The results of the tests of simple main effects indicate that all of the effects are statistically significant. Further, the multiple comparisons with Bonferroni correction showed the results as follows:

Among the sentence types, in most cases,

- WC scores were higher than NC scores, which were followed by FC scores.

Among the participant groups, in most cases,

- L1 users scored higher than L2 users, followed by EM learners and nonEM learners.

Discussions

Overall Tendencies

The answer to the research question one is positive. That is, the contextual information has influence on intelligibility and understandability of utterances: WC scores are higher than NC, which is higher than FC in most of the cases (See Figure 3). In identifying words or interpreting the speaker's intention in utterances, listeners generally refer to the contextual message involved in the utterance. The effect of the context is also indicated in that the differences between FC and WC scores are larger in understandability than in intelligibility task. That is, when listeners are asked to indicate the speaker's intention (understandability), they show a stronger tendency of putting higher priority on the context over the phonological feature, than when they are asked to identify the word within the utterance (intelligibility).

Next, the answer to the research question two is also positive. That is, the effect of the context varies among the listeners. In other words, not all the listeners refer to the contextual messages to the same extent (See Figure 3). Also, the degrees that the listeners are confused by the fake contextual message, or mispronounced words, vary among the groups.

Native Speakers of English (L1)

L1 users have an ability to ignore the contextual messages involved in the sentences, and to distinguish the segmental sounds when they are asked to do so (intelligibility task). The ceiling effects observed in most of L1 users' scores (See Table 4) suggest that L1 users do not necessarily rely on the contextual messages when identifying segmental sounds, even when they do not make sense as meaningful sentences. This ability can be effective in an educational setting, when English native speaker teachers check learners' production of segmentals, because they need to recognize the mispronunciation.

Secondly, in the real communication settings, L1 users are likely to be able to construe the intention of the speakers, even when some words are mispronounced (understandability task). The large standard deviation (*sd*) (See Table 4), and the U-shaped distribution (See Figure 2) found among L1 users' FC understandability scores suggest that they have the ability to replace the mispronounced words with the contextually suitable words. English native speaker teachers should take advantage of this ability and try to interpret the learners' intention, when learners are struggling to express their ideas and thoughts.

International Users of English (L2)

This study suggests that the "native-ness" does not make much difference at least in their perception of the English sounds, since L2 users show similar tendency to L1 users in many aspects. In fact, in all the cases that the multiple comparisons show differences between the L1-L2 pair, their scores also show the ceiling effects (See Table 4), and thus it cannot be judged which group of participants got higher scores. This study reveals no significant difference between L1 and L2 users.

English Major University Students (EM)

The effects of the contextual messages are shown most prominently among EM learners in the present study. In both intelligibility and understandability tasks, they can identify the sounds most easily when contextual clue words are given (WC), though their scores are much lower than those of the English users. When English learners do not seem to understand what is said in the classroom, teachers should give them chances to guess the word by showing contextual information rather than repeating the same word again and again (not to mention louder and louder, which only deprives learners of their confidence and motivation).

EM learners' reliance on the context also suggests that they have a certain test taking strategy. The intelligibility task is similar to a listening test in that they can click on the word whether or not they really know the correct answer. It is advisable that those learners practice using this strategy in real communication. For example, when they are not certain what sound was pronounced, rather than pondering over what exactly the word is, just make a guess and check with the speaker if what they think they heard is correct or not. The real communication should be easier than performing the tasks in the current research, because they can ask the speaker if their guess is right or not on the spot. Thus, English learners should not be worried too much about not being able to catch every sound the speaker utters.

When speaking in international communication settings, English learners should also remember that contextual information could offset the risk of misunderstandings, even when certain sounds are mispronounced. International English users, whether or not they are L1 speakers, have ability to identify the mispronounced words (intelligibility), and they also have ability to construe the message even when the words are mispronounced (understandability). In other words, they can perceive that chopsticks are NOT for eating lice. Thus, the learners should try to give as much contextual information as possible rather than being worried too much about their L1 transfer in segmental sounds.

Non-English Major University Students (NonEM)

In the non-EM learners' case, all of their scores are the lowest among the four groups, and most of their mean scores are close to chance level (See Table 4), which suggests that they have difficulties in distinguishing segmental sounds and also they do not get confused by the fake contextual message in the utterance, probably because they do not get the clue word itself. Their

WC intelligibility score is the only case that is above chance level, but it is still significantly lower than those of the other three participant groups. This could be important in the English classrooms in Japan and Japanese Teacher of English (JTE) because it is likely that proficient international English users may not notice why certain things are difficult for not-so-proficient English learners. An advantage of JTEs is that they once must have been beginning English learners themselves, thus it is advisable that they remember what it was like when they had no clue to understanding a foreign language utterance.

Another implication for the English educators is that they should be aware that the learners with different degrees of English proficiency depend on the contextual messages to different degrees. In most of the cases, contextual clue words help learners in their intelligibility and understandability, thus when they seem to have difficulties in identifying words, teachers should give them contextual messages. On the other hand, they should also be aware that there are learners whose English listening skill is not high enough for referring to the context. In such a case, rather than overwhelming them with English utterances and leaving them with chance level answers, explanation in the learners' L1 should be considered.

Conclusion

The current study showed the effects of contextual messages in communication. Although English learners and teachers are often concerned about L1 sound transfer in certain English segmentals, it may not cause misunderstandings when enough contextual messages are given in communication.

Bio Data

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