

Identification of English Consonants by Interpreting Students and Professional Interpreters

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The present study examines the identification of English consonants (i.e. /l/, /r/, /s/ and /θ/) by interpreting students and professional interpreters. The participants (both interpreting students and professional interpreters) were asked to listen to English words and to identify a consonant included in the word for each trial. The results show that professional interpreters identified better than the interpreting students. However, there was no significant difference between the results of these two groups. Few empirical studies on perception of consonants aiming at comparison between interpreting students and professional interpreters have been carried out. In this regard, the present study explores a new area.

1. Introduction

The present paper deals with the differences in the perception of English consonants between professional interpreters and interpreting students. The participants were asked to listen to a word in a carrier sentence and to identify the consonant included in the word. The consonants to be identified were /l/, /r/, /s/ and /θ/. The results show that although there are individual differences among the members of each group, there is no significant difference between the two groups.

The present study is motivated by the participants' (i.e., interpreting students) claims about their poor perception in the previous study (Takahashi, 2009; see section 2 for the details). Therefore, this paper also compares the results of the present study with those of Takahashi (2009), and discusses the relationship between the result of perception and the actual interpreting performance.

To the knowledge of the authors, few studies about the differences in perception

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between interpreting students and professional interpreters have been carried out. Therefore, the present study intends to contribute to the study of interpreting and educating interpreters.

The present paper is divided into eight sections. The second section provides previous studies and research question. In the third section, the paper deals with the experiment, which is followed by results in the fourth section and discussions in the fifth section. Conclusions are made in the sixth section and the seventh section includes educational implications. The present paper closes with future research suggestions in the eighth section.

2. Previous Studies and Research Question

In Takahashi (2009), interpreting students were asked to interpret English texts and were interviewed after the study. On that occasion, they were asked to reflect upon their interpreting performance in the study, referring to the original English texts. It was found out that omissions in interpreting were one of the common problems of the interpreting students participating in the study. In the post-study interview, five interpreting students blamed their poor speech perception for the omissions in interpreting some parts of the texts. They said, “As I couldn’t identify the word phonetically, I couldn’t interpret”. For example, one of the participants said, “Since I couldn’t distinguish ‘breeze’ from ‘bleed’, I couldn’t interpret the part of the text”. Two participants said, “‘within cell’ sounded like ‘with itself’”. They insisted that such erroneous identification was one of the causes for their omissions in interpreting. In order to verify their claims, the present research was designed and the experiment was conducted with the same interpreting students as in Takahashi (2009). Also professional interpreters were asked to participate in the same experiment and the results were compared with those of the professional interpreters.

The investigation in the area indicates that there is no research regarding speech perception of either professional interpreters or interpreting students. According to Gile (1994), interpreters’ level of comprehension goes beyond the recognition of individual words. Flowerdew and Miller (2005) also indicate that when the listeners decode a verbal message, they rely on not only the acoustic signal but also the prior contextual knowledge. As far as investigations made in this area, there is little research dealing with the relationship between speech perception and interpreting performance of interpreting students. However, as Pöchhacker (2007) indicates, phoneme identification and word recognition are relevant to interpreting. Rost (2002) also claims that recognition of words is the basis of comprehending spoken language, and identification of words is one of the main tasks. Ur (1984) also indicates that listeners’ main problem at the early stage is simply to identify the right phoneme(s) and the right word. In this regard, there is a research study on categorical discrimination of English consonants by native Japanese

listeners. According to the study by Guion et al. (2000), native Japanese speakers with more previous exposure identify consonants better than those with little exposure. However, it is not known whether this can be applied to interpreting students. Therefore, a research question was posed: it is whether poor identification is attributable to omissions in interpretation.

3. Experiment

3.1 The Purpose of the Experiment

The general purpose of the experiment was to examine whether there is a difference in the identification of consonants, /l/, /r/, /s/ and /θ/, between interpreting students and professional interpreters. We used these consonants because native speakers of Japanese have difficulty in distinguishing the contrasts of English /l/-/r/ and /s/-/θ/. This experiment aimed at examining whether there is a relationship between interpreting performance and identification of the consonants.

3.2 Speech Materials

The speech materials were produced by a 41-year-old native speaker of English, who had been teaching English at a private junior-high school in Tokyo for ten years. The speaker was from Hartford, CT., USA and he asserted that he had no difficulties in speaking and hearing. He read out 53 words (see, Table 1) and some distractors in a random order at least five times. These words were in the carrier sentence, "Repeat xxx twice". The utterances were recorded onto a digital recorder (Marantz solid state recorder PMD671) through a microphone (Sony ECM-959DT) and digitized at 48 kHz with 16 bits. The recording took place in the soundproof laboratory belonging to the Phonetics Laboratory of Sophia University. Two tokens per word were selected from the recorded words.

Table 1. *Speech materials***/l/-/r/**

1. CVC (12 words)

limb	rim
lane	rain
led	red
lime	rhyme
long	wrong
load	road

2. VCV (8 words)

hilling	hearing
jelly	Jerry
belly	berry
calling	coring

3. VC (6 words)

hill	hear
call	core
wall	war

4. CCV (8 words)

play	pray
flight	fright
bland	brand
flock	frock

5. Dummy (1 word)

Betty

/s/-/θ/

1. CVC (12 words)

sick	thick
sink	think
sing	thing
sin	thin
sank	thank
sum	thumb

2. VC (6 words)

miss	myth
pass	path
mouse	mouth

3.3 Listeners (Participants)

The listeners were seven interpreting students and five professional interpreters. All of the interpreting students had participated in the previous study for interpreting (Takahashi, 2009). They were coded from Stud1 to Stud7. The definitions of “interpreting students” in the previous research were: 1) mature students who have their own jobs, but are learning at private interpreting schools after work or on weekends, and 2) graduate students enrolled in the interpreting courses at post-graduate schools in Japan.

In order to participate in the study, the interpreting students had to fulfill basic requirements. First, they were required to have completed at least one year of interpreting

training. Second, at the time of the study, the interpreting students were to have achieved either Grade 1 of the STEP or Eiken Test offered by the Society for Testing English Proficiency, or a TOEIC score of 900 or above.

In the previous study (Takahashi, 2009), six participants were graduate students, and three participants were mature students. At the time of the present study, all of the graduate students had finished their interpreting courses and four of these graduates participated in the present study. Out of the four, three had terminated interpreting training (see, Table 2) and one had become an in-house interpreter for a private firm while still continuing interpreting training. On the other hand, the three mature students were still continuing the training under the same conditions. At the time of the present research, four listeners had achieved a certificate of Grade 1 of the Eiken Test and six listeners' TOIEC scores were over 900. Table 2 shows the profiles of the interpreting students.

As for professional interpreters, there was no requirement to participate in the study. Table 3 shows the profiles of the professional interpreters.

Table 2. *The profiles of the interpreting students*

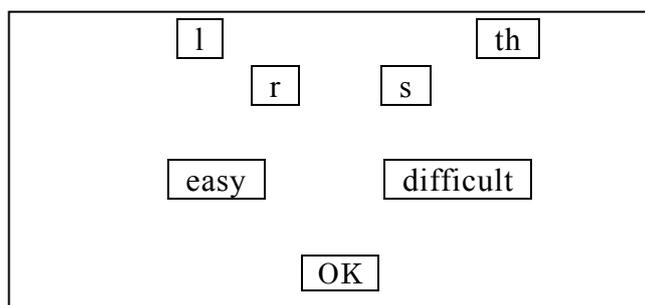
Listeners	Education outside Japan	Ages while abroad	Training period	Present age
Stud1	University in the US	20 to 21	3 years	31
Stud2	No	N/A	4 years	48
Stud3	Japanese school in Australia	8 to 11	3 years 5 months	30
Stud4	Local elementary school in the US	5 to 11	2 years 4 months	24
Stud5	Local elementary school in Australia Local junior high school in Australia University in the US	11 to 12 13 to 14 20 to 21	2 years (terminated)	25
Stud6	No	N/A	3 years (terminated)	31
Stud7	Local high school in the US	16 to 17	2 years (terminated)	26

Table 3. *The profiles of the professional interpreters*

Listeners	Education outside Japan	Ages while abroad	Length of interpreting service
Pro1	No	N/A	6 years 9 months
Pro2	University in the UK	From 28 to 32	8 years
Pro3	American school overseas	From 7 to 11	10 years
Pro4	Local nursery in the US	From 2 to 4	10 years
	Local school in the UK	From 7 to 10	
Pro5	American school overseas	From 7 to 9	15 years
	Local school in the US	From 14 to 16	

3.4 Procedures

The perception experiment was conducted in the same soundproof room in which the study materials had been recorded. The listeners individually participated in the experiment. They were asked to put on a headphone while sitting at the computer. Prior to the experiment, the listeners were provided with a warm-up session consisting of 16 trials. During the session, the volume was properly adjusted. In the experiment, the listeners were asked to use a computer mouse to click the icon bearing the consonant included in the word in the carrier sentence (see, Figure 1). The cue was given in a female voice, with the utterance, “Say” followed by the word to be identified. Also the listeners were asked to click either a “difficult” icon or an “easy” icon below the consonants’ icons on the display. When the listeners were not able to make an instant decision, they were to click the “difficult” icon. When the listeners were able to make a choice without a moment of hesitation, they were to click the “easy” icon. The listeners were allowed to make a correction to their responses before clicking the “OK” icon to proceed to the next cue. Once they click “OK”, they were not able to return to the previous screen. The experiment included 318 trials. (53 words x 2 tokens x 3 repetitions). Upon finishing 108 trials, they were asked to have a break. The stimuli were presented in a random order.

Figure 1. *The display used for the experiment*

This display was shown to the listeners. While looking at the display, the listeners were supposed to choose the consonant that, they thought, was included in the word and click the icon bearing that consonant. After clicking either the “easy” icon or the “difficult” icon, the “OK” icon appeared to proceed to the next. The icon “th” indicates /θ/.

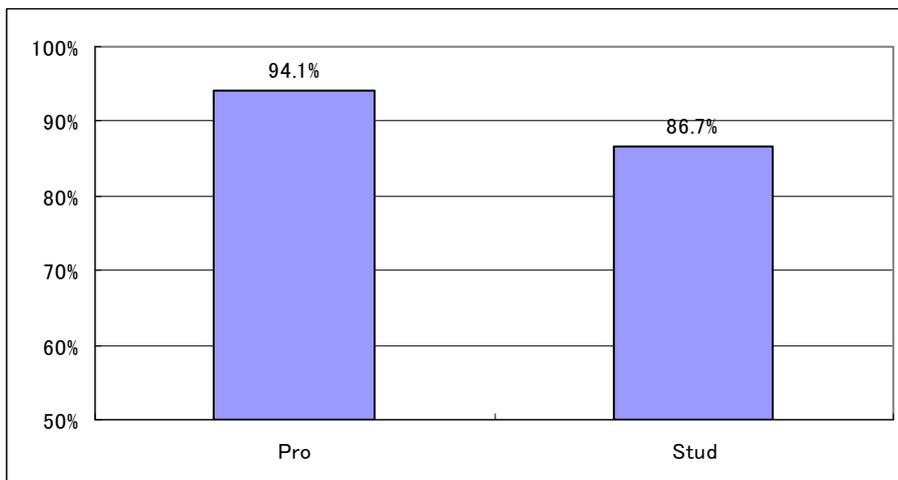
4. Results

We report the results of the identifications of /l/, /r/, /s/ and /θ/ in sections 4.1-4.3, and compare the results of the present study and those of Takahashi (2009) in 4.4. In addition, we also report the results of the categorizations of the dummy stimulus “Betty” in 4.5.

4.1 Difference between the Professional Interpreters and Interpreting Students

The mean rate of accurate identification of the professional interpreters is 94.1% and that of the interpreting students is 86.7% (see, Figure 2). According to the Mann-Whitney *U* Test, there is no significant difference ($U = 7.00, p = 0.088 > 0.05$). However, there is a tendency that the mean rate of accurate identification by the professional interpreters who participated in the research is slightly higher than that of the interpreting students.

Figure 2. *The mean rate of accurate identification*

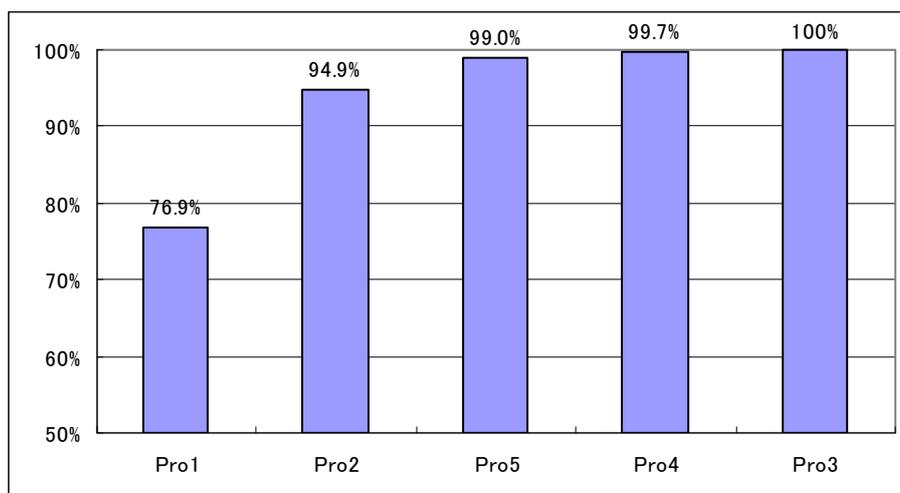


4.2 Differences among the Group of Professional Interpreters

There are individual differences among the professional interpreters (see, Figure 3). Pro3, Pro4, and Pro5 were able to accurately identify either 99% or more than 99% of the trials. These three professional interpreters had spent their childhood outside of Japan. Pro3 had been educated at an American school abroad from the age of seven to eleven. Pro4 had been educated at a local elementary school in the UK from the age of seven to ten. Also she had attended a local nursery in the US from the age of two to four. Pro5 had been educated at an American school abroad from seven to nine years old. Again from the age of 14 to 16, she was in the US, attending a local junior high school. Pro2 had lived in London for four and a half years, doing her master's degree. Pro1, who is on the bottom, had never lived abroad.

Looking at the results, the professional interpreters who had been educated in English outside of Japan identified the consonants better in the experiment than both listeners who had gone to university in her late twenties and the listener who had never lived abroad (Pro5, 4 and 3 identified the consonants better than Pro1 and 2).

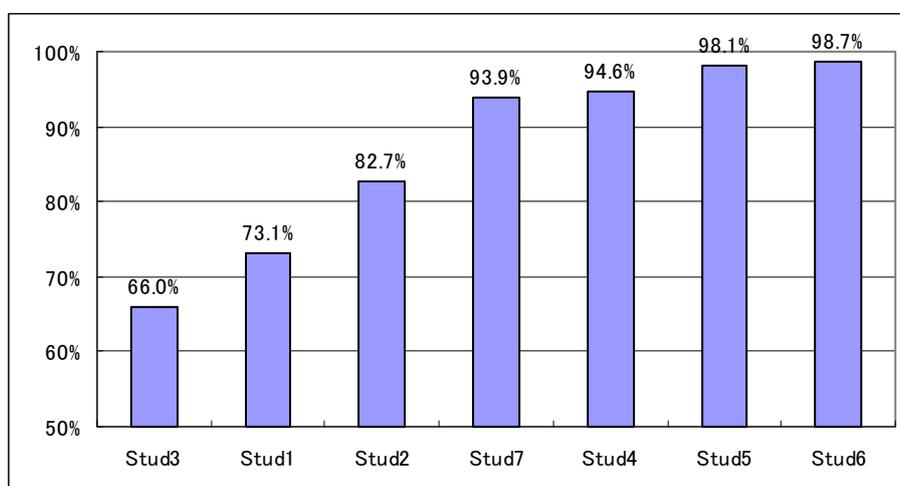
Figure 3. Results by an individual professional interpreter



4.3 Differences among the Group of Interpreting Students

Again, there are individual differences (see, Figure 4). Stud6, ranked highest, had never lived abroad except during a six-month-stay in Germany on vacation, visiting her father assigned there. Stud5, ranked second from the top, had spent 6 years as an elementary school student of a local school. Stud4, ranked third from the top, had been in Australia from the age of 11 to 12, and again from the age of 13 to 14. Besides that, he had studied in the US for one year as a college student. Stud7, ranked fourth from the top, had been an exchange student at the age of 16 years old, staying in the US for one year. These four listeners' rate of accurate identification is more than 93%. Stud2, who follows Stud7, had never lived abroad. Stud1, ranked second from the bottom, had stayed in the US for one year as a college student. Stud3, ranked lowest, had spent three years in Australia. However, she had attended a Japanese school instead of a local school.

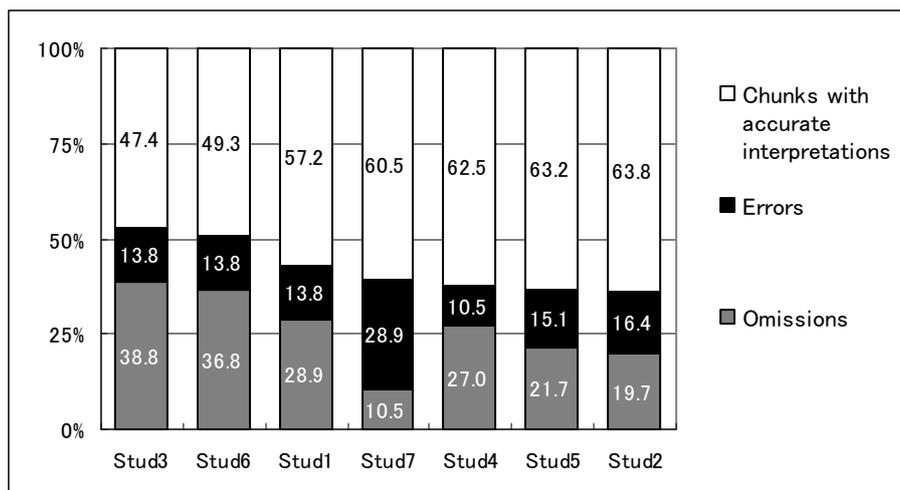
Figure 4. Results of individual interpreting students



4.4 Results of Interpreting Study in Terms of the Interpreting Performance

The following graph (see, Figure 5) shows the result of the study for interpreting performance that was conducted with the same listeners who participated in the previous study Takahashi (2009).

Figure 5. *Results of interpreting performance*



(Replotted from Takahashi 2009)

The listeners (the interpreting students) are ranked in terms of the rate of accurate identification as follows (from worse to better):

Stud3 < Stud1 < Stud2 < Stud7 < Stud4 < Stud5 < Stud6

The listeners (the interpreting students) are ranked in terms of the rate of omissions in interpretations as follows (from worse to better):

Stud3 < Stud6 < Stud1 < Stud4 < Stud5 < Stud2 < Stud7

The listeners (the interpreting students) are ranked in terms of the rate of accurate interpretations as follows (from worse to better):

Stud3 < Stud6 < Stud1 < Stud7 < Stud4 < Stud5 < Stud2

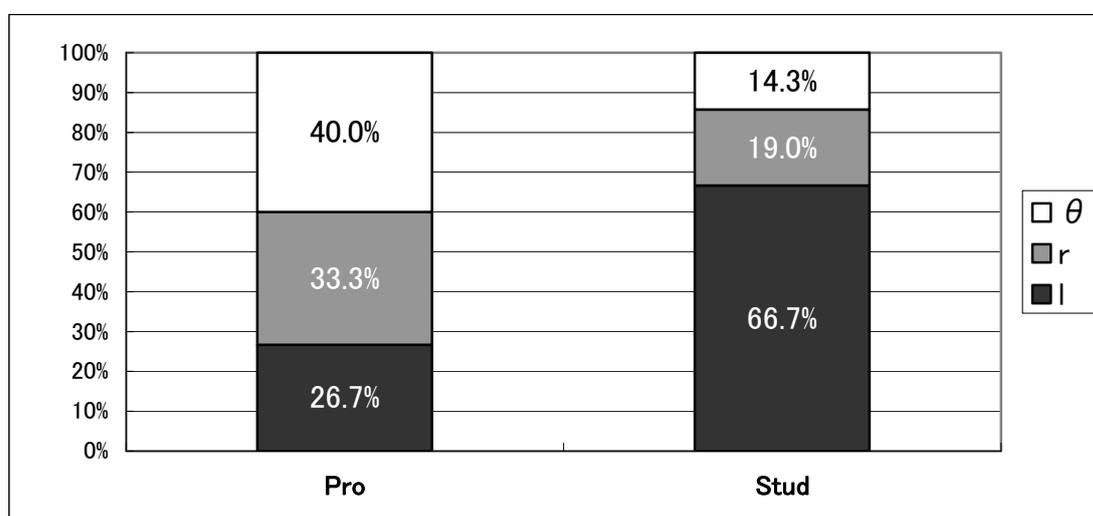
Except for the fact that Stud3 is ranked lowest both in terms of the interpreting study and the speech perception experiment, there is no distinct relationship between the results of the interpreting performance and those of the identification experiment.

4.5 Results of the “Dummy”

We also report the results of the categorizations of the intervocalic /t/ in the dummy stimulus “Betty” (see, Table 1). We carried out this secondary experiment as a preliminary study on categorization of allophonic tap of /t/ in English by interpreting students and professional interpreters.

As is shown in Figure 6, the professional interpreters categorized the intervocalic /t/ as /θ/ (40.0%), /r/ (33.3%) and /l/ (26.7%). The interpreting students categorized the intervocalic /t/ as /θ/ (14.3%), /r/ (19.0%) and /l/ (66.7%). No listeners categorized the intervocalic /t/ as /s/.

Figure 6. *The rate of categorizations of the allophonic tap of /t/ in “Betty”*



5. Discussions

5.1 Differences between the Professional Interpreters and Interpreting Students

Although there is no significant difference, there is a tendency for the professional interpreters' mean rate of accurate identification to be slightly higher than that of the interpreting students. However, based on the results of the present experiment, it is not known whether accurate identification contributes to better interpreting performance, because there are individual differences among the professional interpreters. This is particularly indicated by Pro1, ranked lowest of all the professional interpreters and ranked second from the bottom out of all the listeners in the present research. Therefore, in order to establish a relationship, a greater number of interpreters are needed for the future study: particularly those interpreters who have never stayed abroad and never been educated in English.

5.2 Differences among the Group of Professional Interpreters

As is shown by Figure 3, three interpreters, Pro3, Pro4, and Pro5 who have received primary education in English and Pro2 who went to university in the UK, were able to identify better than Pro1 who has neither stayed abroad nor been educated in English. There were no interpreters with the same background as Pro1 in the experiment. Therefore, it is not possible to draw any conclusion indicating the relationship between perception and omissions in interpretation performed by professional interpreters based on the result. There is a need for examining the perception of more professional interpreters who studied English either only in Japan or mostly in Japan.

5.3 Differences among the Group of Interpreting Students and their Interpreting Performance

Despite the claims made by the listeners in Takahashi (2009), the rates of identification by the interpreting students are not as low as they insisted. They said in the post-study interview, “I have difficulty identifying English sounds. So, I couldn’t interpret the parts of the texts where I couldn’t phonetically identify a sentence/word”. This is particularly observed in Stud6 and Stud7. However, since they had only listened to and identified the consonants /l/, /r/, /s/ and /θ/, it is necessary to examine whether they are able to identify other consonants, and the vowels. Also, since they did not need to think about the meaning of the word and did not need to take notes, it is possible that maximum concentration placed on the single word contributed to higher rate. In the case of actual interpreting, they have to perceive speech, comprehend a text and convert the meaning of the text into the different language. In the present experiment, the listeners were immune from all these processes and were allowed to concentrate on the identification of a single word. However, there is the possibility that the omission rate of an interpreting student with a low identification rate may be high as is indicated by the result of Stud3. Therefore, it is necessary not only to increase the number of listeners but also to examine identification of interpreting students with high omission rates alone in a separate research study.

Finally, there is a distinct relationship between the length of exposure and identification. However, the relation was not valid for all the listeners.

5.4 Categorization of Allophonic Tap of /t/

In American English, the phoneme /t/ can be realized as tap in intervocalic position (Ladefoged, 2006: 63). This sound is similar to Spanish /r/ and Japanese /r/ (Hualde, 2005: 150; Vance, 2008: 17). In addition, it is well known that native speakers of Japanese have difficulty in discriminating English /l/ and /r/ (e.g. Ooigawa, 2008). Some listeners of the present study might have assimilated the intervocalic /t/ in “Betty” as

Japanese /r/ and they might categorize the /t/ as English /l/ or /r/. As the majority of the listeners categorized the intervocalic /t/ as /l/ or /r/ (see, Figure 6), the results support our discussion. Other stimuli such as “belly” and “berry” might have helped the confusions.

Some listeners categorized the American English intervocalic /t/ as /θ/. They must have noticed that ‘t’ is the correct answer for “Betty”. However, there was no icon indicating ‘t’, yet they had to choose an answer by any means in order to continue the experiment (see, Figure 1). Therefore, they must have chosen the closest answer ‘th’ (/θ/). As no native speakers of American English participated in the experiment, we can not conclude that the listeners who categorized the intervocalic /t/ as /θ/ are native-like. However, it is interesting and remarkable that the professional interpreters categorized the intervocalic /t/ as /θ/ more than the interpreting students did.

6. Conclusions

In Takahashi (2009), the study participants (i.e., interpreting students) complained about their poor speech perception and insisted that they were not able to interpret, and omitted interpreting in some areas due to their poor speech perception. In order to verify their claims, we asked seven interpreting students and five professional interpreters to listen to the words in a carrier sentence and to identify the consonants, /l/, /r/, /s/ and /θ/. Partly because of the small number of listeners, and partly because of their diverse English educational background, there is no significant difference in identification of the consonants between the professional interpreters and the interpreting students. However, the professional interpreters were able to identify the consonants slightly more reliably than the interpreting students.

There is no distinct relationship between the results of the identification of the English consonants in the experiment and interpreting performance. Those who complained about their poor speech perception were more able to identify consonants than they had claimed. The listener who did best in identification of the consonants is ranked second from the bottom in terms of interpreting performance, blaming her erroneous speech perception for omissions in interpreting. However, there are individual differences among the members of each group.

7. Educational Implications

The present research was inspired by the frequent comments made by the interpreting students in Takahashi (2009); that is: “As I couldn’t identify the word phonetically, I couldn’t interpret”. However, there is no distinct relationship between the speech perception and interpreting performance in the present research. When students complain about their poor speech perception, we recommend that teachers check their speech perception by administering a quiz that is similar to the experiment in the present study

and examine whether they are able to identify consonants at the single word level. If they are able to identify them well, the problem may lie in an area other than speech perception. Also it would be better to identify which consonants students have a problem identifying. There is also the possibility that students are too much preoccupied with their own poor identification and underestimate their ability.

Even if students complain about their poor perception, it may not be exactly an identification problem. The problem may exist in other phonetic problems than identification, such as ignorance of the intonation rule, English prosody, reductions, and allophones. Therefore, we recommend that teachers who teach how to interpret should examine and identify the problems that students have from a wider viewpoint in order to offer an appropriate solution to students.

8. Future Research

8.1 The number of Speakers and Listeners

The present research involved only one speaker. The number of the listeners was also limited to only five professionals and seven interpreting students. The number of both speakers and listeners should be increased in future research.

8.2 Background of Listeners

The background of the listeners, the interpreting students in particular, was quite diverse in the present study. Future study should be designed to include listeners with more similar overseas experiences. In relation to the point, a greater number of professional interpreters who have neither lived abroad, nor been educated in English, should be included in future research.

8.3 Native English Speakers

It is necessary to examine to what extent native English speakers are able to identify all of these consonants included in a single word.

8.4 Materials for an Experiment

The present research dealt with only /l/, /r/, /s/ and /θ/. A greater number of consonants and vowels should be included in the future. In the present research, the listeners were supposed to listen to only a single word in the carrier sentence and identify the consonant included. Therefore, the future research is intended to deal with the identification of a consonant in a word embedded in a sentence.

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