Influence of L1 Japanese dialect and L2 English TOEIC level on L2 English pitch range

Miyuki Yoshizawa s1160241

Abstract

When Japanese English learners master the right English (especially pronunciation and intonation), L2 learners tend to have a lot of trouble in the pronunciation and articulation which are not in Japanese. In this research, we investigated about the influence which L2 learners dialect and particular intonation of hometown has on English especially being focused on the pitch. We focused on the Fukushima dialect and investigated how the flat intonation which is the feature of the Fukushima dialect would influence the English pitch. Moreover, although the TOEIC score is often used as standard of the skills L2 learners’ English, it was investigated how this would be related to L2 learners’ speech. Essentially, TOEIC score shows reading skills and listening skills, and does not show speaking skills. However, by clarifying these two points, we could clarify the point which it should be careful of when L2 learners master the English (especially speaking skills), and we thought that it could become information useful for L2 learners.

1 Introduction

There are two topics of this research. The first topic is making clear what kind of influence the local accent of Japanese English learners’ hometown has on English pronunciation and intonation.

In the past, research was done comparing the intonation of Japanese and English of those who speak Kanto district (standard Japanese), and those who speak Kansai district [1]. This research was done for the university student who speaks Kanto dialect and who speaks Kansai dialect, which is majoring in the foreign language. They prepared ten English sentences of the form of an interrogative + noun and an adjective + noun (e.g., Which class did you attend today?, There was an interesting book at the shop.), and made subjects read fifteen English sentences (previous English sentences is included) and fifteen Japanese sentences (corresponding to previous English sentences) at each pace. When the pitch of an interrogative or an adjective was higher than a noun, the number of the wrong accents was counted. Then, compared with the Kanto, seven sentences of Kansai were right among ten sentences. It was only two sentences that the Kanto suited. This means that the Kansai dialect has good influence on English pronunciation about a pitch rather than the Kanto dialect. However, when applied for this data in the T-test, it became clear that the difference between two groups was not statistically significant.

Because many students from Fukushima are enrolled in the University of Aizu, more data of the student who speaks Fukushima dialect can be collected. By comparing the data of the student from inside Fukushima, and the student from outside Fukushima, it can investigate about the influence of the Fukushima dialect on English. Generally, it is said that the Fukushima dialect is flat intonation compared with the standard Japanese. Therefore, when the English learner from Fukushima speaks English, the range of a pitch may become narrow. So, our first hypothesis is that L2 English learners from Fukushima will have a narrower pitch range than L2 English learners from outside Fukushima.

The second topic is making clear how the skill of English learners’ English and the pitch range is related. Wilson et al. [4] showed that TOEIC scores are related to phoneme discrimination, so perhaps they are related to pitch range in L2. TOEIC score was used in order to show English skill. The pitch range becomes very wide when a native speaker speaks English. The learner who has high TOEIC score and who can speak English like a native speaker, the pitch range may become wide. So, our second hypothesis is that there is positive correlation between TOEIC score and amount of pitch range in L2 English. When Japanese learners speak English, it is most difficult to master the right pronunciation and intonation. This research can make clear the points one should be careful of when mastering it.

The rest of the paper is organized as follows. Section 2 explains preliminary preparation for recording voice data, how to get this research data, and how to analyze to data. Section 3 shows the results of data analysis through the use of graphs. Section 4 states discussion
of results obtained from analysis, and their relationship to the hypotheses. Section 5 presents conclusions and future work.

2 Method

2.1 Participants

In this research, voice data were collected from 50 Japanese undergraduate students aged from 18 to 24 (mean = 21.00, standard deviation = 1.09). First, 43 persons’ voice data were recorded in the junior English class “Acoustic Analysis Using Software”. Since there was too few female voice data, we asked cooperation of seven women as well. We analyzed 45 persons’ voice data excluding data in which audio files were not clear. Among 45 people, there are 25 people from inside Fukushima (male = 16, female = 9), there are 20 people from outside Fukushima (male = 14, female = 6). Moreover, TOEIC scores were available for 37 out of 45 people.

2.2 Stimuli

In this research, all participants read aloud “The North Wind and the Sun” of the Aesop’s Fables both Japanese edition and English edition, and recorded each to another file. The text of the panphonic version and the original English text in The Principle of the International Phonetic Association 1949 which are used broadly, such as listening tests, pronunciation practice to clinical recording, and acoustic analysis, were used in this research [2]. You can see Japanese text in Appendix 1, and English text in Appendix 2.

2.3 Apparatus

All recording for this research was carried out in the iLab classroom of the University of Aizu. When recording, a headset microphone (Sennheiser PC 131), an iMac (Mac OS X Version 10.6.8), and Praat (Version 5.2.38) were used. An iMac (Mac OS X Version 10.6.8) and Praat (Version 5.2.45) were used to analyze voice files, and Microsoft Excel (Microsoft Excel for Mac 2011 version 14.1.4) was used to create tables and graphs.

2.4 Procedure

2.4.1 Stimuli Preparation

To prepare for data collection, one sheet of paper. The column which writes down personal information in this paper was prepared (student ID number, name, from prefectures name, gender, age, and TOEIC score). Also, notes in the case of recording, such as a setup of a microphone and a submission place of save files, were written on this paper in detail. And the both text of “The North Wind and the Sun” is indicated on the reverse side in a large font size.

2.4.2 Data Collection

When recording, this paper was distributed to all participants. They filled in all the items, and paper was submitted after recording finished. Before recording, they read and understood the notes, and explained again orally. Moreover, we got the participant to practice reading several times, and the words with pronunciation they did not understand were read by professor. After fully practicing, they made recordings.

2.4.3 Data Analysis

The recorded sound files were checked one by one and both Japanese and English files analyzed only audio files that were clear. Because the beginning of a file and the last of a file are the extra parts about which it is not speaking, it cuts and resaved so that it might be easy to analyze each file. The script was run in order to get the duration of the whole paragraph. This script was based on a script used in research by Wilson [6]. The specification of this script opens all files put on the specified directory, calculates total duration, and saves a result as a text file. It was run to all Japanese and English files, and also calculated the interval of the total duration between English and Japanese. These results and participants’ personal information were made into the table. Moreover, the script was created in order to get various data of a pitch (the maximum of a pitch, the minimum of a pitch, the average value of a pitch of the whole file, standard deviation, the interval of the maximum and the minimum). This modified to the previous script of duration, and the script used in research by Fujinuma. The specification is almost the same. We specified the pitch range of a script (male: 75–200Hz, female: 75–350Hz). This script was run to the file divided according to gender. The result was further divided participants into the inside Fukushima or outside Fukushima, and was displayed together with each average and standard deviation. The bar graph of the standard deviation both male and females’ pitch was created based on this table (see Figure 1). Moreover, the table of the TOEIC score and the standard deviation of a pitch was created based on this table (see Figure 1).
shows English capability, in order to also investigate relevance with Japanese, we created the graph of both English and Japanese (see Figure 2, 3 and 4). All tables and graphs were created using Excel.

3 Results

At first, the average pitch of each whole file, and the interval of the maximum and the minimum were calculated to get the dispersion of the pitch. However, because the pitch is fluctuating momentarily, it was meaningless even if it calculated the average pitch. Dispersion cannot be got if the interval of pitch was calculated [5]. Then, in order to get the dispersion of the pitch in the whole speech, the standard deviation of the pitch was calculated.

Figure 1 is expressing the result of males and females respectively. This graph was divided into four and the male detailed mean values were as follows. Inside Fukushima Japanese: 12.8 (s.d = 4.1), Outside Fukushima Japanese: 14.8 (3.7), Inside Fukushima English: 10.9 (3.9) and Outside Fukushima English: 12.0 (3.8). The female detailed values were as follows. Inside Fukushima Japanese: 28.9 (6.4), Outside Fukushima Japanese: 37.7 (12.8), Inside Fukushima English: 28.1 (10.3) and Outside Fukushima English: 33.4 (9.8).

The larger the value of the standard deviation of the pitch, the larger the dispersion of the pitch in the whole speech. This means that the speech has more variable intonation. When the male values is compared with the female values in Figure 1, on the whole, the female values are larger than the male values. Also, Outside Fukushima values are larger than Inside Fukushima values, and the Japanese values are larger than the English values both male and female.

Next, the correlation coefficient was calculated to
investigate the correlation between TOEIC score and standard deviation pitch. Cohen’s [3] guidelines were used to report the behavioural science effect sizes as criterion of size (small, \( r = 0.1 - 0.23 \); medium, \( r = 0.24 - 0.36 \); large, \( r = 0.37 \) or larger). Figure 2 is expressing the correlation between TOEIC score and the standard deviation of English pitch (male). Because the correlation coefficient is \( r = 0.30 \), it is medium strength, positive correlation. This means that as TOEIC score increases, so does the standard deviation of pitch. Figure 3 is expressing the correlation between TOEIC score and the standard deviation of Japanese pitch (male). Fundamentally, TOEIC score shows English skills. But, because Figure 2 show that we have medium strength, positive correlation, these results are important to investigate relationship with Japanese. The reason it is important to check the standard deviation of pitch in L1 (Japanese) is that if the pitch is variable in L1, then it will probably be variable in L2 (English) too. However, if the pitch is variable in only L2, then the reason is because of L2 vs. L1, not simply that the persons’ pitch is more variable. Because the correlation coefficient is \( r = 0.11 \), it is small strength, positive correlation. Figure 4 is expressing the correlation between TOEIC score and the standard deviation of English pitch (female). Because the correlation coefficient is \( r = -0.14 \), it is not correlation. In this case, it means that English listening and reading skills are not directly related to English speaking skill. So, it turned out that results of Japanese were not necessary to obtain.

4 Discussion

This research has two hypotheses. The first hypothesis is that L2 English learners from Fukushima will have a narrower pitch range than L2 English learners from outside Fukushima. When the male values is compared with the female values in Figure 1, first, on the whole, the female values are higher than the male values, and it turns out that a females’ speech has more variable intonation. This may describe that there are females of a rich expression than males. Next, it turns out that Japanese values are higher than English values in both male and female. For participants, Japanese is a native language (L1) and get accustomed to this language. Therefore, it may be easy to express feelings and may be easy to have more variable intonation than English. Furthermore, it turns out that outside Fukushima values are higher than inside Fukushima values in both English and Japanese. This means that the flat intonation of Fukushima dialect may be related. On the basis of above, it can be said that the first hypothesis is probably true.

The second hypothesis is that there is positive correlation between TOEIC score and amount of pitch range in L2 English. Figure 2 show that we have medium strength, positive correlation between TOEIC score and the standard deviation of English pitch (male). At first glance, the English reading and listening skills seems to give good influence for English speech as expected. However, Figure 3 show that we have small strength, positive correlation between TOEIC score and the standard deviation of Japanese pitch (male). It may be because there were people who read pow-
erfully and who put a lot of emotion into reading in people with high English skill. Therefore, the result of Figure 2 has a possibility that not only English skill but also participants’ individual reading has influenced. Also, Figure 4 shows that we do not have correlation between TOEIC score and the standard deviation of English pitch (female). In this case, it turns out that English skill did not affect English speech directly. On the basis of above, it can be said that the second hypothesis is true only for males.

5 Conclusions and Future Work
In conclusion, it can say that the flat intonation of the Fukushima dialects affects English which the English learner from Fukushima speaks. Of course, it is important for the English learner from Fukushima to master the pronunciation of each word properly. However, it will become a shortcut which masters right English by practicing speak with more variable intonation not only per word but also per sentence consciously. Moreover, in this research, the relationship between English listening and reading skills, and English speaking skill was found only for males. However, in any languages, unless reading and listening skills about the language are equipped properly, don’t forget that the language cannot be spoken fluently.

In future work, to investigate the influence of not only Fukushima dialect but also other dialect which has different intonation and foreign language (L1) except for Japanese to English (L2), it will be useful in order that an English learner may master right English.

Acknowledgements
Firstly, I would like to express my sincere gratitude to my supervisor, Professor Ian Wilson, for his guidance and support to my research work. Also, I genuinely appreciate student’s participation of this study and provision of valuable voice data.

References

Appendix 1: Japanese stimuli used (Orthographic version of the Japanese panphonic text)
北風と太陽が、どちらかが強いかで言い争っているところへ、偶然にたんば道を、旅人が暖かそうな上着にくるまってやってきました。そこで、その旅人の上着を脱がせた方が強い、ということにきめました。まず始めに、北風が旅人に向かってせいいっぱい吹きつけました。しかし、乱暴に吹けば吹くほど、逆に旅人は上着をしっかりと体に巻き付けるので、脱がせることができませんでした。北風はくたびれて、ついにあきらめました。今度は太陽の番になりました。太陽が暖かい光をやんわり地面に注ぐと、やがて旅人は、自分から上着を脱いできました。それでも北風は残念ながら、太陽の方が強いと認めなければなりませんでした。

Appendix 2: English stimuli used (The original English text in The Principle of the International Phonetic Association, 1949)
The North Wind and the Sun were disputing which was the stronger, when a traveller came along wrapped in
a warm cloak. They agreed that the one who first succeeded in making the traveller take his cloak off should be considered stronger than the other. Then the North Wind blew as hard as he could, but the more he blew the more closely did the traveller fold his cloak around him, and at last the North Wind gave up the attempt. Then the Sun shone out warmly, and immediately the traveller took off his cloak. And so the North wind was obliged to confess that the Sun was the stronger of the two.