

Japanese Learners of English and Japanese Phonology

KITA Yoko

(Keywords: English language education, Japanese Learners of English, Japanese Phonology)

1. Introduction

Globalization has brought a drastic change to English Education since English is now considered an International language in Japan. According to a survey given out in Japan by the Ministry of Education, Culture, Sports, Science and Technology in 2017, most of the junior high schools nationwide conduct English lessons as a prioritized foreign language. Compulsory English Education in Japan starts the fifth year of elementary school at the age of ten and continues until the third year of junior high school. If a student attends high school and university, which is voluntary after the age of sixteen, then the student must take another three to seven years of English. Since all Japanese must go through a large amount of English education during school, there needs to be a focus on creating a learning environment that helps them become proficient in English.

This paper will discuss how Japanese learners of English are influenced by their native language of Japanese, when producing English sounds and it will provide teaching methods to correct pronunciation errors.

2. Japanese Language

Japanese is the official language of Japan. However, including Japanese emigrant countries, more than 120 million people speak Japanese throughout the world. The lingua franca of Japan is called Standard Language or *Kyotsugo*, which is principally based in the Tokyo area. The country of Japan is divided into two main areas eastern Japan and western Japan. Japan is rich in various regional dialects from Hokkaido in the north, to Okinawa in the south. There are various dialects in the 48 prefectures. Japanese dialects vary in pitch and accent, morphology of the verb and adjectives, particle usage and vocabulary (Shibatani, 2009). Tokyo Japanese is a well-studied pitch accent language and many words in the Tokyo dialect have no underlying high tone that appears on the surface and are phonologically inserted (Hayes, 2009; Otaka, 2009). We could assume that standard Japanese is prevalent nationwide because of its usage in the national curriculum of compulsory education and also due to the influence of television. Different from most European languages, it is difficult to classify Japanese within a particular language family. Japanese syllabic and phonotactic structure do not match any other language, certainly not Chinese and Korean which are the two most geographically close neighbors. Although Japanese shares Chinese characters in the writing system, it is grammatically and phonologically distinct from the Chinese. Phonologically speaking, Japanese is also different from Korean although both languages have the same a five-vowel system (Shibatani, 2009).

The Japanese language is written with a combination of three scripts; Chinese characters called Kanji, and two syllabic scripts called Hiragana and Katakana. Kanji was brought from China in the late 5th century. Hiragana and Katakana were both adopted from Kanji in the 9th century. The Latin alphabet, Romaji, is also used in modern Japanese. The traditional way of writing is to write vertically, lines progressing from right to left. But today both vertical writing and horizontal writing are practiced. In terms of grammatical structure, it is completely different from English. Japanese basic sentence order

(subject-object-verb) is the widespread structure among the world's languages (Shibatani, 2009). Japanese are used to reading Kanji, so it is easier for them to visually identify Kanji than combinations of letters of the alphabet.

3. Japanese Phonology

The Japanese has a five-vowel system; /a/ /i/ /u/ /e/ /o/. The Japanese vowels are pronounced as monophthongs. The Japanese vowels have a phonemic length distinction - using long vowels and short vowels when comparing and contrasting pairs of words such as in /obaasan/ “grandmother” and in /obasan/ “aunt”. /a/ is a low central vowel, which is between /æ/ and /ɑ/ in the English sound. /i/ is an upper front vowel. Shibutani (2009) mentions Tokyo dialect the high back vowel /u/ is an unrounded /u/. /u/ is a centralized close back vowel and is pronounced with the lips compressed toward each other. /e/ is a middle front vowel. /o/ is a middle back and the tongue is kept lowered while pronouncing /o/ (Akamatsu, 2000; Shibatani, 2009). Japanese contains these consonants: /p b m t d n ɾ s z ʃ k g ŋ h j N/. Voiceless stops /p, t, k/ are slightly aspirated. Voiced stops /b, g/ are sometimes pronounced as fricatives or approximants. /t, d, n/ are denti-alveolar by obstructing the air passage with the blade of the tongue. /s z/ are laminal alveolar by obstructing the air passage with the blade of the tongue. /m/ is a nasal. /ɾ/ is an apical post alveolar flap, which cannot be specified as either a central or a lateral flap. It is often pronounced between an /l/ and a retroflex /ɾ/ in an English sound depending on its position. Japanese does not contain the consonants [f v θ ð ɹ l ʒ], which are found in English sounds (Akamatsu, 2000; Shibatani, 2009).

Japanese syllables almost always follow a consonant-vowel pattern such as ‘neko’ meaning “cat” and ‘sayonara’ meaning “good-bye”. Some exceptions are in words that include the /n/ sound. These exceptions can be seen in words like ‘Honda’, ‘panda’, and ‘shinkansen’ (the Japanese bullet train). Geminate consonants can also be considered an exception to this rule as shown in the following: /tt/ in yokatta, /kk/ in sokkuri, /pp/ in yappari (Otaka, 2009). Japanese predominantly has open syllables, with the only exception being a syllabic nasal consonant; on the other hand, English allows a wide variety of syllable types including open syllable and closed syllables (Avery, & Ehrlich, 1992). With this ingrained CV syllable pattern, Japanese learners might face difficulties when producing English closed syllables and consonant clusters. For instance, Japanese speakers often experience difficulty in pronouncing closed CVC syllables in English and add a vowel to the end of a closed syllable to make the word conform to the Japanese consonant-vowel pattern. Therefore, Japanese speakers may pronounce an English word with a closed syllable ‘street’ as ‘sutorito’ with four open syllables.

4. Loanwords in Japanese

Japanese also uses many loanwords from European languages, which are referred to as *gairaigo* which means ‘foreign words’. Roughly 80 per cent of the foreign vocabulary of Japanese is words of English origin (Shibatani, 2009). In order to represent the original sounds, a katakana rendering of the original pronunciation accompanied the translated words such as *birudingu* “building” and *conpyuuta* “computer”. The problem is when rendering foreign loanwords in *Katakana*; the original pronunciation is very often changed. Each *Katakana* character ends in a vowel sound, so consonant clusters and final consonants in loanwords are changed into sequences consisting of a consonant and a vowel (Shibatani, 2009). For instance, a one-syllable word like *text* would be changed a four-syllable word *tekisuto*.

5. Common Errors in Japanese Speakers of English

Japanese learners of English may have difficulty producing English vowels because there are more

vowels in English than in Japanese. The distinction between the tense and lax vowels does not exist in Japanese; for instance, /i/ vs. /ɪ/, /e/ vs. /ɛ/, /u/ vs. /ʊ/. Also, Japanese speakers may have difficulty with these vowel sounds; /ɛ/, /æ/, /ʌ/, and /ə/ since low front vowel /æ/ and central vowels /ʌ/ and /ə/ do not exist in Japanese vowels (Saito, 2007; Avery, & Ehrlich, 1992). In addition, the English vowel /ɑ/ is further back than the low vowel of Japanese.

Japanese speakers tend to replace certain more familiar sounds from their first language for unfamiliar sounds when pronouncing English (Avery, & Ehrlich, 1992; Brown, 2007). This phenomenon is seen in the following examples. The approximants /ɹ/ and /l/ are replaced by an alveolar flap /ɾ/ that is in the Japanese phonemic group “ra ri ru re ro” since Japanese has only one liquid sound which is between the English /ɹ/ and /l/. The voiced version of labiodental fricative /v/ is replaced with a bilabial /b/ since Japanese only has a /b/ sound. The voiceless labiodental fricative /f/ is replaced with a voiceless bilabial fricative /ɸ/ because Japanese does not have a /f/ sound but it has a /ɸu/ sound in the Japanese phonemic group “ha, hi, ɸu, he, ho”. The sound /ɸu/ closely approximates /f/ because of forcing air through more rounded lips (Hayes, 2009). The interdental fricatives /θ/ and /ð/ are replaced by alveolar /s/ and /z/ or /d/ respectively, since there is no /θ/ or /ð/ sound in Japanese. When /s/ and /t/ occur before the high front vowels /i/ or /ij/, Japanese speakers pronounce them as /j/ and /tj/ respectively. Japanese speaker may omit word-initial glides before their high vowel counterparts; for instance, ‘year’ is pronounced as /iɹ/. Also, consonants clusters and word-final consonants would be problematic as the examples of ‘match’ being pronounced as ‘matchi’ and ‘sing’ pronounced as ‘singu’ (Avery, & Ehrlich, 1992; Otaka, 2009).

Other predictable problems in Japanese learners of English are stress, rhythm, and intonation in producing English words and sentences. Japanese is a syllable-timed language so the amount of time required to say a sentence depends on the number of syllables, not on the number of stressed syllables. Japanese does not have a short, reduced vowel equivalent to the English schwa, so when pronouncing English words and sentences, Japanese learners of English may lack the vowel reduction necessary for English rhythm. Also Japanese is a pitch-accent language. In pitch accent languages the primary indicator of accent/stress is pitch. For instance, one class of words has a fall from the stressed syllable to the following syllable, as in *ongak* ‘music’, where the first syllable has high pitch and the second low pitch, or *tamanegi* ‘onion’, with high pitch on the penultimate and low pitch on the final syllable (Davenport & Hannahs, 2005). Recall that stressed syllables in English are marked primarily by length and loudness. Since Japanese and English mark stress in different ways, Japanese learners of English may have difficulty both producing and perceiving the characteristic stress patterns of English. In addition, Japanese learners of English may have difficulty with the characteristic intonation patterns in pronouncing English words since the way pitch functions in Japanese and English is different (Avery & Ehrlich, 1992).

6. Hypotheses

Japanese learners of English may:

1. Have difficulty producing English vowels /ɛ/, /æ/, /ʌ/, and /ə/.
2. Substitute the approximants /ɹ/ and /l/ with an alveolar flap /ɾ/.
3. Substitute the voiceless labiodental fricative /f/ with a voiceless bilabial fricative /ɸ/.
4. Substitute the interdental fricatives /θ/ and /ð/ with alveolar /s/ and /z/.
5. Be confused by consonants clusters and word-final consonants.
6. Be influenced by loanword sounds and pronounce some English words based on the sound of the loanword.
7. Have difficulty with the characteristic intonation patterns in pronouncing English words and sentences.

7. Methods

An Elicitation paragraph (Appendix A) was used which includes most of phonemes existing in the English language. The elicitation paragraph was taken from the *Speech Accent Archive* and then modified. Some specific phonemes based on current research literature were intentionally added. These are sounds which Japanese learners of English frequently mispronounce. Then, special attention was paid to some sounds, which are unique to English when compared to Japanese, in order to research what kinds of strategies are used in their production. The subjects in the study were six Japanese learners of English in their 20s, three males and three females. Subject A and Subject C have both been studying English abroad in the U.S. for approximately six months. Subject B studied at a university in the U.S. and has been working at a computer company for 6 years since then. Subject D and Subject F have both been studying English in Japan for approximately one year at a university. Subject F is living in Japan and has been studying English for approximately 5 months in Japan. All of the subjects took the compulsory English education course for 6 years in Japan. Each of the subjects was recorded while reading the elicitation paragraph aloud and then the recording was analyzed using the International Phonetic Alphabet. As a comparison, phonetic transcription retrieved from the *Speech Accent Archive* was also prepared using Standard English pronunciation.

8. Results

One subject showed native-like vowels in many places; however, vowel substitution frequently occurred in the other five subjects. For example, Subject E and Subject F replaced /ɔ/ with /o:/, /ɛ/ with /e/, and /æ/ with /ə/. Subjects C, E and F also replaced /ɔ/ with /o:/, /æ/ with /ʌ/, and /ɛ/ with /e/. Subject E and Subject F tended to replace /æ/ with /ə/ and show variation in his/her production. Subjects A, E and F substituted the tense /i/ for the lax /ɪ/. It seems that this kind of vowel replacement is common in Japanese learners of English. The results also showed that four subjects used monophthongs instead of diphthongs such as /steʃon/ or /ste:ʃon/ for /steɪʃən/ in the word ‘station’ and /wenzde/ or /wɛnzde:/ for /wɛnzdeɪ/ in the word ‘Wednesday.’

Regarding consonants, Subject B showed native-like production almost all of the time except for consonant clusters. The voiced labiodental fricative is often replaced with /b/ by Japanese learners of English. Subjects A, C, E, and F replaced /v/ with /b/ in the word ‘very’ while the other subjects both pronounced it correctly or like a labiodental plosive. Subject E and Subject F replaced /f/ with /f̥/ in the word ‘five’ or ‘fresh’. Although, Subject D sometimes used a sound in between the /f̥/ and /f/ sound that basically sounded like /f/. Subject F substituted /θ/ with /s/ in the word ‘thank’ or ‘thing’, and /ð/ with /z/ in word-initial position such as in the word ‘they’ or ‘these’. She also has the tendency to pronounce the consonant cluster /ŋz/ as /ks/ in the word ‘things’ and /gz/ as /ks/ in the word ‘bags.’ Subject E almost always replaced /ð/ with /z/ and /θ/ with /s/ in word-initial position. As Japanese learners of English often have difficulty in pronouncing the liquid /ɹ/, Subjects D, E and F used /r/ in almost all words that contained the liquid /l/ or /ɹ/; for instance, in the word ‘really’, ‘Larry’, ‘appreciate’, or ‘help’. When the subjects confused the pronunciation of /l/ and /ɹ/ in the word, the duration of the stressed syllable shortened or lengthened unconsciously depending on subjects. It seems that producing the liquid sound /l/ and /ɹ/ correctly is the most challenging to Japanese speakers of English.

Also, the influence of loanwords in Subject E’s pronunciation was seen in the word, ‘cheese’ and ‘plastic’. He put a sound /u/ at the end of the word ‘cheese’ and pronounced /tʃiku/ for /tɪk/ in the word, ‘plastic.’ Those words are widely used loanwords in Japanese; therefore, Subject E pronounced them based on the loanwords unconsciously. He also frequently inserted vowels at the end of each word. In addition, in Japanese speech, lip and jaw movements tend to be minimized, and many social situations demand soft

speech; Subject E's speech pattern exactly followed this cultural rule.

Another aspect is stress patterns and the duration of the stressed syllable. Some of the syllables usually stressed by native speakers of English did not seem to be stressed in the word 'plastic' or 'appreciate' in the pronunciation of Subject E and Subject F. The duration of the stressed syllable is also shorter than normal in the word 'station' or 'appreciate.' English stress, rhythm, and intonation in producing English words and sentences vary considerably in Subject E and subject F's production. Subject A used a rising intonation at the end of sentences which were not questions.

9. Discussion and Conclusion

Significant differences in phonological acquirement were observed even among just six Japanese speakers of English. Subject B, who took English education for 4 years in the U.S., showed native-like pronunciation, and is still working in the U.S. He said he started his English education in Japan, at the age of 10 with a native speaker English instructor who majored in TESOL. It seems his total amount of exposure to English sounds and systematic English education helped his production improvement drastically. It was especially helpful that the instructor understood the weak points of Japanese speakers of English in producing English sounds and provided appropriate exercises for beneficial sounds. Subject B mentioned that while he showed native-like pronunciation, if he did not pay attention he would subconsciously make mistakes in producing the liquid sounds and vowels. Subject A and subject C attend ESL classes every day and are still in the process of learning English sounds after 6 months. Subject D studies English at a university in Japan and is also still in the process of learning English sounds after one year. Subject E and subject F are both graduate students majoring in Education in Japan. Subject E mentioned difficulty in producing English pronunciation.

Japanese learners of English need a considerable amount of work to acquire correct English pronunciation. The following are the main problems in the speech samples shown above. Some new vowel sounds must be acquired such as /ɛ/, /æ/, /ʌ/, and /ə/ in addition to distinguishing lax and tense vowels. Several consonant sounds must be acquired, including the interdental, labiodental and voiced post-alveolar fricatives, and the two liquids. To cope with these challenges in producing English sounds, Japanese speakers of English often use substitution strategies, by usually using phonemes from Japanese which most closely resemble the sounds that are substituted. It is also important to pay attention to the English stress, rhythm, and intonation in producing English words and sentences.

10. Recommendation for Future Research

Considering there are English vowels and consonants which are unfamiliar to Japanese learners of English, visualized information like diagrams and several systematic pronunciation practices would be required. Then, they should have plenty of opportunities to practice in dialogues, role-plays, and games with authentic conversation. Here are some pronunciation exercise suggestions (Lane, 2004; Avery, & Ehrlich, 1992).

Vowel overview

Tense and lax vowels:

Showing diagrams of tense vowels and lax vowels and let students listen to these words and repeat words. Since the distinction between the tense and lax vowels does not exist in Japanese, it is necessary to show them clear image of the difference of the mouth shape in pronouncing each vowel (Lane, 2004; Avery, & Ehrlich, 1992).

Words with /ɛ/, /æ/, /ə/, and /ɑ/

In learning vowels, students should review vowels all together. Use diagrams to help students pronounce the vowels correctly. The procedure is almost the same as comparing two vowels.

Consonants overview

Since consonants are both voiced and voiceless, it would be useful for students to feel their vocal cords vibrate when they make a voiced sound like /z/ or /v/.

Voiced and voiceless consonants: Saying and feeling

1. Students put their fingers against their throat.
2. Ss make a long /sssss/ sound and see there is no vibration on their throat.
3. Ss make a long /zzzzz/ sound, and then feel for vibration.
4. Ss switch back and forth between the two sounds: /zzzzz/ and /sssss/
5. Ss repeat steps 2 and 3 using /fffff/ and /vvvvv/ sounds.
6. Ss determine if /v/ is voiceless or voiced.

Fricative /v/ and /f/

The labiodental fricative /v/ and /f/ are problematic for Japanese speaker of English. The /f/ sound is replaced with a voiceless bilabial fricative the /ϕ/ sound in the Japanese phonemic group “ha, hi, ϕu, he, ho”. So, Japanese learners of English need a clear distinction how to produce the labiodental fricative /v/ and /f/. It would be helpful to show diagrams. Show a diagram of the /f/ sound and give tips on how to produce the sound /f/.

Stress

Regarding stress, use mnemonic devices for indicating stress. Instructors can indicate stressed syllables with a quick downward hand motion. Then, exaggerate both length and loudness to focus learners’ attention on stressed syllables.

Appendix A

Elicitation sentences: Retrieved from *Speech Accent Archive*

Please call Stella.

Ask her to bring these things with her from the store:

Six spoons of fresh snow peas, five thick slabs of blue cheese, and maybe a snack for her brother Bob.

We also need a small plastic snake and a big toy frog for the kids.

She can scoop these things into three red bags, and we will go meet her Wednesday at the train station.

Modified elicitation sentences:

Please call Stella and Larry.

Ask them to bring these things with them from the store:

Six spoons of fresh snow peas, five thick slabs of blue cheese, and maybe a snack for their brother Bob.

We also need a small plastic snake and a big toy frog for the kids.

They can scoop these things into three red bags, and we will go meet them Wednesday at the train station.

Thank you very much. I really appreciate your help.

The questions given to the subjects: Retrieved from *Speech Accent Archive*

1. Where were you born?
2. What is your native language?
3. What other languages besides English and your native language do you know?
4. How old are you?
5. How old were you when you first began to study English?
6. How did you learn English? (Academically or naturalistically)
7. How long have you lived in an English-speaking country? Which country?

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Abstract

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