

Factors Affecting Japanese EFL Learners' Pronunciation Learning 1: Age, Linguistic Differences, Aptitude, Personality and Gender

日本人英語学習者の発音習得の要因 1 —年齢・言語的相違・適性・性格・性別—

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Different learners show different levels of mastery of a targeted language. Among language skills, pronunciation is one of the most salient skills showing individual differences in terms of attainment level. Japanese EFL learners' pronunciation skills are regarded as low, despite the high interest in pronunciation. The purpose of this paper is to identify the factors that make it challenging for Japanese people to learn English and those that lead to individual differences in terms of attainment level by Japanese learners, through a review of the latest theoretical and empirical studies. In this paper, particularly fixed factors, which are relatively difficult to change through instruction, are discussed within the framework of: 1) age, 2) cross-linguistic influence, 3) aptitude, 4) personality, and 5) gender. Following the review of the literature, pedagogical implications for English pronunciation teaching in Japan are discussed.

Key words : second language acquisition, L2 pronunciation, individual differences, Japanese EFL learners

1. Introduction

Individual differences are important to consider in learning and teaching a second or foreign language. Different learners show different levels of mastery of a targeted language. Among language skills, pronunciation is one of the most salient skills showing individual differences in terms of attainment level. In particular, a learner's native language is one of the strongest factors determining the attainment level in pronunciation learning. Japanese people have been increasingly learning English and spending a great deal of time doing so, yet Japanese EFL learners' pronunciation skills are regarded as low (Purcell & Suter, 1980) in comparison with other language skills such as vocabulary, grammar, and reading. This, however, does not mean that Japanese EFL learners do not care about their pronunciation. They do care about it and are rather sensitive about it. Actually, most Japanese people think that pronunciation skills indicate an individual's general proficiency level in English (Imanaka, 2014). Yet, despite the high interest in pronunciation evinced by Japanese EFL learners, many of them have difficulty in improving their English pronunciation.

Studies have indicated various factors that affect L2 pronunciation learning and have shown several significant predictors for the attainment of L2 pronunciation skills. However, even though a few studies have investigated

particular factors that have an impact on L2 pronunciation learning, with particular focus on Japanese EFL learners, my search of the literature yielded no study that examines those factors comprehensively.

Therefore, one purpose of the present study is to identify the factors that make it challenging for Japanese people to learn English and those that lead to individual differences in terms of attainment level by Japanese learners, through a review of the latest theoretical and empirical studies. In this paper, particularly fixed factors, which are relatively difficult to change through instruction, are discussed within the framework of: 1) age, 2) cross-linguistic influence, 3) aptitude, 4) personality, and 5) gender. The other purpose of this study is to engage in a discussion of pedagogical implications for English pronunciation teaching in Japan that is based on a review of the literature.

2. Age

The first factor is learner age at first exposure to the targeted language because numerous studies have indicated that age is one of the strongest factors that predict the ultimate attainment of L2 learning (Flege, 1987; Lenneberg, 1967; Ovama, 1976; Scovel, 1969). These studies indicate that "earlier is better" holds true in acquiring a new language. In fact, focusing more on

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teaching English to young learners, the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) has decided to shift the first English class from the fifth grade to the third grade from 2020 (MEXT, 2013). In this section, I discuss whether the notion “earlier is better” is valid in L2 pronunciation learning.

2.1 Critical Period Hypothesis

The critical period hypothesis proposes that it is best to master a second or foreign language in a window of time. This would seem to suggest that it is not possible for a learner to start learning a second language after a certain age, which, in general, is claimed to be around the early teens (Lenneberg, 1967; Scovel, 1969). There are many pros and cons for this hypothesis. In fact, while some studies support this hypothesis, various other studies do not (Birdsong, 1992; Bley-Vroman, Felix, & Ioup, 1988; Bongaerts 1999; Oishi, 2010; White & Genesee, 1996).

However, debate concerning the best time in life to acquire pronunciation skills is less controversial when compared with other language skills, and current mainstream scholarship supports the idea that a person's age significantly influences pronunciation skills (Takahashi, 2011). Different language skills are learned optimally at different ages (Brown, 2007); however, a line of research supports the idea that pronunciation skills, which are lower-order processes, are optimally learned in early maturing time (Hyltenstam & Abrahamsson, 2003; Moyer, 2013; Singleton & Ryan, 2004). Scovel (1988) claimed that the age factor exists only for phonology. Scovel (1969) proposed that human brain lateralization is involved with the ability to learn L2 sounds. He suggested that the plasticity of the brain before the completion of lateralization enables children to acquire L2 sounds. Scovel (1988) also discussed sociobiological evidence that supports the critical period hypothesis for phonology learning. A socially bonding accent must develop at puberty for sociobiological reasons because it 1) enables a “species to form an identity with their own community as they anticipate roles of parenting and leadership” and 2) enables “species to attract mates of their own kind in an instinctive drive to maintain their own species” (as cited in Brown, 2007, p. 59). The exact limit point for the acquisition has not been identified so far; however, a gradual decline seems to exist.

2.2 Language Ego

As we grow, we develop an ego, or a language ego, which is the “identity a person develops in reference to the language he or she speaks” (Brown, 2007, p. 69). This language ego has an impact on the learner's behavior in language classes.

Children's (prepubescent) own identity is underdeveloped, and thus, they may more easily share external norms, which is L2 pronunciation in this case (Preston, 1989). Young learners before puberty have an undeveloped native language ego, which is flexible. They show less hesitation in speaking in a foreign language class because they are less aware of how others' evaluation of them can be damaged consequent to their making mistakes in speaking a new language. Thus, learning a new language does not pose “a substantial threat or inhibition to the ego” of young learners, and it is relatively easy for them to adapt to the context of a new language (Brown, 2007, p. 69).

Adolescents have difficulty in learning L2 pronunciation. English teachers teaching teenagers often have students who speak English with a heavy Japanese accent on purpose. According to Brown (2007), during puberty, learners experience significant physical, emotional, and cognitive changes and have a very unstable and fragile ego: therefore, they may develop a defensive language ego that “clings to the security of the native language” (p.70).

Mature adults (after puberty) who have already established a native language ego do not have to be so protective or defensive. However, they are still likely to exhibit inhibitions in their attempts to speak in a foreign language class. They may be afraid of losing face or having others evaluate them poorly, so they tend to hesitate to speak up in class. This hinders them from learning L2 pronunciation skills.

As discussed here, in terms of the effects of language ego, young learners (before puberty) may have a greater advantage in learning L2 pronunciation. Considering this, MEXT's decision to shift the age of first exposure to English to elementary school (before puberty) seems to make sense.

2.3 Hearing Loss with Age

Derwing, Munro, and Wiebe (1997) argued that issues concerning L2 sound production problems can be attributed to perception. To produce a speech sound, auditory input is crucial, without which it is impossible for

people to output a sound. Thus, if a learner cannot physically perceive a speech sound that is beyond their perceivable level of frequency, it may be difficult for them to produce the speech sound.

Ability for sound perception declines as age increases. According to Staiano (2007), the sound range that the human ear can respond to is in the range of 20 hertz to 20000 hertz; however, the human ear is less sensitive in general to sounds at extremely high and low frequencies. This hearing sensitivity is partly explained by individual differences, but aging is a strong factor contributing to the decline of such sensitivity. As people get older, their hearing ability (the range of frequencies that they can perceive) becomes weaker (narrower) (Okamoto, Shitara, Momiyama, Hirayama, & Ishii, 1989; Staiano, 2007; Tsuiki et al., 2002). This type of hearing loss begins earlier than people might think. A clinical study by Takahashi et al. (1996) reported that hearing loss starts during adolescence. Ichijima et al. (2015) found that Japanese adults in their 30s cannot recognize very high frequency sounds such as the buzzing of mosquitoes, which most people in their 20s can hear.

Different languages use different ranges of sound frequencies. Some languages such as English contain sounds of very high frequencies, which Japanese does not contain. Even if sounds are not familiar in their native language sound system, young learners are still able to learn to produce them because they can recognize them. However, this is quite challenging for Japanese adults, who may not be able to perceive such high-frequency sounds in order to produce them. The effects of the decline of physical hearing ability with age may be strong in Japanese adults attempting to learn English pronunciation.

2.4 Segmentals and Suprasegmentals

Pronunciation skills comprise segmental and suprasegmental properties. Research predominantly focuses on segmental skills, and many of these studies support the notion of "earlier is better" (Flege, MacKay, & Meador, 1999; Flege, Munro, & MacKay, 1995; Flege, Yeni-Komshian, & Liu, 1999; Thompson, 1991; Tsukada et al., 2004). However, there are fewer studies on suprasegmental features. Some studies confirm that people acquire suprasegmental features, such as tones and stress, as well as segmental features, more easily at a younger age (Golinkoff, 1983; Li & Thompson, 1977). In addition, Huang and Jun (2011) indicated the effects of age on

learning suprasegmentals in their L2 study with Chinese-speaking immigrants.

3. Cross-linguistic Influence

As stated in the introduction, Japanese EFL learners struggle with learning English pronunciation. Compared with language learners of other native languages, Japanese people have low English pronunciation skills (Purcell & Suter, 1980). L1 plays a vital role in the development of L2 pronunciation (Suter, 1976), and a contrastive analysis of L1 and the targeted language is a valid means of describing the difficulty in pronunciation. This section discusses the factors related to phonological differences between Japanese and English, which partly cause the difficulty that Japanese learners experience in learning English pronunciation.

3.1 Segmentals

Theoretically, when learners cannot transfer their L1 knowledge to learning L2, the difficulty level becomes higher than when they can do so (Brown, 2007; Stockwell & Bowen, 1965). Thus, in the case of learners who speak a native language with a smaller phonological system, it is more difficult to learn a second or a foreign language that has a larger phonological system because there are fewer sound features that they can transfer from their L1; however, in the opposite case, it is easier. An example of the first case is that of Japanese learners of English learning English phonemes. A comparison of the number of phonemes in each language shows that Japanese has 5 vowels and 15 consonants, whereas English has 14 vowels and 25 consonants (Celce-Murcia, Brinton, Goodwin, & Griner, 2010). Even though the number of vowels and consonants may vary depending on the views of a particular linguist, it is clear that English has more phonemes than does Japanese.

In many cases involving adult L2 learners, they may have a problem recognizing the sound or distinguishing it from similar sounds before they produce a sound. Learners cannot produce a sound that they cannot recognize. Even when they can recognize the sound, they may not know how to produce it, i.e., which muscle to move or how to move it, if it is an English phoneme that does not exist among the sounds in their native language. Thus, they may substitute it with a similar-sounding Japanese phoneme or sometimes try to produce it intuitively. For example, English has two different types of vowels (tense and lax), such as /i/ and /ɪ/. Japanese people recognize

these sounds as a short and long version of the Japanese /i/. Thus, they produce this sound as the Japanese long and short /i/. We can observe a similar tendency in recognizing and producing consonants such as /l/ and /r/, /b/ and /v/, /s/ and /θ/, and so on. The schwa sound /ə/ is also problematic for native Japanese speakers because they are unfamiliar with it. Hence, transferring their L1 sounds to producing L2 sounds, which is due to the difference between phonological systems in Japanese and English or due to a smaller phonological system in Japanese than that in English, can be a factor in lowering the intelligibility of their oral communication.

3.2 Suprasegmentals

Language is classified into several categories according to its phonological features. English is considered to be a stress-timed language because of its phonological feature in which “the interval between stresses is approximately of equal duration,” while Japanese is often considered to be a “syllable- (or mora-) timed language in which each syllable is approximately of equal duration” (Riney & Anderson-Hsieh, 1993, p. 27). In fact, Watanabe (1988) demonstrated that when Japanese EFL learners learn to speak English, many of them have difficulty in identifying and producing a stressed syllable because instead of using loudness and length, Japanese speakers use pitch as a cue for stress, which is a phonological feature of the Japanese language. This finding corresponds to the results of a study by Bond and Fokes (1985). Furthermore, Pennington (1987) identified the differences in the pragmatic and semantic roles between Japanese and English suprasegmentals, arguing that “phonological effects of context in English are apparently more extensive than in Japanese” (p. 10). These suprasegmental differences between the two languages could be a factor that explains the issues that Japanese EFL learners face with English pronunciation.

3.3 Articulatory Settings

The term “articulatory setting” was first coined by Honikman (1964) and defined as “the disposition of the parts of the speech mechanism and their composite action, i.e., the just placing of the individual parts, severally and jointly, for articulation according to the phonetic substance of the language concerned” (p. 73). Put simply, it is the positioning and combination of speech articulators such as the tongue, jaws, and lips to produce a speech sound. The articulatory setting is language-specific (Gick, Wilson,

Koch, & Cook, 2004). Vance (1987) identified the articulatory setting differences between Japanese and English in terms of lip rounding, jaw positioning, and tongue use. The differences in articulatory settings between English and Japanese can be another factor contributing to Japanese learners’ pronunciation problems in English.

3.4 Frequency Differences between Japanese and English

Perception skills are considered to be a prerequisite for the production of targeted language sounds (Flege, 2003; Hosomura, 2005). According to Alfred A. Tomatis, a medical doctor specializing in otorhinolaryngology, there is a close relationship between the ear and the voice. He proposed a theory comprising the Tomatis Laws, which are as follows: “1) The voice only contains what the ear can hear; 2) If the hearing is modified, the voice is immediately and unconsciously modified; and 3) It is possible to durably transform phonation when auditive stimulation is maintained over a certain time (the law of duration or remanence.” Tomatis Development, 2017, para. 6). He argued that there is a strong connection between listening and pronunciation and that sound recognition should happen prior to sound production.

Difficulty in recognizing sounds in English can partly explain why Japanese learners may find it challenging to produce English sounds. Aoyagi (2001) identified very different ranges of frequency in English and Japanese speech sounds as one of the causes of this difficulty. According to Murase (1998), different languages have different unique “passbands,” which refer to the range of frequencies that a language predominantly uses. English passband ranges are from 2,000 hertz to 12,000 hertz, which is the highest range among major languages, whereas Japanese speech sounds range from 125 hertz to 1,500 hertz, which is a low range. Thus, the Japanese language does not share any range at all with English (Aoyagi, 2001). When the passband of a learner’s native language is similar to that of the targeted language, it is easier for the learner to recognize targeted language sounds. This suggests that it may be easier for them to master producing targeted language sounds. Hence, this passband difference could be one of the factors contributing to Japanese EFL learners’ difficulty in recognizing and producing English sounds.

As discussed in the previous section, the age factor should be considered in discussing sound recognition skills because as people mature, their physical ability to

recognize sounds decreases or the frequency band that they can recognize narrows. However, even though they can recognize something as a sound, it does not always mean that they can recognize it as a speech sound. As they are exposed to a specific passband, they develop the ability to recognize those sounds as a speech sound; however, if they are not exposed to the frequency, they would be unable to recognize it as a speech sound (Aoyagi, 2001). Therefore, it is natural for learners who are exposed to targeted language sounds when they are able to recognize the sounds or when they are young enough to develop the ability to recognize sounds as a speech sound tend to be good language learners in terms of sound recognition and production.

4. Aptitude

In addition to the factors of age and linguistic differences, aptitude is a salient factor influencing the attainment level of L2 pronunciation. This section discusses several factors (phonetic coding ability, phonological memory, physical ability, and musical ability) comprising the aptitude for L2 pronunciation.

4.1 Phonetic Coding Ability

Among Carroll's (1981) four constituent abilities of language aptitude (phonetic coding ability [PCA], grammatical sensitivity, rote learning ability, and inductive language learning ability), PCA, which refers to "an ability to identify distinct sounds, to form association between these sounds and symbols representing them, and to retain these associations" (p. 105), is the aptitude construct that is most closely related to pronunciation. In fact, Hu et al. (2013) conducted a study to investigate language aptitude for pronunciation in advanced language learners, and a regression analysis revealed that PCA accounts for the significant variance in Germans' L2 pronunciation skills.

4.2 Phonological Memory

Before learners can produce targeted language sounds, they first need to listen to and memorize sound information. Thus, memory capacity, particularly phonological memory capacity, which refers to the ability to retain speech sound information for a period of time, seems to be involved in L2 pronunciation learning. In the field of phonological memory studies, L2 pronunciation skills have yet to be adequately researched. Several studies show the positive role of phonological memory in L2 pronunciation skills (Kondo, 2012, 2014; Nagle, 2013, Tanaka

& Nakamura, 2004). Kondo (2012, 2014) investigated the role of phonological memory capacity in L2 pronunciation learning for Japanese EFL learners. She showed that phonological memory capacity is significantly correlated with L2 pronunciation skills and is a significant predictor of L2 pronunciation skills. Her study focused on not only verbal memory but also nonverbal or musical memory, and both types of memory are significantly related to L2 pronunciation skills. Tanaka and Nakamura (2004) also supported the positive relationship between nonverbal (musical) memory and L2 pronunciation skills for Japanese EFL learners. As these studies show, a learner with a high phonological memory capacity can be a good learner of L2 pronunciation.

4.3 Physical Ability - Perception and Articulation

An f-MRI study revealed that aptitude for L2 pronunciation relies on speech-auditory perception and speech motor-control ability (Hu et al., 2013). Even among individuals of the same age, distinct differences in sound recognition ability can be seen. Some individuals who are highly sensitive to sounds can distinguish subtle differences or recognize very high or very low frequencies, whereas some individuals with a low sensitivity to sounds cannot do so. The kinds of sounds that they are constantly exposed to, or innately good hearing ability, may influence an individual's hearing ability.

In addition to perception ability and articulation ability, speech motor-control ability, is another factor that influences L2 pronunciation skills. People with good motor skills can move their articulatory muscles as intended, whereas people with weak motor skills cannot move them appropriately even if they can perceive sounds. Some people can produce a targeted sound just by listening to it, whereas others need a lot of practice and instruction. In the worst case, they cannot do so even with enormous practice and instruction.

These physical abilities related to sound perception and articulation ability could be factors that cause individual differences in L2 pronunciation skills, which in general have not been taken care of in the L2 pronunciation instruction.

4.4 Musical Ability

Among aptitude factors, musical ability has been frequently studied to demonstrate its involvement with L2 pronunciation. Regarding its structural similarity between

language and music, Tanaka and Nakamura (2004) argued that the “intonation of a sentence is similar to the melodic contour of music in that both have a temporal change in fundamental frequency and rhythmic structure” (p. 724). Mora (2000) also stated that music and language stem from the processing of sound and that they share “intrinsic features such as pitch, volume, prominence, stress, tone, rhythm, and pauses” (p. 147).

With regard to the similarity of the cognitive process related to language and music, several studies on the brain have indicated a strong link between music and language (Griffiths, Johnsrude, Dean, & Green, 1999; Schön et al., 2010). Patel, Peretz, Tramo, and Labreque (1998) investigated two patients with brain damage to show, in particular, a significant relationship between the processing of melodic and rhythmic patterns in speech and music. Furthermore, Milovanov, Pietilä, Tervaniemi, and Esquef (2010) showed a positive relationship between musical ability and L2 pronunciation. They examined 46 Finnish university students’ (English majors, music majors, and non-music majors) L2 pronunciation skills and musical aptitude. The results of a one-way ANOVA showed that the English major group and the music major group were not significantly different even though the English major participants were expected to have higher scores as they had been exposed to English for longer than the music major participants did. Despite the lack of English training, the music majors were able to pronounce English sounds as well as the English major participants. These results indicate not only a significantly positive correlation between L2 pronunciation skills and musical aptitude but also a positive effect of musical training on the development of L2 pronunciation skills. In addition, Kondo (2014) showed the significant role played by one of the musical memory in determining L2 pronunciation skills in a study comprising 170 Japanese university students. She investigated the effects of musical memory on L2 pronunciation, and a regression analysis revealed that students’ musical memory capacity explained the significant variance in L2 pronunciation skills.

Sound recognition ability, which is a prerequisite for pronunciation skills, has also been shown to be significantly related to musical ability. Isaacs and Trofimovich (2011) demonstrated the effects of musical ability on listening sensitivity to L1 sounds. It is not clear whether this finding can be extended to the relationship between L2 speakers’ listening sensitivity and their musical ability; however, the connection would be plausible. In

fact, Slevc and Miyake (2006) showed in a study with 50 native speakers of Japanese aged between 19 and 52 that musical aptitude was a facilitator for learning an L2 sound structure. Hierarchical regression analyses revealed that the musical ability measured explained any unique variance in four L2 aural abilities after controlling for other relevant factors such as age, amount of L2 use, and length of exposure to the language.

5. Personality

The relationship between personality and language acquisition has been investigated. Considering the enormous psychological burden imposed by the nature of speaking, pronunciation appears to be one of the most sensitive skills influenced by a speaker’s personality. Studies have indicated that personality factors may be a significant predictor of L2 pronunciation. Avery and Ehrlich (1992) suggested that outgoing and confident learners have a greater chance of improving L2 pronunciation skills because their personality traits provide more opportunities when they communicate with native speakers. Thus, an outgoing personality leads to openness to experience, which is important to learners when improving their L2 speaking skills. In fact, Hu et al. (2013) conducted a study with 109 German EFL students, and showed that openness to experience was significantly correlated with L2 pronunciation test scores ($r = .29, p < .001$).

While extraversion, another outgoing trait, supposedly can be a significant predictor of L2 pronunciation skills (Zárate-Sánchez, 2017), some studies have failed to show a significant positive relationship between extraversion and L2 pronunciation skills (Hu & Reiterer, 2009; Hu et al., 2013). Moreover, Busch (1982) indicated that introverts, who have an inward orientation that is opposite to extraversion, are better in terms of pronunciation skills. She investigated the relationship between personality factors (introversion and extraversion) and L2 skills among Japanese EFL learners. In contrast to her hypothesis, which proposed that extraverts have better English pronunciation skills than introverts, introverts were found to have significantly better pronunciation skills than extraverts. The traits of introverts, such as self-awareness and prudence may have influenced the results.

6. Gender

With regard to the gender factor, people with language learning or teaching experience may in general have the impression that females tend to perform better in

English pronunciation. Several studies, in fact, indicated that gender is a significant predictor of L2 pronunciation (Asher & Garcia, 1969; Tahta, Wood, & Loewenthal, 1981; Thompson, 1991), whereas other studies have failed to support that hypothesis (Elliot, 1995; Flege & Fletcher, 1992; Purcell & Suter, 1980). While those studies supporting the gender effect did not control other related factors, such as attitudes, motivation, and age of onset L2 acquisition, Moyer (2010) investigated an independent gender effect in 42 ESL learners in the US, finding that female learners had a greater advantage in L2 pronunciation skills than male learners.

As one of the reasons for the female superiority in L2 pronunciation skills, some studies contend that females' greater concern about pronunciation accuracy, as compared to males, contributes to the better L2 pronunciation skills (Moyer, 2016; Spezzini, 2004; Thompson, 1991). Furthermore, some studies showing females' superior sensitivity to sounds have indicated that gender could be a strong factor (Hamamura, Aono, Kishigami, & Iwamiya, 2013; Ozaki, 2000). Ozaki (2000) demonstrated female superiority in sensitivity to sound in a study in which females ranked higher than males in most categories related to sound sensitivity. For example, 40% of all female participants exhibited perfect pitch, whereas for males the proportion was 10%. Ozaki argues that this difference may be caused by various other factors, such as musical experience, because in Japan more girls have experience of learning musical instruments. According to Sugie's (2001) survey, about 80% of Japanese female students had some kind of musical training outside of school, whereas only 26% of Japanese male students had that experience. It would be ambitious to presume that sound sensitivity has a direct effect on L2 pronunciation learning, but as listening ability can also affect L2 pronunciation skills, this superiority in sound sensitivity would support gender as a significant predictor of L2 pronunciation skills.

7. Pedagogical Implications

Factors affecting Japanese EFL learners' pronunciation skills, in particular, factors that are relatively difficult to change through instruction, have been discussed, based on which I consider, in this section, pedagogical implications for current and future pronunciation instruction in Japan.

7.1 Age

As discussed in the previous sections, age is a

significant factor in acquiring pronunciation skills, and the notion "earlier is better" cannot be denied. Currently, in Japan, earlier English education has received considerable attention, and the starting age for English education is going to shift from fifth grade to third grade. The underlying reason for this shift is the belief that the earlier the starting age, the better it is for one to learn a language.

Considering young learners' hearing ability, flexible articulatory muscles, and language ego, as discussed in this paper, earlier exposure to L2 translates into easier perception and production or practice of targeted language sounds. Therefore, in teaching these young learners, it is important to make the greatest use of these advantages by focusing more on oral rather than other skills in the limited amount of class time available. Furthermore, it is important for English teachers of young learners to pay attention to the quality of language input to make use of their hearing ability. Numerous Japanese elementary school teachers are concerned regarding whether their own pronunciation skills might influence their students' pronunciation learning. For those who are not confident in their pronunciation skills, it would be helpful to make use of information and communication technology for language input in the classroom.

This "earlier is better" notion, however, does not mean that adult (postpubescent) learners cannot improve their L2 pronunciation. As numerous studies have shown, they are able to enhance their L2 pronunciation even after the so-called critical period (Ioup et al., 1994; Selinker, 1972). Therefore, it is important for teachers to understand that age is just one of the factors affecting L2 pronunciation learning, and that various other factors such as motivation, aptitude, linguistic differences, and sociocultural factors also influence L2 pronunciation learning.

7.2 Native and Nonnative Instructors

In designing effective pronunciation instruction, it is important for teachers to understand the linguistic differences between a student's native language and the targeted language. As discussed in the previous section on linguistic differences between English and Japanese, there are various, large distinctions between the two languages. Considering these differences would help teachers in identifying or anticipating the problems that Japanese EFL learners may have in producing targeted language sounds and design a teaching approach to overcome these problems.

In Japan, the general belief is that teachers who are native speakers of the language have an advantage in teaching pronunciation. While native-speaking teachers have an advantage in providing native speech sounds and evaluating students' pronunciation, they may not have experienced problems similar to those that Japanese learners have because they acquired speech sounds through "unconscious learning" when they were very young. Hence, native-speaking teachers may have difficulty in explaining how to produce the sounds. Their instruction consequently tends to be more intuitive and presented through practices such as listening and repeating or imitating. This approach to instruction might be more effective in teaching the young because their developmental flexibility makes it easier for them to learn L2 sounds in the same way that they learn L1.

In contrast, nonnative-speaking or Japanese teachers have a greater advantage than do native-speaking teachers in understanding Japanese learners' problems. In teaching adult learners who have already established their native-language sound system, including sound recognition, articulatory setting, and speech-motor control, it is difficult for these learners to learn to produce targeted language sounds only by listening and repeating or through instruction involving imitation. They need more constructive or verbal procedural explanations to learn pronunciation. Japanese teachers who share L1 with their students have some advantages. They can understand Japanese learners' difficulties and know how to address problems because they might have experienced them as language learners. Understanding or anticipating the problems that Japanese learners have and providing them with explanations on ways to produce the required sounds and to overcome their problems are useful in particular for adult learners because they are equipped with cognitive abilities that are developed enough for them to understand and make use of an explanation.

7.3 Aptitude

Language teachers should understand that aptitude greatly influences pronunciation skills. Individual differences in terms of attainment level do not correlate with learners' amount of effort (Celce-Murcia et al., 2010). Some learners can master targeted speech sounds with less effort when compared with other learners. Recent studies have revealed factors significantly affecting L2 pronunciation learning. Thus, it is required that teachers understand and identify the aptitude factors that influence

pronunciation learning. Instruction that compensates for weak ability is important in helping both teachers and students to improve or recognize improvement in pronunciation skills.

Some aptitude factors are relatively difficult to improve, but others could be enhanced through instruction. Thus, instruction on dynamic abilities that can be honed or changed could be incorporated into instruction, which might be useful in helping learners to improve their pronunciation skills. For example, musical ability has been shown to play an important role in learning L2 pronunciation. Therefore, incorporating musical aspects into teaching pronunciation may be useful in improving students' pronunciation skills.

Brown (2001) found that "strategy-based instruction has proven that some elements of learning are a matter of an awareness of your own limitations combined with a conscious focus on doing something to compensate for those limitations. Therefore, if pronunciation seems to be naturally difficult for some students, they should not despair; with some effort and concentration, they can improve their competence" (p. 285). For teachers, it is important first to help learners in recognizing their weaknesses in pronunciation and the aptitude factors that cause the weaknesses. Subsequently, they should offer instruction that considers those issues to improve their pronunciation.

7.4 Listening Skills in Pronunciation Instruction

The strong link between sound recognition and production was discussed throughout this paper. However, many EFL teachers in Japan teach listening and pronunciation skills separately or teach them without having their students recognize the link between those skills. They tend to focus more on production aspects in pronunciation teaching, even though recognizing a targeted sound is a prerequisite for producing the sound. Thus, teachers should design instruction that improves students' recognition and production skills in pronunciation teaching.

With regard to the skills required of teachers in pronunciation teaching, listening ability is more important than production skills. It may be difficult for teachers who are nonnative English-speakers to provide native-like pronunciation for students; however, various tools that can present target-like pronunciation, such as CDs, the Internet, and computer programs, are available these days. However, teachers' skills for recognizing sounds are more critical to evaluating whether students' pronunciation is

intelligible or not. Moreover, they need to provide appropriate feedback on students' performance. Therefore, teachers should take more effort to improve their skills for recognizing English sounds rather than those for sound production.

However, as discussed in this paper, various factors influence sound recognition skills, and it is true that some Japanese EFL teachers have difficulty in acquiring sufficient listening ability to evaluate students' pronunciation. Here, computer technology that can analyze pronunciation in terms of pitch, tone, and frequency can be of great help for these teachers. State-of-the-art computer software can analyze learners' speech sounds and provide effective feedback based on performance. One type of computer software, AmiVoice (Advanced Media, 2014), can provide visual information on learners' speech in terms of frequency and pitch, which they can compare with the model sound. It also gives feedback on learners' performance, such as "your /r/ sound in 'right' sounds like the Japanese /r/ sound" or "you added an unnecessary vowel /o/ after /t/ in want." Making use of this kind of computer technology would be another way to compensate for the listening ability of teachers who are nonnative speakers of English in teaching pronunciation.

7.5 Presenting Sounds with Visual Images

In teaching pronunciation, the model pronunciation is usually only present in audio; however, several research findings have suggested that it would be more effective if the model sound were presented with visual information. Hazan, Sennema, Iba, and Faulkner (2005) conducted a study with 39 Japanese EFL learners to examine the effects of using audio-visual training to teach pronunciation. Their study indicated that audio-visual training is more effective than audio training in improving Japanese learners' English pronunciation skills. Moreover, they argued for the effects of showing the facial gestures of the speaker to improve pronunciation skills. Hayashi and Sekiyama (1998) also supported the importance of presenting visual information in teaching pronunciation. They conducted a study to examine the ways in which audio-visual speech is perceived, and the results revealed that the Japanese participants use more visual information related to speech perception when they speak with foreigners.

Based on these findings, it is recommended that teachers provide not only audio information from the targeted language but also visual information. Considering

this, utilizing audio-visual materials such as films could be of great help in teaching pronunciation. Kondo (2015) argued that repetitive exposure to the targeted language through films that offer both visual and sound information from the targeted language is an effective way for students to learn L2 pronunciation. This type of exposure helps learners to create cognitive links between the audio and the speaker's mouth movement in making the sound, which raises the effectiveness of learning pronunciation. Furthermore, pronunciation, in particular suprasegmental features such as intonation and stress, vary according to the context. Thus, films that can offer the targeted language with context can be useful materials for helping students to learn the suprasegmental features of a targeted language. In addition, using films, which are entertaining materials with carefully designed context, may make pronunciation teaching, which tends to be mechanical, more interesting to learners (Kondo, 2009).

7.6 Communicative Pronunciation Teaching

Brown (2007) argued that pronunciation teaching should be discourse-level instruction. It often happens that even though learners can produce targeted language sounds on the segmental or word level, such as in mechanical drills or repetition-type practice, they cannot produce them on the intelligible level in free speech, conversations, or meaning-focused communication. When they have the cognitive resources required for paying attention to their pronunciation, they can produce target-like L2 sounds. However, when the majority of their cognitive resources are in use for constructing English expressions by retrieving language information from their long-term memory, they have fewer cognitive resources for monitoring or producing English sounds. Therefore, it is important for learners to practice producing targeted sounds in near-real communicative contexts so as to be equipped to produce target-like pronunciation in real communication, which should be the ultimate goal of teaching pronunciation.

These cognitive resources vary depending on the individual. Learners with a high working memory span have more resources for paying attention to or monitoring their pronunciation, whereas learners with a low working memory span have fewer resources for that. Learners' total L2 proficiency level also influences this process. Learners with high proficiency do not need as many cognitive resources as learners with low proficiency do in constructing speech by retrieving expressions from their

long-term memory. However, even if learners' cognitive resources are limited, it is important to practice allocating their resources to necessary aspects in their oral communication. Celce-Murcia et al. (2010) suggested a framework for teaching pronunciation that includes the following stages: (1) description and analysis, (2) listening discrimination, (3) controlled practice, (4) guided practice, and (5) communicative practice. This step-by-step teaching framework can enable learners to practice producing targeted sounds in communicative discourse while they adequately allocate their cognitive resources.

8. Conclusion

This paper first discussed various factors affecting Japanese EFL learners' pronunciation learning, such as differences in age, linguistics, aptitudes, personality, and gender, followed by an examination of pedagogical implications for current and future instruction in English pronunciation in Japan. Future studies should empirically investigate the extent to which the factors discussed in this paper influence Japanese EFL learners' learning of pronunciation and the effectiveness of the pedagogical implications in terms of improving Japanese EFL learners' pronunciation skills. Several studies that focus on a specific aspect with a relatively small sample have been conducted. However, a study that collects qualitative and quantitative data from large samples would provide more reliable and comprehensive insights into L2 pronunciation teaching.

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