論文

The Role of Contrasts in Phoneme Theory and Practices of Teaching Pronunciation*

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/mɪˈʊrə/ /təˈkajukɪ/

Abstract

Phoneme contrasts bring several changes to the way the meaning of speech is perceived. This paper aims to give a brief investigation into the role of contrasts in phoneme theory and presents how the phonemic contrasts are learnt in class.

Keywords

Phoneme Theory, Principle of Contrast, Minimal Pairs, Speech Perception, Teaching Pronunciation

1. Introduction

It is not until people come across another language and find out its features that are different from theirs that they realise that their language differs from it and discover what kind of language they have. Johann Wolfgang von Goethe (1749-1832) once said, "Those who know little about foreign languages know nothing of their own." The proverb has two implications. It tells literally, on the one hand, that people do not know anything about their own language unless they learn a foreign language. What is more important and relevant to the current theme is that it also supposes, on the other, that comparison between the languages raises people's awareness of what they already have and allows them to give additional value to their own language.

This paper attempts to give a brief exploration of the role of contrasts in phoneme theory. Before going into the main parts of the essay, it would be appropriate to cite the definition of phoneme by Laver (1994):

> Two speech sounds are said to be manifestations of different phonemes in a given accent of a language when they act as the basis of a contrastive opposition that distinguishes a pair of words of identical phonological structure, differing in the system choice made at a single place in that structure (p. 41).

It seems that as their original traits phonemes incorporate contrastive characteristics that discriminate themselves from other phonemes which have different features.

The following sections will include: how the "contrast" is defined and what type of contrasts can be observed; what kind of changes the "contrast" brings; and a discussion about Lyons' assertion, and practices of teaching phoneme contrasts.

2. The definition of contrast in phoneme theory and its types

Contrast which is a more favourable term to American phonologists, is explained by Brasington (1994) as "covering the two relationship between any two phonemes in a phonological system and covering the relationship between two phonological elements which are logical opposites, such as nasal versus oral, whether the negation of the one implies the assertion of the other [...]" (p. 2876). An interesting example can be seen on an advertisement on a public phone box, which promotes no littering on the street using two

words: *bin* and *sin*. *Sin* is related to the behaviour of throwing away garbage such as cigarettes, whereas *bin* is to the good behaviour of throwing them in a bin. This advertisement is making use of the phonemic differences between the two words and the differences in their meanings. A fascinating aspect of the advertisement is that the two words have similar sounds, but convey different meanings, consequently making the message appealing.

When there is only one distinctively different element in two phonologically homogeneous words, they are called a minimal pair (Laver, 1994, p. 30). Hence, *sin* and *bin* are a minimal pair of contrasting structures. They are transcribed as /sɪn/ and /bɪn/ to make their phonological features manifest. This type of minimal pair can happen especially in a stress-timed language such as English in which each vowel and consonant has its role in attributing to change of meaning. In a syllable-timed language such as Japanese, which has open-syllable endings of every word, there is a minimal pair as follows: *karasu* /kaɾasɯ/ (crow) and *garasu* /gaɾasɯ/ (glass). The two words share the same phonological feature of /ɾasɯ/ that consists of two sounds /ɾa/ and /sɯ/. Here, the two phonological components are not divided into four phonemes: /ɾ/, /a/, /s/ and /ɯ/ because /ɾa/ and /sɯ/ are counted as two *moras* in Japanese (Takamizawa, 2004).

When two words are differentiated by phonological constituents either at the beginning, the end or in the middle, they are said to have what Laver (1994, p. 30) calls a contrastive function. Hockett (1958, p. 26) states that "a phoneme in a given language is defined only in terms of its differences from the other phonemes of the same language [...]" Putting the two views together, without taking into consideration phonologically contrasting counterparts, a phoneme cannot be identified, i.e., contrasts make it possible to find out what kind of characteristics a phoneme has.

3. Changes the "contrast" brings

Laver (1994, p. 436) shows that there are more contrastive vowel lengths observed among languages in the world than consonant lengths. He uses the term "contrastive segment length" to refer to the two types of contrasts mentioned above. A typical example of contrastive vowel length is seen in Japanese between *obasan* /obasan/ and *obaasan* /oba:san/ (double "*a*" is used to express a long vowel of /a:/ here for convenience). *Obasan* means an "aunt (or a

middle-aged woman)" and *obaasan* means a "grandmother." The length of the vowel brings an entire change in the age and the impression given to their perceivers. Verbs are also affected by the vowel length in Japanese such as *toru* /toɾɯ/ and *tooru* /tɔːɾɯ/. *Toru* has several possible meanings such as "to take," "to get," "to catch," etc, whereas *tooru* has different meanings of "to pass through," "to pass a test," and even a boy's name. The effect of vowel length becomes more obvious in English, for example in words such as "lick" /lɪk/ and "leek" (or leak) /liːk/. Needless to say, to "lick" is what people do to taste something such as ice cream and "leek" is a green vegetable (sometimes fried and put in noodles).

It is often the case with phonological contrasts that they change the meanings of words when they have a similar word structure and there is only one distinctive difference in them. Except for phonemic differences, lexically speaking, English words such as *book* has two functions of a noun and a verb as in "I have a *book* written by Chomsky." and "I will *book* a train ticket." This makes it more complicated especially for listeners to understand unless they are used in a certain context. English also has words whose pronunciations are the same, but meanings are not, so-called homophones such as hair /hɛər/ and hare /hɛər/. Hair means "something seen on someone's head, arms and hands, often look like threads" and hear "a kind of rabbits, untamed and live in grassland or open woodland," respectively. Words have different labels such as *sin* and *bin* with two different meanings as shown earlier. People can tell what makes them different when they hear and see them in context. Hawkins (1984) mentions that "phonemes are contrastive units in that they distinguish words, thus representing differences in meaning (p. 30)." Phonemes cause changes in meaning by replacing minimal units with compatible units.

4. Discussion about the assertion by Lyons

Lyons (1968, p. 67) maintains that "the principle of contrast (or opposition) is fundamental in modern linguistic theory." As we have seen the functions or roles of contrasts of phonemes, it is crucial to consider the functions of contrasting phonological elements in the same language. Understanding what makes them different brings a new insight into what kind of functions other phonemes have and how they behave in different contexts. These notions give us a critical viewpoint of how phonemes function and in what circumstances they are

able to do so, e.g., [pu], [ti] and [ka] appear as the only possible combinations of consonant and vowel in first and second place of the succession (Lyons, 1968, p. 75).

What if people do not have any contrast in their concept? They would behave as if they were entirely the same robots that have a single structure and algorithm ending up never thinking about why they are the same. On the other hand, even though it is true that languages have different features phonologically, syntactically and morphologically, it is also possible to find similarities between the languages. It is not necessarily the case that people find only differences when they try to compare things in general. It is also the case and even inevitable that they find similar aspects between the target language and their own language. For example, Muller (2005) attempted to investigate similarities between German and Dutch and showed Hauser-huizen (houses) as an example in that they have similarities on the phoneme level (p. 1609), especially because the two languages have close origins: German *Haus* and Dutch *huis* (Oxford Learners' Dictionaries, 2020). In conclusion, Muller (2005) suggests that "if the [phonological] classes are augmented by exemplifying word pairs, a language learner can use the classes for more systematic learning" (p. 1612). Therefore, Lyons' claim can be interpreted contrastively as follows: the principle of similarity (or equivalence) is necessary in terms of comparing features of languages.

5. Practices of teaching contrasts in class

There are said to be forty-four phonemes in English (González, 2008, p. 659) and fewer consonantal phonemes in Japanese than in English (Tsubaki & Kondo, 2011), between nineteen and twenty-nine depending on the way the Japanese phonemes are categorised (Misawa, 1990). Hence, it is only natural that many Japanese learners of English find it demanding to distinguish the English phonemes in listening and speaking, e.g., between *three* /θriː/ and *tree* /triː/ (Ibrahim et al., 2019), while maintaining attention to the English phonetic system.

In order for the students to become able to pay attention to phonemic contrasts, a free web-based phonetics learning tool called *Sounds of Speech*, which can be found at https://soundsofspeech.uiowa.edu/main/english, has been used in my English speaking and reading classes at Hakodate University. The website provides an animated anatomical

Figure 1

The pronunciation of /ʌ/ as shown on the Sounds of Speech website (https://soundsofspeech.uiowa.edu/main/english).
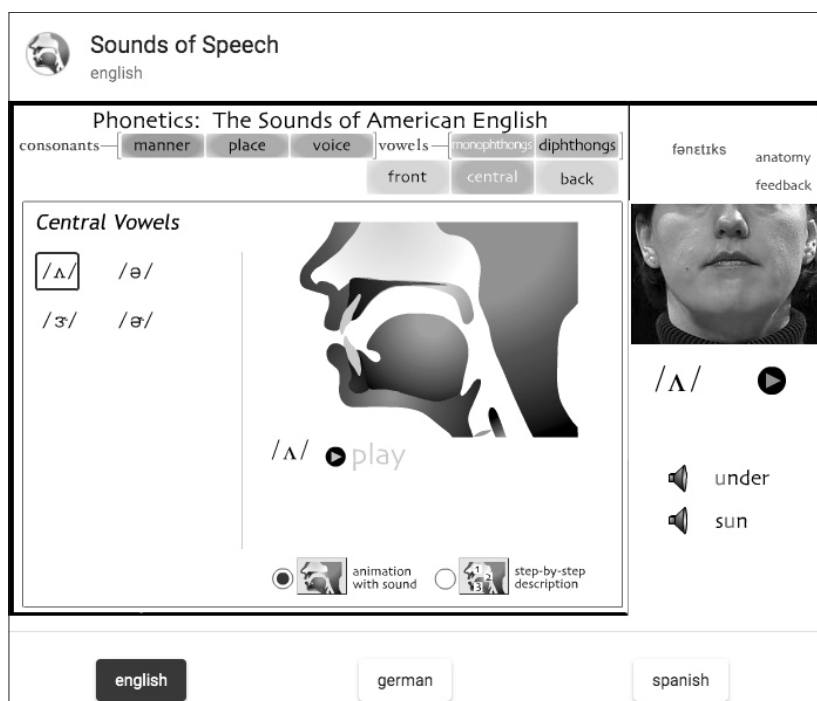
representation of the jaws and tongue for each phoneme, a description of how each articulatory apparatus (e.g., soft palate) works when the sound is produced (click on *anatomy* on the upper-right corner), a short video clip of a female speaker vocalising the sound, and example words with recordings (Yoshida, 2018), as shown in Figure 1.

In each class, a target phoneme from a pronunciation textbook by Iwamura (2017) is presented on the *Sounds of Speech* website on the screen and practiced all together. On the website, the students can review the shape of the mouth they should make when making a particular sound. Although, unfortunately, the website no longer exists, resources for teaching English pronunciation which were freely available on a website of Okanagan College, Canada, are used to demonstrate and practice pronouncing minimal pairs such as *three* and *free*, *thin* and *sin*, and *both* and *boat*. Example sentences such as "*Please come and*

have lunch with us." (Iwamura, 2017, p. 4), whose target phoneme /ʌ/ is seen on the underlined words, are modified to longer sentences, for instance, "*Please come and have lunch with us at one o'clock this Saturday if the weather permits*." (underlined words are the added words). The students are told to keep their textbook closed and repeat several times the longer sentence uttered by the lecturer. Once in a while, they are instructed to make an alternative long sentence and let their paired partner repeat it. In this way, they can use the target phoneme in sentences with context and furthermore improve their verbal short-term memory in English, which is crucial in the acquisition of vocabulary (Baddeley, 1992) and learning new phonological forms (Baddeley, 2007).

Since the introduction of iPad in my classes in 2019 at Hakodate University, the speech-to-text function of the *Notes* app that comes with the iPad has been utilised to informally examine the students' pronunciation of the example sentences as mentioned above. On *Notes*, after creating a new note, selecting the input language of English, either British, American, or other variants of English, and tapping the microphone icon, they read aloud the example sentence and check if what they have said has been faultlessly written down. They continue to do this activity until *Notes* has accurately noted down the sentence at least three times.

As the students also need to improve their phoneme perception skill, free apps called *English Ear Game* (Kamioka, 2011a) (for practicing distinguishing between /l/ and /r/), *English Ear Game 2* (Kamioka, 2011b) (between /b/ and /v/), and *English Ear Free* (Watanabe, 2017) (between /l/ and /r/, and between /ʌ/, /ɔ/, and /æ/) are used. So as to assess what they have learned, a pronunciation section is included in term exams. They listen to three words whose audios are generated by *Text2Speech* for Mac (Jianyu, 2011) and choose one that has a different type of vowel or consonant compared to the others, e.g., bread /brɛd/, flood /flʌd/, and head /hɛd/, and the answer is flood. *Text2Speech* is used to guarantee stable presentation of audios. There are options of genders and kinds of English of the voice, and they are normally set to male and American English called *Alex*. Moreover, the speech rate can be set on *Text2Speech* and it is usually set to 180 words per minute (wpm) as the normal speech rate of British English spoken by, for example, radio personalities or lecturers has been investigated to be 175 wpm on average (Tauroza & Allison, 1990), anticipating that the

students will get used to the normal speed.

6. Conclusion

Best and Tyler (2007) maintain that difficulties second language (L2) learners feel when learning new sounds of the L2 will be influenced not only by interlingual, but also by intralingual similarities and differences with regard to articulation. Some of the things teachers can make use of in order to relieve and eventually help the students overcome the difficulties are the digital tools introduced earlier. As Miura (2020) suggests, teachers are supposed to aid the students to maintain their attention to and make them conscious of the linguistic features of the L2 and differences between the L2 and their own language. He also asserts that teachers are required to get used to using useful new tools in class so that the students receive the best possible learning experience (*ibid*.).

In closing, an online speech recognition and pronunciation assessment tool called *SpeechAce* (founded in 2014 and made available to the consumer market in 2015), whose *Pronunciation Check Browser* (available at https://app.speechace.co/placement/) is going to be used in my forthcoming classes, is described. On the browser app, one can make a profile to keep track of pronunciation exercises including those on consonants, vowels, words, sentences, and so forth. As can be seen in Figure 2, for instance, a score of 94% is given to the recording of *Policeman*. One can first listen to a model audio by clicking on the play icon next to the word, then record her/his reading by clicking on the microphone icon, and check the recording by clicking on the play icon next to the microphone icon. Detailed feedback on whether each phoneme has been uttered correctly is given along with what is wrong with the phoneme /i:/ in case of the example shown in Figure 3.

In the following semester, it is highly hoped that the students in my classes will become more aware of and improve their pronunciation better than before in a similar way as those ($N = 372$), although explored in a self-perceived assessment, in a study by Aiello and Montebello (2019).

Figure 2

The assessment of the recording of "Policeman" as shown on the SpeechAce pronunciation exercise website (https://app.speechace.co/placement/course/5/quiz/1/1).
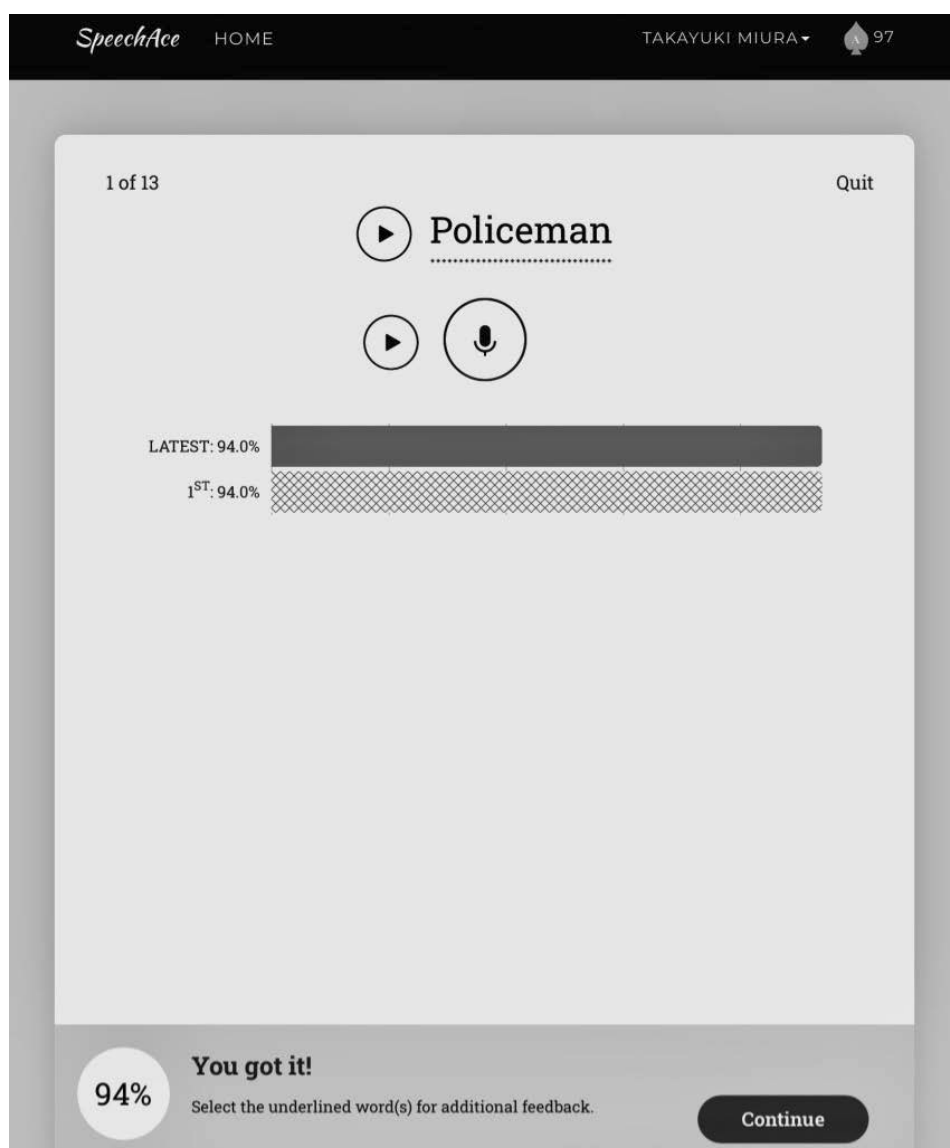
Figure 3

The feedback on the recording of "Policeman" as shown on the SpeechAce pronunciation exercise website (https://app.speechace.co/placement/course/5/quiz/1/1).

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