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A Contrastive Study of Chinese Japanese Learners' Pronunciation of Plosives in Japanese

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Abstract: This is a contrastive study. The aim of this study was to discover the reason why learners misunderstand 'ashi-ta' as 'ashi-da' from the acoustic perspective. This paper adopts the method of phonetic experiment. By comparing the VOT of consonants [p], [t], [k], [b], [d] and [g] between Japanese beginners and Japanese native speakers, this paper analyzes the acquisition of Japanese plosives by Chinese Japanese learners, and explores the problems of Chinese Japanese learners in the perception of voiced plosives.The comparison suggsets that Chinese Japanese beginners can not distinguish the opposition of Japanese voiceless stops, and the pronunciation of similar [p], [k] and [t] in Chinese and Japanese is affected by the negative transfer of mother tongue.

Keywords: Chinese Japanese learners, Japanese, plosives, VOT, second language aquisition

1. Introduction

Chinese Japanese learners often listen to or read the 'ta' at the end of the sentence as 'da'. The author examined the causes of Chinese Japanese beginners mistakenly hearing the sound 'ashi-ta' as 'ashi-da' in this study. Taking the word ' あした(ashi-ta)' in Japanese as an example, this type of mishearing is common among second year English major students at Zhejiang Ocean University, and it has happened several times before. They find that the final "ta" should be read according to the teaching of Chinese teachers, but listening to Japanese native speakers reads very much like "da", which is very confusing. The author was curious as to why the students mistook 'ta' for 'da'.

2. Literature Review

Flege believes that the accuracy of learners' perception of the target language restricts the accuracy of learners' production of the target language [1]. Flege's language learning model (SLM theory is mainly aimed at second language learners with a certain learning foundation, believing that new pronunciation is easier to acquire than similar pronunciation. The smaller the phonetic difference between the two languages, the greater the difficulty for learners. Similar phonetics are difficult to acquire because learners incorporate these phonetics into the original phonetic category of their mother tongue, perceive them as similar phonetics, and may also replace each other in pronunciation, so similar phonetics will be negatively transferred by their mother tongue in acquisition. The reason why new pronunciations are easy to acquire is that learners can easily recognize the differences

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between them and their mother tongue, thus establishing new phonetic categories [2]. However, the fact is that Japanese learners do not always misread or misheard all the plosives in Japanese. According to the different types of stops, the situation of misreading and listening will be different [3]. The main source of errors in Chinese learning Japanese pronunciation is the interference of mother tongue, that is, using mother tongue phonemes instead of Japanese phonemes. 'Language is a set of habits, learning a foreign language is to develop a set of special habits' phonetic acquisition is also true [4]. Hu Wei conducted a perceptual analysis of the acquisition of パ/バ plosives by elementary and intermediate Japanese learners, and found that Chinese learners' perception accuracy is low, that is, it is difficult to distinguish plosives [7]. Foreign studies mainly focus on the analysis of the characteristics of Japanese itself, and mostly focus on the analysis of the VOT value of the initial plosive, in order to explore the clear and turbid opposition characteristics of Japanese plosive [6]. There are few discussions on the pronunciation of Chinese and Japanese plosives from the perspective of second language acquisition.Thus, a constrast study is of magnitude for Chineses learners' Japanese learning.

The L2 language's sound change, and the phonological system's difference are responsible for the listening problem. The Chinese and Korean languages have sound systems that are both aspirated and unaspirated, but the Japanese language has sound systems that are both voiced and voiceless. The vibration of the vocal cords is a distinctive characteristic for Japanese people. Despite this, in Chinese and Korean languages, aspiration and unaspiration are distinct features. The amount of air is a distinctive characteristic. Air reduced Japanese plosive sounds are understood as a different sound and meaning for the Chinese and Korean [7].

Table 1 shows the stops of Mandarin Chinese and Japanese standard language. As shown in Table 1, Mandarin Chinese distinguishes aspirated clear consonants from unaspirated clear consonants, with the former marked as t and the latter marked as d. Japanese does not distinguish between the two, directly as a sound. Japanese really distinguishes between clear consonants and voiced consonants, and the difference is that the vocal cords do not shake rather than send unaspirated.

Table 1: The plosives of Mandarin Chinese and Japanese standard language [8].

		Manderin Chinese			Japanese		
unvoiced sound	Aspirated	p^h	t^h	k^h	p	t	k
	Unaspirated	p	t	k			
Voiced sound					b	d	g

What makes it difficult for learners to distinguish between these two different words? The author chose to analyze the value of the VOT of plosives to prevent learners from miscommunicating. A plosive is a sound that breaks out when the vocal tract is completely blocked during pronunciation. The plosive is the most representative feature of consonants and is the only consonant category in all languages [9]. Voice onset time (VOT) is the important parameters in plosive analysis. Therefore, it is of magnitude to analyze the vot value of plosives.

3. Methods

This paper takes Japanese learners in Zhejiang, China as the object of investigation to carry out pronunciation experiments and tries to explore the above problems.

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3.1. Participants

The subjects of this study are all third-year students in the Japanese language course of the School of Foreign Languages, Zhejiang Ocean University, with an average age of 21 years. A total of 10 people, 4 males and 6 females, all from Zhejiang Province, all began to learn Japanese from sophomores, and the average learning time of Japanese was half a year to one year. And 2 native Japanese speakers participate in the experiment.

3.2. Materials

It is divided into Chinese and Japanese word lists. The Chinese vocabulary is 20 words and Japanese vocabulary is 30 words, both of them containing [p], [t], [k], [b], [d], [g] six stops.

3.3. Procedure

Before the experiment, the speaker is asked to be fully familiar with the meter to ensure accurate reading during the experiment. When reading the word list, the subjects read aloud at a normal speed. Voice acquisition is performed in a quiet venue. Praat software was used for plosive analysis and data extraction. In Praat, select the corresponding part of the graph to display the time value of that part. Eliminate data that cannot be analyzed (such as cases where blasting or locking intervals cannot be observed). The duration of VOT was measured for [p] and [b], [t] and [d], [k] and [g]. Excel was used for plotting.

Due to the large number of experimental samples, different points may overlap and cross. Here we intend to use the method of calculating the average value to observe the overall distribution of the data, so as to capture the distribution characteristics of different plosives and the basic situation of Chinese students' acquisition of Japanese plosives.

4. Result and Analysis

The VOT values of the Japanese stops of ten Chinese Japanese beginners and two native Japanese speakers were measured, and the average and variance results were calculated as shown in Table 2, 3, 4:

Table 2: Chinese learners' plosives VOT in Chinese and standard deviation (unit: milliseconds).

	Manderine	
	Mean	Std
p^h	97.28	20.436
t^h	92.424	19.081
k^h	107.314	28.578
p	19.926	17.58
t	15.887	5.659
k	31.814	14.685
b		
d		
g		

Table 3: Chinese learners' plosives VOT in Japanese and standard deviation (unit: milliseconds).

	Japanses (Chinses learners)	
	Mean	Std
p^h	84.988	32.534

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Table 3: (continued).

t^h	109.417	62.677
k^h	86.038	34.697
p		
t		
k		
b	-37.61	70.988
d	-36.971	32.832
g	-31.089	31.089

Table 4 Japanese' plosives VOT in Chinese and standard deviation (unit: milliseconds).

	Japanese	
	Mean	Std
p^h	51.725	28.811
t^h	89.957	58.999
k^h	83.341	39.012
p		
t		
k		
b	-11.768	2.123
d	-15.544	7.523
g	-25.325	10.324

4.1. VOT Comparison Between Chinese Learners and Japanese Native Speakers

Lisker and Abramson investigated the plosive VOT of 11 languages and found that a common feature was that the closer the tuning point was to the back of the mouth, the greater the VOT value [10]. Japanese learners' Japanese pronunciation also basically conforms to this rule. Through Table 2, it can be seen that the VOT value of Japanese stops of Japanese learners, and the VOT of soft palate stops is the longest.

In the VOT value of the learner's Japanese voiceless stops, the difference in VOT value from the smallest to the native speaker is [k]<[t]<[p]; in the learner's Japanese voiced stop VOT value, the difference in the VOT value from the native speaker is from smallest to largest. Mostly [g]<[d]<[b].

4.2. Japanese Learners' Pronunciation of Japanese Stops in China Is Affected by Negative Transfer from Their Native Language

The problem of Japanese voiceless plosives is common in the stage of Chinese Japanese learners' acquisition of Japanese pronunciation. It can be seen from the three sets of VOT values that Chinese Japanese beginners are less affected by their native language on voiceless stops and more affected on voiced stops. Through comparative analysis, Chinese learners' pronunciation of similar [p], [k] and [t] in Chinese and Japanese is affected by the negative transfer of mother tongue.

5. Conclusions

This paper uses phonetic experiments to extract the VOT parameters of Mandarin and Japanese plosives for Chinese beginners of Japanese. By comparing them with the VOT of Japanese plosives of native Japanese speakers, it analyzes from an acoustic perspective the indistinguishability of voiceless and voiced stops among Chinese beginners of Japanese. There are some limitations in this

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study. For example, the data sample is not big, and the words of Chinese and Japanese word lists are not minimal pairs. At the same time, the influence of Zhejiang dialect on Chinese learners' Japanese acquisition can also be considered.

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