Review of Phonological Adaptation of English-based Loanwords in Mandarin Chinese

Qinxin Wang[1,*]

[1]*Department of Social Science, Hong Kong Baptist University, Shanghai, 200040, China*
*Corresponding author. Email: emmadeloinj@163.com

ABSTRACT
Many English-based loanwords undergo the phonotactic nativization in mandarin phonology. This paper reviews phonological deletion and phonological preservation as two common patterns of achieving phonological adaptation in mandarin Chinese. Notably, the discussion mainly focuses on English-based loanwords in mandarin Chinese. The phonological adaptation is then reflected with gaps in current studies and implications on teaching.

Keywords: Loanwords Adaptation, Phonological Adaptation, Loanwords Phonology, Mandarin Phonology, English Phonology, Mandarin Loanwords

1. INTRODUCTION

The study of phonological adaptation of loanwords bridges the deconstruction of phonetic structure and learners' phonology perception in different cultures. In mandarin Chinese, there are various types of loanwords in utterances such as phonemic loanwords, semantic loanwords, semi-phonemic loanwords, and semi-semantic loanwords [1]. When studying the phonological adaptation of English-based loanwords in mandarin Chinese, Chinese researchers paid much attention to the phonemic loanwords. Segmental and suprasegmental factors were also involved in the discussion when adaptation analysis was conducted on phonemic loanwords.

When English-based loanwords adapt to mandarin Chinese phonological system, phonological deletion and phonological preservation are considered as two common patterns of achieving phonological adaptation. Notably, segmental and suprasegmental factors interact with these two adaptation strategies [2]. This review article begins by reviewing strategies of phonological deletion and phonological preservation in mandarin Chinese. It then describes research gaps such as insufficient and inappropriate research samples as well as lacking of investigation on socio-cultural factors. Subsequently, ideas of appropriate loanword selection and phonics teaching are proposed for future teaching design.

2. PHONOLOGICAL ADAPTATION

Here, the further discussion reviews phonological deletion and phonological preservation with phonological factors (segmental and suprasegmental factors) involved.

2.1. Phonological Deletion

When English words are borrowed in mandarin Chinese, phonological deletion occurs in simplex codas and complex codas. Peperkamp et al. echoed that part of illegal consonant clusters in mandarin phonology underwent consonant deletion and this phonological adaptation helped a non-native segment adapt to a mandarin segment [3]. For instance, the consonant coda (-C coda) /-r/ in "bar" (a place of entertainment where alcoholic drinks and food are served) is deleted and "bar" /bɑ:r/ is adapted as the Chinese Pinyin "Ba1"(a modal particle in mandarin). Likewise, the -C1C2 coda /-rg/ in "hamburger" /hæmbɜ: rgər/ is deleted as well. More deletion cases are shown in Table 1.

Table 1. More deletion cases

Loanwords	IPA	Chinese Pinyin
chocolate	/ˈtʃɒ:klət/	Qiao3-Ke4- Li-4
guitar	/gɪˈtɑ: r/	Ji2-Ta1

Jacket	/ˈdʒækɪt/	Jia2-ke4
logic	/ˈlɑːdʒɪk/	Luo2-Ji4
cool	/kuː l/	Ku4

As shown in Table 1, phonological deletion occurs more in unstressed syllables (e.g. /r/ in lacquer /ˈlækər/, /l/ in cool /kuː l/). Miao resonated with this result that liquid codas such as coda /-l/ experienced higher frequencies of deletion in unstressed syllables than in stressed ones [2].

2.2. Phonological Preservation

In general, compared with phonological deletion, phonological preservation occurs more frequently than phonological deletion in Mandarin Chinese loanwords [2]. In many cases, when the loaned pronunciation is perceived by Chinese second language learners, native Chinese listeners manage to preserve different phonemic information in English complex onsets and codas. The "Preserve Principle" proposed by Paradls [4] provides good theoretical support for this perceptual phenomenon.

To preserve illegal word-final codas in loanwords, vowel epenthesis in loanwords adaptation is adopted to balance bilingual speech systems in mandarin and English. Uffmann noted three common vowel epenthesis patterns [5] in research: (a) vowel insertion; (b) vowel harmony, that is, the quality of vowel inserted to preserve the consonant is the same with vowel quality of the previous syllable; (c) consonant assimilation, that is, the place characteristic of the previous consonant is the same with the epenthetic vowel.

To find more evidence, Miao evaluated 184 phonological cases in English-based loanwords in the study. Miao argued that most adaptation of bilabial nasal coda /-m/ was to insert a vowel and to change to the licit coda [2]. Hence, native Chinese learners rarely delete the nasal coda when preserving illicit consonants during speech perception. For example, Chinese second language learners perceive "Slime" /slaɪm/ (soft moist earth or clay) as "Shi3-lai2-mu3". In "Shi3-lai2-mu3", Chinese speakers insert a bilabial vowel /u/ after the final coda /-m/. Likewise, the word "toast" /toʊst/ is perceived as "Tu3-si1".

Table 2 shows more cases in phonological preservation.

Table 2. More cases in phonological preservation

Loanwords	IPA	Chinese Pinyin
Bus	/bʌs/	Ba1-Shi4
Jeep	/dʒiːp/	Ji2-Pu3

| Tank | /tæŋk/ | Tan3-Ke4 |
| Mini | /ˈmɪni/ | Mi2-Ni3 |

However, cases shown in Table 2 give evidence that tones are often not retained during the phonological preservation in adaptation.

3. RESEARCH GAPS

Existing studies on loanwords phonological adaptation in mandarin Chinese have a number of gaps and the problem starts with insufficient and inappropriate research samples. For example, based on the transliterated names, Guo's study conducted a constraint-based analysis to better interpret phonology in mandarin [6]. However, most of the investigated loanword samples were written transliterated samples. Due to the diachronic and synchronic nature of translation, further analysis on this sample will cause deviation. Moreover, quantitative analysis is essential to explore the relationship between loanwords and speech perception. Feng analyzed loanword adaptation patterns in Chinese [7] and the more quantitative analysis of the speech perception was carried out based on Flemming [8]. The researcher should have focused on a wider range of words to provide evidence for perceptual phenomena at different stages, for example, loanwords in gaming and media sectors. Notably, loanwords adaptation in games(e.g. MOBA games and FPS games) varies when affected by the game sound effect and character backgrounds. This will result in phonological adaptation and speakers' choices in speech perception. Moreover, source language samples are worth categorizing. There is still an insufficient discussion on source language samples (e.g. English pronunciation in different regions or English loanwords in Chinese originated from a third language) and this appears as a huge gap in existing studies.

Another area of concern regarding a research gap is the investigation on socio-cultural factors. Since loanword adaptation refers to adaptation phenomena in many different situations [9], these socio-cultural factors can also be regarded as research variables. In most studies on the phonological adaption of loanwords, researchers pay much attention to the linguistic structural classification, such as -C, -CC; -CCC; -CVC et al. In this case, Kim pinpointed that social bilingualism was related to phonological adaption as well as speech perception but taking the bilingualism factor into consideration would limit exceptions in investigated cases [10]. However, the degree of Chinese second language learners' bilingualism and bilingualism in different regions are worth discussing. Current ignorance on these factors is a significant limitation to both phonological adaptation of loanwords and loanwords perception among Chinese English learners.

In addition, further discussion evidenced from the phonological adaptation of English-based loanwords in mandarin Chinese remains a research gap. Hence, further discussion on the Chinese English learners' perception process or choice of loanwords phonology can be discussed and categorized based on Chinese society and national conditions. For instance, is the loanwords phonological perception of Chinese trilingual learners in minority groups different? How does a primary school student's perception work on English loanword phonology when marking phonetic symbols with Pinyin? How does information re-editing through an input medium such as the short video platform Tiktok affect the phonological perception of loanwords?

Overall, these unanswered questions and wide gaps are worth forthcoming. Cooperation between linguistic researchers and researchers in other fields, such as psychologists and acoustical experts, will lead to further finds.

4. IMPLICATIONS ON TEACHING

Facing the increasing use of loanwords in Chinese second language learners' study and life, L2 teaching in China requires innovative reforms and improvements. Also, Chinese students' perception of loanword phonology has been proved to be different because of the influx of new words on the Internet. In addition, since most loanwords are borrowed from other countries, L2 teachers should emphasize the student-centered teaching mode in classroom to the avoid mechanically pronunciation imitating. Therefore, innovative teaching design is required to improve students' awareness in classroom. Hence, two elements are proposed for future teaching design.

4.1. Loanwords Selection

Loanwords selection plays a significant role in loanword phonology teaching and the application of teaching strategies. As for consonant teaching, disyllabic English words are preferred in loanwords selection. Polysyllabic English-based loanwords are selected when disyllabic loanwords are well comprehended. This selection method from disyllabic to polysyllabic words allows students to adapt to the new phonological system. Besides, it offers L2 teachers a good foundation to guide students to find out similarities and differences of speech in the follow-up teaching process. Before forming false perceptions, students become the center of teaching and learning. L2 students are able to actively explore the relationship between borrowed phonology and phonological grammar. At the same time, these words can also be classified according to time and occurrence. Moreover, in this case, the comparative teaching method can be scientifically combined.

4.2. Phonics Teaching

For L2 students under grade 4 in primary school, conducting phonics teaching is beneficial to the phonetic perception of loanwords. In most primary and secondary schools in mainland China, especially in the underdeveloped areas, vocabulary teaching in primary school is mostly concerned with the international phonetic alphabet (IPA). On this basis, a number of Chinese primary school students are used to mastering the phonological symbols of English words with Chinese pinyin. However, phonics is a phonetic system suitable for children to learn English pronunciation according to their characteristics since it elaborates on grapheme-phoneme correspondences [11]. It aims to establish the correspondence between letters and sounds. During phonics learning, without the aid of phonetic symbols such as IPA, L2 students are able to read the pronunciation of words directly by looking at the letters. Therefore, integrating phonics teaching into traditional teaching methods helps to reduce the interference of inappropriate phonetic perception in phonological grammar learning. Furthermore, Phonics teaching bridges bilateral speech understanding of L2 students. Their initiative for speech learning will also be enhanced.

5. CONCLUSION

To conclude, a review program that discusses the phonological adaptation of English-based loanwords in mandarin Chinese is carried out. Guided by studies in recent 20 years, phonological deletion and preservation are highlighted in this phonological adaptation. Notably, phonological deletion occurs in simplex codas and complex codas. Three vowel epenthesis patterns, namely, vowel insertion, vowel harmony, and consonant assimilation, are adopted to preserve illegal word-final codas. However, research gaps such as insufficient and inappropriate research samples as well as lacking of investigation on socio-cultural factors are pointed out. Last but not least, to improve students' perception of loanword phonology, loanwords selection, and phonics teaching are suggested to combine with traditional teaching methods such as the comparative teaching method.

AUTHORS' CONTRIBUTIONS

This review article contributes to phonological adaptation discussion and loanwords teaching of English-based loanwords in mandarin Chinese. First of all, this article puts forward its own case analysis on phonological deletion and preservation. Gaps in research samples and socio-cultural investigation are elaborated with insights from China's actual condition. Secondly, two critical elements affecting traditional teaching methods are illustrated. For example, polysyllabic English words are selected when disyllabic loanwords are well

comprehended. Moreover, integrating phonics teaching into traditional teaching methods helps to reduce inappropriate phonetic perception in phonological grammar learning.

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