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An OT Analysis of Chinese Transliterations of English Place Names

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Abstract

This paper focuses on the analysis of the Chinese transliterations of English place names in the Optimality Theory (OT) [1]. Three groups of monosyllabic, disyllabic and multisyllabic English place names are analyzed to represent the hierarchical ranking of both Markedness and Faithfulness constraints in terms of sound epenthesis, which is one of the most important repair strategies named the Preservation Principle [2] devised to "preserve" every source segment (or sound) of the target place names. By doing so, this paper tries to answer the question of why sound epenthesis takes place in transliterating words between languages. With the help of the established ranking of the relevant constraints, this paper explains the process of sound epenthesis formally.

Keywords: *transliteration, Optimality Theory (OT), epenthesis, English place names*

1. Introduction

The phenomenon of word-loaning between languages is very common, and its scope is getting much wider in many different kinds of words. Transliteration refers a conversion process of a text from one script to another, using literal notations to represent the words in a different language system. Chinese and English have different syllable structures from each other, and Chinese requires more restrictions on its syllable structures than English. Therefore, in order to fulfill the phonotactic requirements of the target language (Chinese), it is necessary to depend on phonological repairs like sound epenthesis, deletion or replacement (or feature change) which will modify the syllable structures of the source language (English) according to those of the target language (Chinese).

Since the introduction of the Optimality Theory (henceforth, OT) in phonology by Prince and Smolensky in 1993, it has been widely applied to the study of syntactic fields as well. According to OT, differences between languages are reflected in hierarchical rankings of universal constraints, which is of great guiding significance for cross-linguistics study.

Transliteration is one of the most important methods in loaning words from foreign languages. Previous studies on English loan words in Chinese done by Chinese scholars such as Zhang [3] & [4] and Chen [5] mainly focus on the cases of transliterating common nouns. They do not provide detailed OT analysis on Chinese transliterations of English place names of various syllable structures (monosyllabic, disyllabic and multisyllabic).

This paper focuses on the transliteration of English place names into Chinese. Especially this paper explores the sound epenthesis scenario in the transliteration process from English to Chinese, and tries to find out the reason(s) why the English place names in discussion should go through the phonological phenomenon of epenthesis.

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2. Syllable Adjustment and Epenthesis

We can find many English loan words in Chinese so far by transliteration, however, there are some considerable differences between original English segments (or sounds) and Chinese segments. In order to solve this problem, three main phonological repairs – sound epenthesis, deletion or replacement are employed to maintain consistency (between both source and target languages) as much as possible under the premise of syllable acceptability of target language. [3] "In the process of transliterating words into Chinese, original spellings and source segments (or sounds) of these words might be changed into possible ones according to Chinese syllable structures." [3] When we input an English loan word, various candidates generated by GEN (generator) must be evaluated by Markedness and Faithfulness constraints (Markedness and Faithfulness constraints are ranked hierarchically). If a candidate violates the above constraints minimally, we can select an optimal candidate with the most well-formed Chinese syllable structure(s).

In English, the maximum syllable structure is (C) (C) (C) V (C) (C) (C) (C) ('C' stands for a consonant and 'V' stands for a vowel). In contrast, the maximum syllable structure of Chinese is (C) (G) V (N) ('G' stands for a glide, and 'N' stands for a nasal sound). Only one of two consonants [n] or [ŋ] is allowed in the coda position in Chinese. Therefore, whenever there are more than one consonant cluster appearing in the onset or coda position, some kinds of repair job need to be adopted to optimize the transliterations so that the transliteration will conform to the Chinese syllable structure. And among such repair jobs, epenthesis is the most commonly requested one.

The data I will analyze in the paper are listed as follows:

#1 Examples of sound epenthesis in transliterations of monosyllabic place names
  a. Example of a simple monosyllabic place name
    English: Lott [lɑt] ⇨ Chinese: [lwo-tə] (洛特)
  b. Example of a complex monosyllabic place name
    English: Flint [flint] ⇨ Chinese: [fu-lin-tə] (弗林特)

#2 Examples of sound epenthesis in transliterations of disyllabic place names
  a. Example of a simple disyllabic place name
    English: Charlotte [ʃɑlət] ⇨ Chinese: [ʃɑ-lə-tə] (夏勒特)
  b. Example of a complex disyllabic place name
    English: Bradford [brædfəd] ⇨ Chinese: [bu-lɑ-tə-fu-də] (布拉特福德)

#3 Examples of sound epenthesis in transliterations of disyllabic place names
  a. Example of a simple multisyllabic place name
    English: Salinas [sɑlinəs] ⇨ Chinese: [sɑ-li-nə-sɨ (centralized i)] (萨利讷斯)
  b. Example of a complex multisyllabic place name
    English: Indianapolis [indiənæpəlis] ⇨ Chinese: [in-di-ɑn-nɑ-po-li-sɨ] (印第安纳波利斯)

Epenthesis occurs in transliterating monosyllabic, disyllabic and multisyllabic English place names into Chinese. The data I am going to deal with in the paper are like following: CVC structure as simple example #1a and CCVCC structure as complex example #1b of monosyllabic place names; CVCVC structure as simple example #2a and CCVCCVC structure as complex example #2b of dissyllabic place names; CVCVCVC structure as simple example #3a and VCCVCVCVCVC structure as complex example #3b of multisyllabic place names.

An English monosyllabic place name of 'Lott [lɑt]' is transliterated into a disyllabic Chinese '[lwo-tə] (洛特)' , and 'Flint [flint]' into '[fu-lin-tə] (弗林特)'. An English disyllabic place name of 'Charlotte [ʃɑlət]' is transliterated into Chinese '[ʃɑ-lə-tə] (夏勒特)', and 'Bradford [brædfəd]' into '[bu-lɑ-tə-fu-də] (布拉特福德)'. English multisyllabic place names like 'Salinas [sɑlinəs]' is transliterated into '[sɑ-li-nə-sɨ (centralized i)] (萨

利讷斯)', and 'Indianapolis [indiənæpəlis]' into '[in-di-ɑn-nɑ-po-li-sɨ] (印第安纳波利斯)'.

When the three types of English examples are analyzed into those of Chinese, the following Markedness constraints [3] (a) & (b), and the Faithfulness constraints [3] (c) & (d) are involved.

[Markedness constraints]
(a) *COMPLEX [6]: consonant clusters must not exist in the syllable.
(b) CODA-CONDITION (CODA-CON) [1]: Different languages have different syllable structures, *i.e.* only [n] and [.˙] can appear in the coda in Chinese syllable.
[Faithfulness constraints]
(c) MAXIMALITY-IO (MAX-IO) [7]: Every segment of the input has a correspondent in the output. (No phonological deletion)
(d) DEPENDENCY-IO (DEP-IO) [7]: Every segment of the output has a correspondent in the input. (No phonological epenthesis)

In order to simplify consonant clusters in onset and coda of English words, epenthesis applies which is not to violate "Preservation Principle" [2]. According to OT, epenthesis takes place to conform to the Markedness constraint of *COMPLEX: vowels are added after each consonant of consonant clusters to create new syllables in order to preserve all source segments, *e.g.* 'Flint [flint]' into Chinese '[fu-lin-tə] (弗林特)'; epenthesis violates DEP-IO cited as (d) above and obeys MAX-IO: epenthesis takes place when 'Charlotte [ʃɑlət]' into Chinese '[ʃɑ-lə-tə] (夏勒特)', and every segment of the input has a correspondent in the output, but not vice versa. Therefore, it is reasonable to represent the ranking of these constraints as "*COMPLEX >>MAX-IO>>DEP-IO".

Except for [n] and [ŋ] in coda, epenthesis phenomena occur in transliterations in Chinese, because the constraint "CODA-CON has to be ranked higher among constraints (Only [n] and [ŋ] can appear in the coda in Chinese syllable.), *i.e.* "CODA-CON>>MAX-IO>>DEP-IO".

Based on Chen's research [5] on OT analysis of English loan words in Chinese, "the ranking between both *COMPLEX and CODA-CON constraints does not play a decisive role in selecting an optimal candidate in Chinese, *i.e.* there is no ranking between *COMPLEX and CODA-CON in the analysis of epenthesis." Thus, the ranking of all constraints involved will be the relative ranking between the two constraints as follows: "*COMPLEX<>CODA-CON>>MAX-IO>>DEP-IO" ('<>' means that there is no hierarchical ranking between the two constraints).

According to Zhang's research [4] on English loan words in Chinese, "A loanword from English is minimally disyllabic as minimal word (MIN-Wd). Epenthesis occurs in all transliterations of monosyllabic words and builds disyllabic words in Chinese." All monosyllabic English loan words discussed in the paper will become disyllabic when transliterated into Chinese. However, for most of English disyllabic and multisyllabic words, MIN-Wd does not play any role. Comparing with *COMPLEX and CODA-CON, MIN-Wd should be ranked lower than both of them. As a common method of adjustment and optimization of transliteration from foreign language system, epenthesis violates DEP-IO and obeys MAX-IO. In summary, the ranking of the above-mentioned epenthesis relevant constraints will show the following ranking: "*COMPLEX <>CODA-CON>>(MIN-Wd)>>MAX-IO>>DEP-IO".

After analyzing the ranking of above constraints, the 6 tableaux of epenthesis phenomena in transliterations from English to Chinese can be listed as follows. Tableau 1-6 show the application of the constraints ranking discussed above to select an optimal candidate respectively.

3. Analysis and Discussion

After analyzing the ranking of above constraints, the 6 tableaux of epenthesis phenomena in transliterations from English to Chinese can be analyzed as follows:

<Tableau 1> Selection of an Optimal Candidate of Example #1a

Input (English) : Lott [lɑt]

Output (Chinese) : [lwo-tə] (洛特)

Candidates	*COMPLEX	CODA-CON	MIN-Wd	MAX-IO	DEP-IO
☞(a) lwo-tə	*			*	**
(b) lwot	*	*!	*	*	*
(c) lyɛ-tə	*			*	**!*

Among the candidates, the schwa [ə] will be added to the coda position with the purpose of satisfying Chinese phonological rules. The reason why Chinese employs schwa [ə] as the epenthesis sound is because schwa [ə] is a common unstressed vowel which can be easily inserted into loan words, *e.g.* tank [tæŋk] into [tan-kə] (坦克); bit [bit] into [bi-tə] (比特). And the reason why the last column of candidate (a) in terms of DEP-IO has two asterisks rather than three is because generally [ɑ] of [lɑt] in source language can change into [ɑ], [ɔ], [o] or [u] rather than [ɛ] or [i]. We can find [ɑ], [ɔ], [o] and [u] have a common feature that all of them belong to back vowels; however, it is quite rare for us to find some common features between [ɑ] and [ɛ]/[i].

From the tableau, we can select an optimal candidate in example #1a. First, candidate (b) violates CODA-CON once because of [t] in coda; second, candidate (a) violates DEP-IO twice owing to two added sound [w] and [ə], and candidate (c) violates DEP-IO for three times owing to three added sound [y], [ɛ] and [ə]. Therefore, (a) can be regarded as the desired candidate according to syllable structure.

<Tableau 2> Selection of an Optimal Candidate of Example #1b

Input (English) : Flint [flint]

Output (Chinese) : [fu-lin-tə] (弗林特)

Candidates	*COMPLEX	CODA-CON	MIN-Wd	MAX-IO	DEP-IO
☞(a) fu-lin-tə			*		**
(b) flin-tə	*!				*
(c) ful-in-tə		*!	*		**

We can find that the CCVCC structure in example #1b is more complex than CVC example #1a, because two complex consonant clusters appear in both English onset and coda comparing with example #1a. Among the above candidates in complex monosyllabic example #1b, schwa [ə] will be added to the coda position like example #1a. Similar as [ə], high back rounded vowel [u] is usually inserted into coda with the purpose of satisfying Chinese syllable structure, *e.g.* golf [gɔlf] into [gau-ər-fu] (高尔夫); jeep [dʒip] into [dʒi-pu] (吉普). This more complex case of example #1b will generate the forms of the above candidates.

According to the tableau, we will select an optimal candidate in example #1b. First, candidate (b) violates *COMPLEX once because of the consonant cluster [fl]. Second, candidate (c) violates CODA-CON because of [l] in coda, and thus candidate (a) will be selected as an optimal candidate in example #1b.

<Tableau 3> Selection of an Optimal Candidate of Example #2a

Input (English) : Charlotte [ʃɑlət]

Output (Chinese) : [ʃɑ-lə-tə] (夏勒特)

Candidates	*COMPLEX	CODA-CON	MIN-WD	MAX-IO	DEP-IO
☞ (a) ʃɑ-lə-tə			*		*
(b) ʃɑl-ə-tə		*!	*		*
(c) ʃlɑ-ə-tə	*!		*		*
(d) ʃɑ-lət		*!			

Even though example #2a belongs to simple disyllabic words, there occurs the sound epenthesis similar to

the situation of a monosyllabic word. Similar as example #1a, the schwa [ə] is the added vowel to the coda position.

On the basis of the tableau, we can select an optimal candidate in example #2a. Initially, candidates (c) violates *COMPLEX due to the consonant cluster [ʃl]; then candidate (b) violates CODA-CON due to [l] in coda, and similarly candidate (d) violates CODA-CON due to [t] in coda. Therefore, candidate (a) can be selected as an optimal candidate in example #2a.

<Tableau 4> Selection of an Optimal Candidate of Example #2b

Input (English) : Bradford [brædfəd]

Output (Chinese) : [bu-lɑ-tə-fu-də] (布拉特福德)

Candidates	*COMPLEX	CODA-CON	MIN-WD	MAX-IO	DEP-IO
☞(a) bu-lɑ-tə-fu-də			*	***	******
(b) blɑd-fu-də	*!	*	*	**	***
(c) bɑ-tə-də			*	***!*	***

We find that the CCVCCVC structure in example #2b is more complex than CVCVC example #2a, because two complex consonant clusters appear before the vowel comparing with example #2a. Based on the Chinese corpus, common vowels [ə] and [u] are added into coda like example #1b. In other words, a complex disyllabic word also requires inserted vowels to make Chinese syllable available.

From the tableau, we will select an optimal candidate in example #2b. First, candidate (b) violates *COMPLEX as a result of the consonant cluster [bl]; second, candidate (a) violates MAX-IO for three times because of the deletion of [r], [æ] and [d], and candidate (c) violates MAX-IO for four times because of the deletion of [r], [æ], [f] and [d]. Thus, the candidate (a) will be selected as an optimal candidate in example #2b.

<Tableau 5> Selection of an Optimal Candidate of Example #3a

Input (English) : Salinas [sɑlinəs]

Output (Chinese) : [sɑ-li-nə-sɨ] (萨利讷斯)

Candidates	*COMPLEX	CODA-CON	MIN-WD	MAX-IO	DEP-IO
☞(a) sɑ-li-nə-sɨ			*		*
(b) sɑl-i-nə-sɨ		*!	*		*
(c) sɑl-li-nə-sɨ		*!	*		**

On the basis of Chinese syllable structure, another common vowel [ɨ] (centralized [i]) can be inserted into coda in the process of transliteration, *e.g.* mousse [mus] into [mu-sɨ] (慕斯); lace [leis] into [lei-sɨ] (蕾丝). On a similar scenario with the above examples, vowels [ɨ] and [ə] are the added vowel to the coda position to satisfy the rules in example #3a as a simple multisyllabic word.

According to the tableau, we can select an optimal candidate in example #3a. Candidates (b) and (c) violate CODA-CON because of [l] in coda. Therefore, candidate (a) can be selected as an optimal candidate in example #3a.

<Tableau 6> Selection of an Optimal Candidate of Example #3b

Input (English) : Indianapolis [indiənæpəlis]

Output (Chinese) : [in-di-ɑn-nɑ-po-li-sɨ] (印第安纳波利斯)

Candidates	*COMPLEX	CODA-CON	MIN-WD	MAX-IO	DEP-IO
☞(a) in-di-ɑn-nɑ-po-li-sɨ			*	***	*****
(b) ind-ɑ-nɑ-po-li-sɨ	*!	*	*	****	****
(c) in-dɑ-nɑ-po-li-sɨ			*	***!*	****

We find that the VCCVCVCVCVC structure in example #3b is more complex than CVCVCVC example #3a, because a complex consonant cluster appears between the vowels comparing with example #3a. In terms of Chinese syllable structure, the vowel [ɨ] can be arranged in coda to build a proper Chinese syllable in a complex multisyllabic word. Thus, [ɨ] is similar to [ə] and [u] which are considered as common inserted vowels in most cases.

Based on the tableau, we will select an optimal candidate in example #3b. Initially, candidate (b) violates *COMPLEX due to the consonant cluster [nd]; then candidate (a) violates MAX-IO for three times due to the deletion of [æ] and double [ə], and candidate (c) violates MAX-IO for four times due to the deletion of [i], [æ] and double [ə]. Thus, candidate (a) will be selected as an optimal candidate in example #3b.

During the sound epenthesis process, the vowels added after different consonants are mainly [ə]/[ɨ]/[u], which is related to "Perception-Map" [8] theory represented by Steriade: "Human beings tend to preserve those segments that are obvious acoustically, and to delete inconspicuous ones." Three strategies for analyzing the process are represented by Uffmann [9], namely "Consonant Assimilation", "Vowel Harmony", and "Default Vowel Epenthesis". "Consonant Assimilation" requires that the place of articulation of the inserted vowel be consistent with the consonants, especially with the former consonants. The labial vowel [u] is added precisely after [m] in "Salem", because the consonant [m] also has labial features; "Vowel Harmony" requires that the inserted vowels be consistent with the features of the front and back vowels, *e.g.* "Paul [pau]" in "St. Paul" is transliterated into Chinese as [bau-lwo] (保罗). As a result of rounded features owned between the inserted diphthong and the former one, the Chinese words sound quite harmonious; "Default Vowel Insertion" requires that the inserted vowels have the shortest articulation time and the least speech perception, such as the default vowel [ə] inserted after [s] of "Indianapolis".

4. Conclusion

Transliteration of English place names in Chinese may involve various factors from cross-cultural and semantic fields. With the guidance of OT and the Perception-Map Theory, this paper focuses on analyzing this process from the perspective of phonology. In order to optimize the phonological structures of source words into Chinese phonological structures, three methods – epenthesis, deletion and replacement – can be employed to change original spellings and source segments (or sounds) in transliteration. As the most commonly requested method to maintain consistency between source language (English) and target language (Chinese) under the premise of syllable acceptability of target language (Chinese), the process of sound epenthesis is formally explained in this paper.

The paper focuses on analyzing the sound epenthesis in the process of transliteration, trying to represent the hierarchical ranking of Markedness and Faithfulness constraints in OT, and explaining of the reasons why sound epenthesis is employed in transliterating general English place names into Chinese. In this respect, this paper has surely advantages over the previous studies on loan words, especially on transliterating words with different syllable structures (monosyllabic, disyllabic and multisyllabic).

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