

Diminutive Suffixes (Erhua) in Standard Chinese

In Standard Chinese, er-hua, or referred to as diminutive suffixes by some researchers (San, 2007), is a common phenomenon, especially for speakers around Beijing area. There are several versions of the analysis of er-hua in Standard Chinese. Section 1 to 5 are a series of literature reviews of different categorizations and approaches of er – hua phenomenon. In this paper, er – hua and diminutive suffix are using interchangeably.

1. Zee and Lee’s er – hua approach

Eric Zee and Wai-Sum Lee argue that “er-hua refers to suffixation of a rhotacized subsyllabic [ə̃] to a rhyme, or to rhotacization of a vowel or a sequence of two vowels in a rhyme” and they further state that “in the cases where the rhyme ends with [o], [ɤ] or [u], the vowel is rhotacized, i.e. [õ], [ɤ̃] or [ũ], instead of the rhyme being suffixed with [ə̃]; and in the cases where the diphthong or triphthong ends with [i] or [e], [i] or [e] is deleted” (2003:111). Given the vowel chart provided by Zee and Lee, it is clear to see that [o], [u] and [ɤ] are all back vowels. Using adjacent matrices to represent diphthongs or triphthongs, a set of three phonological rules reflecting the statement of Eric and Wai – Sum can be written as the following.

$$(1) \begin{bmatrix} +\text{syllabic} \\ +\text{back} \end{bmatrix} \rightarrow [+ \text{rhotic}] \quad / \quad _]_{\text{syll}}$$

$$(2) \quad \emptyset \rightarrow \left[\begin{array}{c} + \text{syllabic} \\ - \text{front} \\ - \text{back} \\ - \text{low} \\ - \text{high} \\ + \text{rhotic} \end{array} \right] / \left[\begin{array}{c} + \text{syllabic} \\ - \text{back} \end{array} \right] \text{ — }]_{\text{syll}}$$

$$(3) \quad [+ \text{syllabic}]_2^1 \left[\begin{array}{c} + \text{syllabic} \\ + \text{front} \\ - \text{round} \end{array} \right] \rightarrow [+ \text{syllabic}]_2^1 \left[\begin{array}{c} + \text{syllabic} \\ - \text{front} \\ - \text{back} \\ - \text{low} \\ - \text{high} \\ + \text{rhotic} \end{array} \right] / \text{ — }]_{\text{syll}}$$

Zee and Lee also state that a rhyme consisting of a vowel followed by a nasal consonant may also undergo erhua as “in the cases where the rhyme ends with [ŋ], the nasal ending is deleted and the rhyme is nasalized” (2003:111). Unfortunately, this claim is not supported by the data they provided. With the dataset they provided, here are the structure changes of morphemes that undergo er-hua.

- | | |
|-------------------------|-----------------------------|
| (5) [naəŋ] ‘that place’ | [tɕiəŋ] ‘strength’ |
| [liau~ɤŋ] ‘already’ | [iŋ xuəəŋ] ‘a moment later’ |

Surprisingly, the following dataset provided by Eric and Wai – Sum were transcribed as if it didn’t undergo er-hua at all.

- | | |
|--|------------------------------------|
| (6) [fəŋ] ‘wind’ | [pən ¹ liŋ] ‘capacity’ |
| [tʰaŋ mən ¹ lian ¹] ‘the two of them’ | [ɬən ¹] ‘person’ |
| [ʃaiŋ] ‘expose to the sun’ | [iŋ xuei ¹] ‘one time’ |

Thus, it is clear to see that the data provided by Zee and Lee doesn’t really cooperate with what they claimed about the environment where erhua occurs. In general, their analysis of erhua fails to capture the inner essence of erhua. It still, can be considered as a valuable study as it illustrates some important details of erhua

phenomenon.

2. Lin's er–hua approach

Unlike Zee and Lee, Lin transcribes the diminutive suffix as [r] (1989:112).

Rephrased by Duanmu, Lin's er – hua analysis could be described as the following

(Duanmu 2007: 214).

(7) (a) Replace the coda of host syllable with [r] or add [r] to the coda if there is no coda in this host syllable.

(b) Reattach the replaced coda to the nucleus when the coda is [+back]

(c) Delete the unattached phonemes

(d) Add [ə] between a front vowel and [r]

Showing the replaced sound in parenthesis, (7) can be illustrated as the following.

(8)

Input	Replace	Reattach	Delete	Add [ə]	Surface
o	or	--	--	--	or
u	ur	--	--	--	ur
ʊ	ʊr	--	--	--	ʊr
e	er	--	--	--	er
a	ar	--	--	--	ar
au	a(u)r	a ^u r	--	--	a ^u r
əu	ə(u)r	ə ^u r	--	--	ə ^u r
əŋ	ə(ŋ)r	ə ^ŋ r	--	--	ə̃r

aŋ	a(ŋ)r	a ^ŋ r	--	--	ãr
əi	ə(i)r	--	ər	--	ər
ən	ə(n)r	--	ər	--	ər
an	a(n)r	--	ar	--	ar
ai	a(i)r	--	ar	--	ar
i	ir	--	--	iər	iər
y	yr	--	--	yər	yər
in	i(n)r	--	ir	iər	iər

Consider the following dataset, where the suffix was transcribed as [ɿɪ] and it attached to the end of the host syllable. A new transcription using Lin's system is applied to the dataset. For readability, the original transcribed dataset is written using a pair of slashes, and the new transcription using Lin's system will be shown using a pair of brackets.

(9)

/aɪ - ɿɪ/ → [arɪ] 'son' /iɪ - ɿɪ/ → [iərɪ] 'clothes' /yɪ - ɿɪ/ → [yərɪ] 'fish'
/uɪ - ɿɪ/ → [urɪ] 'house' /iaɪ - ɿɪ/ → [jarɪ] 'tooth' /uaɪ - ɿɪ/ → [warɪ] 'child'
/iɪɪ - ɿɪ/ → [jɪɪ] 'yo' /uɪɪ - ɿɪ/ → [wɪɪɪ] 'grip' /ɿɪ - ɿɪ/ → [ɿɪɪ] 'goose'
/xaiɪ - ɿɪ/ → [xarɪ] 'child(ren)' /tauɪ - ɿɪ/ → [ta^uɪɪ] 'peach'
/iauɪ - ɿɪ/ → [ja^uɪɪ] 'medicine' /uaiɪ - ɿɪ/ → [warɪ] 'inclined'
/xanɪ - ɿɪ/ → [xarɪ] 'sweat(noun)' /ianɪ - ɿɪ/ → [jarɪ] 'smoke(noun)'
/uanɪ - ɿɪ/ → [warɪ] 'play' /yanɪ - ɿɪ/ → [yarɪ] 'circle'
/k^həŋɪ - ɿɪ/ → [k^həŋɪɪ] 'pit(noun)' /inɪ - ɿɪ/ → [iərɪ] 'sound'

From the dataset in (9), it is clear that after er – hua, [iərŋ] will be the transcription of both ‘clothes’ and ‘sound’ and so it is with [warŋ] as it is the transcription for both ‘child’ and ‘play’. However, the transcription that eliminates the difference of the structure description of ‘sound’ and ‘clothes’ are not really convincing. In fact, if the suffix is treated as a sound [r], after er – hua, ‘sound’ would better be transcribed as [iərŋ] as there is a clear nasalization occurred in the [ə]. Similarly, ‘play’ would better be transcribed as [wərŋ] to signify the nasalization occurred in the host syllable.

In addition, Lin uses [a^u] and [ə^u] to represent a short diphthong (1989), which is not common to see. According to Duanmu, “the existence of short diphthongs is controversial in feature theory because they allow two feature values in a single sound”

(2007: 215) as the feature representation of [a^u] would be
$$\begin{bmatrix} +\text{high} \\ -\text{high} \\ +\text{round} \\ -\text{round} \end{bmatrix}$$
, which is controversial.

3. Chao’s approach and Wang & He’s approach

Both Chao and Wang & He focus on the description or transcription of diminutive suffix [ə] instead of rule – based analysis. Though their approaches and systems for diminutive suffix [ə] are different, their transcriptions of diminutive suffix [ə] turn out to be extremely similar.

Given all the possible rhymes in Standard Chinese provided by Duanmu (2007), Chao transcription and Wang & He’s transcription of diminutive suffix [ə] are shown

in the chart below.

(10)

Unsuffixes rhymes	Chao (1968)	Wang & He (1985)
ɹ, ɹ̥, əi, ən	ər	ər
a, ai, an	ar	ar
o	or	or
u	ur	ur
ɤ	ɤr	ɤr
au	aur	aur
əu	əur	our
əŋ	ǣr	ǣr
aŋ	ǣ̃	ǣ̃r
uŋ	ũr	ũr
e	ɛr	ɛr
i, in	iər	iər
y	yər	yər

Thus, the only differences in transcriptions are [əur] and [our] for /əu/, together with [ǣ̃] and [ǣ̃r] for /aŋ/. According to Cheng (1973), [ə] is essentially [ɤ] in Standard Chinese and he proposes the following phonological rules for the allophones of /ɤ/ in Standard Chinese.

(11) /ɤ/ → [ɛ] / __V[+high, +front]

(12) /ɤ/ → [e] / V[+high, +front]__

(13) /ɤ/ → [ɔ] / __V[+high, +back]

(14) /ɤ/ → [o] / V[+high, +back]__

Therefore, there is no need to distinguish between [ə] and [o]. Also, since there is only one low vowel, in Standard Chinese, it doesn't matter if this low vowel is [a] or [ɑ]. Hence, the above two transcriptions of diminutive suffix are essentially identical to each other.

It is worth revisiting the dataset in (9). Using the transcription provided by Chao, the dataset in (9) would be transcribed as the following. The dataset is extended with some data involving [ʐ] and [ʑ], where Cheng consider them as allophones of /i/ (1973).

(15)

/a - ɤ/ → [ar]	‘son’	/i - ɤ/ → [iər]	‘clothes’	/y - ɤ/ → [yər]	‘fish’
/u - ɤ/ → [ur]	‘house’	/ia - ɤ/ → [jar]	‘tooth’	/ua - ɤ/ → [war]	‘child’
/iɤ - ɤ/ → [jɪr]	‘yo’	/uɤ - ɤ/ → [wɪr]	‘grip’	/ɤ - ɤ/ → [ɪr]	‘goose’
/xai - ɤ/ → [xar]	‘child(ren)’	/tau - ɤ/ → [taur]	‘peach’		
/iau - ɤ/ → [jaur]	‘medicine’	/uai - ɤ/ → [war]	‘inclined’		
/xan - ɤ/ → [xar]	‘sweat(noun)’	/ian - ɤ/ → [jar]	‘smoke(noun)’		
/uan - ɤ/ → [war]	‘play’	/yan - ɤ/ → [yar]	‘circle’		
/kʰəŋ - ɤ/ → [kʰər]	‘pit(noun)’	/in - ɤ/ → [iər]	‘sound’		
/tʂɤ - ɤ/ → [tʂər]	‘child’	/ʂɤ - ɤ/ → [ʂər]	‘poem’		

Either Chao's approach or Wang and He's approach successfully overcomes the

suspicious short diphthong transcription proposed by Lin (1989) and both approaches cover a wide range of rhymes to study. However, as they focus on the descriptions and transcriptions of diminutive suffix, their works are in lack for step to step analyses and thus, it is hard for them to answer questions like the followings: Why are final [i] and [n] deleted but final [u] not? Why is [ə] added for some forms (e.g. [in]) but not for others (e.g. [uŋ])?

4. Duanmu's er–hua approach (1990)

Duanmu's diminutive suffix approach could be summarized as the following steps.

- (16) (a) Replace the coda of the syllable with [r].
- (b) Reattach any compatible feature that was replaced in (a).
- (c) Unattached features do not surface.

(17)

Input	Replace	Reattach	Surface
a	ar	--	ar
i	ir	--	ir
au	a(u)r	ar ^w	ar ^w
aŋ	a(ŋ)r	ã	ã
an	a(n)r	--	ar
ai	a(i)r	--	ar

In a way, Duanmu's approach (1990) could be considered as an improvement of Lin's approach (1989) as it deletes the [ə] in between [i] and [r]; it replaces the short diphthong part with a rounded r, transcribed as [r^w]. However, this approach fails to explain why [+nasal] feature is saved with [ŋ] but not with [n].

5. Duanmu's er-hua approach (1999)

Instead of transcribing the suffix [ə] as a sound as Lin (1989) does, Duanmu treats the suffix as a feature [+retroflex] (2007: 218). It is worth noticing under Duanmu's system, coronal is considered as an articulator and [+retroflex] is a feature defined for the sound whose articulator involves coronal. Given the assumptions that nasal [n] and high front vowels [i, y] are specified for [-retroflex] and there are incompatible with [ə], while [ŋ] and other vowels are unspecified for coronal and are compatible with [ə], Duanmu presents his er-hua approach as follows, described in (18) to (20) (2007: 218).

(18) Add [ə]: Add [ə] to the coda position and replace the incompatible sound, if possible. If the host syllable doesn't have a coda, then the suffix [ə] is appended as the coda; if the host syllable does have a coda but the coda is incompatible, then the suffix [ə] will replace the original coda as the new coda; otherwise, the suffix [ə] will append to the end of the coda of the host syllable.

(19) Rhyme-Harmony: rhyme sounds cannot differ in [retroflex] (Duanmu 2007: 219).

(20) Mid: The default height of the nucleus is mid.

This is the final summarization given by Duanmu to show his approach.

(21)

Unsuffixes rhymes	Suffixes rhymes
ʒ, ʒ̥, ɾ, əi, ən, i, in, yn	əə or ə:
u	uə
o	oə
e	eə
ɤ	ɤə or ɤ:
a, ai, an	aə
au	au ^r
əu	əu ^r
əŋ	əŋ ^r
aŋ	aŋ ^r
uŋ	uŋ ^r

The following part of this section is a combined dataset, where some of the data was provided by Duanmu himself and the rest is the data from (15). It is transcribed according to the approach described by Duanmu, who believes that the reason why other researchers transcribe [əŋ^r, aŋ^r, uŋ^r] as [ǣr, ǣ̃, ũr] is about the nasal coda in Standard Chinese (2007: 221). In other word, Duanmu does find a connection between his transcription and the transcriptions of others.

(22)

[tsəə] ‘character’ [tʃəə] ‘twig’ [tɕəə] ‘chicken’ [tɕəə] ‘today’

[ʋə̌ə̌] ‘fish’ [pə̌ə̌] ‘tablet’ [kə̌ə̌] ‘root’ [huə̌] ‘lake’
 [woə̌] ‘nest’ [ʋeə̌] ‘moon’ [kɤə̌] ‘song’ [paə̌] ‘handle’
 [pʰaə̌] ‘plaque’ [pʰaə̌] ‘dish’ [taǔ] ‘knife’ [kəǔ] ‘hook’
 [təŋ̌] ‘lamp’ [kaŋ̌] ‘jar’ [kʰuŋ̌] ‘free time’
 /a/ - ɤ̌ / → [aə̌] ‘son’ /i/ - ɤ̌ / → [ə̌] ‘clothes’ /u/ - ɤ̌ / → [uə̌] ‘house’
 /ia/ - ɤ̌ / → [jaə̌] ‘tooth’ /ua/ - ɤ̌ / → [waə̌] ‘child’ /iɤ̌ - ɤ̌ / → [jɤ̌] ‘yo’
 /uɤ̌ - ɤ̌ / → [wɤ̌] ‘grip’ /ɤ̌ - ɤ̌ / → [ɤ̌] ‘goose’
 /xai/ - ɤ̌ / → [xaə̌] ‘child(ren)’ /tau/ - ɤ̌ / → [taǔ] ‘peach’
 /iau/ - ɤ̌ / → [jaǔ] ‘medicine’ /uai/ - ɤ̌ / → [waə̌] ‘inclined’
 /xan/ - ɤ̌ / → [xaə̌] ‘sweat(noun)’ /ian/ - ɤ̌ / → [jaə̌] ‘smoke(noun)’
 /uan/ - ɤ̌ / → [waə̌] ‘play’ /yan/ - ɤ̌ / → [yaə̌] ‘circle’
 /kʰəŋ/ - ɤ̌ / → [kʰəŋ̌] ‘pit(noun)’ /in/ - ɤ̌ / → [ə̌] ‘sound’
 /tɕɤ̌ - ɤ̌ / → [tɕə̌] ‘child’ /ɕɤ̌ - ɤ̌ / → [ɕə̌] ‘poem’

Duanmu’s approach for diminutive suffix is perhaps one of the most complicated as he introduces [+retroflex] feature to incorporate the diminutive suffix to the host syllable structure. However, his approach involving a new feature seems too complicated and not showing the tone in the data and his analysis may have weakness his proposal.

6. Conclusion

The studies of diminutive suffix in Standard Chinese could be classified into two

categories. The focus of the first category is the description or transcriptions of the diminutive suffix, led by Chao (1968), Wang and He (1985), whereas the core research of the second category is the rule – based analysis of the diminutive suffix and. In generative phonological analysis, proposed underlying representation of diminutive suffix include /ɣr/ (Cheng 1973), /ɿ/ or /r/ (Lin 1989, Duanmu 2000), /ə/ (Duanmu 2007) and feature [retroflex] (Duanmu 2007). Syllable structure plays an important role in these analyses. One way to make analysis on diminutive suffix is the combination of all compatible elements of the root and the suffix into one syllable. The work presented by Lin (1989) is a valuable contribution of such analysis. Another way is to incorporate the suffix, which could be either a segment or feature, directly into a fixed VC or VV rhyme template by means of the replacement of root elements or the adjustments via the removal of incompatible elements. Duanmu's works (1990, 2007) signify that he has been working through this approach for years with important contribution.

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