

The Transitional Role of the Glottal Stop in the Development of Glottalized Diminutives *

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This study focuses on the transitional role of the glottal stop in the development of glottalized diminutives. First, this study compares the historical development of two types of widely-observed diminutives (nasalized diminutives and glottalized diminutives) in southeastern Chinese dialects, with special focus given to the transitional stages, CVN and *CVk. While CVN can be easily gathered in synchronic dialects, it seems impossible for *CVk to exist in the dialects of Min and Wu. Then, the asymmetry between CVN and *CVk is explored in terms of sonority as well as *the emergence of the unmarked*. This study further suggests that, because of the internal glottal stop and its special articulatory characteristic, diminutives with middle glottal stop insertion (middle-GSI) can be viewed as the transitional stage in the development of glottalized diminutives in southeastern Chinese dialects. Finally, the immigration history between Min and Hakka also shows that the view proposed in this study can be historically supported.

Keywords: diminutive, glottal stop, glottalized, Min, Wu

1. Introduction

Diminutives are widely observed among Chinese dialects, and play significant roles in the history of Chinese dialects (Tsao 2006). They are always regarded as one of the major issues in Chinese phonology, and a great body of related literature has been devoted to them in recent decades.¹ In southeastern Chinese dialects (e.g. Min, Wu, Hui, Gan), there are two types of diminutives, nasalized diminutives and glottalized diminutives, both of which are different from each other not only in their phonological representations, but also in their diachronic developmental processes.

Nasalized diminutives can be widely observed in Wu and Hui (Cao 2001, 2002, Fang 1986, 1993, Qian 1991, Shi 2002, Zhao 1999).² They surface in these dialects by complicated phonological shapes. Though their phonological shapes may be diverse, Cao (2001, 2002) and Zhao (1999), after having conducted large-scale surveys about nasalized diminutives in synchronic Wu and Hui dialects, proposed the

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¹ The diminutives in Chinese dialects have been surveyed in a great body of literature, including Huang (1993), Li (1978), Li (1996), Liang (1989), Liang (2002), Pan (1999), Shi (1997), Xie (1991), Yan (1989), Ye and Tang (1982), Zhao (2002), Zhou (1987), among others.

² Nasalized diminutives are also observed from dialects in Guangdong, Guangxi, Jiangxi, Henan and Hubei.

developmental stages in (1). The second stage functions as a *transitional* stage because of the syllable merger between the base and the diminutive suffix. Most important of all, every stage in (1) can gain empirical support from synchronic dialects, as in (2-5).

(1)	1 st stage	2 nd stage	3 rd stage	4 th stage	5 th stage
	(C)V + nie/ni/ni/ŋ/ŋ	(C)V: n	(C) ʋn/ŋ	(C) ṽ	(C) ṽ

˘ = diminutive tone change ṽ = vowel nasalization

(2) a. Yunhe (Wu dialect): Cao (2001:33)

ɑŋ ⁵ ji ³²⁴	‘small duck’	mao ⁴²³⁻⁴⁴ ji ³²⁴	‘small cat’
tɿ ³²⁴⁻⁴⁴ ji ³²⁴	‘small pig’		

b. Jiande (Hui dialect): Zhao (1999:137)

ho ŋ	‘small shrimp’	t ^h u ŋ	‘small rabbit’
tsu ŋ	‘small desk’	pie ŋ	‘small pigtail’

(3) a. Pujiang (Wu dialect): Chen (1992a:75)

to: n	‘knife’	da: n	‘bag’
do: n	‘peach’	tso: n	‘jube’

b. Yanshi (Hui dialect): Zhao (1999:137)

p ^h io: n	‘ladle’	tɕi: n	‘chick’
k ^h wa: n	‘chopstick’	ue: n	‘nutlet’

(4) a. Tangxi (Wu dialect): Cao (2001:34)

sya ⁵²⁻³³ tɕie- iŋ ²⁴	‘small chick’	sya ⁵²⁻³³ tɕə- əŋ ²⁴	‘small knife’
tɕiə- ioŋ ²⁴	‘bamboo’	vo ³⁴¹⁻¹¹ tɕio- iuŋ ¹¹³	‘rice ladle’

b. Tunxi (Hui dialect)³: Qian (1991:201-202)

tɕi ³¹ → tɕin ²⁴	‘finger’	k ^h wa ⁵³ → k ^h wan ²⁴	‘chopstick’
tɕy ⁵⁵ → tɕyn ²⁴	‘orange’	tɕiu ¹¹ → tɕiun ²⁴	‘hook’
pie ⁵³ → pien ²⁴	‘pigtail’	tɕie ¹¹ → tɕien ²⁴	‘chick’

³ According to Qian (1991), there are thirty-one rimes in Tunxi, but /-n/ cannot be attached to such rimes as /ŋ/, /ŋ/, /we/, /ye/, /aw/, /yaw/ and /əw/. In terms of rimes closed by /n/ (e.g. /an/, /yan/, /üan/ and /in/), bases and diminutives have identical phonological representations. Moreover, similar to other Chinese dialects, Tunxi allows one coda consonant at most. Therefore, after the attachment of /-n/, CV and CVC will turn out to be CVN (Tsao 2004).

(5) a. Jinhua (Wu dialect): Cao (2001:35)

li → lĩ³¹³ ‘pear’ t^hu → t^hũ⁵⁵ ‘rabbit’
 ɕyɣ → ɕyẽ⁵⁵ ‘brush’ ɣ → ɣ̃¹⁴ ‘box’

b. Shouchang (Hui dialect): Zhao (1999:139)

u t^hie → t^hiã ‘butterfly’ tyɣ → tyã ‘bird’

How about glottalized diminutives? Glottalized diminutives also widely exist in the dialects of Wu and Yuebei Tuhua (YBTH). In his study of the diminutives in the dialects of Wu and Min, Chen (1992b, 1999) asserted that the glottal stop in glottalized diminutives in Wu originated from a reduced form of the diminutive suffix /kiaŋ/ in Min.⁴ He then proposed the developmental stages in (6) for glottalized diminutives.

(6)

1 st stage	2 nd stage	3 rd stage	4 th stage	5 th stage
CV + kiaŋ/kĩ	*CV k	CV ʔ	C ʔ [?]	C ʔ
Fuzhou Datian	?	Nanxiong Wuyi	Ningpo Qingtian	Wenzhou

ʔ = glottal stop ʔ = glottalization ʔ = diminutive tone change

Diminutives in the first stage exist in Min, while diminutives of the last three stages can be easily gathered in Wu and YBTH.⁵ For example, diminutives in (7) are from Fuzhou and Houlu (in Datian County). They are formed by syllabic diminutive suffixes, so they belong to the first stage in (6). Diminutives from Nanxiong and Qingtian, as shown in (8), support the existence of the last three stages.

⁴ According to Chen (1992b), the first argument for this view is based on the function of diminutives. In one of the Min dialects, Houlu, diminutives are formed by either vowel nasalization or bases plus /kĩ⁴²/. The former is a comparative form, while the latter is a superlative form. Similar phonological phenomena also appear in Wu dialects. In Wenzhou, diminutives are formed by the attachment of a syllabic nasal diminutive suffix /ŋ/ to the bases (comparative) or glottalization (superlative). Hence, if both /kĩ⁴²/ and glottalization can be used as superlative forms for diminutives, they can be assumed to have the same origin. Moreover, according to Norman and Mei (1976), the diminutive suffix in Min dialects can trace its origin to the Austro-Tai family, and thus is regarded as the earliest form in the development of glottalized diminutives.

⁵ In-depth observation of the last three stages reveals the relationship between the glottal stop and diminutive tones (DTs). The glottal stop in the third stage is a primary segmental feature without any influence on diminutive tones. As time goes by, the glottal stop is weakened in the fourth stage and such a weakening has an impact on tone changes. It is this stage that enables Hirata (1983) and Chen (1992b) to hypothesize that both the glottal stop and glottalization are greatly relevant to high DTs. In the last stage, the glottal stop completely disappears, and high tones turn out to be the primary distinctive feature for diminutives. The fact that the loss of the glottal stop leads to high tones is widely observed in the literature (Dell 1977, Haudricourt 1954, Matisoff 1970).

- (7) a. Fuzhou (Min dialect): Liang (1989:213)
- | | | | | | |
|-------------------|-----------------------|-----------------|--------------------------------|-----------------------|---------------|
| kie ⁵³ | (k-)iaŋ ³¹ | ‘small chicken’ | k ^h u ⁵³ | (k-)iaŋ ³¹ | ‘small pants’ |
| yoŋ ³¹ | (k-)iaŋ ³¹ | ‘small sheep’ | t ^h o ³¹ | (k-)iaŋ ³¹ | ‘small peach’ |
- b. Houlu (Min dialect): Chen (1992b:36)
- | | | | | | |
|-----------------------------------|------------------|--------------|---------------------|------------------|--------------|
| xu ²⁴⁻³³ | kĩ ⁴² | ‘small pot’ | te ⁵⁵⁻²¹ | kĩ ⁴² | ‘small carp’ |
| k ^h u ³³⁻²² | kĩ ⁴² | ‘small hill’ | xua ⁴² | kĩ ⁴² | ‘small pit’ |
- (8) a. Nanxiong (YBTH dialect): Egerod (1983)
- | | | |
|--------------------|-------------------|------------|
| hei ²¹ | hei ² | ‘monkey’ |
| mtuŋ ²¹ | mtuŋ ² | ‘mosquito’ |
| niŋ ²¹ | niŋ ² | ‘human’ |
- b. Qingtian (Wu dialect): Pan (1988)
- | | | |
|--------------------|---------------------|----------------------|
| lue ²¹³ | lue ²³⁵⁵ | ‘donkey’ |
| ŋe ²¹³ | ŋe ²³⁵⁵ | ‘fish’ |
| ji ²¹³ | ji ²³⁵⁵ | ‘lamb’ |
| ja ²² | ja ²²⁴ | ‘swallow’ |
| bĩa ²² | bĩa ²²⁴ | ‘a braid or pigtail’ |

However, problems arise when the second stage (*CVk) is taken into account. Patterning with CV:n, *CVk is also a transitional stage that indicates the syllable merger (i.e. bases plus diminutive suffixes). Yet, different from CV:n and other stages in (6), diminutives collected from synchronic dialects cannot support the existence of such an imaginary stage. If so, why can *CVk still be viewed as the transitional form for glottalized diminutives? Chen (1999) surveyed the rimes closed by /-p, -t, -k/ in Min and Wu, advanced an evolving process (-p, -t, -k → -k → -ʔ → ∅), and stated that “although the form *CVk does not occur in either Wu or Min dialect, it is not hard to imagine that this transitional form existed ... at some early time” (Chen 1999:39). However, it is argued in what follows that *CVk is impossible to exist in Min or Wu, and that it is diminutives with middle glottal stop insertion (middle-GSI) that can function as the transitional stage in the development of glottalized diminutives.

This study is organized as follows. Section 2 introduces the types of diminutives in YBTH and the diachronic order between them. Section 3 is first devoted to why the transitional stage *CVk proposed by Chen (1999) seems impossible to exist in Min and Wu, and then examines the asymmetry between the two transitional stages, CVN and *CVk. Why can CVN, but not *CVk, surface as the transitional stage? In Section

4, the focus is shifted to the view that middle-GSI diminutives should be regarded as the transitional stage because of the special articulatory characteristic of the glottal stop. Section 5 discusses the immigration history in northern Guangdong, which supports the view in our study. Section 6 concludes this study.

2. Diminutives in Yuebei Tuhua

Because this study aims to explore the role of middle-GSI diminutives in YBTH in the development of glottalized diminutives, having a general knowledge of the diminutives in YBTH is crucial. *Yuebei*, literally the northern part of Guangdong, is an area surrounded by different Chinese dialects: Hakka, Yue, Xiang, etc. (Zhuang 2004a). More specifically, YBTH exhibits linguistic characteristics of Hakka (Li 2000, Lin et al. 1995, Sagart 2001, Zhang and Wan 1996), of Yue (Lin et al. 1995), of Gan (Zhuang 1999), of Southwest Mandarin (Zhuang 2004a), and of Xiangnan Tuhua and Guibei Pinghua (Wang 2001, Zhan et al. 2003). Diminutives in YBTH are formed by tone and/or rime changes of the bases, and can be divided into three types in terms of the position of the inserted glottal stop, as in (9-11).⁶ In middle-GSI and final-GSI, a glottal stop is inserted into the syllable-medial or syllable-final position, making the single syllable sound like two or creating a new syllable ending with a glottal stop. In no-GSI, no rime change occurs; diminutive tones (DTs) are assigned to derive diminutives.^{7,8}

⁶ The data are based on twelve YBTH dialects in Zhuang (2004a) – Shangyao, Zhoutian, Baisha, Lishi, Lashi, Meicun, Guitou, Shitang, Beixiang, Changlai, Changjiang and Wujing.

⁷ There are basically two types of DT changes: *fusion* and *splitting*; the former gives rise to one single DT, while the latter produces two DTs. Fusion is termed *hebianishi* and splitting, *fenbianishi* in Cao (2001) for diminutives in Wu dialects. In *fusion*, all syllables have the same DT (e.g. [55] in Tangxi and [ʔ45] in Lishui), regardless of their citation tones. In *splitting*, syllables of different citation tones have different DTs. However, citation tones and DTs may not be in one-to-one correspondence. Citation tones with similar characteristics may have the same DT, and different dialects have their own criteria to select appropriate DTs. For example, in Qingtian, [ʔ55] is used for Level tones, whereas [ʔ224] is used for non-Level tones. The same criterion is also utilized in Wenling (Li 1978). In Taishun, all *Yin* citation tones have [44], while [213] is used for all *Yang* citation tones.

⁸ DTs in YBTH are marked as MH, ML, H↗ and HL. Careful readers may notice that such tonal notations are different from those (i.e. tonal numbers) in previous examples. This is because, without any tonal adaption, tones in previous examples are kept as original as those authors’.

(9) Middle-GSI diminutives

Locations Gloss		Fusion		Splitting		
		Shangyao	Zhoutian	Baisha	Lishi	Lashi
‘cover’	Base	kuy	kœ	kɤ:	kwo:	kuy
	Dim.	ku ^M ɣ ^H	kɔ ^L ɣ ^M	kɤ ^L ɣ ^M	kwo ^L ɣ ^M	ku ^L ɣ ^M
‘spring’	Base	ts ^h on	tʃ ^h un	ts ^h un	ts ^h ɛn	ts ^h wɔn
	Dim.	ts ^h o ^M ɣ ^H	tʃu ^L ɣ ^M	ts ^h u ^L ɣ ^M	ts ^h ɛ ^L ɣ ^M	ts ^h wɔ ^L ɣ ^M
‘goose’	Base	ŋ ⁹ ɔw	ŋɔ:	ŋɔ:	gow	gɔw
	Dim.	ŋ ⁹ ɔ ^M ɣ ^H	ŋɔ ^L ɔ ^M	ŋɔ ^M ɔ ^H	go ^M ɣ ^H	gɔ ^M ɣ ^H
‘money’	Base	ts ^h en	ts ^h yɛn	ts ^h ye:	ts ^h ey	ts ^h en
	Dim.	ts ^h e ^M ɣ ^H	ts ^h ye ^L ɣ ^M	ts ^h ye ^M ɣ ^H	ts ^h e ^M ɣ ^H	ts ^h e ^M ɣ ^H

(10) Final-GSI diminutives

Locations Gloss		Fusion				Splitting
		Meicun	Shitian	Guitou	Beixiang	None
‘cover’	Base	kwx	kwa	kvu	kwe	No dialects with Final GSI are of the <i>splitting</i> type.
	Dim.	kwx ^{ML}	kwa ^{ML}	kvu ^{ML}	kwe ^{ML}	
‘spring’	Base	ts ^h aŋ	ts ^h wɛŋ	ts ^h aŋ	tʃ ^h aŋ	
	Dim.	ts ^h aŋ ^{ML}	ts ^h wɛŋ ^{ML}	ts ^h aŋ ^{ML}	tʃ ^h aŋ ^{ML}	
‘goose’	Base	gɔw	ŋɔ:	gɔw	ŋɜw	
	Dim.	gɔw ^{ML}	ŋɔ: ^{ML}	gɔw ^{ML}	ŋɜw ^{ML}	
‘money’	Base	ts ^h ɛŋ	ts ^h iŋ	ts ^h ɛn	tʃ ^h i	
	Dim.	ts ^h ɛŋ ^{ML}	ts ^h iŋ ^{ML}	ts ^h ɛn ^{ML}	tʃ ^h i ^{ML}	

(11) No-GSI diminutives

Gloss	‘bucket’		‘orange’		‘grandma’		‘mother’	
	Base	Dim.	Base	Dim.	Base	Dim.	Base	Dim.
Wujing	ku	ku ^{ML}	kã	kã ^{ML}	p ^h o	p ^h o ^{HM}	ŋyõ	ŋyõ ^{HM}

Gloss	‘filter’		‘head’		‘grid’		‘mode’	
	Base	Dim.	Base	Dim.	Base	Dim.	Base	Dim.
Changjiang	sɛ	sɛ ^{H↗}	t ^h ɛw	t ^h ɛw ^{H↗}	kɛ	kɛ ^{H↗}	ts ^h ɔŋ	ts ^h ɔŋ ^{H↗}
Changlai	ʃi	ʃi ^{HL}	ti	ti ^{HL}		ka ^{HL}	ts ^h aŋ	ts ^h aŋ ^{HL}

According to Zhuang (2004a), there exists a diachronic order in the development of YBTH diminutives. Middle-GSI is diachronically prior to final-GSI, and no-GSI is the last developmental stage (i.e. middle-GSI → final-GSI → no-GSI).⁹ This

⁹ Hirata (1983) has observed that tone changes in diminutives are highly correlated with the glottal stop or glottalization. He further points out that the most common tonal shapes in diminutives are high-rising or high-level and that the glottal stop (or glottalization) is usually tied with tone changes.

developing direction is also a reflection of *the emergence of the unmarked* (Cheng 2006, Chung and Cheng 2007).¹⁰ However, careful readers may have three questions in mind. First, it is quite unusual to insert a sound into a base in Chinese phonology. Why does such a marked structure surface? Second, where does the glottal stop come from? Third, why is it the case that a glottal stop, instead of other sounds, is inserted in middle-GSI diminutives? All of these questions will be explicated in the following sections.

3. The non-existence status of *CVk

It has been stated previously that the imaginary stage *CVk is regarded as the transitional stage that might diachronically exist in the development of glottalized diminutives, even though it cannot gain any empirical support from synchronic dialects. *CVk is viewed as being transitional because of the merger of two lexical forms (i.e. a base + a diminutive suffix). According to Chen (1992a, 1999), /kian/ is reduced and simplified to a single consonant /k/; then, /k/ is suffixed to the coda position of the bases, and finally the imaginary diminutive *CVk is derived. However, can *CVk exist in the synchronic dialects of Min and Wu? To clarify this issue, the following arguments are devoted to why *CVk does not show up in the dialects of Min and Wu respectively.

3.1 Min dialects

According to Norman (1988) and Z. Zhang (2000), Min can be divided into two groups, Southern Min and Northern Min, and one of the major differences between them exists in /-p, -t, -k/ codas. In Southern Min, rimes closed by /-m, -n, -ŋ, -p, -t, -k/ are maintained to contrast different lexical meanings (Chen and Li 1991), while Northern Min, similar to Wu (Cao 2002, Yuan 2001), Hui (Hou 2002) and YBTH (Zhuang 2004a), lacks rimes closed by /-p, -t, -k/.

Due to the closure of vocal folds when producing the glottal stop, rising tonal shapes are not hard to account for. This is also confirmed by Chen (1992b), who claims that the glottal stop (or glottalization) is one of the important characteristics of diminutives in southern Chinese dialects, and suggests that the glottal stop is the early form of tone changes in diminutives.

¹⁰ This diachronic order is viewed as a reflection of *the emergence of the unmarked* in terms of the position of the inserted glottal stop. Positional shifts of the glottal stop in YBTH diminutives are put into the OT framework, which shows that diminutives in YBTH evolve from a marked phonological structure to an unmarked one. In middle-GSI, the contiguity of the bases is broken by an internal epenthesis of a glottal stop, while in final-GSI, the contiguity of the bases is respected, for the glottal stop is inserted on the rightmost edge of morphological constituents. In no-GSI, phonological identity is thoroughly pursued between the bases and their morphologically related optimal outputs (i.e. diminutives). Therefore, diminutives have the same segmental shapes as their bases. For more details, please refer to Chung and Cheng (2007).

In Southern Min, if coda consonants /-p, -t, -k/ in the bases are maintained, can the reduced diminutive consonant /k/ get attached to these bases? This question can be explored from three aspects. First, if /k/ is assumed to be merged into the bases and *CVk is generated, then CVp, CVt and CVk will all turn into *CVk. Namely, owing to the attachment of /k/, bases that are originally distinctive will be neutralized to *CVk. Such a neutralization process will undoubtedly complicate language perception. When facing *CVk, listeners would doubt whether it is a base or a diminutive and, if a diminutive, whether it is derived from the base CVp, CVt or CVk. Second, /k/ in /kian/ is unstable and is apt to disappear in Southern Min, as in (12).

(12) *kian/ŋ > kiã/kã > iã/ã > ia/a > ε (Tsao and Liu 2001:325)

Tsao and Liu (2001) conducted a fieldwork survey of diminutives in Southern Min, and summarized the simplifying process as (12). /k/ disappears after the third stage in (12), and the loss of /k/ is of crucial relevance to grammaticalization. Diminutives extend their semantic functions by grammaticalization, and such a process is always accompanied by sound loss, especially for less sonorous sounds (Hopper and Traugott 2003). So far, in Southern Min, /k/ either is maintained as the onset of the diminutive suffixes or dies out. In either case, *CVk is impossible. Third, the attachment of /k/ will create syllables that are deviant from the canonical syllable structure CGVE (Chung 1989). Take bases CVN and CVG for example. The attachment of /k/ will create syllable structures CVNk and CVGk. Consonant clusters Nk and Gk are non-canonical in Southern Min and in almost all southeastern Chinese dialects. Under such a condition, no skeletal position is left for /k/ to fill in. In a nutshell, it seems impossible for *CVk to exist in Southern Min.¹¹ Besides, diminutives in Southern Min discussed so far remain in the first stage in (6).

How about Northern Min? An extensive survey by Chen and Li (1991) indicates that rimes closed by /-p, -t, -k/ disappear in the dialects of Northern Min, except Jianning.¹² Hence, unlike Southern Min, the lack of /-p, -t, -k/ codas should make possible the attachment of the reduced /k/ to the bases. However, it is also impossible for *CVk to exist in Northern Min because of the same syllable problem encountered in Southern Min. If /k/ is attached to CVG or CVN, syllables that are incongruous to the canonical structure CGVE will be created.¹³ Moreover, according to Chen and Li

¹¹ An anonymous reviewer states that, for those who are in favor of the imaginary *CVk, the formation of *CVk may involve the /-p, -t, -k/ codas in literary versus colloquial systems in Southern Min. Here, I leave this issue open for future research.

¹² Rimes closed by /-p, -t, -k/ are maintained in Jianning. Besides, diminutives in Jianning include /tsei/ and /tsə/. The former can stand alone with the meaning of 'son' whereas the latter is a diminutive suffix.

¹³ The canonical syllable structure in some dialects of Northern Min is CGVGC (Chen and Li 1991).

(1991), diminutives are still formed by two lexical forms (a base + a diminutive suffix) in the dialects without /-p, -t, -k, -ʔ/ codas. All variants of /kiaŋ/ hold the shapes as syllabic diminutive suffixes, as in (13).

(13) Variants of /kiaŋ/ in the dialects of Northern Min

Dialect		Dialect		Dialect	
Jianou	/kyiŋ/	Songxi	/kyŋ/	Yangdun	/kiŋ/
Shipo	/kyŋ/	Shanyang	/kiŋ/	Zhenghe	/kyiŋ/
Jianyang	/kyeiŋ/	Chongan	/kyaiŋ/	Xinqiao	/kiũ/
Yongan	/kyeiŋ/	Sanyuan	/kyaiŋ/	Shaxian	/kyẽ/
Shaowu	/kin/	Taining	/kien/	Shunchang	/kiẽ/
Guangze	/kin/	Mingxi	/kieŋ/	Jiangle	/kiẽ/
Xiyang	/kyŋ/	Tangchuan	/kɯ/	Zhongxian	/kœŋ/

In addition, some dialects in Northern Min may have rimes closed by /-ʔ, -k/ or only by /-ʔ/, even if the number of these dialects is not many. Chen and Li (1991) only cited two such dialects. Rimes can be closed by /-ʔ/ in Yangzhong, and by /-ʔ, -k/ in Jiemian. Similar to the dialects without /-p, -t, -k/ codas, these two dialects utilize syllabic diminutive suffixes, as in (14).

(14)	Yangzhong: ky(ø)ŋ	Jiemian: kiã	Gloss
	kyŋ tsi	kiŋ kiã	‘child’
	t ^h au lyøŋ kyøŋ	tau loŋ kiã	‘neck’
	tsy nyøŋ kyŋ	tsa bə kiã	‘daughter’
	u kyøŋ	u kiã	‘pregnant’

According to the previous observation, /kiaŋ/ in Min dialects tends not to be merged into the bases. The variants of /kiaŋ/, in spite of their different phonological representations, are inclined to be maintained as syllabic diminutive suffixes. More

However, no matter whether CGVE or CGVGC are taken into account, the illegitimate coda consonant clusters Gk, Nk or GNk would be created if the degenerated /k/ were merged into the bases. In addition, syllables incongruous to CGVE may not be generated because the original coda N or G may be replaced by /k/. However, Liu (2003) indicates that there are two tendencies towards the development of syllable codas in Chinese dialects: (a) syllables tend to be open or be ended with sonorants (i.e. nasals or glides) and (b) coda consonant clusters tend to be avoided. Hence, the attachment of /k/ to bases with rimes VG, VN and VGN will create consonant clusters, and, no doubt, deviates from the second tendency. However, note that coda consonant clusters do exist in some dialects in Northern Min. If coda consonants G and N are replaced by /k/, the derivational direction is opposite to the first tendency. What’s worse, this is not the direction of diminutives in Chinese dialects. According to Wu (2001), if diminutives are formed by diminutive suffixes, these suffixes can be classified into three types: vowels (-ə, -iə, -uə, etc.), liquids (-r and -l) and nasals (-n and -ŋ), all of which are sonorants.

specifically, all the observed variants of /kian/ in Min dialects belong exclusively to the first stage in (6); for this reason, *CVk seems to be an impossible structure in the dialects of Min.¹⁴

3.2 Wu dialects

What about the dialects of Wu? In Wu, syllables closed by /-p, -t, -k/ become glottalized syllables, reflecting a common phonological process in Wu, *glottalization* (called *cuhua* in Chinese), by which /-p, -t, -k/ codas are changed into a glottal stop. Glottalization applies not only to bases originally closed by /-p, -t, -k/, but also to those closed by /-n, -ŋ/, such as /²ŋ³¹³/ in Wenzhou and /ŋ²/ in Lishui (Kao 2004). This view of the influence of glottalization upon /-p, -t, -k/ codas is also supported in Li (1999), Li and Cao (2004), Lin (2005) and Pei (2002).

According to Li (1999), southeastern Chinese dialects are classified into two groups, called *jinjiang fangyan* and *yuanjiang fangyan*. The former comprises Hui, Xiang, Wu and Gan, while Min, Yue and Hakka (Kejia) belong to the latter.

Dialects in *jinjiang fangyan* are distributed mainly in the basin of the Yangzi River (the longest river in China), and, because of their adjacency to Mandarin, show more linguistic influences from Mandarin than those in *yuanjiang fangyan*. Li (1999) observed coda changes in *jinjiang fangyan* and stated the changing pattern /-p, -t, -k/ → /-ʔ/ → ϕ . In Hui and Xiang, /-p, -t, -k/ codas totally disappear, while they are congruously shifted to /-ʔ/ in Wu. Coda changes are complicated in Gan. Glottalization applies to one, two or all of /-p, -t, -k/ codas, and such complex phenomena can be observed from Li and Zhang (1992).

The view of glottalization in Wu is also discussed in Lin (2005). Using twenty-three riming books or tables from the Ming Dynasty and the Qing Dynasty as his research resources, Lin (2005) investigated phonological characteristics of onsets

¹⁴ Another argument for the inexistence of *CVk is due to *debuccalization*. Debuccalization means deletion of oral place features from consonants, hereby removing the constriction in the oral cavity (de Lacy 2002, 2006, Lombardi 2001, McCarthy 2007, Rice 2007, Yip 2001). Debuccalization of obstruents typically leaves [h] and [ʔ] behind, and the debuccalized segments will go on to be deleted or assimilated, depending on different languages. /k/ in *CVk is epenthetic in nature, and it is a tendency for inserted segments to be neutral/unmarked in place of articulation, as stated in Rice (2007:83):

Epenthetic segments are not present in a lexical entry, but are added to satisfy surface constraints on well-formed prosodic structures. Their absence from lexical representations makes epenthetic segments strong candidates for unmarked features as insertion might be expected to provide the least marked features...the most common epenthetic consonant is probably a laryngeal, either glottal stop or [h].

Maybe, this is the reason why *CVk does not exist synchronically. For more details, please refer to Cheng (2008b).

and rimes in Wu, and discovered three patterns in terms of /-p, -t, -k/ codas. These codas (a) are all maintained or (b) are shifted to /-ʔ/ or (c) completely disappear. Such a finding, no doubt, supports the process /-p, -t, -k/ → /-ʔ/ → ∅. Holding the same view towards /-p, -t, -k/ codas, Pei (2002) investigated rimes in rhyming books during the Song Dynasty and concluded that /-p, -t, -k/ codas turn out to be /-ʔ/ at nearly the same time.¹⁵

Based on this observation, it is impossible for *CVk to exist synchronically in Wu. The imaginary diminutive form *CVk is shaped by the bases plus /k/. If glottalization changes /-p, -t, -k/ codas in the bases into a glottal stop, can /k/ be attached to the bases again? If the attachment of /k/ to the bases were possible, it would generate a syllable *CVk, which is not allowed in the syllable inventory. Besides, can *CVk exist diachronically? The answer to this question must be traced back to the time when /-p, -t, -k/ codas were not neutralized to a glottal stop. If /-p, -t, -k/ codas had been maintained at that time, the linguistic phenomenon, by inference, would have been similar to that of Southern Min. The merger of /k/ into the bases will neutralize CVp, CVt and CVk.

In sum, it seems impossible for the imaginary stage *CVk to exist in Min and Wu. As argued by Lass (1997:10), “intelligent study of the linguistic past relies on an understanding of the linguistic present”. Diachronic forms of a language should be observed from synchronic alternations. Without any empirical support for *CVk, there will always be a weakness in the diachronic stages.

3.3 The asymmetry between CVN and *CVk

Revealed from the previous discussion is an asymmetry between CVN and *CVk. The former can emerge as a phonological form for diminutives, but the latter cannot. Yet, are there any other linguistic explanations for such an asymmetry? Below, the asymmetry between CVN and *CVk is explored from two significant aspects – sonority and *the emergence of the unmarked*.

The first difference between CVN and *CVk exists in sonority differences between nasals and obstruents. Based on the Sonority Dispersion Principle (SDP), a principle that shows the preferred combinations of vowels and consonants, the maximized sonority slope is desired in CV syllables (onset + nucleus) while VC syllables (nucleus + coda) favor a minimized sonority slope. The scales in (15), extracted from Kenstowicz (1994:283), clearly signify the manipulation of the SDP.

¹⁵ Actually, the development of /-p, -t, -k/ codas is quite complex among Chinese dialects, and scholars have different viewpoints. According to Liu (2003), besides the pattern /-p, -t, -k/ → /-ʔ/ → ∅, there are also two patterns about the development of /-p, -t, -k/ codas. One is /-p, -t, -k/ → /-k, -ʔ/ → /-ʔ/ → ∅, and the other is /-p, -t, -k/ → /-p, -k, -ʔ/ → /-p, -ʔ/ → ∅.

(15) Sonority rankings for CV, VC, CCV and VCC syllables

- a. CV: OV > NV > LV > GV
- b. VC: VG > VL > VN > VO
- c. CCV: OLV > ONV; OGV > NLV; NGV > LGV
- d. VCC: VGL > VLN; VGN > VGO; VNO > VLO

(V = vowel, G = glide, L = liquid, N = nasal, O = obstruent)

The scale in (15b) suggests the universal tendency that VL and VN are better than VO, and it is also observed that such a tendency is widely utilized by diminutives in Chinese dialects. According to Wu (2001), if diminutives are formed by suffixes, these suffixes can be classified into three types, vowels (-ə, -iə, -uə, etc.), liquids (-r and -l) and nasals (-n and -ŋ), all of which are sonorants. Retroflex liquid /-r/ is used in such dialects as Beijing Mandarin, Yichang (H. Hu 1994), Ganyu (Jiang 1962), Datong (Jiang 1999), Baotou (Shen 2001), Shangqiu (Xie 2004) and Shangzhou (C. Zhang 2000); lateral liquid /-l/ occurs in Zunyi (G. Hu 1994) and Yanggu (Dong 1985). With regards to obstruents, there are few, if any, that can be used as diminutive suffixes, except /ʔ/ (see Section 4 for more details of its property). As a result, based on the investigation, it is apparent that the emersion of CVN as a diminutive, instead of *CVk, results from the operation of the SDP. Probably, it is the operation of the SDP that transforms /-p, -t, -k/ into /-m, -n, -ŋ/ in such dialects as Yulin (Liang 2002) and Rongxian (Zhou 1987).

Second, the emergence of CVN as a diminutive, rather than *CVk, also echoes *the emergence of the unmarked*. As discussed in McCarthy and Prince (1994), morphological processes, such as reduplication, tend to show unmarked syllable structures (e.g. ONSET and NO-CODA) and prosodic structures (e.g. Reduplicant = Prosodic Word). In the transitional stage, two lexical items (a base + a diminutive suffix) are merged into a one-syllable diminutive, and such a morphological process (i.e. a syllable merger) is liable to bring out the unmarked syllable CVN, but not *CVk.¹⁶

Third, the view that sonorants and obstruents behave differently can also be observed from diminutives in one variety of Hakka, spoken at Chinoulan in Taoyuan County, Taiwan.

¹⁶ It is indicated in de Lacy (2006) that glottals pattern with sonorants in terms of sonority. For a detailed discussion about this, please see Chapter Three of de Lacy (2006) and the related works that are cited in that chapter.

(16) Diminutives in Chinoulan Hakka¹⁷

a. CV:

tʃa	a	‘umbrella’
ki	i	‘saw (n)’
vu	u	‘taro’
to	o	‘knife’

b. CVG

kay	i	‘chicken’
hay	i	‘shoe’
t ^h oy	i	‘ladder’
paw	u	‘steamed bun’

c. CVN

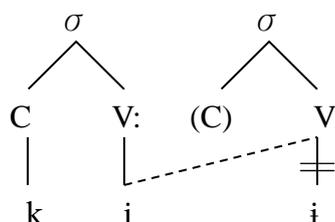
lam	m̩	‘basket’
ten	n̩	‘stool’
kiaŋ	n̩	‘mirror’

d. CVO

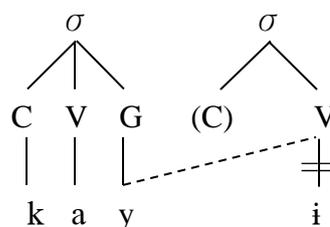
ap	bi	‘duck’
tset	di	‘thief’
kak	gi	‘grid’

Diminutives in Chinoulan are created by bases plus a syllabic diminutive suffix (a nominalization marker). Close investigation of (16) reveals that the diminutive suffixes can be V or CV. The former occurs when bases are closed by sonorants (i.e. CV:, CVG and CVN), while the latter appears when bases are ended with oral stops. It can be assumed that all diminutive suffixes take the shape of (C)V, and the underlying vowel in the suffix is /i/. Only sonorants can be spread into the syllable nucleus and replace /i/, as in (17a-c). Unable to be syllable nuclei, obstruents in (16d) can only be spread into the syllable onset, as in (17d).

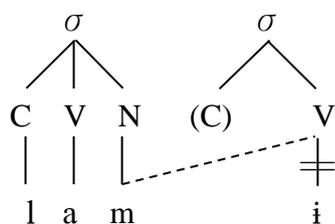
(17) a. CV:



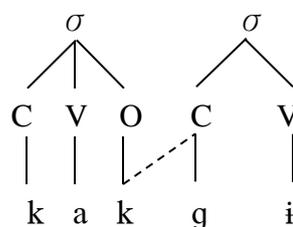
b. CVG



c. CVN



d. CVO



In a word, VN is superior to Vk because of the sonority difference between nasals and obstruents. The sonority difference is also reflected in the property of *the*

¹⁷ The diminutive tones, either 55 or 5, are ignored because of their irrelevance to the discussion.

emergence of the unmarked and in the different phonological behavior when diminutives are formed.¹⁸

4. Middle-GSI as the transitional stage

It is time to go back to the status of middle-GSI. Among all stages in (6), none can cover middle-GSI. What role does middle-GSI play in the development of glottalized diminutives in southeastern Chinese dialects? Should it be viewed as a special case in the development of glottalized diminutives? Or should it be regarded as a developmental stage, and be placed somewhere in (6)?

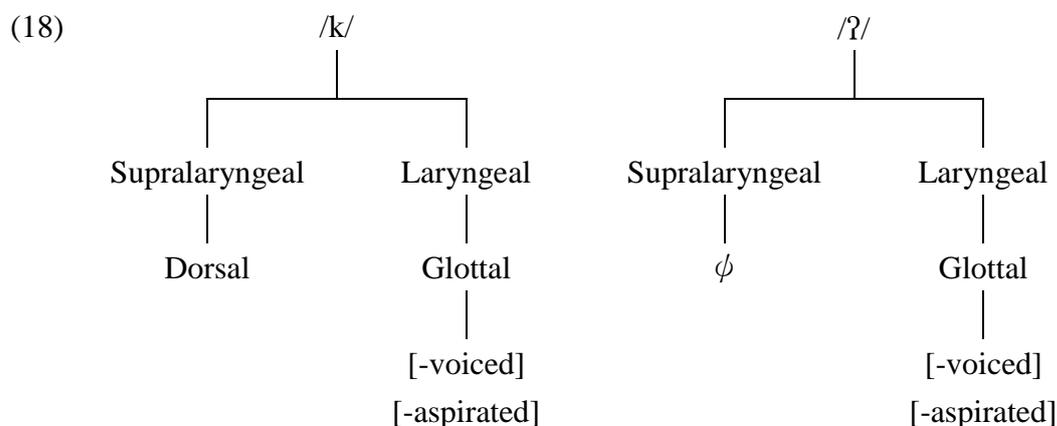
Even though not covered by any stages in (6), middle-GSI diminutives are widely observed in Gutian (Xiang 2002), Yongkang (Cao 2001) and dialects in YBTH. Hence, the existence of middle-GSI should not be viewed as being accidental; in contrast, it ought to occupy a significant position in the development of glottalized diminutives. As a matter of fact, instead of *CVk, middle-GSI can and should be regarded as the transitional stage in (6).

The insertion of a glottal stop breaks the contiguity of the bases and gives rise to middle-GSI diminutives, and this is a “bizarre” linguistic phenomenon in Chinese phonology. However, if (6) is given careful consideration, the occurrence of middle-GSI will turn out to be plausible. The affixational suffix /kian/ attaches itself to the bases. If /kian/ is reduced to a single consonant /k/, and must be merged into the bases, then *CVk should emerge. However, previous discussion precludes the emergence of *CVk. In such a way, middle-GSI can function as the transitional stage in view of the following points.

First, /k/ and /ʔ/ are phonetically similar. Both of them are voiceless, unaspirated oral stops, but they are different from each other only in the supralaryngeal specifications (Gussenhoven and Jacobs 1998). The former refers to a state of

¹⁸ The difference between CVN and *CVk can also be explored in terms of mora count. “Mora” is a weight unit representing a potential beat, and syllables are represented by the notion of “weight” and thus are measured by mora count. A *heavy* syllable contains two moras whereas a *light* syllable only one. In normal conditions, onsets are weightless, and every vowel is assigned a mora. However, languages differ in their mora count. In languages, like Latin, Classical Greek and English, CVV and CVC are treated as heavy and CV is light. In Lardil and Cahuilla, CVV and CVG are heavy while CVC and CV are light. In other languages (e.g. Yupik), the assignment of moras to codas depends on its context (Hayes 1989, 1994). Not all languages assign moras to codas, and, even though moras are assigned to codas, not every class of sounds receives an equal moraic value. Such an empirical stance can be extended to account for the difference between CVN and *CVk. It can be assumed that moras are assigned to nasals, but not to obstruents, in diminutives in southeastern Chinese dialects. As a result, CVN contains two moras, consistent with the widely accepted assumption that every Chinese syllable is heavy (i.e. two moras). However, the claim that CVN contains two moras is contrary to that of Duanmu (1990), who claims that CVG, CVN and CVʔ in Wu dialects should be treated as CV^G, CV^N and CV^ʔ, and are light. Yet, it can be assumed that, after the morphological “merger”, diminutives tend to show the unmarked structures.

articulation, while the latter is a phonation status. Their difference is schematically shown in (18).



When /k/ is articulated, the back of the tongue is raised so that it touches the velum. There is an overt place of articulation in the oral cavity (i.e. dorsal). However, except for the sudden closure of the glottis, there is no overt supralaryngeal specification in the production of /ʔ/.¹⁹

Second, if middle-GSI diminutives are derived from a base plus /kian/ or /kĩ/, then, following the SDP, it becomes reasonable that /ʔ/ (which is similar to /k/) still remains as the onset. This gives rise to an apparent question, however. If this assumption is on the right track, then diminutives ought to be CVkV, CVkG and CVkN, rather than CVʔV, CVʔG and CVʔN. The groups formed by /k/ and /ʔ/ are different because of their distinct supralaryngeal specifications. If CVkV, CVkG and CVkN are derived as diminutives, they will be pronounced like two syllables, for /k/ has an overt and concrete place of articulation (i.e. dorsal). However, because /ʔ/ is not specified for place of articulation in the supralaryngeal cavity and represents a state of phonation, the transition of the two syllables will be short and rapid. In other words, after the first syllable in middle-GSI is articulated, a phonation caused by the glottal stop occurs. During the phonation, it is possible to suddenly close the glottis, hold that closure briefly and then suddenly allow the vocal folds to vibrate again. As compared with /k/, /ʔ/ in middle-GSI not only helps maintain a two-syllable structure, but also helps the two syllables in it integrate more tightly.²⁰ Probably, this is the reason why, in the

¹⁹ For more details of the relation between place of articulation and feature specification, please see Lombardi (2001) and de Lacy (2006).

²⁰ Most literature points out that the inserted sound in middle-GSI is a glottal stop. Zhu (2004a, 2006), based on his collected acoustic data, argues that it is not a glottal stop, but a creaky voice that exists in middle-GSI. However, the collected samples are small in their study. To have a full understanding of this question, large-scale collections of acoustic data should be executed. From an articulatory viewpoint, whether it is a glottal stop or a creaky voice causes no difficulties to our assumption, for both of them lack an overt supralaryngeal specification (i.e. no overt place of articulation in the supralaryngeal cavity). The sound without any supralaryngeal specification will, undoubtedly,

next stage (i.e. final-GSI), the contiguity of the bases is maintained. Accordingly, middle-GSI must play a role in syllable simplification.

Third, this phenomenon can also be observed from t-glottalization in some varieties of American and British English. In (19), the oral stop /t/ is reduced to /ʔ/ when it is located in unstressed syllables. In this way, the words can be articulated with a rapid transition between syllables.

(19) T-glottalization (Wolfram and Johnson 1982:18)

‘bottle’	/báʔl/	‘little’	/líʔl/
‘button’	/bʌʔŋ/		

According to the discussion above, middle-GSI should be treated as the transitional stage in the development of glottalized diminutives in southeastern Chinese dialects. The existence of the glottal stop in middle-GSI not only helps maintain a two-syllable structure, but also accelerates the syllable merger between them. It is these two characteristics that establish the transitional status of middle-GSI.

5. Immigration history

If the glottal stop in middle-GSI is highly related to /kiaŋ/ in Min dialects, then there should be some evidence that can show the close relationship between YBTH and Min. Actually, such evidence may be found from the immigration history in Yuebei.

To begin with, as far as the geographic location is concerned, *Yuebei*, surrounded by Jiangxi Province, Hunan Province and Guangxi Province, refers to a region in the northern part of Guangdong Province. The mainstream dialect spoken in this area is Hakka, so this is why the inhabitants in this area bear a close relationship with the ancestors of Hakka. In terms of the immigration history, between the Tang Dynasty and the Ming Dynasty, most inhabitants of northern Guangdong emigrated from central and southern Jiangxi, through western Fujian, then to northern Guangdong in order to escape wars and famines.²¹

According to Zhuang (2004b), during the period of the South Song Dynasty, most people moved out of this area on account of wars. From then on, a lack of manpower inhibited economic development in this area. Until the middle period of the Ming

promote the agglutination of the syllables in middle-GSI diminutives. Another related question is that, if the inserted sound is a creaky voice, the relationship between the glottal stop and high DTs ought to be revised. High DTs may not be correlated with the glottal stop, but with other related factors, such as intimacy, smallness and so on (Zhu 2004b).

²¹ For details about the immigration history, please refer to Wen and Wen (2003) and Zhuang (1999).

Dynasty, greater numbers of people moved into the Yuebei area from Fujian and Jiangxi, with more people from the former than from the latter. Among the people who emigrated from Fujian to northern Guangdong, the Hakka people took a high percentage. This is why many Hakka people in Yuebei think that their ancestors came from Fujian, and view Fujian as their hometown (Zhuang 2004b). If Hakka ancestors moved from western Fujian into northern Guangdong, what influence did they bring to languages in this area? According to Chen (1997), the Hakka and Min peoples are closely related, and such a close relationship is directly reflected in the pedigrees of Hakka people. Li (1995) and Zhuang (1997, 1998) also emphasized the close relationship between Min and Hakka dialects in terms of word similarities. This linguistic phenomenon can be clearly seen on the basis of the examples in (20) (Zhuang 2004b:66-67).

(20) Similar words from Hakka (Meixian) and Min (Xiamen) (Tones are skipped.)

Meixian	Xiamen	Gloss	Meixian	Xiamen	Gloss
ha pai	e pai	‘next time’	p ^h u	p ^h u	‘unclear’
ts ^h iu sui	siu tsui	‘swim’	lan si	lan si	‘lazy’
ts ^h un	ts ^h un	‘to stretch’	mɔ p ^h u	bo p ^h ɔ	‘unreasonable’
siuk	sik	‘ripe’	ɔi	ai	‘want to’
k ^h ut	k ^h ut	‘bald’	t ^h eu kɔn	tau kuã	‘dried bean curd’

From (20), it is clear that Min and Hakka are closely related. If so, then the assumption that the glottal stop in YBTH diminutives is a reduced form of /kian/ is also possible. The immigration history and the linguistic similarities in words, no doubt, strengthen our assumption.²²

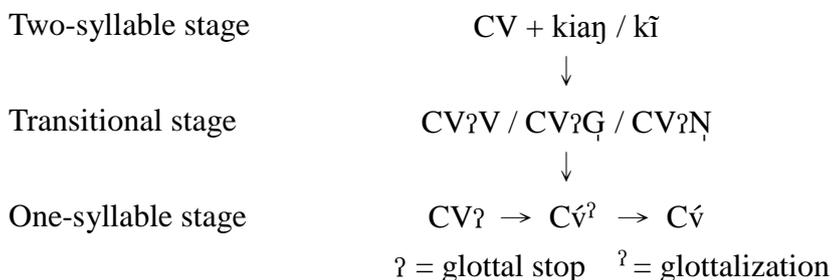
6. Conclusion

Accordingly, middle-GSI in YBTH should be the transitional stage in the development of glottalized diminutives, rather than the imaginary stage *CVk proposed by Chen (1992a, 1999). /k/ and /ʔ/ are phonetically similar, except that the glottal stop lacks an overt supralaryngeal specification. Such a characteristic is beneficial to the agglutination of the two syllables in middle-GSI (Cheng 2006). As a

²² Anonymous reviewers point out that other dialects, such as Wu, Yue and Gan, also show a close relationship to Min, and some of the items in (20) can also be found in other dialects. As stated in Z. Zhang (2000), the relationship between Min and its neighboring dialects is complicated, resulting from the special geographic location and historical development of Min. For this reason, indicating an exactly direct relationship between two dialects is not always easy, and awaits further investigation and comparison. However, the statement made in this study is merely to indicate that our assumption is still on the right track, based on the immigration history.

result, the development of glottalized diminutives can be schematically shown as (21).

(21) The Development of Glottalized Diminutives



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喉塞音在喉塞化小稱發展中的中介角色

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本文探討喉塞音在漢語東南方言喉塞化小稱發展中的角色。文章一開始先回顧東南方言二類常見的小稱在歷史發展上的異同，特別著重在中介階段 CVN 與 *CVk 的討論上。其次，從吳、閩語的語料探討 *CVk 這個中介階段是否存在，並從響度及無標浮現的角度比較 CVN 與 *CVk 的相異之處。接著，由於喉塞音特殊的發音特質及出現位置，本文主張中塞式小稱詞應為喉塞化小稱發展過程中的中介階段。最後，從移民史的角度出發，說明我們的論點是有其歷史根據的。

關鍵詞：小稱、喉塞音、喉塞化、閩、吳