



TONE MORPHEMES IN SINITIC: where prosody meets morphology

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Abstract

Sinitic languages, under the umbrella term of ‘Chinese’, are typically celebrated as isolating languages *par excellence*. They are generally described as lacking inflectional morphology while derivational morphology is minimal, the main processes used in word formation being affixation, compounding and reduplication. This view has been further reinforced in work over the last decades on diachronic change, for example, Bybee et al (1994: 118), Bisang (2009) and Ansaldi et al (2018), who uphold the view that little phonetic erosion, if any at all, accompanies grammaticalization in Chinese languages. Innumerable studies based on fieldwork data show otherwise.

This paper will examine one of the endpoints of phonological processes involved in the evolution of grammatical categories that lead to the creation of purely suprasegmental morphology, namely tone morphemes, considered as cases of nonlinear morphology in Bickel & Nichols (2007) and also in Lamarre (2011, 2015a, 2015b) and Arcodia (2013, 2015). The diachronic development responsible for tone morphemes initially involves phonetic reduction of unstressed grammatical morphemes, fusion with the stem they modify, and formation of a new tone contour, to the eventual point of complete loss of segmental material. In the final stage, only the new tone value remains to code the original grammatical function.

Tone morphemes are used in the coding of a variety of grammatical functions in Sinitic languages, such as the plural formation of personal pronouns, the diminutive forms of nouns, as well as different kinds of perfective and completive aspect marking which are reported for dialects located in non-contiguous areas of China in the north and the south. For verbal morphology, it will be shown that there are different processes and stages of evolution evident between the Yue dialects and Hakka dialects, on the one hand, and Northern Sinitic on the other. A pathway of evolution for pluralization of Sinitic pronouns by a tone morpheme, as well as another for the coding of perfective aspect in Yue and Hakka are respectively proposed in this analysis.

Keywords : tone morpheme, tone change, sandhi, morphologization, plural pronouns, diminutives, verbal morphology, Yue, Hakka, Sinitic

1. Introduction

Word-formative affixes are overwhelmingly suffixes in modern Sinitic languages. They are used as noun markers and to nominalize, to form diminutives, to code aspectual meanings when attached to verbs, if not to derive verbs from nouns. In Standard Mandarin, there are more than twenty different suffixes, and most are productively used to derive these different classes of words; see Chao (1968), Kratochvil (1968), Li and Thompson (1981) and Packard (1998).

It has become an *idée fixe* in linguistic typology that Chinese is the best exemplar of an isolating language due to its allegedly inflexible morpheme boundaries, an idea which has lingered on for several centuries. Despite this view, more and more data have come to light on the use of non-linear processes to signal not only derivation but also something akin to a fledgling inflectional system for aspect. These findings are doubtlessly due to the study of Sinitic languages other than the standard language, Mandarin (*pǔtōnghuà*). See, for example, Wang (2014), Jiang (2000), Lamarre (2011, 2015a, 2015b) and Arcodia (2013, 2015) as pioneering works in this domain, among many other dialect studies on morphologization involving rhoticization, syllable nucleus ablaut on verb stems and tone change, if not combinations thereof, linked in particular with the coding of verbal aspect in the Sinitic languages of Northern China.

The process of morphologization under examination in this article refers to the development of new bound morphology from existing morphemes, which begin as free, independent words, then may undergo change to distributionally more restricted clitics and from there may further evolve to become bound forms such as affixes (Zwicky 1985, Joseph 2003). By analogy with grammaticalization processes, ‘morphologization’ refers to the development of new morphology from existing morphemes.

Figure 1: The process of morphologization

content word > grammatical word > clitic > inflectional affix

(Hopper & Traugott 1993 :7)

According to Heine & Kuteva (2007), the parameters for grammaticalization usually take place in the order of: (i) pragmatic extension, (ii) desemanticization, (iii) decategorialization and (iv) erosion. In this respect, the parameter of erosion is claimed

to be rare for Chinese language,s as opposed to the more readily identifiable parameters of extension, desemanticization and decategorialization.

With reference to Chinese, Bybee et al. (1994) uphold the view on the stability of isolating languages, pointing out that

“in some languages grammaticization does not proceed as far as it does in others. In particular, isolating languages do not carry grammaticization as far as fusional or agglutinating languages do. Not only do they do not affix, they also do not have grams with meaning as abstract and generalized as synthetic languages do.” (Bybee et al.,1994: 118)

A similar standpoint is prominent in specific research on East and Southeast Asian languages with respect to the notion of limited coevolution of form and meaning, as in Ansaldo, Bisang & Piu (2018) too, who maintain that

“tone systems and the discreteness of syllable boundaries in EMSEA languages contribute to the relative morphophonological stability of grammaticalized items in these languages.” (Ansaldo, Bisang & Szeto, 2018: 225) (EMSEA = *East and Mainland Southeast Asian – HMC*)

The authors, furthermore, uphold the view that if erosion takes place, it mainly affects syllable duration and possibly vowel qualities (Ansaldo & Lim 2004). These claims do not appear to take into account research over the past three decades on the morphology of Sinitic languages, particularly the findings of fieldwork-based studies which have opened up a vast new field of scholarship on these very topics of tone change with grammatical functions. Quite to the contrary, the processes of grammaticalization and morphologization do involve many different kinds of phonetic reduction which erode morpheme boundaries, create new syllable templates and even new tone values.

Lamarre (2011, 2015a, 2015b) and Arcodia (2013, 2015) have effectively argued against these views, discussing fusion of aspect suffixes and tone change for Northern Mandarin as well as the Jin dialects, while Chen & Wu (2015) have examined the same kind of phenomena in Southern Min. Numerous articles on Chinese languages are cited in the following sections which similarly attest to these different kinds of morphological processes, notably Gan Yu'en (2001, 2002, 2012) for Yue dialects, Liu & Zhao (2007) and Wang Guiliang (2014) for surveys on this topic.

In this respect, we can only agree with Bybee et al (1994: 110) who separately point out that grammatical categories (grams) are ‘more prone to coarticulation with other phonetic material in the environment’, a feature which is entirely applicable to Sinitic languages. Section 3 below discusses further examples which are complementary to those treated in the references cited above on Sinitic. According to Heine & Kuteva (2007:43), the *kinds of erosion* include the following, potentially also combinations thereof:

- (i) loss of segments including loss of full syllables
- (ii) loss of suprasegmental properties such as stress, tone, or intonation
- (iii) loss of phonetic autonomy and adaptation to adjacent phonetic units

These are precisely the processes leading to the creation of portmanteaux morphemes in Sinitic due to the loss of phonetic substance of a grammatical morpheme and its coalescence with the form it modifies (its head).

Let us consider some straightforward examples first of all of fusion showing that Sinitic is not exotic in any way, through being spared from the process of fusion, as has been supposed in much of the literature on typology. In an increasingly grammaticalized function, prepositions may fuse with the generic pronouns ‘person, someone’ they govern, one example being the marker which introduces an indefinite agent in Sinitic passive constructions. In the Taiwanese Southern Min example in (1), *lang*⁵ is a generic pronoun ‘person, people, someone’ which fuses with the preceding passive marker *hou*⁷. Pace Ansaldi et al (2018: 225) this creates an alternative form that occurs in the natural flow of speech:

- (1) Taiwanese *hou*⁷ passive with contracted agent NP:
*hong*⁵ < *hou*⁷ *lang*⁵ 與儂 ‘by someone’ (agent marker of the passive)

*tng*⁵-*lai*⁵ *toh*⁸ *hong*⁵ *phah*⁴ *kah*⁴ *beh*⁴ *si*³.
 return then PASS hit EXT want die
 ‘[When I] returned home, I really got a terrible beating [from my parents].’
 轉來著與儂拍甲欲死。 (J 142, *Author’s text*)

As a directional verb, *khɿ³laɿ⁰* ‘movement upwards towards the speaker’ in Hui’an Southern Min shows several stages of phonetic erosion in the form of tone reduction and fusion in progress. The following example shows that *khɿ³laɿ⁰* may undergo tone reduction to a ‘light’ or ‘neutral’ tone, *khɿ⁰-laɿ⁰*, and in a further stage has a fused form, *khaɿ⁰*:

(2) Hui'an Southern Min directional verb

puã¹ kɦi³-la⁰/kɦi⁰-la⁰ /kɦa⁰ lau²⁻⁴tiŋ³

move up-come upstairs

‘Carry (it) upstairs.’ (Chen & Wu 2015)

搬起来楼顶。

Chen & Wu (2015) explain that when speakers use the inchoative aspect marker, the fused form, *kɦa⁰ < kɦi³-la⁰* 起来 is obligatory. This conforms with the distinct grammatical function of *kɦi³-la⁰* 起来, reflecting a more highly grammaticalized stage than its directional use.

(3) Hui'an Southern Min inchoative aspect

tua⁵ kɦa⁰ lɔ⁰

big INCH SFP

‘It is getting bigger now.’

The same processes of contraction apply equally to negative adverbs which fuse to differing degrees with their neighbouring modal morphemes in a large number of Sinitic languages, the volitional negatives showing transparent sources in ‘not want’ : In Southern Min (Taiwanese variety) and Meixian Hakka, the negative adverb has an [m-] initial which fuses with the verb ‘want’ 爱, whereas in Suzhou Wu and Standard Mandarin, distinct negative adverbs combine with cognates of a different verb form for ‘want’ 要, retaining the possibility of using the full forms :

Table 1: Negative imperative adverbs in some Sinitic languages

Taiwanese Southern Min	Meixian Hakka	Suzhou Wu	Standard Mandarin
[mai ³¹]莫 < m ³³ -ai ³¹ NEG-want 毋爱	[moi ⁵²] ~ [m ¹¹ oi ⁵²] 唔爱	[fiæ ⁵¹³] 𪛗 ~ fə ⁷⁵ -iao ⁵¹³ 勿要	[pie ³⁵ 别] ~ [pu ³⁵ iau ⁴¹] 不要

These are just a few of the countless examples of this kind of ‘negative attraction’ in Sinitic languages and dialects (see also Chappell 2019 : 210). Another illustration of a further type of fusion is found in Hakka dialects which typically have a special portmanteau genitive form for pronominal possessors in the singular series.

Table 2: Meixian Hakka pronouns

	Nom/Acc	Genitive
1SG	ŋai ¹¹	ŋa ⁴⁴ ‘my’
2SG	ŋi ¹¹	ŋie ⁴⁴ ‘your’
3SG	ki ¹¹	kie ⁴⁴ ‘his/her’

(Data from Xie 1994:298)

Such examples are commonplace in Sinitic and militate against the view of discrete syllable boundaries that pre-empt the creation of sub-syllabic morphemes.

Returning to the affix stage on the cline in Figure 1, Joseph (2003) treats the morphologization it exemplifies as a form of ‘desyntactization’ or ‘morphologization from above’ which has its source in free syntactic words as opposed to ‘morphologization from below’ which arises from phonological elements, a case in point being the well-known umlaut rule of plural formation in the history of Germanic languages. The Sinitic data are one such a case of morphologization from above.

Phonological tone sandhi involves a change in pitch and contour conditioned by features of context, whereas morphologically-conditioned tone is also attested in Sinitic languages, in which the modified tone value signals grammatical meaning. Its function is equivalent to processes of derivation and inflection in other, unrelated language families. Note that the latter is generally called ‘tone change’ to distinguish it from tone sandhi.

The aim of this paper is thus to provide a brief survey and interpretation of the nature and distribution of this phenomenon of tone change, by examining pluralization of personal pronouns, and verbal aspect, the latter for the Yue dialects. The areal distribution of tone change will also be taken into account, since it is much more widespread than previously believed and shows a clear division in its type between northern versus central and southeastern China.

2. Tones, tone sandhi and tone change

Sinitic languages, certain of the Tibeto-Burman languages, as well as a majority of Southeast Asian languages in the Kra-Dai and Hmong-Mien language families share the feature of lexical tone systems. Phonetically, Matisoff (1989, 2000 : 86) has described tone systems in this linguistic area as involving a bundle of features, including phonation type, pharyngeal tension, relative pitch and contour, labelling the tone-prone Southeast Asian languages as ‘omnisyllabic’.

The following two examples show the contrast between a omnisyllabic system of phonation types in Sgaw Karén, a Tibeto-Burman language spoken in Moulmein, Myanmar and the purely modal system of Standard Mandarin, based on the Beijing

variety. Sgaw Karén has a six-tone system incorporating the three phonation features of breathy, creaky and murmured voice, whereas Mandarin has four citation tones and plain phonation. The examples below provide an illustration of the well-described phenomenon of lexical tone, whereby different meanings of the same segmental syllable are distinguished solely by tone :¹

(4)	<i>Moulmein Sgaw Karén</i>	(Karenic, Tibeto-Burman, Burma and Thailand)
1.	[kɔ ⁴⁴] =	‘difficult’ high level, plain
2.	[kɔ ³¹] =	‘country’ falling contour, breathy
3.	[kɔ ²¹] =	‘throat’ low falling contour, creaky
4.	[kɔ ³⁷] =	‘call out’ mid-level, glottalized
5.	[kɔ ⁵⁷] =	‘gossip’ high pitch, glottalized
6.	[kɔ ¹¹] =	‘withhold’ low pitch, murmured
	<i>(Author’s data)</i>	

(5)	<i>Mandarin Chinese</i>	(Sinitic, Northern China)
1.	[ɕien ⁵⁵] 鲜	‘fresh’ high level
2.	[ɕien ³⁵] 咸	‘salty’, high rising
3.	[ɕien ²¹⁴] 险	‘danger’, dipping & rising
4.	[ɕien ⁵¹] 县	‘a county’ high falling

2.1. Tone sandhi

Hand-in-glove with tone systems is the prosodic phenomenon of tone sandhi, whereby tonal values change in the context of speech, due to the ‘environmental’ influence from the tonal value of a preceding or a following syllable, the precise features depending on the particular language.

A major tone sandhi belt in China extends across Central and Southeastern China, including many of the Wu and Min dialects, where the tone sandhi is much more complex (see Chen 2000). For instance, in Taiwanese Southern Min, the final syllable in the word, phrase or clause remains in its citation tone, while preceding syllables undergo tone sandhi. The basic system is illustrated by Table 3 below, in which the citation tone values are given in regular script and the sandhi values for context tones, in italics:

¹ The general practice in Chinese linguistics is to use Chao Yuen Ren’s relative pitch scale for tone values of 1 to 5, 5 being the highest. See Chao (1930).

Table 3: Taiwanese Southern Min tone system (Northern variety)

Register	Level tone	Rising tone	Falling tone	Entering tone
Upper	<i>yīnpíng</i> 阴平 55 33 <i>su⁵⁵</i> 書 ‘book’	<i>shǎngshēng</i> 上声 51 55 <i>su⁵¹</i> 使 ‘to cause’	<i>yīnqù</i> 阴去 21 51 <i>su²¹</i> 思 ‘be anxious’	<i>yīnrù</i> 阴入 2 5 <i>su²</i> 率 ‘to lead’
Lower	<i>yángpíng</i> 阳平 25 21/33 <i>su²⁵</i> 詞 ‘an expression’		<i>yángqù</i> 阳去 33 21 <i>su³³</i> 事 ‘business’	<i>yánggrù</i> 阳入 5 2 <i>su⁵</i> 述 ‘to recite’

(Data adapted from Chappell & Lien 2011; Chappell 2019)

The next examples show tone sandhi in action in different tone units with nominal and verbal phrases for the Xiamen dialect of Southern Min, closely related to Taiwanese variety:

(6) Southern Min tone sandhi

<i>tsin⁴⁴</i> <i>p^hai⁴⁴</i> 真芳 ‘very fragrant’	<i>p^hai²²</i> <i>tsu⁵³</i> 芳水 ‘perfume’
<i>k^hi⁵³</i> <i>ts^hu²¹</i> 起厝 ‘build a house’	<i>ts^hu⁵³</i> <i>ti⁵³</i> 厝顶 ‘roof’
<i>pak⁴</i> <i>a²²</i> 北鸭 ‘Peking duck’	<i>a²³</i> <i>ni²²</i> 鸭卵 ‘duck egg’

pai²¹ *hoi⁴⁴-ts^he⁴⁴* 放狂差 → *pai⁵³* *hoi²²-ts^he⁴⁴*
‘to fly a kite’

(Data adapted from Chen 2000:432-434)

By comparison, Standard Mandarin has one of the simplest sets of tone sandhi rules. A well-described pattern occurs when two *shǎngshēng* or third tone [214] syllables form a syntactic unit, which can be either a word or a phrase with the first tone in the series changing to a high rising *yángpíng* tone: [li²¹⁴ɕian²¹⁴] > [li³⁵ɕian²¹⁴] 理想 ‘ideal’.

2.2. Tone change and diminutives

Significantly, tone sandhi is distinct from tone change, the focus of this paper. Tone sandhi relies on phonological context for its application and is related to tone units, as the examples above indicate, whereas tone change consistently maps a given meaning to a form. Following Matthews & Yip (2011: 29), we will use the term ‘tone sandhi’ for purely phonological processes, such as those just described, and ‘tone change’ for morphological tone, in other words, tones which code grammatical meaning.

In Sinitic, diminutives are commonly coded by suffixes on the noun, as for Standard Mandarin suffixes [ʃ̯] < [ʃ̯]³⁵ 兒(儿) and [tsɿ] < [tsɿ]²¹⁴ 子, both meaning ‘son’, ‘child’, or derived from a syllable with a nasal initial in many Wu dialects, *ni̯e ~ ni̯i ~ n̩ ~ n̩* (Cao 2001), whose source is also in the etymon 兒, while in the Min dialects, the suffix is derived from *kian*⁵³ 囡, similarly meaning ‘son’, ‘child’. These represent the three main etymons in Sinitic, the source being a common one cross-linguistically for diminutives (see Heine et al 1991: 79-88).

A first example of a highly reduced form comes from the Ningbo Wu dialect in which tone change, accompanied by the feature of constricted glottis, forms the diminutive. Chen (1999a) argues that the tone morpheme 35 has most likely arisen from a lost segmental morpheme for ‘child’

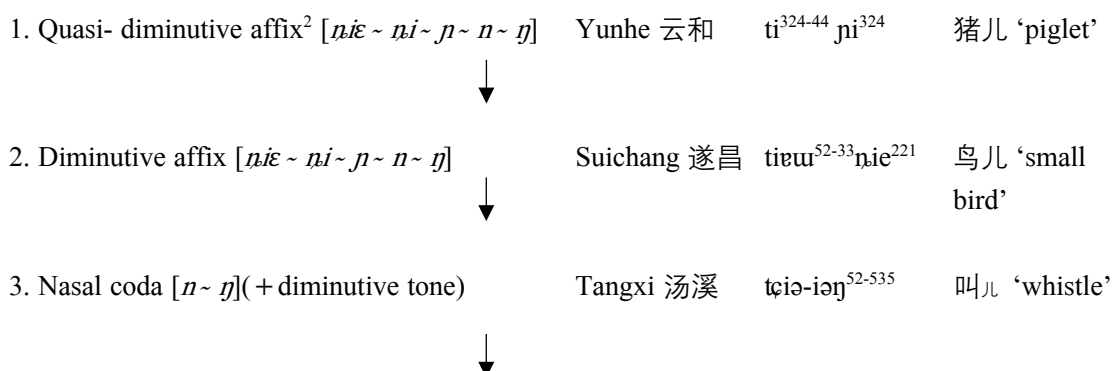
Table 4: Ningbo Wu 宁波话 diminutive tone change

Gloss		Basic form	Diminutive form
‘chicken’	鸡	<i>tɕi</i> ⁵³	<i>tɕi</i> ³⁵
‘pig’	猪	<i>tsɿ</i> ⁵³	<i>tsɿ</i> ³⁵
‘shrimp’	虾	<i>ho</i> ⁵³	<i>ho</i> ³⁵

Adapted from Chen (1999a)

Cao (2001) presents a more detailed description of diminutive formation in Southern Wu dialects. Figure 2 is an adaptation from Cao’s Figure 1 (2001 :43, my translations) and shows the pathway he has proposed for the evolution of the diminutive tone from a fully syllabic morpheme, ‘son’, that has a nasal initial, to a purely tonal morpheme [55], such as in Qingyuan 庆元:

Figure 2 : Evolution pathway for diminutive tone in Southern Wu dialects



² Cao (2001 :33) explains that the Yunhe nasal suffix is a quasi-diminutive as it only expresses ‘smallness’ and has no affective meanings. According to the same author, the character for the diminutive suffix in the Chinese gloss is in its regular size, 儿, if it represents a separate syllable, and in reduced size, 儿, when it has merged with the preceding syllable.

4. Nasalisation (+ diminutive tone)	Jinhua 金华	tɕioŋ-iō ⁴⁰⁻⁵⁵	竹儿 ‘bamboo’
		↓	
5. Diminutive tone	Qingyuan 庆元	ʔdɛu ³³⁴⁻⁵⁵	刀儿 ‘small ‘knife’

The Wu data may be usefully compared with a continuum of the Min diminutive suffixes from the full form *kiaŋ* ‘son’, ‘child’ in Fuzhou to increasingly reduced forms, perceived in the following example for ‘morning sickness’ 病困, adapted for this purpose from Chen (1999b: 80, — *no tonal values provided by Chen*):

Table 5: The diminutive forms for ‘morning sickness’, 病困, in the Min dialects, Fujian province

Fuzhou 福州	Jianyang 建阳	Xiamen 厦门	Zhangzhou 漳州	Datian 大田	Quanzhou 泉州	Putian 莆田
paŋ kian	paŋ kyeiŋ	pī kiā	pē kiā	pā kiā	pī kā	pa ya

Putian is one of the coastal Min groups and it clearly shows the greatest reduction to -*ya* but not to a single tone morpheme, nor to a monosyllabic word.

In Cantonese Yue, by contrast, the citation tone of the stem becomes a high rising tone, although like Ningbo Wu but unlike Min, the intermediate stages are not easy to trace from what must have been an earlier segmental morpheme meaning ‘child’ or ‘son’. The diminutive tone change is detectable on certain low tone syllables and it produces a high rising tone: 25 or 35, the pitch contour depending on the variety. We use the notation [^{T*}] in the examples below, where ‘T’ stands for the citation tone, while the asterisk ‘*’ denotes that the syllable undergoes tonal change. It apparently does not affect the High Level tone and evidently cannot be readily detected if the original tone is High Rising itself, that is, 25. The basic diminutive sense is evident in the following examples which refer to, in the main, small, round objects. Despite this, there is a large number of compounds, reduplicated forms and other expressions which also show this tone change, yet whose resultant meaning is not a diminutive form (Matthews & Yip 2011:29-33). The data are taken from Jurafsky (1988).

(7)

(i) **Fruit and vegetables (small, round):**

[ts^ha:ŋ^{21*}] 橙 ‘orange’, [lei^{23*}] 李 ‘plum’, [t^hou^{21*}] 桃 ‘peach’, [k^hɛ^{21*}] 茄 ‘eggplant’, [ka:i³³la:n^{21*}] 芥蘭 ‘Chinese broccoli’, but not for [pɔ⁵⁵lɔ²¹] 菠萝 ‘pineapple’ as Jurafsky observes.

(ii) **Small-sized edible seafood:**

[ts^hoŋ⁵⁵jy²¹*] 鯧魚 ‘pomfret (kind of fish)’, [jɐu²¹jy²¹*] 魷魚 ‘squid’, [p^haŋ²¹k^hei²¹*] 蟹 ‘land crab’ but not for [ŋɔk¹¹jy²¹] 鱷魚 ‘crocodile’ or [k^hiŋ²¹jy²¹] 鯨魚 ‘whale’

The origin of this tone change is claimed to be a segmental affix that has undergone attrition: *tsaɿ*²⁵ 仔 ‘child’ (Chen 1999a).

Diminutives have been comprehensively investigated for Sinitic and, for this reason, only a brief sketch of the formation processes is given here. The distribution of morphological types for the diminutive suffix is provided in Map 53 (Cao 2008, Vol.3) with Yue, Gan and Wu dialect groups showing the highest incidence in use of tone change or tone change in combination with rhyme change.

2.3. Tone change studies

Apart from the tone-prone Mainland Southeast Asian languages, morphological and morphosyntactic tone is found in Africa, in particularly the Bantu languages (Hyman 2018) and in the Otomanguean languages of Central America (Palancar 2016). This process comes under various names such as ‘tonal compensation’ and ‘cheshirization’, the latter being a term coined by Matisoff (1991) to refer more comprehensively to the attrition of segmental phonemes to the point where only a mere trace of their former phonetic substance remains, namely the tone.³

Tone change is treated as a ‘floating tone’ in autosegmental phonology by Bao (1999), morphophonemic tone by Ratliff (1992), ‘alternation tonale’ in Lamarre (2015b), ‘relational tone’ by Palancar & Léonard (2016) or simply as a ‘tonal morpheme’ or ‘tonal affix’ by Hyman (2016)⁴. As foreshadowed above, in this analysis, we will use ‘tone change’ to denote the process and ‘tone morpheme’ for the combined phonetic and semantic value.

Tone morphemes have not been comprehensively investigated for Southeast Asian languages, let alone for Sinitic, Ratliff’s research on Hmongic being an exception (Ratliff 1992). There is nonetheless a sufficient number of studies available on individual Sinitic languages and dialects which can cumulatively attest to its widespread nature in certain areas of China, where it applies to different grammatical categories.⁵ Tone morphemes can function in various domains to form the plural and possessive pronouns, distal, medial and proximal distinctions on demonstrative pronouns (Chen

³ Based on the character of the Cheshire cat in *Alice in Wonderland*.

⁴ Palancar (2016) also makes a further distinction between ‘morphological’ and ‘morphosyntactic tone’ for Oto-Manguean languages which is not relevant to the Sinitic type and will not be further discussed here.

⁵ Note that most of these publications appear in Chinese journals.

2010, Gan 2001), bare classifiers (Wang 2015), the diminutive, on fledgling inflectional markers for realis and perfective aspects in defined micro-areas of China, nominalization, not to overlook special polysyllabic tone patterns for reduplication of verbs to code delimitative and conative meanings, or approximation and intensification for reduplicated adjectives.

3. Emergence of tone morphemes in Sinitic in two grammatical functions

In the following sections, we will consider tone morphemes used in the pluralization of personal pronouns, and in the coding of verbal aspect in central and southeastern China.

3.1. Pluralization of pronouns

Any general description for the person pronominal systems in Chinese languages may observe that the singular form is commonly the base to which a plural suffix is added, as in Mandarin: *-mən* in *nǐmən* ‘2PL’ (< *nǐ* ‘2sg’ + *-mən*) or *-li* in Xinhua Xiang: *tɕɿ²¹li* ‘3PL’ (*tɕɿ²¹* ‘3SG’ + *-li*) (Wu 2005:121). Less well-known is the large number of Sinitic pronominal systems that make use of fused plural forms. These are not sporadic examples but quite regular patterns for pronouns in Sinitic languages which involve syllable reduction and fusion. For example, in many Min, Yue and Pinghua varieties, the forms are truly portmanteaux, while the source for the plural marker may often remain obscure without the aid of internal reconstruction.

To take a first example, fused plural forms in Southern Min dialects generally have a coda [-n] as in Taiwanese and Xiamen, as in Table 6.

Table 6: Taiwanese (Southern Min) 台湾闽南话 personal pronouns

	Singular		Plural	
1.	gua ²	我	gun ² lan ² (inclusive)	阮咱
2.	li ²	汝	lin ²	恁
3.	i ¹	伊	in ¹	伊 因

In the related varieties of Penang 檳榔话, Longyan 龙岩话 and Teochew 潮州话 Southern Min, the full form has been retained in the form of analytic plurals, that are clearly segmentable. The suffix can be reconstructed as having its source in *lang⁵* 儂 < ‘person, people’, as in Table 7:

Table 7: Penang Hokkien (Southern Min) 檳城閩南話 personal pronouns

	Singular		Plural	
1.	gua ¹	我	gua ¹ -lan ⁵	我儂
2.	lu ¹	汝	lu ¹ -lan ⁵	汝儂
3.	i ¹	伊	i ¹ -lan ⁵	伊儂

(Author's data)

The Taiwanese Southern Min pronouns thus neatly exemplify all three processes of phonetic erosion adumbrated by Heine & Kuteva (2007), namely, loss of a syllable [lan⁵] and most of its segments, including the suprasegmental feature of tone on the plural morpheme, accompanied by merging with adjacent phonetic units, leaving just a trace in the nasal coda [-n].

Many Yue dialects such as Hong Kong Cantonese use the common pattern of suffixing to create the plural form from the singular : [k^hœi¹³] ‘3SG’ 佢 → [k^hœi¹³-tei²²] ‘3PL’ 佢哋 but not so in the neighbouring Szeyap [Siyi] dialects. A distinct source for the fused plural forms is present in many Yue dialects in which the fused form arises from a combination of the singular form of the pronoun with a [-k] coda, with some changes to the vowel nucleus in 2nd and 3rd person plural pronouns.

Table 8: Szeyap (Siyi) Yue 四邑話 personal pronoun paradigms

	1SG	1PL	2SG	2PL	3SG	3PL
Doumen 斗门镇	ŋɔ ³³	ŋɔk ²¹	nei ³³	niak ²¹	k ^h ui ³³	k ^h iak ²¹
Jiangmen Baisha 江門白沙	ŋai ²³	ŋok ²¹	lei ²³	liok ²¹	k ^h ui ²³	k ^h iok ²¹
Xinhui Huicheng 新會會城	ŋɔ ²³	ŋɔk ²¹	nei ²³	niak ²¹	k ^h ui ²³	k ^h iak ²¹
Xinhui Xiaogang 新會小剛	ŋɔ ²⁴	ŋɔk ²¹	nei ²⁴	niak ²¹	k ^h øy ³³	k ^h iak ²¹
Heshan Hecheng 鶴山鶴城	ŋɔ ³³	ŋɔk ²¹	nei ³³	niək ²¹	k ^h ui ³³	k ^h iek ²¹

Data and table adapted from Gan (2001 :58)

According to the explanation given by Zhang Huiying 張惠英 (2001), the [-k] coda on plural forms is a reduced form of the classifier [-ko] 個. It is first used as a possessive marker on singular pronouns, then later reanalysed as the plural suffix. Since classifiers are regularly used as possessive markers in Yue dialects, this seems at first blush to be a plausible explanation in terms of reanalysis of a morpheme in its given phonetic environment.

Gan Yu'en 甘于恩(2001) does not fully agree with Zhang, however, observing that while the singular form suffixed by the classifier might be the explanation for the 1st person series in Szeyap Yue, it cannot explain 2nd and 3rd person forms which show inflectional processes at work. Although Gan does not provide the details of how these changed rhymes come about, he does go on to suggest that the [-k] coda could have its source in [uk⁵⁵] 屋 'home' and by extension 'family'. Plural suffixes based on the morpheme 'home, family' are not uncommon in Sinitic, such as in the Shanyin dialect 山阴话 (Jin, Shanxi) where 1PL is [ua⁵¹], a contraction of WO JIA 我家 'my family' (Chappell & Li 2016, Wang 2008) and also in the Hongtong dialect of Central Plains Mandarin 洪洞话 (see Table 9 below).

Wen (1999) refers to a similar case found in the personal pronoun paradigm of the Hongtong dialect 洪洞话 whose different plural forms allow reconstruction of the plural suffix as [-tia] 家 'family' on the basis of the 3PL form. By contrast, the 1st and 2nd person plural forms show a greater degree of fusion than 3PL as a result of syllable reduction of [-tia] to just [-a].

Table 9: Hongtong dialect 洪洞话 (Central Plains Mandarin, Shanxi)
personal pronoun paradigm

	1	2	3
SG	ŋo ³³	ni ³³	ŋa ²¹
PL	ŋua ⁴²	ni ⁴²	ŋu ²¹ tia

Data from Wen (1999 :35)

A more thorough-going syllable reduction of a former plural suffix is seen in the Wanrong dialect of Shanxi in which vowel lengthening at the segmental level combines with a high falling tone morpheme of 51, distinct from the level tone of the singular form, 55.

Table 10: Wanrong dialect 万荣话 (Central Plains Mandarin, Shanxi)
personal pronoun paradigm

	1	2	3
SG	ŋɤ ⁵⁵	ni ⁵⁵	t ^h a ⁵⁵
PL	ŋɤ: ⁵¹	ni: ⁵¹	t ^h a: ⁵¹

Data from Wen (1999 :35)

Still more radical cases of reduction in personal pronoun paradigms are found in other dialect groups across China, such as in Guanzhong Mandarin dialects of Shaanxi province (Liu & Zhao 2007 : 228), in the Hunanese Xiang dialects, and in Hakka and Yue. The segmental forms are the same for both the singular and plural

series of pronouns and it is only the distinct tone morpheme on the plural form which can code its meaning. In these cases, it is reasonable to assume that the tone morpheme is a trace of a former ‘cheshirized’ suffix.

For example, in Longhui Xiang, singular and plural differ only in having a high rising tone morpheme 35 on the plural form versus a mid-falling 31 on the singular series:

Table 11: Longhui (Xiang, Hunan) 隆回湘语 personal pronouns

	Singular	Plural
1.	o ³¹	o ³⁵
2.	n ³¹	n ³⁵
3.	tɕi ³¹	tɕi ³⁵

(Data from Wu Yunji 2005:121)

As Wu observes, the plural forms are not easily reconstructible on the basis of the remaining tone morpheme. A comparable situation is found in Heshan, one of the Szeyap group of Yue dialects, and in Shangxian, a Central Plains Mandarin dialect, where the fusion process has similarly reached its endpoint: only a low register tone morpheme signals the plural form of the personal pronouns.

Table 12: Heshan 鹤山话 (Yue, Guangdong) personal pronoun paradigms

	1SG	1PL	2SG	2PL	3SG	3PL
Heshan Yayao 河山雅瑶	ŋɔ ³³	ŋɔ ²¹	nai ³³	nai ²¹	kui ³³	kui ²¹
Heshan Shaping 鹤山沙坪	ŋɔ ³³	ŋɔ ²¹	nei ³³	nei ²¹	ky ³³	ky ²¹

Data from Gan (2001 :59)

Table 13 : Shangxian dialect 商县话 (Central Plains Mandarin, Shaanxi)
personal pronoun paradigm

	1	2	3
SG	ŋɣ ⁵³	ŋi ⁵³	t ^h a ⁵³
PL	ŋɣ ²¹	ŋi ²¹	t ^h a ²¹

Data from Wen (1999:35)

The full circle is achieved in the curious case of Kaiping Yueshan dialect reported in Gan (2001: 59) in which singular and plural pronouns are not distinguished at all, with the plural taking on the singular form.

Table 14 : Kaiping Yueshan dialect 开平月山 (Yue, Guangdong)

personal pronoun paradigm

	1	2	3
SG	ŋɔk ²¹	niɛk ²¹	k ^h iɛk ²¹
PL	ŋɔk ²¹	niɛk ²¹	k ^h iɛk ²¹

Data from Gan (2001:59)

The expanded set for the stages of evolution from the suffixed form to tone change of Sinitic plural pronouns can thus be represented as follows, noting that not all languages and varieties will reach the final stage :

(8) Cycle of plural pronoun evolution

Stage 1 : Free lexical form adopted to express plural meaning : ‘family ~ home’, ‘people’, etc.

Stage 2 : Lexical form morphologizes to a segmentable and bound plural suffix

Stage 3 : Loss of initial consonant of suffix and contraction of suffix to coda – Taiwanese Southern Min [-n] or vowel lengthening of medial as in Wanrong – V:

Stage 4 : Tone change only

Stage 5 : Tone copying by analogizing the value of the singular pronouns, leading to identity of the singular and plural forms

Stage 6 : Renewal of plural form by a new lexical element as the suffix

Felicitously, in a separate publication, Gan (2012:73) describes diffusion of the plural suffix [-tei²²] 哋 into the Szeyap dialects from the dominant Guangfu varieties of Guangzhou and Hong Kong Cantonese, for example, in the Xinhui Huicheng variety 新会会城话, but also further afield in the non-Szeyap Xinxing Tiantang 新兴天堂话 dialect. This suggests one possible solution for the disambiguation of singular and plural forms in this micro-area. Clearly, a new cycle of pronoun evolution begins.⁶

The pronominal paradigms presented in this section can be neatly treated as representing different stages in the process of phonetic erosion of the original suffix. The data confirm, moreover, that plural tone morphemes are not confined to any one particular micro-area in Sinitic.

⁶ For precise details of the formally identical singular and plural pronouns and the use of the borrowed Cantonese suffix -tei²² 哋, the reader is referred to Gan (2001).

3.2. Aspect marking

Since the 1950s a series of studies on quasi-inflectional properties of verb stems has been the subject of much interest (for discussion, see Zhang & Pan 2013, Wang 2014, Li 2016). At issue is both tone change and stem alternations including ablaut for typically the perfective kinds of aspect marking. These processes may also be found with other kinds of telic aspect including completive and resultative types as well as with the durative aspect and certain postverbal complements.

To take one example, in many varieties of Sinitic, a verb combined with its overt aspectual suffix may alternate with a modified verb stem and zero suffix to code the perfective. The focal areas appear to be in Northern China, including several (non-standard) Northern Mandarin dialect groups as well as the Jin branch, in an area that stretches from western Shaanxi to Shanxi, Hebei, Henan and as far east as Shandong (see Shi Youwei 2003, Wang Guiliang 2014, Lamarre 2011, 2015a, 2015b, Arcodia 2013, 2015).

Lamarre (2011, 2015a, 2015b) sets up a classification into four main types of fused verb forms for Northern Sinitic. In addition to stem alternation (change to the rhyme of the syllable), there may also be tone change, a combination of the two (ablaut and tone change) as well as rhoticization of the coda by [ʃ].

- | | | |
|-----|---------|---|
| (9) | Type A: | rhyme change or ablaut [<i>biànyùn</i> 变韵] |
| | Type B: | tone alternation [<i>biàndiào</i> 变调 ; i.e. our tone change] |
| | Type C: | complex forms with rhyme-lengthening and tone contraction |
| | Type D: | rhoticization |

As far as areal distribution is concerned, Lamarre explains that the Type A rhyme change and ablaut is found largely in Henan for Central Plains and non-core Jin dialects. The Type B with tone change alone is found in a discontinuous area for non-standard Mandarin dialects located in central and western Shandong and belonging to the dialect groups of Ji-Lu 冀鲁, Jiao-Liao 胶辽, such as those in Yantai 烟台 and Qingdao 青岛 (see also Wang 2014). The complex Type C with syllable-lengthening of the verb stem and formation of a complex contour tone is found in a highly restricted area of Western Shaanxi province for Central Plains Mandarin, and some dialects in Hebei and Shandong and finally Type D with rhoticization is found in Eastern Shandong. The larger sample of dialects used by Arcodia (2013) essentially overlaps in

distribution with that of Lamarre, although a somewhat different classification is presented.

The exclusive use of the Type B tone change is thus a minority type within Northern Sinitic, compared with the use of widespread verbal ablaut, rhoticization, rhyme lengthening and combinations of these, amongst languages that have been documented with this kind of formative. The rhyme change may create new rhymes (shown by [ɿɛ] , [ɔ] and [iɔ] in the shaded cells in Table 15 below). However, the set of changed rhymes essentially represents a simplified system, as seen in the many-to-one correspondences between the original rhymes (listed between parentheses) in Yancheng and the changed rhymes in **bold font**.

(10) Table 15: Rhyme change syllables in Yancheng (Central Plains Mandarin, Henan)

၂၉ <(၇)>			
၂၉ <(၇)>			
၉ (< an ən ai əi)	၂၉ (< i ian iən iai)	၅၉ (< uan uən uai uəi)	၇၉ (< y yan yən)
၁ (< an əŋ əu əu)	၂၁ (< ian iəŋ iau iəu)	၅၁ (< u uan uəŋ)	၇၁ (< yəŋ)

(Data from Zhang & Pan 2013 :95)

- (11) kei¹³ ŋan³³ nai³³.nai pɔ¹³ kə yʌ¹³
for 1PL grandma wrap.PFV CLF medicine
'Wrapped up a packet of medicine for our grandma.'
给俺奶奶包^D个药。(Zhang & Pan 2013 :97)

Since these processes are well-described in the publications referred to above, just one further example of rhyme change or *biànyùn* 变韵 is provided below from one of the early studies discussing this phenomenon for the Jin dialect of Huojia 获嘉, spoken in Henan province and described in the grammar of He Wei 贺魏 (1989, his example):⁷

- (12) Huojia stem alternation 获嘉方言, (Jin) Henan
- | | |
|--|---|
| 你量 ^o 啥? | 我量 ^o 大米。 |
| ni ^{ʔ3} liarj ³¹ ʂa ¹³ ? | ua ^{ʔ3} liarj ³¹ ta ¹³ mi ⁵³ . |
| 2SG measure.IPFV what | 1SG measure.IPFV husked.rice |
| ‘What are you weighing?’ | ‘I’m weighing rice.’ |

⁷ In these examples, D next to the character script signals that tone change applies and this only with respect to a defined number of grammatical categories, while O indicates the unchanged tone of the stem base.

- | | |
|---|---|
| <p>(13) 你量^D啥?</p> <p>ni^{ʔ3} liʃ³¹ ʂa¹³?</p> <p>2SG measure.PFV what</p> <p>‘What did you weigh?’</p> <p>(Data from He 1989 :58)</p> | <p>我量^D大米</p> <p>ua^{ʔ3} liʃ³¹ ta¹³mi⁵³.</p> <p>1SG measure.PFV husked.rice</p> <p>‘I weighed rice.’</p> |
|---|---|

Although there has been less research on this phenomenon in the central, transitional area of China and in southern Sinitic languages, tone change coding an aspectual distinction is also attested in many Yue dialects including Cantonese and a few Hakka dialects in Guangdong, as well as Hakka and Gan dialects in Jiangxi. Evidently, these areas are totally discontinuous from those described for Northern Sinitic. We now take a look at the situation for Far Southern Sinitic languages, a micro-area which includes Pinghua, Yue and Hakka Chinese.⁸

4. Tone change in the Yue dialects

Attested in more than 35 dialects of the Yue branch of Sinitic, including Hong Kong 香港, Guangzhou 广州 Cantonese, Taishan 台山, Zhongshan 中山, Zengcheng 增城, Shunde 顺德, and Macau 澳门, perfective aspect can be expressed by the use of a high tone morpheme (Bai 1989, Shi 2003, Gan 2012, Wang 2014: 114).

In Hong Kong and Guangzhou Cantonese, the tone change is high rising 35 on the low and mid-level tones, while for the high tone series, in the Guangzhou variety, the high rising and high level tones can be realized by a slight rise or by an extra high pitch value of 55*, and 5* on the high checked tone. The latter may also be accompanied by a slight lengthening of the syllable.

Table 16: Guangzhou Cantonese tone change

<i>Hong Kong Cantonese</i>	<i>Basic verb stem</i>	<i>Gloss</i>	<i>Verb stem + tone change</i>	<i>Gloss</i>
Mid level	høi ³³ 去	‘go’	høi ³⁵	‘went’
Mid checked	fat ³ 發	‘emit’	fat ³⁵	‘emitted’
Low level	mai ²² 賣	‘sell’	mai ³⁵	‘sold’
Low falling	lei ²¹ 嚟	‘come’	lei ³⁵	‘came’
Low rising	mai ¹³ 買	‘buy’	mai ³⁵	‘bought’
Low checked	lok ² 落	‘fall’	lok ³⁵	‘fell’
<i>High register tone categories</i>				
High level	tsem ⁵³ 斟	‘pour’	tsem ^{55*}	‘poured’
High rising	se ³⁵ 寫	‘write’	se. ^{355*}	‘wrote’
High checked	tsok ⁵ 捉	‘catch’	tsok ^{5*}	‘caught’

⁸ See Chappell (2015) for details of five main linguistic areas in China and de Sousa (2015) for a description and definition of Far Southern Sinitic.

(Adapted from Cheung 2007 :152-153 and Shan 2013 : 650)

Speakers thus have the choice of alternating between the use of an overt perfective suffix or the tone change on verb stem, to which comparison of the following examples, (13) and (14), testify for the Low Level 22 tone:

- (14) Hong Kong Cantonese Yue 香港粤语
 佢落咗堂喇。
 k^høi²³ lɔk²²-tsɔ³⁵ t^hoŋ²¹ la³³
 3SG finish-PFV class SFP
 ‘Her class is over now.’ (lit.: ‘She’s finished class.’)
 (Cheung, 2007: 152)

- (15) 佢落咗堂喇。
 k^høi²³ lɔk³⁵ t^hoŋ²¹ la³³
 3SG finish.PFV class SFP
 ‘Her class is over now.’
 (Cheung, 2007: 152)⁹

Tone change affecting the mid-level 33 tone is illustrated by the next example, (15) from the Guangzhou variety of Yue, and for the low rising tone in Zhongshan Xiaolan 中山小榄话 in (16):

- (16) Guangzhou Cantonese Yue 广州话
 本嚟佢想去嘅，而家又變咗卦嘞。
 pun³⁵loi²¹ k^høi²³ sœŋ³⁵ hœi³³ kɛ³⁵,
 originally 3SG want go SFP

 i²¹ka⁵³ iœu²² pin³³⁻³⁵ kua³³ la³³
 now again change mind SFP
 ‘First of all he wanted to go, but now he’s changed his mind again.’
 (Bai 1989: 115)

⁹ I have converted the Yale transcription used in Cheung (2007) to IPA to highlight the tone values which are not transparent in Yale.

- (17) Zhongshan Xiaolan Yue 中山小欖話
 ɲeu¹³⁻²⁵ ky¹³ jet⁵ tam²² 咬咗佢一啖。
 bite 3SG one CL
 ‘bit him once.’ (Data from Gan 2012 :71)

In another example from Zhongshan Xiaolan, the high register tone similarly changes to an ultra-high 55* tone to express the perfective:

- (18) Zhongshan Xiaolan 中山小欖話 (Yue, Guangdong)
 kem⁵³tsiu⁵³ tɔŋ^{53-55*} kei⁵³. 今朝割咗雞。
 today.morning kill chicken
 ‘This morning (we) killed a chicken.’ (Data from Gan 2012 :71)

An important feature to note is that the tone change under discussion is claimed to be restricted to a small number of high frequency verbs in these Yue dialects (Gan 2012 :72) such as ‘eat’, ‘go’, ‘buy’ and ‘walk’ to the extent that Gan views its use as synchronically non-productive. Despite this, selectivity is a hallmark of morphologization, according to Joseph (2003) and, on this point, we may usefully compare tone changed forms with ablaut and suppletive forms in English which do not affect all verbs, as the English glosses in Table 16 show (nor in German and other languages with large sets of irregular verbal paradigms for that matter).¹⁰ Gan further claims that the tone morpheme is steadily being replaced by *tsɔ*³⁵咗 and other overt perfective markers in Guangzhou and Hong Kong, as do Cheung (2007 :153) and Shan (2013), *inter alia*. In areas of Guangdong province, far or at some distance from these two major Cantonese-speaking cities, the tone morpheme predominates, such as in Zhaoqing 肇慶, Shunde 順德 and Foshan 佛山, according to Gan’s survey (2012 :71).

The perfective tone change is also noted for a few varieties of Hakka such as Heyuan Shuiyuan 河源水源話 in Guangdong, Shicheng 石城 and Yudou 于都 in Jiangxi (Wang 2014 : 113-114). In Shicheng Hakka, the perfective tone change can be used on both monosyllabic verbs as well as on the second (or third) component of resultative and directional verb compounds. Apart from the high 43 tone itself, the low register tones change to 43 while the other tones change to 34.¹¹ These two

¹⁰ I counted around 30 different Cantonese Yue verb forms which could undergo perfective tone change in the examples from various references. This would not be far less in number than English irregular verbs.

¹¹ More precisely, Wen (2006:54) explains that the Yángpíng tone (24) and the Shǎngshēng tone (21) both change to the Yīnpíng tone (43), whereas the Qùshēng tone (54) and the Rùshēng tone (2) both change to 㗎 short and abrupt Yángpíng tone (34).

allotones of the tone change can alternate with the use of the perfective marker [ə⁴³] 呃, just as in Hong Kong Cantonese.

(19) Shicheng Hakka 石城客家话

t ^h ien ⁴³ -p ^h iaŋ ²⁴⁻⁴³	ts ^h ɔ ⁴³ -ha ²¹ -hə ²¹⁻⁴³	tsiem ²¹ -səp ²⁻³⁴	siək ² -nən ⁵⁴⁻³⁴
fill-flat	sit-down-go	soak-wet	pare-fine
‘fill and level up’	‘sit down’	‘soak wet’	‘pare finely’
填平	做下去	浸湿	削嫩

(Data from Wen 2006:54)

Below are some examples from Yudou for which the tone change is an invariant 42 on the verb stem or on the second component in a verb compound.

(20) Yudou Hakka 于都客家话

(fã ⁴²) tsɿ ²² tʂã ²²⁻⁴² li ³ .	teŋ ²² -si ³⁵⁻⁴²	ts ^h ẽ ⁴⁴ -tɔ ²²⁻⁴² (li ³)
(food) make proper CRS	freeze-die	look-ACH (CRS)
‘The food’s been cooked.’	‘very cold’	‘find after searching’
饭做好了。	冻死了。	找着了。

(Data from Wen 2006:57)

In this southern area of China, tone change appears to be the dominant type of morphologization, as opposed to stem alternation (*ablaut* and more broadly rhyme change), rhoticization, or combinations thereof, as described for Northern Sinitic. Rhoticization can in fact be independently viewed as a Northern feature. Furthermore, the tone change may be used on polysyllabic verb compounds in Hakka, whereas the rhyme and tone change processes of Northern Sinitic largely affect monosyllabic verbs, but this is also the situation in Yue.

This suggests that Southern Sinitic languages have moved much further along the morphologization pathway than the Northern Sinitic languages, and have, in many rural dialects, reached the conventionalization stage with the preferential use of tone change to code perfective meanings, as opposed to rhyme change. Notwithstanding this, in a further stage of development, the tone morpheme is apparently on the way to obsolescence in certain of the urbanized Yue dialects, evident in the reversion to overt affixation by -tsɔ³⁵ in Cantonese, reported for both Hong Kong and Guangzhou. This is confirmed in a sociolinguistic survey of 150 Cantonese speakers of the Guangzhou variety by Shan (2013) who found that the dominant trend for speakers with a higher education is to consistently use -tsɔ³⁵, without alternation with the tone morpheme. Nevertheless, it should be noted that the questionnaire required speakers to evaluate

their own use of minimal pairs of written sentences with and without *-tsɔ̃³⁵*. According to Gan's own fieldwork (2002 :65), there are generation differences in use, as in Xinhui 新会, where older speakers exclusively use the perfective tone morpheme, whereas younger generation speakers show the alternation.

In resumé, a new cycle begins which reveals perfective tone morphemes, in their turn, being superseded by segmental aspect markers, the clearest case being reported for the prestige varieties of Cantonese, namely Hong Kong and Guangzhou (Bai 1989, Cheung 2007, Gan 2012, Shan 2013), in which both analytic and synthetic forms alternate. Attrition in use of the tone morpheme diffuses from this central area more gradually to the Yue dialects that are further away from major administrative centres such as Foshan, Shunde and Zhaoqing. All varieties are thus subject to 'pressure from above' in different measures from the standard language, Mandarin, in re-introducing an overt marker such as *-tsɔ̃³⁵* 㗎 by analogy to its set of verbal aspect suffixes, in what can be considered as Stage IV (see Figure 3 below).

Hence, if scholars of Yue dialects are correct, the urbanized varieties of Yue are in the process of losing their nonlinear verbal morphology, while Jin and Northern Mandarin dialects are in the process of developing and expanding it, according to the numerous descriptions listed above. Lamarre (2015a:298) explicitly claims that Northern Sinitic represents an area of innovation, a conclusion which has its corollary in the generally lower degree of morphologization in Northern Sinitic, where rhyme change is typical, if not combinations of rhyme and tone change. Hence, these features point to the presence of earlier stages on the morphologization chain, while tone morphemes used alone can thus be regarded as a potential final stage in this process, exactly as they have been described for the diminutive cycle (§2.2.) and for pluralization of pronouns (§3.1.).

- Figure 3: Evolution of the perfective tone morpheme in Yue dialects and Hakka
- Stage I: *Verb – perfective enclitic or suffix* with its full tonal value
- Stage II: In informal or fast speech, omission of the segmental perfective morpheme is accompanied by transferral of its tone value onto the verb stem, replacing the original base tone. The changed-tone verb form thus alternates with the verb in its base form, modified by the overt perfective marker.
- Stage III : A special tone morpheme is created for the perfective, as seen in less urbanized varieties of Yue and Hakka with little or no alternation with the overt aspect marker.

Stage IV : Under the influence of the standard language, Mandarin, the overt perfective marker is re-introduced in more educated and formal speech styles of urban centres, from where it diffuses into the less urbanized varieties (cf. Wang & Lien 1993 on the process of diffusion)

A final note is to point out that the extant analyses of Yue and Hakka perfective tone change do not describe in any detail the possible intermediate stages in which a reduced form of the given perfective suffix undergoes coalescence with the preceding verb stem. Gan (2002: 64) briefly remarks that, in many of the Szeyap Cantonese dialects, the perfective suffix is [ə³³], as in Taishan 台山, or [a³³] as in Enping 恩平, which are potentially cognate with -tsɔ³⁵ 㗎, while other dialects have distinct sources from Guangzhou and Hong Kong. Note that the origin for -tsɔ³⁵ 㗎 is considered by some scholars to be the verb ZHUO 着 ‘to place, to adhere, to hit the mark’, through extension of meaning to the perfective from its use as a durative aspect.

Such a stage intermediate between Stages I and II in Figure 3 above would certainly be predicted on the basis of the laws of sound change: we can assume with reasonable confidence that the tone replacement on the verb head precedes the loss of segmental matter of the aspectual modifier.¹²

By way of contrast, morphologization creates a large set of changed rhymes (or stem alternations) in the verbal paradigms for Northern Sinitic (cf. He 1989 on the Huojia dialect of Jin; Zhang & Pan 2013 on the Yancheng dialect of Central Plains Mandarin *inter alia*; see example (11) above). In Yue and Hakka, we have no attestation to date of rhyme change or combinations of rhyme change with tone change, let alone rhoticization which is not a feature of this micro-area.

Clearly, much more in-depth investigation of morphological tone will be necessary, *pan-Sinitic*, as there will undoubtedly prove to be many more languages and varieties that can be added to this areal patterning of morphological tone for Sinitic.

5. Crosslinguistic comparison: a brief consideration

Hyman (2016) provides evidence of the large number of grammatical functions of both derivational and inflectional kinds that tone may code with reference mainly to Bantu and other languages of Africa. Inflectional marking by tone includes TAM and negation, while derivational marking can code the passive, causative, applicative and reciprocal verb forms. A further distinction for

¹² In the case of many Northern Sinitic languages, this would be a tone merger, as an outcome of tone sandhi rules between head and modifier, rather than replacement, as in Yue and Hakka.

morphological tone is that it may be replacive or additive (Feist & Palancar 2016). Clearly, the Sinitic perfective tone change discussed above is inflectional and replacive of the tone on the verb stem.

As mentioned in §2.3. above, research on the morphological use of tone in East and Southeast Asian languages is at an early stage. Lexical tone is intimately linked to the segmental morpheme such that few languages in this region reveal the kind of tone contours and tone spreading found in many Bantu and other languages of Africa (cf Hyman 2014), nor the complex tone patterns of Oto-Manguean languages of Central America, such as Cuicatec (Feist & Palancar 2016). Yet, despite the differing typological profiles of the aforementioned languages *vis-à-vis* Sinitic, these analyses point to the fact that the pathways of evolution for morphological tone we have proposed in the preceding sections are not specific to Sinitic languages.

The basic assumption behind these hypotheses is that the presence of inflectional tone implies the tone in question has been used as a lexical tone at some point in its evolution before segmental features are lost. This is borne out by Vydrin (2016) for two Mande languages, Bamana and Dan-Gwɛɛtaa: The floating low tone morpheme coding the function of definite article in Bamana derives from a former segmental article *-ò, related to an even earlier anaphoric use. In Dan-Gwɛɛtaa, locative cases are similarly marked by tone change, being the trace of former postpositions which have fused with the preceding noun stem.

Further corroboration comes in the form of aspectual prefixes in Cuicatec (Oto-Manguean) which are phonologically reduced to non-syllabic ones while the tone of the prefix shifts onto the stem and is reanalyzed as an inflectional exponent, with regard to distinct tones for completive and perfective aspects (Feist & Palancar 2016).

Similar examples can be found in the neighbouring Hmongic languages in which different types of tone change have led to the creation of a dual versus plural contrast in the pronominal systems. In one of the few descriptions of tone change for Southeast Asian languages, Ratliff (1992:99-105) postulates that in several of the Hmongic languages, dual forms have arisen from “tonal assimilation of the plural pronoun(s) with the following numeral for ‘two’”: ‘we ~ you ~ they + two persons’:

(21) Table 17: Green Hmong 2nd person pronouns

	Dual	Plural
2 nd	me ⁵⁵ < me ⁵² ‘2PL’ + ʔ ⁵⁵ ‘two’	me ⁵²

(Data from Ratliff 1992:102, 104)

Tone change is also described as forming two tonally distinct grammatical categories of demonstrative prepositions and demonstrative nouns of location, derived from common nouns denoting places (Ratliff 1992: 104-120), as well as a male-female contrast in kinship terms.

6. Conclusion

We have argued in favour of the standpoint that tone morphemes for plural pronouns and verbal aspect are typically the traces of a former segmental morpheme such as a plural suffix, or an aspectual clitic which through coalescence with the noun or verb stem, erodes its phonetic form in this unaccented position, leading to the loss of an initial or final consonant and other changes. Further reduction of segmental phonemes may take place to the point of total loss of the original segmental morpheme. The only feature which then remains on the new host syllable is tone, arising from either the tone sandhi that the lost morpheme triggers, prior to attrition (Northern Sinitic), or transfer of the original tone of the suffix or clitic onto the stem (Far Southern Sinitic). In other words, the segmental morpheme metamorphoses into a suprasegmental affix in the form of a tone morpheme. As Hyman (2016) has neatly captured it : ‘morphs don’t always stay on their own words’.

Epilogue

Sinitic languages are not isolating to the degree generally believed in typology. Analytical word formation and syntax may certainly be two of their driving forces, yet the notion of their representing the ideal ‘isolating’ language has been highlighted out of proportion. This ideal undoubtedly has its source in the model of Classical Chinese, an elevated style of written language whose golden age is represented by a set of canonical works, particularly from the period of 5th-3rd centuries BC, including *Lúnyǔ* 论语 (*The Analects of Confucius*), *Mèngzi* 孟子 (*Mencius*) and the *Shūjīng* 书经 (*Book of Documents*). Moreover, the types of morphologization presented in this overview are generally the least well-represented in the standard language, Mandarin.

Consequently, the cumulative effect of such case studies referred to in this paper point to the need to adjust the typological profile for Sinitic. The new profile should include the widespread use of tonal distinctions in grammar and morphology, not only for plural formation, diminutives, demonstratives and verbal aspect, but also for reduplication with its complex tonal patterns used to form approximatives, expressives and ideophones, and aspectual meanings such as delimitatives and conatives. One example for this is the pioneering research by Xing & Ma (2019) which describes special word- and phrase-level tone patterns that distinguish grammatical categories and constructions in some of the Mandarin dialects of Shaanxi, China.

From a Sinocentric point of view, one could say that it is European languages which are morphologically impoverished on the suprasegmental level, as they do not sufficiently exploit the possibilities offered by tone distinctions, neither in the lexicon nor in their word formation processes, as opposed to Sinitic, Bantu, Otomanguean and Southeast Asian languages in general.

Sinitic could thus be felicitously removed from the isolating end of the 19th century continuum of ‘whole’ language types, cited by Bickel & Nichols (2007), which continues to hold force in typological studies:

Figure 3 : 19th century conception of ‘whole’ language types

isolating	>	agglutinative	>	flexive	>	nonlinear
Chinese	>	Turkish	>	Latin	>	Arabic

As we have suggested, the position of Chinese on this cline might be more appropriate for the written works of Classical Chinese whose authors had other objectives in their writing and editing tasks, least of all, the intention of representing the derivational or inflectional morphology of the spoken court language of successive periods. Admittedly, this would be difficult in the form of Chinese characters which are morphosyllabic and only partially represent the phonetic composition.

Contemporary Sinitic languages and dialects show a composite typology of analytic, agglutinative and non-linear features, and cannot be easily ranged along this traditional cline. The non-linear characteristics clearly surface in the case for tone morphemes, the focus of this paper, while other types include stem alternation and merger forming portmanteaux morphemes, to which we have briefly alluded.

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ABBREVIATIONS :

CL = classifier, CRS = currently relevant state discourse marker, EXT = marker of a postverbal extent complement, IMPV = imperfective, INCH = inchoative aspect marker, MC = Mandarin Chinese, PASS = marker of the agent in the passive construction, PFV = perfective aspect marker, PL = plural, SFP = sentence-final particle, SG = singular

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