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THE RISE AND FALL OF TONES
THROUGH DIFFUSION(1)

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0. Introduction

Much is known about the origin of tones in monosyllabic languages of East Asia. Haudricourt (1954) blazed the trail. Matisoff (1973) laid out the general scheme tying the origin of tones with the loss of syllable-final consonants and the neutralization of voiced / vs. voiceless syllable-initial consonants. Hombert (1978) and others substantiated the interaction between consonants and tone with phonetic analysis and experimentations. Placzek (1985) succinctly summarized the study of tonal development and called Matisoff's general scheme the "standard theory" of tonogenesis in South East Asia. But what about the rise and fall of tones through diffusion? It is universally acknowledged that the rise and fall of tonal systems through diffusion is a historical fact. For example, consider the myriad tone languages of South East Asia; regardless of how one views their genetic classification, one cannot escape from inferring that some must have acquired tones through contact and some must have lost tones through contact(2). However, the establishment and acceptance of contact-induced tone-loss and tone-acquisition poses an interesting question: how does a non-tonal language become tonal through diffusion and conversely, how does a tonal language become non-tonal through diffusion? There are probably many diachronic pathways through which contact-induced tone loss or tone acquisition may be accomplished, but none has been established or elucidated. Matisoff (1973) went as far as suggesting that tones may be acquired by diffusion if the acquiring language possesses certain properties such as mono-syllabicity and the merging of consonants that predispose it toward tonogenesis. In this paper, I will attempt to shed light on a diachronic pathway of tonogenesis and a diachronic pathway of tonoxodus (a term coined by Matisoff). First I will present data from a Mongolian language in western China which appears to be in the process of acquiring tones through diffusion. Then, I will present data from a Chinese language spoken in the same area which has already lost its tones because of contact-induced changes.

I. Contact-induced development of tones

A language which displays evidence of having

reached a certain stage of tone development through contact is Baonan, a member of the Mongolian language family in west-central China(3). Baonan has two dialects: one spoken by approximately 3,000 Lama Buddhists in Tongren County of Qinghai Province, the other by approximately 3,500 Moslems in Linxia County of Gansu Province. The data in this paper is collected from a Moslem Baonan farmer of Linxia County.

The major contact language for the Baonans is the Chinese dialect of Linxia which, like all Chinese dialects, is tonal. The degree to which Baonan has been influenced by the Chinese dialect of Linxia depends on the age of the speaker. The speech of the village elders shows the least influence of Linxia. The speech of the middle-aged farmers is considerably affected by Linxia. Finally, the speech of the youth has undergone dramatic changes from the elders and the middle-aged groups, incorporating both lexical and grammatical elements from Linxia. My native language consultant, Habib, is in his forties. He is an active trader and entrepreneur during the off seasons of farming. Consequently his speech might contain more borrowings from Linxia than most members of his generation. Nonetheless, he claims that his children speak a version of Baonan that is, in his words, 'far less pure' than his own.

In a lexicon of approximately 2,500 morphemes I collected from Habib, the percentage of loan words from Linxia is 40 percent. These loan words, however, are not restricted to the cultural domains where the Baonan people are most indebted to the Chinese speakers of Linxia, such as the domains of technology, education, politics, etc. In many indigenous cultural areas, Linxia loan words have replaced Baonan words. For instance, out of the 61 kinship terms in Baonan, 29 are loans from Linxia which have replaced the native terms and 10 are mixed compounds of Linxia and Baonan words. Even for numerals, Linxia loans sometimes replace indigenous words, especially in narrative (as opposed to individually elicited sentences). Some examples of Linxia loans and their Baonan counterparts are given in Table 1:

<u>Gloss</u>	<u>Recently adopted</u>	
	<u>Chinese loan</u>	<u>Indigenous Baonan</u>
highway	/gonlú/	/fgo mər/
doctor	/dǎfu/	/mənǔ/
tiger	/loxú/	/basí/
to play an accordian	/la-ge/	/tǝirge/

mouse	/xanlotʃú/	/xardá/
to catch cold	/ganmó-ge/	/jibadʃ kur/
married couple	/lián-kv/	/erí murálé/
stutterer	/dʒædzí/	/dækældʒigʃ kuŋ/
thumb	/dámutsu/	/fgo kor/

Table_1. Recent Linxia loans and their indigenous counterparts.

The main stress of an indigenous Baonan word falls on the final syllable, i.e. if a morpheme appears in its root form, the stress falls on the final syllable of the root; if a morpheme occurs with suffixes, the stress falls on the last suffix. e.g. Habíb, Habíb-né 'Habib-accusative case'. This stress placement rule, however, does not apply to the loan words from Linxia. Before delving into the placement of stress on loan words from Linxia, I should briefly describe the tones in Linxia and the acoustic features of stress in Baonan.

Linxia has three lexical tones: high level (44), high falling (42) and rising (24). e.g. /jy/ (44) 'rain', /vu/ (42) 'fog', /xu/ (24) 'lake'. However, if a syllable is de-stressed, it will have a low level tone (22), e.g. /ja-ʃua/ (24-22) 'tooth brush', /luædzɿ/ (22-44) 'mule', /bɔ-to/ (22-42) 'scarf'.

Stress in Baonan is characterized by high pitch and great acoustic energy.

Table 2 provides some examples illustrating the stress placement on Linxia loan words in Baonan.

Gloss	Linxia	Baonan
craftsman	/dʒanrən/ (42-22)	/dʒánrən/
wild rabbit	/jɛtu/ (44-42)	/jétú/
blacksmith	/tʃædzan/ (22-42)	/tʃædzán/
glove	/ʃvtɔ/ (44-44)	/ʃvtó/
doctor	/dɛfu/ (44-22)	/dэфu/
landlord	/dʒidzu/ (44-22)	/dʒídzu/
factory		
manager	/tʃanɖzan/ (44-42)	/tʃánɖzán/
school	/ɕyɛɕɔ/ (22-42)	/ɕyɛɕó/
automobile	/tʃitʃɛ/ (44-22)	/tʃítʃɛ/
male donkey	/dʒɔly/ (44-22)	/dʒóly/
model (person)	/muɛfan/ (22-42)	/mэфán/
commune	/gonʃɛ/ (22-42)	/gonʃé/
expert	/dzuandʒa/ (24-22)	/dzuándʒa/
spider	/dʒvɖzɿ/ (22-24)	/dʒvɖzɿ/

Table_2: Correspondence between Linxia tones and Baonan stress/high pitch.

The correspondence illustrated by the examples in Table (2) can be stated as follows.

Baonan high pitch	↔	Linxia { 44 42 } tones
Baonan low pitch	↔	Linxia: 22 tones

Given the extensive Linxia loan words in Baonan, we find large number of bisyllabic words with high pitch on both syllables, or on either one of the two syllables:

C'V(C)CV(C)	e.g.	/m'ímɔ/ /m'óniv/ /t'şúntşan/ /b'ódzɿ/	'eyebrow' 'yak' 'spring season' 'leopard'
CV(C)C'V(C)	e.g.	/şang'é/ /luetúe/ /mianxúfa/ /ganr'í/ /b'éttán/ /n'ódz'í/ /j'édşú/ /e'ştó/	'folksong' 'camel' 'cotton' 'dried meat' 'white sugar' 'brain' 'wild pig' 'gloves'

Similarly, for tri-syllabic loan words from Linxia, high pch may fall on any one or two or all three syllables:

C'V(C)CV(C)CV(C)	e.g.	/j'ínjyédza/ /v'íguoren/ /j'éb'efi/ /g'edz'édzɿ/ /san'lyntşe/ /tuib'ódzɿ/ /tabidz'í/ /momodz'í/ /reşguid'é/ /g'úlúj'án/ /ni'ndz'índzú/ /x'édş'fx'ún/ /p'ínşpántşv/ /f'úlúbiŋ/ /ş'úşúndzi/	'musician' 'foreigner' 'bats' 'elbow' 'petticoat' 'wood shaves' 'a person with a deformed nose' 'suds' 'hot water bottle' 'wild geese' 'eyeball' 'alcoholic' 'pingpong ball' 'prisoner of war' 'smoothly'
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CV(C)CV(C)CV(C)	e.g. /tʂáŋdzí/	'tea cup'
	/tʂítʂedzán/	'bus station'
	/kʷtʂijí/	'mouth and hoof disease'
CV(C)CV(C)CV(C)	e.g. /dzímájí/	'sesame oil'
	/potʂáxú/	'tea pot'
	/lamádʒó/	'Lama Buddhism'

The most significant result of the massive infusion of Linxia loan words into Baonan is that the one word-one stress rule is no longer valid. Instead of stress, what we have now is a contrast between high and low pitch on the syllables within a word. It is, therefore, not surprising that minimal pairs on the basis of pitch contrast now exist in Baonan. Table 3 below provides some examples:

/xéxə/	'box'	/xexé/	'hairlip'
/dzíndzɿ/	'mirror'	/dzindzɿ/	'nail'
/guándzɿ/	'crown of a bird'	/guandzɿ/	'restaurant'
/ʂídzɿ/	'persimmon'	/ʂidzɿ/	'lion'
/gáŋŋaŋ/	'a metal bar'	/gaŋgáŋ/	'cistern'
/dándzɿ/	'courage'	/dandzɿ/	'a piece of cloth'

Table 3: Baonan minimal pairs based on pitch contrast

To demonstrate the significance of the two distinct pitch levels in Baonan, I will cite two passages from two narrative texts. The first passage is the beginning of a narrative describing the year-round agricultural activities in the Baonan village of my native language consultant, Habib. In order to distinguish the Linxia loans from indigenous morphemes, I will underline the morphemes borrowed from Linxia Chinese.

- i) ne dzandzárən - ne dzuandzɿ fánmian
the peasant - genitive agriculture aspect
'The agricultural side of the peasant (life).'
- ii) dzuandzɿ fánmian sun ne fú - tʂan loxomú
agriculture aspect from the hot - day plowing
ʂge - gv - sí kesí
do - nominalization- from begin
'The agricultural side (of the peasant life)
begins from the plowing (of the land) (during) the
hot days.'
- iii) fú - tʂan loxomú ʂge - gv - sí ne,
hot - day plowing do - nominalization-if pause
particle
'As for plowing (the land) in the hot days,

dui dzandzären ne si liŋi dzuántun.
 to peasant pause be history tradition
 it is a historical tradition of the peasant.'

- iv) dzandzären jó - dε - fú , fu - lɿ lɿ
 peasant want - obtain - wealth heat - in plow
 ty - tgú
 first - round

'If a peasant wants to do well, (he) plows the first round in the heat.'

- v) jó - dε - tgún , ŋi - jye - lɿ lɿ
 want - obtain - poverty ten - month - in plow
 ty - tgú
 first - round

'If (he) wants to be poor, in October, (he) plows the first round.'

- vi) ne ŋi dzandzären - ne bíliŋ
 this be peasant - genitive rule
 'Such is the rule of the peasant.'

The second passage is the beginning of a narrative on the matrimonial tradition and practice of the Baonan people.

- i) buda - né baonán gatɕf.
 we - genitive Baonan language
 (exclusive)
 'Our Baonan language.'
- ii) keŋi.
 begin
 'Let me begin.'
- iii) au - dé ver' kal - dzi gesí
 son - dative wife talk - subordinator concerning
 'Concerning talking to (your) son about (getting) a wife,
jidó ŋi-wu - liɿ ,
 as soon as ten-five-six
 as soon as (he) reaches fifteen or sixteen,
áda ámu ver' kal - dzi ok -
 father mother wife talk - subordinator give -
 dzó .
 imperfective
 his father and mother (will) be giving (him) talks
 (about taking) a wife.'
- iv) ver' kal - dzi gesí ,
 wife talk - subordinator concerning
 'As for talking about a wife,
keŋi qún kaŋ - né agɿ saŋ .
 begin first who - genitive daughter good
 one begins with (the question): whose daughter is good?'

- v) agv - né dufǝǝn ndʒa - dʒó .
 girl - accusative match look - imperfective
 '(The boy's parents will) be considering the girl
 as a match.'
- vi) ndʒa - dʒí saŋ jidʒigesí ,
 look - subordinator good if
 'If (the boy's parents) consider (the girl) good,
agv vendǝn , tǝintǝfn sv - dʒó .
 girl steady relation settle - imperfective
 (that is,) the girl is steady, a relation will be
 in the making.'
- vii) tǝintǝfn sv - dʒí gesí
 relation settle - subordinator concerning
 'As for making a relation,
keǝí , nə sí jigé guandʒǝn .
 beginning this be one pivot
 the beginning is pivotal.'

The evidence presented in this section clearly shows that Baonan has developed two contrastive pitches (high and low) for the syllables of loan words from Linxia. In addition, we have the following facts:

(i) Whether a syllable has high pitch or low pitch is not predictable. In other words, pitch level is part of the syllable structure in the lexicon. Furthermore, this fact supercedes the indigenous stress placement rule when a loan morpheme is combined with indigenous morphemes. Thus, if a Linxia loan word is used as a verb and thereby takes on Baonan suffixes, the high pitch falls on the syllable that has a 44, 42 or 24 tone in Linxia, not on the word-final syllable, e.g. consider the Linxia loan, /fajǝn/ 'faint,' in the following sentence,

- (1) Habib fajǝn-ge -dʒi
 Habib faint-predictor-perfective
 Habib fainted.

The high pitch remains on the second syllable as in /fajǝn/ 'faint'.

(ii) For bi-syllable and tri-syllable loan words high pitch may fall not only on any syllable, but also on all two or all three syllables of the word.

In view of (i) and (ii), what Baonan is developing appears to fall on the tonal end of the continuum between tone languages and pitch accent languages(4). The question, "Is Baonan a tone language?" still lacks a definitive answer. But there is no doubt that the language is in the process of developing a tonal system. What is also significant in this development is that Baonan, a Mongolian language, is not monosyllabic. It is not "tone-prone," a term coined by

Matisoff (1973). Yet, it is in transition from a non-tonal language to a tonal language. As a case of contact-induced development of tones, it serves to illustrate not only a diachronic process at work but also the far-reaching effect of languages in contact.

II. Contact-induced loss of tones

As a case study of contact-induced loss of tones, I will cite Wutun. Wutun is a language spoken by approximately 2,500 people living in five villages in Tongren County of Qinghai Province which is historically a part of Amdo Tibet. According to the oral history of the Wutun people, their ancestors were Chinese soldiers sent to Amdo Tibet from the coastal province of Jiangsu and the south central province of Sichuan several centuries ago(5). It was often the policy of the Chinese imperial court during many dynasties that garrisons in the frontier should engage in agriculture and be self-sufficient. Thus, for most soldiers, being sent to a frontier garrison was tantamount to being forced to immigrate without family to a minority region. In the case of the Wutun, the soldiers settled in Tongren County and married the native women most of whom were either Amdo Tibetans, Monguors or Baonans, all speakers of verb-final agglutinative languages. There was no reason to expect the soldiers to speak any of the native languages of the area. Being soldiers of the imperial court, they brought power and prestige with them. The women they married either by force or with the consent of the women's families would have to learn the soldier's Chinese dialects. What the women learned was probably a pidgin Chinese with a Chinese lexicon and a verb-final, agglutinative type of grammar. As the pidgin became established among the females, the soldiers must have adopted their wives' speech. Besides the obvious need of communication with their spouse, the soldiers had another reason for adopting their wives' speech, and that is, the soldiers didn't have a uniform language among themselves. Coming from two different provinces where divergent dialects abound, they spoke dialects that were barely, if at all, intelligible to each other. The absence of a uniform language among the soldiers made it easier for the soldiers to give up their own dialects and adopt their wives' pidgin tongue. After the children were brought up, we had a creole situation and the beginning of the Wutun language. Thus, Wutun is a Chinese-based creole developed by the speakers of Baonan, Monguor and Amdo Tibetan. Its lexicon is basically Chinese, but its grammatical features are taken from verb-final agglutinative languages. I will

highlight a few of the grammatical features of Wutun to show its difference from Chinese and its similarity with verb-final, agglutinative languages(6).

(a) The language is strictly postpositional and without co-verbs.

e.g. [t^huo - ɣɿ] [nantʃiŋ - ra]
 head - on Nanjing - from
 'on the head' 'from Nanjing'
 [tʃian - li]
 sky - in
 'in the sky'

(b) The language is rigidly verb-final. The following sample sentences illustrate this principle.

1) wut un ʃtɛxpɑ vu - kɛ
 Wutun village five - classifier
 jv - li
 exist - attitudinal
 particle

'Wutun has five villages'

2) ɲo kuo ta - li
 I him/her hit - attitudinal
 particle

'I will hit him/her.'

3) ɕampa ɲɑ tʃhian ji - ta
 ɕampa me money one - dollar
 kʰɑ - liɔ
 give - perfective

'ɕampa gave me one dollar.'

(c) Pronouns are inflected according to nominative-accusative/dative in the singular only. Other grammatical cases are expressed by case suffixes.

	Singular		Plural
	nominative	accusative/ dative	
1st person	[ɲo]	[ɲɑ]	[ɲo-tɕike]
2nd person	[ni]	[niɑ]	[ni-tɕike]/[nin]
3rd person	[ku]	[kuo]	[ku-tɕike]

(d) The case suffixes of Wutun are the following:
 Nominative = ∅ Genitive = [-tɛ]
 Dative/Accusative = [-hɑ] Comitative = [-tɛ]
 Instrumental = [-liɑŋkɛ]

There is an interesting interplay between the ordering of the nominals and the presence/absence of the dative/accusative suffix in a sentence. In the unmarked word order, [-hɑ] marks the dative rather than

the accusative. Of all the case suffixes, only the genitive, the comitative and the instrumental are obligatory in all contexts.

(e) The classifier, [kə], has replaced almost all other classifiers in Wutun. When [kə] occurs with a numeral to form a classifier phrase, the phrase follows the head noun. For example,

[ʁua vu - kə]
mountain five - classifier
'five mountains'

[tʰianmi tʰi - kə]
candy seven - classifier
'seven pieces of candy'

[jitsɿ san - kə]
soap three - classifier
'three pieces of soap'

[kə] can also occur as a nominal suffix with the meaning,

'one', e.g.

[xuitʃ^ha - kə]
book - classifier
'one book'

[pʰinkuo - kə]
apple - classifier
'one apple'

[rən - kə]
person - classifier
'one person'

(f) There is no resultative compound in Wutun. Instead, causative constructions are marked by a causative suffix, [-kə], on the verb, e.g.

4) i) ɕampa tɔŋtʂɿ- (hə)
ɕampa Doŋdʒɿ- (accusative)
ta - liɔ
hit - perfective
'ɕampa hit Doŋdʒɿ.'

ii) ŋo ɕampa - hə tɔŋtʂɿ
I ɕampa - dative Doŋdʒɿ
ta - kə - liɔ
hit - causative - perfective
'I made ɕampa hit Doŋdʒɿ.'

Notice in 4) i) the accusative marker is optional, whereas in 4) ii), the agent [ɕampa] of the verb [tɔ] 'hit', having been demoted to the dative slot because of the causative, is obligatorily marked with the dative case marker.

(g) Finally, Wutun is non-tonal, like Monguor, Amdo-Tibetan and the Baonan spoken by the Lama Buddhists.

The absence of tones in Wutun parallels the presence of tones in another creole, Krio(7). Krio is an English-based creole in Sierra Leon developed by the speakers of tonal languages of the Bantu family. In the genesis of Krio, the target language was non-tonal, but the native languages of the learners were tonal. These tonal languages interfered with the learners' effort to acquire the target language and the consequence was a creole with a tone system. In the genesis of Wutun, the target language was tonal, but the native languages of the learners were non-tonal. These non-tonal languages interfered with the learners' effort to acquire the target language and the consequence was a creole that is non-tonal.

Notes

1. Research and preparation of this paper is supported in part by NSF grant BNS-83-08220.
2. Contact-induced rise and fall of tone system is also found in Africa (Russ Schuh, personal communication). For Example, pre-historic Chadic tones developed through contact with tonal Bantu languages, and Wolof probably lost its tones through contact with non-tonal Afro-Asiatic languages.
3. Baonan is one of the nine Mongolian languages spoken in China (Poppe, 1970). It is genetically distant from Khalkha, the best known Mongolian language. Khalkha is often used synonymously with the term, Mongolian, i.e. the unqualified language name, Mongolian, always refers to Khalkha because it is the national language of the People's Republic of Mongolia. In China, the standard language of Inner Mongolian is a dialectal version of Khalkha and it is called Inner Mongolian, or simply, Mongolian. In order to illustrate the genetic distance between Baonan and Inner Mongolian, I will provide a few cognate examples of the two languages in the following table:

Gloss	Inner Mongolian	Baonan
sun	[nor]	[narón]
star	[ot]	[hot ^h ɛ]
wind	[xi:] 'air' [salx] 'wind'	[khi]
donkey	[éldzik]	[tɕigé]
fish	[tʃágas]	[tɕalɕasón]
door	[u:t]	[tɕɔŋ]
cry	[uflax]	[lagó]
red	[úlɑ:n]	[fulón]

cooking pot	[tʰ ʒgo:]	[tʰ ʒóŋ]
chicken	[tʰ ʒxia]	[tʰ ʒa]
eat	[ʒdex]	[ndagó]
water	[us]	[su]
cattle	[úne]	[uniʒŋ]
negative		
imperative	[péʰtʰ kʰi]	[tʰhégé]
cold	[xúithʰen]	[kʰithʒŋ]
younger		
sister	[ʒxindu]	[ʒindí]
older		
brother	[ax]	[kagé]
fruit	[álim]	[almʒŋ]
knife	[xúʰag]	[toʒó]
ride	[únax]	[honegó]
(a horse)		

- The continuum with true tonal language at one pole and pitch-accent language at the opposite pole is discussed by both McCawley (1978) and Bolinger (1978).
- A bit of linguistic evidence of some of those soldiers coming from Jiangsu is the presence of some morphemes in Wutun that are unmistakably from Wu dialects. Wu dialects consist of a group of Chinese dialects spoken around the Yangtse river in Jiangsu province and Zhejiang province. An example of a Wu dialect morpheme in Wutun is /miŋdzɔ/ 'tomorrow'.
- The Wutun data is based on the speech of my native Wutun consultant, Caiji, who is one of the few Wutun people fluent in Chinese.
- For a discussion of Krio tones, see Nylander (1984).

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