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RESEARCH ARTICLE

Dissimilation and phonological conspiracy in Tenyidie tone

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Abstract

In this paper, I propose an analysis for tonal alternations at the prefix–stem boundary in Tenyidie (Angami), where Mid tones in prefixes and stems dissimilate. I argue that this alternation is driven by the OCP (Obligatory Contour Principle) (Leben 1970) of Mid tones. However, sequences of Mid tones are seen elsewhere. I claim that this asymmetry can be solved with recourse to prosodic phonology (Nespor & Vogel 1986/2007). By assuming that stem and suffix form a prosodic word, excluding prefix, I argue that Mid tones fuse within the prosodic constituent to avoid OCP-Mid. The same constraint also triggers dissimilation across the prefix–stem environment, because of prohibition of fusion across prosodic boundaries. This is an example of phonological conspiracy where multiple processes work together to repair or avoid a single marked structure (Kisseberth 2011).

1. Introduction

Tenyidie, also known by the exonym Angami (ISO 639-3:njm), is a Tibeto-Burman language spoken in the state of Nagaland in northeast India. This paper analyses the case of dissimilation of Mid-toned stems with certain Mid-toned prefixes in the language. Sequences of Mid tones are, however, seen with other seemingly Mid-toned prefixes and also in the root–suffix environments. In this paper, I will show that this difference is because of two reasons: (i) phonological tonelessness of some prefixes, leading to non-dissimilation, and (ii) the prosodic structure, leading to the distinction between the prefix–root and the root–suffix environments. I will show my workings in the framework of Optimality Theory (OT) (Prince & Smolensky 1993/2008, McCarthy & Prince 1993).

Section 2 of this paper exposes the dissimilation data as well as cases where the same is not observed. Section 3 first displays the process of Mid tone dissimilation in the language and then goes on to show why this dissimilation is not seen in other cases by invoking the notion of the prosodic word. Section 4 concludes the paper.

2. The Data

Tenyidie is a tonal language which employs four level tones, exemplified in 2. All the data in this paper are from my own fieldwork.

(1) EXTRA HIGH dǎ́ 'to chop' zḗ 'to wrap'
HIGH dá 'to pack' zé 'to pierce'
MID dā 'to blame' zē 'to sell'
LOW dà 'to paste' zè 'to sleep'

In the following subsections, I present the structure of a word in Tenyidie, followed by the prefix data regarding the dissimilation in question. This is followed by prefix data that does not show this dissimilation pattern. And finally follows the data concerning no dissimilation (i.e. sequences of Mid tones), with suffixation.

2.1. Prefixation

There are only six prefixal forms in Tenyidie – namely, /kē–, mē–, pē–, rə̄–, tē–, t^{h}ē–/ – all surfacing with a Mid tone. Roots in the language are fairly simple with only one open syllable of the CV or CrV structure. And any non-compound word in Tenyidie maximally only has three syllables, meaning a maximum of two prefixes are permitted. If this word is trisyllabic, then it is predictable that the first syllable is /kē/ and the second syllable is one of the other five prefixes. There are no words starting with /kēkē–/ or any word formation process that leads to such a structure. Table 1 illustrates this structure.

Some of these prefixes seem to have no semantic function. The ones that do are /kē–/ and /pē–/, which in some words appear without any semantic function like the rest. There are two kinds of the /kē–/ form prefixes – one, which universally converts a predicative verbal to an attributive verbal; the other, which denotes reciprocal activity. The prefix /pē–/ is a causative marker and is not as productive.

The following prefixation data in this subsection are the main data regarding this paper. Dissimilation of Mid tones is seen in prefixation where a monosyllabic stem bearing a Mid tone becomes a High tone when it is affixed with a prefix having the same tone. However, there are no tone changes observed when the same Mid-toned prefix is affixed to a stem

Table 1. Structure of a word in Tenyidie

Trisyllabic		
	Disyllabic	
		Monosyllabic
ke	(ke)	
	me	
	pe	CV
	rə	CrV
	te	
	t^{h}e	

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bearing any other tone than a Mid tone. In (2), the attributival prefix /kē–/ triggers a High tone on the Mid-toned stem in (c).

(2) **Prefixation of the attributival morpheme /kē–/:**

a.	nǐ	→	kēnǐ	(happy)
b.	ví	→	kēví	(good)
c.	**zī**	→	**kēzí**	**(early)**
d.	sì	→	kēsì	(cold)

The same tonal observation is also seen in the prefixation of the causative prefix /pē–/ to verbal bases in (3).

(3) **Prefixation of the causative morpheme /pē–/:**

a.	krā́	→	pēkrā́	(white)
b.	ví	→	pēví	(good)
c.	**zī**	→	**pēzí**	**(early)**
d.	sì	→	pēsì	(cold)

The data in (4) show other examples of the tone change with the attributive prefix /kē–/ and the causative prefix /pē–/.

(4)

a.	ciē	→	kēcié	(wet)
b.	liō	→	kēlió	(fat)
c.	krā	→	kēkrá	(many)
d.	lē	→	kēlé	(hot)
e.	ciē	→	pēcié	(wet)
f.	liō	→	pēlió	(fat)
g.	krā	→	pēkrá	(many)
h.	krī	→	pēkrí	(different)
i.	zē	→	pēzé	(to melt)

The prefixes /mē–, tē–, t^{h}ē–/ do not have any semantic effect on them, but there are nouns in the language which depend unpredictably on one – and only one – of them for a full word status. I will call them 'supporting prefixes'. Supporting prefixes disappear when the nouns are preceded by a possessive. This is illustrated in (5). These nouns are never seen on their own without the prefix or a possessor.

(5)

a.	mēní	→	ā-ní	puō-ní	ú-ní
	'trousers'		'my trousers'	'his/her trousers'	'one's trousers'
b.	tēfə̃	→	ā-ə̃	ūkō-fə̃	Ābà-ə̃
	'dog'		'my dog'	'their dog'	'Aba's dog'
c.	t^{h}ēvə̀	→	ā-və̀	n̄-və̀	Jōhn-və̀
	'chicken'		'my chicken'	'your chicken'	'John's chicken'

Just like /kē–/ and /pē–/, the prefixation of the supporting prefixes /mē–, tē–, t^{h}ē–/ also results in the same tonal behaviour, albeit to nominal stems this time. They change the Mid tone of nominals to High but keep the other tones unchanged (6).

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(6) **Prefixation of the supporting prefixes /mē–, tē–, t^{h}ē–/ :**

a.	–ní	→	mēní	(trousers)
b.	–k^{h}ō	→	mēk^{h}ó	(basket)
c.	–k^{h}ū	→	mēk^{h}ú	(plate)
d.	–fə̃	→	tēfə̃	(dog)
e.	–pfĩ	→	tēpfĩ	(monkey)
f.	–hiē	→	tēhié	(cup)
g.	–r^{h}ì	→	tēr^{h}ì	(louse)
h.	–ziə̃	→	t^{h}ēziə̃	(blood)
i.	–muó	→	t^{h}ēmuó	(meat)
j.	–bā	→	t^{h}ēbá	(seat)
k.	–ʒvə̀	→	t^{h}ēʒvə̀	(bed)
l.	–zā	→	t^{h}ēzá	(name)
m.	–ruō	→	t^{h}ēruó	(luck)
n.	–və̀	→	t^{h}ēvə̀	(chicken)
o.	–miè	→	t^{h}ēmiè	(person)

However, this happens only when the stem is monosyllabic. When the stem is disyllabic (i.e. when there is an intervening prefix), no tone change is observed upon the same prefixation. Only /kē–/ prefixes to polysyllabic bases. Examples of prefixation on disyllabic words are given in (7).

(7)

a.	mēsə̃́	→	kēmēsə̃́ (clean)
b.	mēriə̃	→	kēmēriə̃ (red)
c.	mēhé	→	kēmēhé (yellow)
d.	pēɟò	→	kēpēɟò (green)
e.	mēnè	→	kēmēnè (soft)
f.	mētī	→	kēmēt (hard)

There is another exception. These nominal stems do not change tones when they follow a Mid-toned possessor prefix found in (5). Examples of such cases with Mid-toned stems are /ā-k^{h}ō/ ‘my basket’, /puō-hiē/ ‘his/her cup’, /ūkō-zā/ ‘their names’.

2.2. Mid-tone sequences

As mentioned before, the form ‘kē–’ is also a reciprocal prefix. This prefixation is productive but does not show similar dissimilation patterns as the homophonous attributival prefix.

(8)

–biē	→	kēbiē	(‘touch’	→	‘to touch each other’)
–kiē	→	kēkiē	(‘call’	→	‘to call each other’)
–ŋū	→	kēŋū	(‘see’	→	‘to see each other’)
–tē	→	kētē	(‘catch’	→	‘to catch each other’)

All the forms /kē–, pē–, mē–, r–, tē–, thē–/ appear in the language as prefixes having neither derivational nor inflectional functions. Sequences of Mid tones are also seen with these ‘empty’ prefixes. The data in (9) are some words which surface with Mid-tone

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sequences in the prefix–stem environment, where the prefix does not play an attributive, causative, supporting or reciprocal function.

(9) **Prefixed stem with Mid-tone sequences:**

a.	kēlē	'to pinch'
b.	mētī	'hard'
c.	rə̄krā	'to remember'
d.	t^{h}ērī	'poison; poisonous'
e.	kēmēnā	'flirtatious'

As a consequence of the word structure given in 1, only Mid tones are found in non-word-final syllables because those are prefixes, while word-final syllables (i.e. roots) may have any of the tones of the language. There are some exceptions with this structure in very few words, but they are most likely newer words, like 'paper' /léʃé/ and 'rubber' /ràbə̄/. Set (10) – along with (9) – shows this distribution of tones in polysyllabic words.

(10) **Mid tones on all non-final syllables:**

a.	kēbvə̋	'to disturb'
b.	kēvávə̀	'ginger'
c.	kēvávə̀	'bamboo'
d.	rə̄zá	'to get injured'
e.	rə̄và	'leech'
f.	tēk^{h}ű́	'tiger'
g.	tēr^{h}ì	'louse'
h.	pēkrié	'ice/snow'
i.	pēl^{h}ì	'to asphyxiate'
j.	kēt^{h}ēguő	'satisfied'
k.	kēmēkó	'conceited'
l.	kētēmò	'playing innocent'

2.3. Suffixation: More Mid-tone sequences

Unlike the prefix–stem boundary, sequences of Mid tones are actually quite common in the root–suffix boundary. This is shown in (11) where a non-alternating Mid-toned suffix can follow a Mid-toned stem with no tone change observed. No dissimilation of Mid tones like the ones in prefixation is observed in suffixation.

(11) **No tone change in non-alternating suffixes.**

a.
zə̋ ciē	'to wrap'+ IMP
zé ciē	'to pierce' + IMP
zē ciē	'to sell' + IMP
zè ciē	'to sleep' + IMP

b.
sə̋ kō	'wood'+ PL
(puō) sí kō	'(its) seed' + PL
(niē) **p^{h}īkō**	'(your) leg' + PL
(niē) m^{h}ikō	'(your) eye' + PL

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In fact, Mid-tone sequences are even seen to be actively created in the root–suffix boundary when a Mid-toned stem is followed by an underspecified quirky alternating suffix (12), in (c).

(12) **Quirky alternating suffixes**
- a. zǐ̋ liè ‘to wrap’+ IRR
- b. zé liè ‘to pierce’ + IRR
- c. **zē liē** ‘to sell’ + IRR
- d. zè liē ‘to sleep’ + IRR

An additional case of Mid-tone sequences arises when a quirky alternating suffix is added to a root with the so-called ‘fifth tone’. Although this tone is realised as High (13)(c), it behaves as a Mid tone (d), in the sense that it results in a Mid tone on a quirky alternating suffix. This can be contrasted with ‘regular’ High tones which produce a Low tone on the quirky alternating suffix (b).

(13) **Quirky alternating suffixes repeated with the fifth tone in (c).**

	n.	DEF.SG		*v.*	IRR	
a.	sǐ̋	–ù	(wood)	zǐ̋	–liè	(to wrap)
b.	kēví	–ù	(good)	zé	–liè	(to pierce)
c.	**pé**	**–ū**	**(bridge)**			
d.	pērā	–ū	(bird)	zē	–liē	(to sell)
e.	thēmiè	–ū	(person)	zè	–liē	(to sleep)

Meyase (2014) proposes to analyse the fifth tone as a High tone followed by a floating Mid tone, H⟨M⟩. I am assuming here that this is the case and that /pé/ is actually underlyingly /pé¯/. As such, the data in (13)(c) again contains a sequence of a floating Mid tone and the Mid tone of the suffix, as H⟨M⟩-M, without changing any of the Mid tones. /bá¯/ ‘bell’ and /có¯/ ‘branch’ are other such examples.

The derivation of a High tone from a Mid tone in (2) and (4), in fact, seems to create the fifth tone rather than the regular High tone. This is seen in (14)(b) when a quirky alternating suffix is affixed to a derived High. The suffix becomes a Mid instead of the expected Low. The High tone in (14)(a) is the regular High tone.

(14) **Difference between /kēví/ and /kēzē/ in (2):**
- a. /kēví–u/ → [kēví–ù]
  —where the base stem is /ví/ with a High tone.
- b. /kēzí–u/ → [kēzí–ū]
  —where the base stem is /zī/ with a Mid tone.

2.4. Interim summary

The attributive prefix /kē–/, the causative prefix /pē–/ and the supporting prefixes /mē–, tē–, thē–/ all with Mid tones have a dissimilatory effect on all roots with Mid tones raising the latter to a High tone. However, this dissimilatory effect is not seen with other prefixes, leading to cases of Mid-tone sequences. And in fact, sequences of Mid tones are found across

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root–suffix boundaries. This is the asymmetry that I would like to analyse with recourse to the prosodic structure. The analysis of the creation of Mid-tone sequences in the quirky alternating suffixes involves delving into the sub-tonic features of tones (Meyase 2014); therefore, I will consider that to be beyond the scope of this paper. It is included here to show, as will be seen later, that floating tones are found in the language.

3. Analysis

3.1 Mid-tone dissimilation triggered by prefixes

Let us recall the main tone change concerned with this paper from (2), (3) and (6), where prefixation changes a Mid-toned root to a High tone.

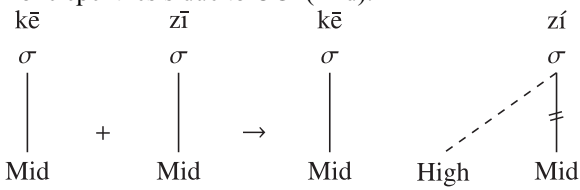
(15) kē– + zī → kēzí
PREFIX early. PRED early. ATTR

This tone change does not happen to roots with tones other than Mid. I will argue that the tone change observed in (15) is due to the dissimilation of the Mid tones in the language, which triggers the second Mid tone to change to High. More specifically, there is an active OCP (Leben 1970, Goldsmith 1976, McCarthy 1986, Odden 1986) of Mid tones that penalises the sequence the Mid tones (16). In order to counter the OCP, a High tone is epenthesised between the Mid tones. The epenthesised High tone then displaces the Mid tone in the root, and the root gets the High tone.

(16) OCP(Mid): Assign a violation for every pair of adjacent Mid tones.

The process of Mid-tone dissimilation is laid out in (17), making use of autosegmental representations. Here, OCP(Mid) triggers the epenthesis of an intervening High tone; this tone is then associated to the root. The Mid tone in the root is displaced and remains floating.

(17) Tone epenthesis due to OCP(Mid):



This is achieved in OT by ranking OCP(Mid) over the two constraints DEP (High) and *FLOAT (Mid) 1. DEP (High) prohibits the epenthesis of a High tone, and *FLOAT (Mid) prohibits Mid tones to stay unassociated to any of the tone bearing units.

(18) OCP(Mid) ≫ DEP (High), *FLOAT (Mid)

This ranking eliminates the candidate faithful to the input as it violates the OCP despite satisfying the other constraints, shown in Tableau 1.

A possible candidate for the output is the candidate where the epenthesised High completely replaces the stem Mid tone by deleting the latter tone. On the surface, it is phonetically the same

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Tableau 1. OT evaluation of /kē + zī/

	kē Mid zī Mid	OCP(Mid)	DEP (High)	*FLOAT (Mid)
a.	kē Mid zī Mid	*!		
☞ b.	kē Mid zí High Mid		*	*

as the intended winner with the Mid-High sequence on /kēzī/. However, this candidate would then also be exactly the same as an underived Mid-High word which would not trigger a Mid tone on a quirky alternating suffix as is seen in (14). For this, we need the Mid tone in the input stem to remain visible to the suffix and not be deleted entirely (i.e. remain floating). We can eliminate this candidate by introducing MAX (Mid) and ranking it higher than *FLOAT (Mid). The faithfulness constraint MAX (Mid) prohibits the Mid tone to be deleted. Introducing this ranking also penalises any other candidate that deletes Mid tones.

The language is seen to allow floating Mid tones, as is the case of the so-called phonological fifth tone, which is a High tone with a floating Mid tone. But there is no evidence for a floating High tone in the language (or indeed of the Extra High or the Low). This tells us that it is better in the language to have a floating Mid tone than a floating High tone. That is, *FLOAT (Mid) is lower ranked than *FLOAT (High). We get the ranking in 1 following the discussion in the last two paragraphs.

(19) MAX (Mid), *FLOAT (High) ≫ *FLOAT (Mid)

The reason for the epenthesis of the High tone can be explained by the property of the tone to be unmarked. Since the analysis calls for the dissimilation of Mid tones with OCP(Mid), we can safely rule out the epenthesis of another Mid tone, as it only creates more OCP(Mid) violations.

As for the other two tones, *viz.* Extra High and Low, one can assume that since they are the phonetic extremes of the pitch range in the language, they are more marked than the High tone. There is also evidence from the tonology of the language. The overall data of tone change collected reveals that in any tone change observed in the language, from any of the four tones, the resultant tone in any process is always a Mid or a High. That is, no tone ever changes to an Extra High or a Low in any given case. Therefore, the epenthesis of an Extra High or a Low is more expensive than the epenthesis of a High or a Mid. This can be expressed with constraints as in (20).

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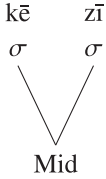
(20) DEP (Extra High), DEP (Low) ≫ DEP (High), DEP (Mid)

One other way of solving the OCP problem here is to fuse the Mid tones together into one such that (21) is a possible winner in the evaluation. Fusion of Mid tones is excluded in Tenyidie by the highly ranked anti-fusion markedness constraint UNIFORMITY.[1]

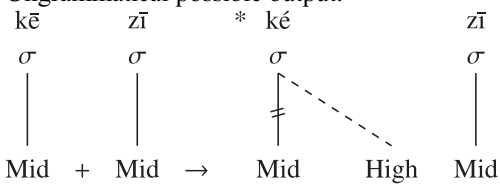
(21) Unwanted fusion of Mid tones in the prefix–stem boundary:



Using the constraints in (18), (19), (20) and UNIFORMITY in Tableau 2, we eliminate candidates with the complete deletion of the Mid tone (b and c), the epenthesis of Low (e), and also show how the ranking favours a floating Mid tone over a floating High tone (d and f). The epenthesis of Extra High is also prohibited in the same way as the epenthesis of Low is done.

Another possible candidate is the output in (22). This candidate involves the re-association of the epenthetic High tone to the prefix instead of the root.

(22) Ungrammatical possible output.



In order to eliminate this candidate, we refer to the prosodic structure of the words. I propose that the prosodic word (*ω*) in the language is made up of the root and suffixes that follow it. A high-ranking constraint ALIGN-L (Root, Prosodic Word) defined in (23) takes care of this structure. Prefixes form a prosodic unit higher to the prosodic word. The constraint PARSE (Syllable) given in (24) ensures that prefixes are incorporated into a higher prosodic structure instead of them floating outside the prosodic word.

(23) ALIGN-L (Root, Prosodic Word): Assign a violation mark for every lexical root whose left edge does not coincide with the left edge of a prosodic word. (McCarthy & Prince 1993: 34)

(24) PARSE (Syllable): Assign a violation mark for every syllable node that is not incorporated into a higher prosodic structure.

Finally, the IDENT constraint in (25) ensures that any prefix to the leftmost side of the stem retains its tone.

[1] The case of fusion is actually more complicated than this and will be discussed in a later section.

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Tableau 2. OT evaluation of /kē + z/ī

	kē Mid zī Mid	OCP (Mid)	MAX (Mid)	*FLOAT (High)	DEP (ExHi, Low)	UNIFORMITY	DEP (High)	*FLOAT (Mid)
a.	kē Mid zī Mid	*!						
b.	kē Mid zi		*!					
c.	kē Mid zí High		*!				*	
d.	kē Mid High zī Mid			*!			*	
e.	kē Mid Low zī Mid				*!			
f.	kē zī Mid					*!		
☞ g.	kē Mid High zí Mid						*	*

(25) IDENT (Tone)$_{(\omega-\text{Max})}$: Assign a violation mark for every output TBU that lies at the left edge of a maximal prosodic word and whose input correspondent is associated to a different tone.

Making these three constraints highly ranked, we get Tableau 3, which successfully eliminates the candidate in (22). The constraint IDENT (Tone)$_{(\omega-\text{Max})}$ eliminates candidate (d) because the prefix /ke–/, which here is the TBU at the left edge of the maximal prosodic word, is not faithful to its input tone.

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Tableau 3. OT evaluation of /kē + zī/

	kē Mid zī Mid	ALIGN-L	PARSE (σ)	IDENT (T)$_{(\omega-\text{Max})}$	OCP (Mid)	DEP (High)	*FLOAT (Mid)
a.	(kē zī)$_\omega$ Mid Mid	*!			*		
				*!	*		
c.	(kē (zī)$_\omega$)$_\omega$ Mid Mid				*!		
d.	(kē (zī)$_\omega$)$_\omega$ Mid High Mid			*!		*	
☞ e.	(kē (zī)$_\omega$)$_\omega$ Mid High Mid					*	

3.2. Non-dissimilatory prefixes

As seen in Section 2.2, not all prefixes trigger a dissimilatory tone change on a Mid-toned stem even though the prefix appears to have a Mid tone. Also, in (7) (for example, [mēhé] → [kēmēhé] (yellow)), the attributive prefix /kē–/, which triggers a High tone on all monosyllabic Mid-toned stems, fails to trigger the same effect to stems of two syllables. This is addressed by assuming that while attributive /kē–/, causative /pē–/ and the supporting prefixes come with a Mid tone specified to them, all the other prefixes, including the non-attributive /ke–/ and the non-causative /pe–/, are not specified any tone on them. They simply surface with a Mid tone phonetically. Therefore, since they are toneless, there is no violation of OCP whatsoever in words like [kēlē] 'to pinch' and [mēt] 'hard' in (9) because such words are basically /kelē/ and /met/ phonologically, without any tone in the first syllable. This kind of tone is seen also in Yoruba (Akinlabi & Liberman 2000), where a Mid tone in that language is actually the phonological absence of tone. The difference with Yoruba is that in Tenyidie, there are both kinds of Mid tones – a phonologically Mid tone as well as a phonologically unspecified tone surfacing phonetically as Mid.

As mentioned earlier, /ke–/ is the only prefix that can be prefixed to a disyllabic stem. The only possible issue now is when this is an attributive /kē–/ with a specified Mid tone (since all

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other forms are toneless). This prefix will never be prefixed over the supporting prefixes /mē–, tē–, t^{h}ē–/ (which are all specified for tone) because these are all affixed to nominal stems and remain nouns, while /kē–/ attributivises verbals. There are no instances in the language of a causativised verbal that is then attributivised. That is, there are no instances of /kē–/ prefixing to /pē–/ (with an underlying tone) in turn prefixing a root. But there are words like [kēmēsā́] 'clean. ATTR' which can be decomposed into /kē + mesā́/, where the prefix /me–/ in /mesā́/ 'clean. PRED' is not a supporting suffix (cf. the interim summary in Section 2.4), and are therefore toneless.

Having made these claims, the data in (7) with the attributive prefix should be phonologically represented as a trisyllabic word with an initial Mid tone, a toneless TBU and a final unpredictable tone; for example, [kēmēsā́] is phonologically /kēmesā́/. In this case, even though the prefix has a Mid tone, the following stem does not have a Mid tone initial syllable because it is a toneless prefix. Therefore, OCP(Mid) is vacuously satisfied, resulting in a surface phonetic sequence of Mid tones. Words like [kēmēnā] 'flirtatious' in (9) are simply /kemenā/ with just one tone specified on the final syllable.

The following examples illustrate surface Mid-tone sequences, which are phonologically not such sequences.

(26) Disyllabic words with Mid-tone sequence as a consequence of toneless prefixes:

ke	lē
σ	σ
	|
	Mid

(27) Trisyllabic words attributivised by /kē–/:

kē	me	sā́
σ	σ	σ
|		|
Mid		Ex-High

(28) All other trisyllabic words:

ke	me	nā
σ	σ	σ
		|
		Mid

3.3. Suffixation

In this paper, the issue with suffixes is the presence of Mid-tone sequences in the root–suffix environment despite the OCP(Mid) constraint, which triggers the tone dissimilation in prefixes and stems, as discussed in the previous section. I will address this issue by positing that the reason behind this mismatch is the prosodic structure which intervenes in the tonal changes, thereby resulting in other tonal patterns.

In Section 2, I proposed that fusion of tones is prohibited by the constraint UNIFORMITY, thereby eliminating candidates that fuse tones, like (21). I now reanalyse this approach by

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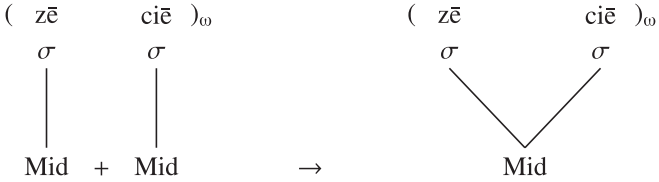
saying that Mid tones can indeed fuse, but only when they are in the same prosodic unit. The prohibition to tone spreading will therefore need a more specific constraint.

The prosodic structure I proposed earlier in this paper is that the root and the suffix form a prosodic word (ω) to the exclusion of the prefix. By assuming such a structure, I can now say that the OCP(Mid) is solved in the prosodic word by the fusion of Mid tones within that domain. While on the other hand, the same OCP(Mid) is the trigger of the tone epenthesis in the prefix–root boundary. The reason for the epenthesis of the High tone in such a context is because fusion across the prosodic boundary is banned.

For instance, in (11), /zē ciē/ is a Mid-toned stem followed by a (fully tone- specified) Mid-toned suffix. Both of them are inside the prosodic word; therefore, the Mid tones in them fuse into one Mid tone, as shown in (29).

(29) Fusion of Mid tones within the prosodic word due to OCP(Mid):



The premise here is that Mid tones would rather fuse into one tone in order to avoid the OCP(Mid). However, in the prefix–root environment, this fusion is blocked by the initial boundary of the prosodic word which lies between the prefix and the root. Such a blocking can be captured by the constraint CrispEdge (Prosodic Word), defined in (30), which demands a tone in the prosodic word to remain within the prosodic word.

(30) CrispEdge (Prosodic Word): Assign a violation mark for every prosodic word dominating an element that is linked to a prosodic category external to that prosodic word. (Itô & Mester 1999, Pater 2001)

Now, since the OCP(Mid) is still active, the phonology resorts to epenthesising a High tone (as was the case in Tableau 1) instead of fusing the tones across the prosodic word because of the constraint in (30). At this point, it should be noted that the first reaction of Mid tones towards OCP(Mid) is fusion with each other. Dissimilation takes a back seat with regards to preference, happening only when fusion is disallowed.

Tableau 4 shows how this is worked out with the string /pē + z̲ī + ciē/ (caus + early + imp), a chain of prefix, root and suffix all of which are underlyingly specified with a Mid tone each (the root is underlined for clarity).

In Tableau 4, prosodic words are built into the outputs. The Align, Parse and Float (High) constraints are assumed to be highly ranked and therefore not included in the tableau, as are candidates that violate them, which include candidates with incorrect prosodic structure. The most faithful candidate to the input (a) violates the OCP twice, as there are two successions of Mid tones. Candidate (b) fuses the tones within the minimal prosodic word, which reduces the violation count of the OCP but is still eliminated since the OCP is still violated once. To repair the OCP, a High tone is inserted in (c) and (d) between the first Mid tone and the fused Mid tones. Because of the highly ranked Float (High) constraint, this High tone is associated to the prefix syllable in (c), but this violates Ident as in Tableau 3.

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Tableau 4. OT re-evaluation of /pē + zī + ciē/

	pē zī ciē Mid Mid Mid	IDENT (T)$_{(\omega-\text{Max})}$	OCP (Mid)	CRISPEDGE (ω)	DEP (High)	*FLOAT (Mid)
a.	(pē (zī ciē)$_\omega$)$_\omega$ Mid Mid Mid		*!*			
b.	(pē (zī ciē)$_\omega$)$_\omega$ Mid Mid		*!			
c.	(pé (zī ciē)$_\omega$)$_\omega$ Mid High Mid	*!			*	*
☞ d.	(pē (zí ciē)$_\omega$)$_\omega$ Mid High Mid				*	
e.	(pē (zī cié)$_\omega$)$_\omega$ Mid High Mid			*!	*	*
f.	(pē (zī ciē)$_\omega$)$_\omega$ Mid			*!		

Candidate (d), however, associates the High tone to the root syllable. Both candidates (e) and (f) involve fusion of tones across the prosodic boundary, which are promptly eliminated by CRISPEDGE. Candidate (d) emerges as the winner with the epenthesised High tone realised on the root.

The analysis of the data in this paper is an example of 'phonological conspiracy' (Kisseberth 2011) where multiple processes work together to avoid a single marked structure. The marked structure here is sequences of Mid tones, which are penalised by OCP(Mid). This sequence of Mid tones is avoided within a prosodic word by fusing the Mid tones, as in (29). At the same time, the process of epenthesis is also triggered by the constraint

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OCP(Mid), as fusion of Mid tones would not be possible across the prosodic boundary. So here, fusion and epenthesis conspire together to avoid sequences of Mid tones. As opposed to the order of exposition in this paper, fusion of Mid tones is the first reaction to OCP(Mid). It is only when fusion is banned that the OCP triggers a dissimilation by the epenthesis of a High tone.

4. Summary and Conclusion

In this paper, I have presented data showing tone change upon prefixation in Tenyidie. The tone change in the data appears irregular because sometimes with certain prefixes, Mid tones in the prefix–stem domain dissimilate by changing the stem tone to a High tone, while other times, with other prefixes that appear with a Mid tone, these do not trigger any tone change on Mid-toned stems.

I have argued that the driving force behind the tone change seen with prefixation in Tenyidie is the OCP of Mid tones.

Prefixes in the language come either specified with a Mid tone or are otherwise toneless. Pre-specified Mid-toned prefixes trigger the observed dissimilation on roots. Toneless prefixes are only realised phonetically as Mid tones and therefore can appear right next to phonological Mid tones on the surface. This explains the apparent non-triggering of Mid tone dissimilation because under this assumption of toneless prefixes, there is no underlying sequence of Mid tones. The surface Mid-tone sequence is just phonetic in nature. The implication of this analysis to the tone system of Tenyidie is that, apart from the five tones that can appear in a syllable in the language, there is also the possibility that a syllable is toneless. This renders the total number of tone options for a syllable in Tenyidie to be six (excluding cases of underspecification reported in Meyase 2014).

This data also separates the prosodic or phonological word from the morpho-syntactic word in the language where the prefixes are seemingly closer to the root than the suffixes, as prefixing a root in the language entails change of word class, while suffixation chiefly marks the tense, aspect and mood. The dual action tone epenthesis and the tone fusion, both triggered by the constraint OCP(Mid) shown in this paper, are examples of conspiracy in linguistics. Here, epenthesis and fusion conspire to avoid a single restriction.

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