Fixed-tone reduplication in Cantonese*

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SUMMARY

This paper analyzes Cantonese attenuatives which are reduplicative and where there is a variable fixed-tone pattern. The fixed tone concerned is argued to be affixal. Reduplication is treated by Morphological Doubling Theory (Inkelas and Zoll 2005, Inkelas 2008). Taking into account an obligatory affix in the attenuatives discussed, the overall analysis is based on Phonological Subcategorization (Paster 2006, Yu 2007a,b).

RÉSUMÉ

Cet article s'adresse au redoublement à sens affaibli en cantonais où il existe un phénomène variable avec un ton fixe. Le ton fixe est considéré comme affixe. Le redoublement observé est analysé suivant la Théorie du Redoublement Morphologique (Inkelas et Zoll 2005, Inkelas 2008). Prenant en compte un affixe obligatoire dans les formes discutées, l'analyse globale se base sur la Sous-catégorisation Phonologique (Paster 2006, Yu 2007a,b).

1 INTRODUCTION

In the theoretical study of reduplication, the central question is how exactly a reduplicative form is derived from its input form. An intriguing area is concerned with fixed phonological material at one (or both) of the reduplicative copies which does not come from the input. An example is English *shm*-reduplication, as in *table-shmable* where *shm* is the fixed material not from the input *table*. This paper presents such a case from Cantonese, where the fixed material in reduplication is tonal, and offers an analysis. Particularly noteworthy is that, depending on certain morphophonological factors, there is variation among speakers as to whether the fixed tone in reduplication emerges. In the course of argumentation, various constructions in Cantonese, reduplicative or not, are also taken into account in order to justify the analytical decisions.

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This paper is structured as follows. Section 2 introduces Cantonese attenuatives with fixed tone in reduplication and argues that the fixed phonological material in question is affixal. Sections 3 through 5 deal with the analytical challenges posed by the Cantonese data one by one. In section 3, reduplication in Cantonese is argued to be better treated by Morphological Doubling Theory (Inkelas and Zoll 2005, Inkelas 2008) based on other reduplicative and truncation-rich constructions in the language. Section 4 shows that the fixed-tone reduplicative phenomenon in Cantonese attenuatives is in fact part of an affixational tone-alternating process in the general grammar of Cantonese outside of reduplication. Section 5 models the morphophonological behavior of a concomitant affix in Cantonese attenuatives based on Phonological Subcategorization (Paster 2006, Yu 2007a,b), and explains how this is connected to the analyses of reduplication and the fixed tone pattern. Section 6 concludes the paper.

2 TONAL OVERWRITING AND ITS (NON-)BLOCKING

Cantonese is a tone language where every syllable bears one of the six lexical tones. Attenuatives, meaning 'a little X', are formed with both monosyllabic and disyllabic inputs; see Francis and Matthews (2005) on the semantic properties of the possible inputs. This section introduces the data and discusses issues of markedness pertaining to some morphophonological patterns observed.[1]

(1) Cantonese attenuatives with monosyllabic inputs[2]

a.	syn55	'sour'	→	syn55 syn5**5** teɪ25
b.	jiu25	'girly'	→	jiu25 jiu2**5** teɪ25
c.	tsʰi33	'similar'	→	tsʰi33 tsʰi3**5** teɪ25
d.	kuʏ22	'tired'	→	kuʏ22 kuʏ2**5** teɪ25
e.	kʰɐn23	'near'	→	kʰɐn23 kʰɐn2**5** teɪ25
f.	hʊŋ21	'red'	→	hʊŋ21 hʊŋ2**5** teɪ25

Several observations are in order with respect to (1). First, there is total reduplication, in the sense that all segmental material of an input is copied. Second, each attenuative form has a concomitant affix *teɪ25* which appears suffixing. Third, the second reduplicative copy invariably ends with a high tone ('5' in Chao tone numbers). The fixed-tone reduplicative pattern is analogous to fixed segmentism in reduplication (Alderete et al. 1999).

At this juncture, it is imperative to discuss the nature of the fixed high tone in (1) in terms of markedness, because this will bear directly on the analysis of the data in (1). Alderete et al. (1999) distinguish two types of analyses for reduplication with fixed phonological material: when the fixed material is unmarked, the analysis is based on TETU (The Emergence of The Unmarked, McCarthy and Prince 1994), but if it is marked (e.g., *table-shmable*), then it is a case of (Melodic) Overwriting, which means that the fixed material is affixal.

In our case, the fixed material is the high tone '5'.[3] Whether high tone is unmarked in Cantonese is far from clear, due to the apparent lack of tonal processes such as spreading, deletion, and default tone assignment. Cross-linguistically, evidence and analyses diverge (see, for example, Hargus and Rice 2005, Hyman 2010a,b, Odden 1995, Pulleyblank 1986, Yip 1995, 2002). Nonetheless, there seem to be indirect clues that high tone is *not* unmarked in Cantonese. First, the mid-level tone 33 has been argued to be unmarked, based on evidence from sentence final particles (Sybesma and Li 2007). Second, insofar as markedness is concerned with empirical frequency (cf. 'p-markedness' in de Lacy 2006), level tones in Cantonese significantly

[1] In this paper, IPA transcriptions are used, where lexical tones are transcribed with Chao tone numbers immediately following each syllable, with 5 being the highest tone and 1 the lowest.

[2] 35 is a contour tone only found in a derived context. It is acoustically distinct from the lexical contour tone 25, but perceptually indistinguishable (Yu 2007c). This is akin to [d̥] for German final devoicing with respect to [t] and [d].

[3] On the formal status of tone numbers, they can be represented by a two-feature system such as [±upper] and [±raised] to distinguish four tonal levels, see Yip (2002); this is possible because only four tone numbers are employed (cf. Cheung 1986). The tone number '5' can, then, be formalized as [+upper, +raised].

outnumber contour tones both by type and token (Yu 2009). Third, what the high tone in question produces on the surface appears to adjudicate. In (1c,d), the derived tones due to the fixed tone '5' are contour tones 35 and 25, and the non-derived tones are level tones 33 and 22 respectively. If contour tones are more marked than level tones for theoretical and representational reasons (Yip 2002), then the fact that the fixed high tone in (1) creates allegedly more marked structures seems to suggest that the fixed-tone pattern in (1) be considered a non-TETU phenomenon.[4] For these reasons, I refer to the fixed-tone pattern in reduplication in (1) as *tonal overwriting*. Indeed, as will be clear in sections 4 and 5, my analysis of tonal overwriting treats the fixed high tone as an affix.

Cantonese attenuatives with disyllabic inputs are illustrated as follows:

(2) Cantonese attenuatives with disyllabic inputs

				Speaker group I	Speaker group II
a.	ɔŋ22 kɵʏ55	'daft'	→	ɔŋ22 ɔŋ22 teɪ25 kɵʏ55	ɔŋ22 ɔŋ2**5** teɪ25 kɵʏ55
b.	pʰa33 tsʰɐu25	'shy'	→	pʰa33 pʰa33 teɪ25 tsʰɐu25	pʰa33 pʰa3**5** teɪ25 tsʰɐu25
c.	tsʰi55 sin33	'crazy'	→	tsʰi55 tsʰi55 teɪ25 sin33	tsʰi55 tsʰi5**5** teɪ25 sin33

In contrast to (1), the attenuatives with disyllabic inputs exhibit distinct morphophonological phenomena that pose challenges to the goal of advancing an analysis which accounts for both (1) and (2). First, reduplication in (2) is partial in that only the first syllable of the input but not the second one is copied. Second, the affix *teɪ25* now appears infixing.[5] Third, the syllable that receives the fixed high tone is the second reduplicative copy in the attenuative form, not the final syllable (2c). Lastly, and most interestingly, there is variation in tonal overwriting. For certain speakers, tonal overwriting is blocked (group I speakers in (2)). The notion of 'blocking' is purely descriptive, as the data with monosyllabic inputs (1) for the group I speakers concerned show tonal overwriting.

3 REDUPLICATION AS MORPHOLOGICAL DOUBLING

This section focuses on the analysis of reduplication as observed in the Cantonese data at hand. Several recent approaches to reduplication are considered. While the options discussed are able to model the attenuatives in (1) and (2) in one way or another, other constructions in Cantonese are brought into the picture to help decide on the optimal treatment of reduplication for this particular language.

3.1 APPROACHES TO REDUPLICATION

Recent research on reduplication has revolved around several perspectives which distinguish different theories of reduplication. Two important paths of discussion are: (i) whether a given reduplicative phenomenon serves a morphological or (purely) phonological purpose, and (ii) whether the two reduplicative copies are formally symmetrical. In the following, I discuss three approaches to reduplication and sketch possible analyses of the Cantonese attenuatives illustrated in the previous section. The focus is partial reduplication, as total reduplication is not as revealing in disentangling theories of reduplication.

The first theory under consideration is Base-Reduplicant Correspondence Theory (BRCT; McCarthy and Prince 1995, 1999). Referred to as base and reduplicant (RED) in BRCT, the two reduplicative copies bear an asymmetrical relationship. In principle, reduplication for either morphological or phonological purposes can be modeled. In BRCT, what formally drives copying is phonological identity enforced by base-reduplicant faithfulness that makes the reduplicant acquire its phonological material from the base. As parallel Optimality Theory is the execution program of BRCT, a conceivable BRCT-based analysis of Cantonese attenuatives

[4] See Chan (2008) on the difficulty in arriving at a justified decision.

[5] Or arguably interfixing. Wordhood is a recalcitrant problem in Chinese linguistics, see Packard (2000). Colloquial words such as *ɔŋ22 kɵʏ55* 'daft' in (2) are difficult to break down morphologically, and are therefore better candidates as monomorphemic words.

with disyllabic inputs (2) may consist of the following elements. For instance, the input is /RED-AB-*tɐi25*/, where 'AB' represents a disyllabic input. *tɐi25* has to somehow infix between [A] and [B] by some alignment constraints. RED is an infix as well, lodging itself to the immediate right of [A]; this is necessary as it is on RED that tonal overwriting is observed. RED also has the size of a syllable and is filled up by [A]. Alternatively, if one subscribes to some version of Generalized Template Theory (e.g., to eschew the Hamilton-Kager paradox of templatic backcopying), RED can be, for instance, an affix with the size of a syllable; see Downing (2006) on morpheme-based templates.

The second theory of reduplication to discuss is Morphological Doubling Theory (MDT; Inkelas and Zoll 2005, Inkelas 2008). MDT is distinct from BRCT in that there is no asymmetry between the two reduplicative copies. In MDT, reduplication is governed by morphosemantic identity. The input to reduplication is only morphologically delineated: it can be a root or some intermediate, possibly morphologically complex, stem. Since full copying is assumed, partial reduplication is achieved by truncation at one of the copies. For Cantonese attenuatives with a disyllabic input [AB] as in (2), full copying results in [ABAB]. The first copy is then truncated to the first syllable by the daughter cophonology: [ABAB] → [AAB]. The infixation of *tɐi25* follows.

Lastly, we consider what Yu (2005) calls Compensatory Reduplication (CR), or more generally 'phonological copying' by others such as Inkelas and Zoll (2005). CR is specially for reduplication of the non-morphological kind driven by syllable well-formedness or prosodic templates. For the data in (2), an analysis along the lines of CR may possibly hinge on the treatment of *tɐi25* which has its special alignment and templatic requirements. More concretely, *tɐi25* could infix into [AB], which results in [A-*tɐi25*-B]. *tɐi25* also demands that what is on its left be of the size of a disyllabic foot; see section 3.2.2 on disyllabic feet. This templatic requirement forces [A-*tɐi25*-B], one syllable short of the target prosodic size, to expand by copying 'A' which is the syllable most local to the position where the extra syllable needed has to appear.

In principle, tonal overwriting and its variation in (2) can be modeled within the analyses of reduplication discussed. At least, MDT and CR are compatible with the analysis of *tɐi25* based on Phonological Subcategorization in section 5. Tonal overwriting in BRCT might be less straightforward, but if variation is treatable in Optimality Theory (e.g., Anttila 2006), the variation in tonal overwriting shall not present a problem to BRCT.

If several analyses of reduplication based on recent distinct proposals as sketched just above are plausible, how, then, can we decide which one to adopt? The answer emerges when we do not restrict our attention to the attenuatives in (1) and (2). In the following subsection, I discuss Cantonese interrogatives and conclude that MDT offers a better treatment of reduplication in Cantonese.

3.2 THE MDT ANALYSIS: INTERROGATIVES AND TRUNCATION

On the one hand, MDT distinguishes itself from CR by having as its premise full copying with no locality constraints or prosodically defined templatic restrictions. Cantonese interrogatives, to be discussed below, are revealing because they are reduplicative, and that they strongly suggest that some morphological full-copying mechanism is needed for Cantonese. On the other, MDT differs from BRCT in not invoking formal asymmetry between the two reduplicative copies. For the attenuative data above, the base-reduplicant distinction is entirely arbitrary and depends only on where tonal overwriting shows up. The argument is circular: X is RED because of tonal overwriting, and there is tonal overwriting because X is RED. With no reduplicative phenomena in Cantonese that would strongly justify the need to tell apart 'base' and 'reduplicant', I conclude that we fail to reject the null hypothesis: there is no base-reduplicant distinction in Cantonese. On partial reduplication in MDT, truncation is central and should ideally be well-motivated (cf. Urbanczyk 2008). As we show below, truncation is independently motivated in the grammar of Cantonese, as evidenced by general word formation processes. In what follows, we focus on interrogatives and truncation.

3.2.1 CANTONESE INTERROGATIVES

Cantonese interrogatives are reduplicative forms of verbs or adjectives, with the negator *m̩21* as an infix. For readability, *m̩21* is underlined in (3):

(3) Cantonese interrogatives[6]

a. kʷaɪ55 → kʷaɪ55 m̩21 kʷaɪ55
'well-behaved'

b. happy → hap m̩21 happy *or* happy m̩21 happy

c. fa55 li55 lʊk55 → fa55 m̩21 fa55 li55 lʊk55 *or* fa55 li55 lʊk55 m̩21 fa55 li55 lʊk55
'visually messy'

b. fi22 li25 fɛ21 lɛ21 → fi22 m̩21 fi22 li25 fɛ21 lɛ21 *or* fi22 li25 fɛ21 lɛ21 m̩21 fi22 li25 fɛ21 lɛ21
(onomatopoeic for crying heavily)

The data in (3) show Cantonese interrogatives with inputs of different sizes, from monosyllables through quadrisyllables, including English words code-mixed in Cantonese speech such as *happy*. Importantly, both total and partial reduplication are observed in interrogatives. There is no semantic difference between total and partial reduplication in this context, though the interrogative forms with total reduplication appear more emphatic or formal, possibly due to the influence of Mandarin Chinese. The interrogative forms are arguably words on their own right but not syntactic phrases: *hap* in *hap m̩21 happy* cannot possibly be a word. The upshot here is that MDT with no locality or templatic restrictions in copying is a better theory of reduplication than CR for these interrogative data; for partial reduplication in interrogatives, truncation as defended just below is employed. While this paper is mainly concerned with the attenuative data, taking the interrogatives into account is a further step towards a more comprehensive understanding and analysis of Cantonese morphophonology.

3.2.2 TRUNCATION

Outside the domain of reduplication, truncation to the first syllable abounds in the grammar of Cantonese. The motivation for truncation is strongly tied to the word size requirements in the language.

One fruitful area for truncation is loanword adaptation. For instance, colloquial verbs in Cantonese are mostly monosyllabic. When English verbs and adjectives are code-mixed into Cantonese speech, they are often truncated to their first syllables (more data and discussion in Luke and Lau 2008):

(4) Truncation to the first syllable: Cantonese (stative) verbs[7]

a. in55 'to interview'
b. pʰɐp55 'to publish'
c. pʰ(r)ou22 'professional'

The other salient size constraint in Cantonese is disyllabicity, a general word size requirement in the language which appears to be concerned with both minimality and maximality. Yip (1994) argues for the disyllabic (iambic) foot as a prosodic unit in Cantonese. Her examples are drawn from address terms in Cantonese. Essentially, when a name is monosyllabic and is used as an address term, the prefix [a33] appears, e.g., /lœn21/ (a first name) → [a33 lœn21]. But when the name is already disyllabic or polysyllabic, *a33*-prefixation is not obligatory.

[6] The quadrisyllabic case might be dispreferred, presumably due to processing difficulty, but is by no means ungrammatical. This is analagous to recursion to syntax. *fi22 li25 fɛ21 lɛ21* may be considered the expanded form of two sesqui-syllables *f(ə)li25 f(ə)lɛ21* by Compensatory Reduplication, see Yu (2005).

[7] What would be called 'adjectives' in English often behaves like verbs in Cantonese. These 'adjectives' in Cantonese are often called stative verbs; see Matthews and Yip (2011: chap. 3).

As a maximality requirement, disyllabicity forces truncation in word formation. In Cantonese, verb-object and modifier-noun compounds in Cantonese are subject to this disyllabicity requirement, when the individual components of the compounds are not monosyllabic. The compounds are illustrated below with recent trendy expressions with, again, loanwords from English (see also Matthews and Yip 2011: 442-443):

(5) Truncation to the first syllable: Cantonese compounds
  a. sɪŋ55 lɛ55 'to upgrade' (lit. increase-level)
  b. lɛŋ55 mou21 'young female model' (lit. young-model)
  cf. mou21 tɐk22 ji21 'model' (an already-existing loanword)

The whole discussion on truncation above is to show that truncation is a general morphophonological process in the grammar of Cantonese. This is important, because one of the central tenets of MDT is the Generalized Phonology Predication:

(6) Generalized Phonology Prediction of MDT (Inkelas and Zoll 2005: 69)
'The set of phonological effects found applying within reduplication is equivalent to the set of morphologically conditioned phonological effects found outside of reduplication. There is nothing unique about the phonology of reduplication constructions.'

To achieve partial reduplication as observed in (2), MDT relies crucially on truncation. Now that truncation is shown to be part of the general grammar of Cantonese, the Generalized Phonology Prediction of MDT is supported.

4 TONAL OVERWRITING AS TONAL ALTERNATION

The fixed high tone in attenuatives, if present, always shows up immediately before the concomitant affix *teɪ25*, as shown in (1) and (2). For the sake of argument, I assume for the moment that this high tone is indeed part of the affix *teɪ25*. In this situation, the data in (1) and (2) *alone* appear to suggest two formally distinct *teɪ25*, one with tonal overwriting blocked sometimes (group I speakers) and the other with tonal overwriting always active (group II speakers). At least two recent approaches are possible to model two distinct affixes *teɪ25*: (i) cophonology theory (e.g., Inkelas and Zoll 2007) which would have two morphological constructions, each with one of the two affixes, bear the same constraints but ranked differently; and (ii) indexed constraint theory (e.g., Pater 2010) which would posit morpheme-specific constraints for one of the two affixes while the grammar has only one ranking for a given set of constraints. However, I propose that there be only one *teɪ25*, and that the variation of tonal overwriting in (2) be due to the properties of the overwriting high tone. In particular, tonal overwriting in reduplication is part of a tone-alternating process in the general grammar of Cantonese outside reduplication.

Tonal alternation, or *pin-jam* in the literature on Cantonese linguistics, is morphosemantically divergent. It is the exponence of diminutive or familiarity, nominalization, and various constructions subject to syllable elision (see, for example, Yue-Hashimoto 1972, Matthews and Yip 1994, 2011, Bauer and Benedict 1997, Yu 2007c); not surprisingly, the diverging functions of tonal alternation have led to lexicalization, and many speakers are not aware of the relationship between some words with tonal alternation and their respective alleged non-derived base form (Kam 1977). Morphophonologically, however, tonal alternation shows consistent properties. Here are some data, organized by the functions of tonal alternation: (7a) shows cases where tonal alternation is obligatory, and (7b-c) show the optional ones.

(7) Cantonese tonal alternation

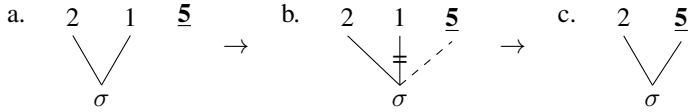
a.	Nominalization				
i.	sou33	'to sweep'	→	sou3**5**	'a broom'
ii.	$ts^hɔ21$	'to plough'	→	$ts^hɔ2$**5**	'a plough'
b.	Aspects (perfective and potential)				
i.	sɪk22 tsɔ25	'eat-PERF'	~	sɪk2**5**	'eat.PERF'
ii.	pɔŋ22 tɐk55	'weigh-POT'	~	pɔŋ2**5**	'weigh.POT'
c.	Unpredictable/no apparent meaning				
i.	wu21 tɪp22	'butterfly'	~	wu21 tɪp2**5**	'butterfly'
ii.	hɐu21 si55 tɔn22	'Houston'	~	hɐu21 si55 tɔn2**5**	'Houston'

The morphophonological generalization is that a word subject to tonal alternation has a high tone as the tonal offset of the final syllable. Importantly, tonal alternation never occurs stem-internally. Even when tonal alternation appears word-internal, there is a justified stem-final boundary to the right of the syllable subject to tonal alternation. For instance, *ŋɐu21* 'cow' has a tone-alternating version of *ŋɐu2***5**, as in [[ka33leɪ55][ŋɐu2**5**][fan22]] 'beef curry with rice (lit. curry-cow-rice)' and [[ka33leɪ55][ŋɐu2**5**][min22]] 'beef curry with noodles (lit. curry-cow-noodles)'.

The relevance of the stem-final boundary as a crucial part in the analysis of attenuatives will become clear in the next section.

Following Yip (1980) and Chen (2000), we adopt a floating-tone analysis (8). Tonal alternation is triggered by a segmentless tonal morpheme which is a high tone, **5** in (8). Each lexical tone in Cantonese is assumed to have two tonal targets specified; a level tone has two identical tonal targets, and a contour tone has two different ones.[8] The tonal morpheme concerned docks to the right of the stem-final syllable, and the middle tonal target in the three-tone complex is delinked (8b). The resultant tone is one whose tonal offset is switched to high tone, from (8a) to (8c).

(8) The floating tone analysis of tonal alternation



In bracket notation, tonal alternation is represented as follows; note the stem-final boundary:

(9) Tonal alternation in bracket notation (X = any tone; **T** = floating high-tone morpheme):
X] **T** → **5**]

This floating tone analysis is supported by the origin of tonal alternation. It is well-recognized that tonal alternation originated from a high-tone affix whose segmental material has been lost, see Yu (2007c) for more details. The floating high tone posited in (8) as the trigger of tonal alternation is the relic of the historical high-tone affix. This diachronic story of tonal alternation also helps us understand why it must be stem-final synchronically: the floating high tone itself is an adpositional affix.

Tonal overwriting is tonal alternation.[9] This echoes the claim of MDT that the phonological processes in reduplication are part of the phonological processes outside of reduplication – the Generalized Phonology Prediction (6). The reason why tonal overwriting is tonal alternation is not only because tonal overwriting in (1) and (2) does look like tonal alternation discussed here, but also because the kind of tonal alternation in (7), i.e., a tonal offset becoming high tone, is the *only* kind of alternation in the tonal domain of Cantonese. There is no reason to posit another distinct analysis to model the tonal behavior in tonal overwriting. In other words, the analysis of tonal overwriting should be along the lines of the floating tone analysis of tonal alternation as

[8] See, however, Yip (2001) and Barrie (2007) for a different proposal of tonal representation for Cantonese and other Chinese languages.
[9] See also Nevins (2005) on overwriting being rule-based.

in (8) and (9); a noteworthy corollary is that, for (1), tonal alternation applies vacuously when the non-derived tone is 55 or 25.

The understanding that tonal overwriting is tonal alternation leads to the insight as to why tonal overwriting is variably blocked when the input is disyllabic, the topic of the next section.

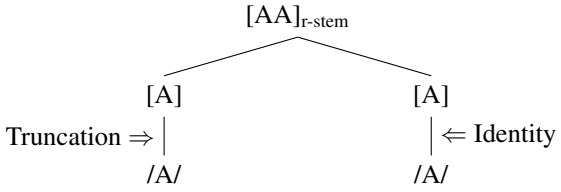
5 PHONOLOGICAL SUBCATEGORIZATION

With the analysis of reduplication and tonal overwriting in place, the final missing piece is the affix *tei25* in attenuatives. This section deals with it head-on, and completes the picture of the analysis of Cantonese attenuatives by showing how everything – reduplication, tonal overwriting, and *tei25*-affixation – fits together. The overall analysis is based on Phonological Subcategorization (Paster 2006, Yu 2007a,b).

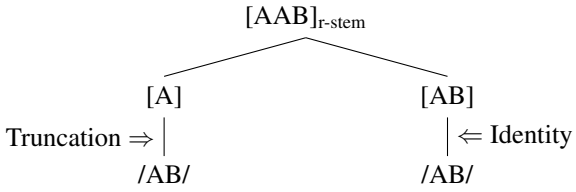
Before *tei25* itself is discussed, we look more closely into the stem to which *tei25* is affixed. In my analysis, the stem is the locus of reduplication. More specifically, the stem to which *tei25* is affixed is a reduplicative stem, or *r-stem*. Following Morphological Doubling Theory as discussed briefly in section 3.1, it is formed by the self-compounding of an input for the attenuatives in (1) and (2). The first daughter, in the sense of MDT, is subject to a cophonology of truncation to the first syllable, a general phonological process in Cantonese as argued in section 3.2.2. (10a) below illustrates the MDT analysis of the r-stem formation for a monosyllabic input [A] (where truncation applies vacuously because the input is already monosyllabic), and (10b) for a disyllabic input [AB]. The r-stem from a monosyllabic input is $[AA]_{\text{r-stem}}$, whereas that from a disyllabic input is $[AAB]_{\text{r-stem}}$.

(10) The MDT analysis of r-stem formation

a. With a monosyllabic input [A]



b. With a disyllabic input [AB]



tei25 is special in two respects. First, **T**, the trigger of tonal alternation (9), is part of *tei25* and precedes it. That is, *tei25* has a floating high tone on its left. Second, *tei25* subcategorizes for a phonological pivot which is the first (disyllabic) foot of r-stem (see section 3.2.2 on disyllabic feet in Cantonese):

(11) Subcategorization requirement of *tei25*:
ALIGN(*tei25*, L, Foot_1 ,R)

The alignment properties of *tei25* give rise to two distinct subcategorization frames of attenuatives, depending

on the size of the input:

(12) Subcategorization frames of Cantonese attenuatives

a. Monosyllabic inputs:
[[Foot$_1$]$_{\text{r-stem}}$ **T** *tɐɪ25*]$_{\text{Attenuative}}$

b. Disyllabic inputs:
[[Foot$_1$ **T** *tɐɪ25* ...]$_{\text{r-stem}}$]$_{\text{Attenuative}}$

In both (12a) and (12b), *tɐɪ25* is affixed to the r-stem according to the subcategorization requirement in (11). **T** always precedes *tɐɪ25*, as claimed just above. The difference between (12a) and (12b) lies in the size of the r-stem: it is disyllabic in (12a), but trisyllabic in (12b). In (12a), *tɐɪ25* is suffixing because the r-stem is a disyllabic foot, precisely of the size of the prosodic constituent that *tɐɪ25* subcategorizes for. In (12b), then, *tɐɪ25* is infixing because the r-stem is prosodically larger than a disyllabic foot.

To more perspicuously illustrate the overall analysis of Cantonese attenuatives, the following is a concrete example of derivation with a monosyllabic input:

(13) The derivation of a Cantonese attenuative, with a monosyllabic input

Input:	hʊŋ21 'red'	
r-stem:	[hʊŋ21 hʊŋ21]$_{\text{r-stem}}$	Self-compounding by MDT (10)
tɐɪ25-affixation:	[[hʊŋ21 hʊŋ21]$_{\text{r-stem}}$ **T** *tɐɪ25*]$_{\text{Atten.}}$	Subcategorization of *tɐɪ25* (11)
Output:	hʊŋ21 hʊŋ2**5** tɐɪ25	Tonal alternation (9)

Now we turn our attention to disyllabic inputs with which the attenuatives exhibit variation:

(14) The derivation of a Cantonese attenuative, with a disyllabic input

	Group I speakers	Group II speakers
Input:	ɔŋ22 kɵʏ55 'daft'	ɔŋ22 kɵʏ55 'daft'
r-stem:	[ɔŋ22 ɔŋ22 kɵʏ55]$_{\text{r-stem}}$	[ɔŋ22 ɔŋ22 kɵʏ55]$_{\text{r-stem}}$
tɐɪ25-affixation:	[[ɔŋ22 ɔŋ22 ~~**T**~~ *tɐɪ25* kɵʏ55]$_{\text{r-stem}}$]	[[ɔŋ22 ɔŋ22 **T** *tɐɪ25* kɵʏ55]$_{\text{r-stem}}$]
Output:	ɔŋ22 ɔŋ22 tɐɪ25 kɵʏ55	ɔŋ22 ɔŋ2**5** tɐɪ25 kɵʏ55

When the input is disyllabic, what makes the output forms in groups I and II different in (14) is whether there is tonal overwriting, or, in other words, whether tonal alternation applies. According to the application conditions of tonal alternation (9), there must be a stem-final boundary immediately to the left of **T**. If the required boundary is absent, tonal alternation is blocked. This is denoted by **T** being crossed out for group I speakers in (14). Group II speakers, then, have presumably reanalyzed, and loosened, the application conditions of tonal alternation, where **T** always triggers tonal alternation disregarding the stem-final requirement.

The implication of this analysis is that the group II output forms, but not the group I ones, are the new variants. This is supported by reference grammars such as Matthews and Yip (1994, 2011) which have the group I forms only. This is not the end of our story, however. There are at least three issues.

First, the claim that the group II forms are more recent is empirically testable, specifically through corpus-based investigations. Unfortunately, the dearth of corpus data is of significant hindrance. In Luke (2011) with approximately 180,000 words for contemporary Cantonese spoken in Hong Kong, there are only twelve instances of the attenuative constructions in question. What we would also need is diachronic data.

Second, the disyllabic inputs of attenuatives are assumed to be monomorphemic, which is a crucial assumption in the analysis of the blocking of tonal overwriting in (14). If a disyllabic input can be further parsed into two morphemes, with each syllable being a morpheme, then we should expect tonal overwriting. Two instances of attenuatives from Luke (2011) appear to be examples in point, in (15a):

(15) Attenuatives with disyllabic, and arguably bimorphemic, inputs; data from Luke (2011)

a. i. lʊk22 lʊk2**5** teɪ25 sɪk55 (← *lʊk22 sɪk55* 'green (lit. green-color)')

ii. hɐŋ22 hɐŋ2**5** teɪ25 sɪk55 (← *hɐŋ22 sɪk55* 'apricot (lit. apricot-color)')

b. i. [[[lʊk22] [lʊk22] **T** *teɪ25* [sɪk55]]$_{\text{r-stem}}$]$_{\text{attenuative}}$

ii. [[[hɐŋ22] [hɐŋ22] **T** *teɪ25* [sɪk55]]$_{\text{r-stem}}$]$_{\text{attenuative}}$

(15b) shows the Phonological Subcategorization analysis of the data in (15a) using the subcategorization frame for a disyllabic input in (12). Since each of the two syllables in the input is a morpheme itself, there is a right-hand morphological boundary preceding **T**. Tonal alternation is predicted to apply, according to (9). This results in tonal overwriting as observed in (15a). These data suggest that perhaps there exists a subgroup within the group I speakers that exhibit tonal overwriting with disyllabic inputs just in case when the input is bimorphemic. Other than the color terms as in (15), another area potentially with a substantial amount of disyllabic, bimorphemic words are the verb-object compounds, see Matthews and Yip (1994, 2011). In fact, many of these so-called compounds are potentially ambiguous between two morphosyntactic parses: a bona fide word with two morphemes, or a phrase composed of two words. It may turn out that the locus of variation in tonal overwriting is not at the application of tonal alternation, but at the parsing of these disyllabic inputs, or a combination of both. An analysis based on the varying nature of morphosyntactic parsing is, however, not pursued here, because such an analysis would not be robustly falsifiable: wordhood is a perennial problem for Chinese languages, see footnote 5 above.

Lastly, a prediction is borne out, which has to be verified empirically. The state of affairs with respect to the variation in tonal overwriting is more complicated than what has been described so far: there exist speakers with no tonal overwriting in attenuatives with monosyllabic inputs. For these speakers, then, tonal overwriting is *not* expected to be found with disyllabic inputs, either. This is because, in terms of my analysis, **T** is absent as part of the affix *teɪ25* to begin with.

We await more corpus data, both synchronic and diachronic, to shed light on the issues alluded to above.

6 CONCLUSIONS

Empirically, this paper has introduced a case of fixed-tone reduplication in Cantonese. The emergence of the fixed-tone pattern was argued not to be due to TETU, based on language-internal facts and their analyses, viz., tonal alternation and general issues of tonal markedness. The tonal and reduplicative phenomenon adds to our cross-linguistic study another example of non-TETU fixed phonological material in reduplication in the tonal domain, apart from Downing (2005) on African languages. Moreover, the Cantonese attenuative data are interesting in that there is variation with respect to the fixed-tone pattern. Other few cases of variation in reduplication discussed recently, though not in terms of fixed phonological material, include Ilokano plurals (Hayes and Abad 1989) and Pima plurals (Riggle 2006).

On the theoretical front, this paper has analyzed the fixed-tone reduplicative pattern and its variation in terms of Phonological Subcategorization. Furthermore, in the course of laying a concrete foundation for further analysis of Cantonese morphophonology, this paper has argued that Morphological Doubling Theory offers a better treatment of reduplication, by virtue of what has to be modeled in the broader picture of Cantonese grammar without invoking theoretical constructs not (yet) justified for this language. This paper is an illustrative example of doing analysis without losing sight of the general grammar of the language under study.

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