Circumscriptive haplologizing reduplicants

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Abstract

This paper argues that there are morphemes that circumscribe subparts of stems, creating word-internal boundaries that condition phonological processes, trigger allomorphy, and provide a locus for concatenation. Examples are found in Māori, a Polynesian language spoken in New Zealand. Circumscriptive morphemes are shown to trigger allomorphy in a number of morphemes, including the imperative *e*~∅ and tense marker *ka~kaː*. They are also used to account for vowel lengthening in certain plural and passive forms, and motivate infixation in reduplication.

Keywords: circumscription, haplology, infix, Māori, reduplication

1. Introduction

Some morphemes have no underlying content of their own; they borrow it from the stems they attach to (McCarthy & Prince 1999). Such 'reduplicants' are ubiquitous. There are several in the Polynesian language Māori, which will be the empirical focus here (ISO: mri; Austronesian>Malayo-Polynesian>Polynesian>Central Eastern Nuclear Polynesian). For example, the base [pi.ɾau] *pirau* 'to be extinguished' reduplicates as [pi-pi.ɾau] <pipirau> 'to be decayed' and [pi.ɾa-pi.ɾau] <pirapirau> 'to be decayed' (Keegan 1996).

Some morphemes undergo 'morphological haplology': their segments merge with neighbouring material when it is sufficiently similar. For example, the genitive suffix in many dialects of English merges with the plural morpheme: e.g. /dɔg-z_1-z_2/ 'dog'+plural+possessive → [dɔgz] <dogs'>, *[dɔgzəz]. Similarly, French /ist/ *-iste* merges with preceding /i{s,z}(t)/: e.g. /analiz-ist/ 'analyze'+agentive→ [analist] <analyste>, *[analizist]. For other examples, and why morphological haplology involves merger rather than deletion, see de Lacy (1999b).

Here, I will argue that there are morphemes that are *both* contentless and undergo morphological haplology, expanding on previous work (de Lacy 1996, 1999a). Such 'haplologizing reduplicants' merge with the phonological material of adjacent morphemes. Following my previous work, such morphemes will be called 'circumscriptive' (CR) because of their phonological and morphological effects.

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The behavior of circumscriptive morphemes is schematized in (1) below. The string [taka] in the output [pataka] is an exponent of both the root morpheme PATAKA and the haplologizing reduplicant CR. Lines show morpheme affiliation, not association.

(1) *Haplologizing reduplicants schematized*

Underlying: /pataka+CR/

PATAKA CR

Reduplication: [pataka - taka]

PATAKA CR

Morphological haplology: [pataka]

Circumscriptive morphemes can be detected by how they affect their environment. Phonologically, they can cause prosodic and segmental changes in the stem they merge with. Morphologically, they can condition allomorphy, and serve as the base of affixation.

de Lacy (1996, 1999a) argued that circumscriptive morphemes are found in Māori. I go further here in arguing that Māori contains two distinct types of circumscriptive morpheme: 'coextensive' and 'non-coextensive'. Non-coextensive circumscriptive morphemes can merge with parts of stems, and are discussed in §2. Coextensive circumscriptive morphemes – discussed in §3 – must align with the edges of the stems they merge with. A formal implementation and typology are sketched in §4.

2. Non-coextensive circumscriptive morphemes

There are several non-coextensive circumscriptive morphemes (NCRs) in Māori. In all cases, the NCRs are foot-sized in the output: i.e. (C)V(C)V (de Lacy 2004).[1] They are suffixal in that they merge with the rightmost set of elements in the stems they attach to: e.g. /wahine+NCR/ → [wahine].

de Lacy (1996, 1999a) argued that formation of the Māori kinship plural involves a circumscriptive morpheme. I review the argument here, augment it with additional evidence, and recast the morpheme as specifically a non-coextensive circumscriptive morpheme.

The Māori kinship plural morpheme is an NCR. Its presence can be detected through a side effect of Māori's alignment restrictions on stems (de Lacy 2003): stem edges must align with Prosodic Word (PrWd) edges. For example, in /wahine+NCR/ → [wahine], [h] is the left

[1] There are several theories of how the surface form of underlyingly contentless morphemes is determined. In templatic theories, the Māori NCRs would consist of a Ft node underlyingly (e.g. Marantz 1982, McCarthy & Prince 1986); in Generalized Template Theory, they would be marked as stems, and constraints would emergently enforce foot size (McCarthy & Prince 1999, Urbanczyk 1996).

edge of the NCR morpheme, and so it must align with a PrWd edge: [wa{hine}]. However, doing so strands [wa] – as root material [wa] must also inhabit its own PrWd: [{wa}{hine}]. The problem with {wa} is that it is too small – it is below Māori's minimum size requirement of one foot per PrWd (de Lacy 2004, McCarthy & Prince 1986). Consequently, /wa/ must augment, economically achieved by lengthening: [{waː}{hine}].

(2) *Formation of wāhine*

Input:	/wahine+NCR$_{PLURAL}$/
Merger of NCR:	[wa.hi.ne]
PrWd boundaries:	[{wa}{hi.ne}]
Subminimal word lengthening:	[{waː}{hi.ne}] <wāhine> 'woman+PL'

So, the effect of the kinship plural NCR is to cause vowel lengthening. However, exactly *which* vowel can be lengthened is very restricted: the kinship plural NCR can only cause lengthening of the initial vowel in *trimoraic* stems /(C)V(C)V(C)V/. For bimoraic stems like /tama-NCR/ 'son, nephew', the NCR merges with the *entire root*: [{tama}]. Consequently, no segments are stranded, so lengthening does not occur.

(3) *Kinship plural*[2]

a. No lengthening in bimoraic roots

Singular		*Plural*		*Gloss*
[ta.ma]	<tama>	[ta.ma]	<tama>	boy
[tau]	<tau>	[tau]	<tau>	husband, spouse

b. Lengthening in Trimoraic roots (Hohepa 1967: 12; Bauer 1993: 354)

[ma.tu.a]	<matua>	[maː.tu.a]	<mātua>	parent
[ta.ŋa.ta]	<tangata>	[taː.ŋa.ta]	<tāngata>	man
[tu.pu.na]	<tupuna>	[tuː.pu.na]	<tūpuna>	ancestor
[wa.hi.ne]	<wahine>	[waː.hi.ne]	<wāhine>	woman
[ɸae.a]	<whaea>	[ɸaː.e.a]	<whāea>	mother
[tei.na]	<teina>	[teː.i.na]	<tēina>	younger sibling (same sex)

Notice that the NCR carves out (circumscribes) a foot disregarding the derivational base's syllable structure: e.g. /teina/ is [tei.na] in the singular, but [teː.i.na] in the plural, where the NCR has effectively cut the base's first syllable in two.

The NCR analysis has two subtle effects. One is that the NCR cannot affect trimoraic roots of the form /CVːCV/. Māori does not permit adjacent identical vowels within a stem. So, the plural of [taːne] <tāne> 'husband' is the unaugmented [taːne]; it is blocked from becoming *[taː.a.ne] because [aː.a] consists of adjacent identical vowels.

Using the NCR also means that longer roots will not have lengthening. For example, [paːpaː] <pāpā> 'father' merges with the NCR as [paːpaː]; the remnant [paː] already has enough material for a PrWd, so does not lengthen: [{paː}{paː}]. The same goes for [tamaːhine] 'daughter(s)', [hu.nao.ŋa] <hunaonga> 'son(s)/daughter(s)-in-law', [tuakana] <tuakana>

[2] Unless stated otherwise, words and their glosses are from Williams (1957). If a word has several meanings, only one is provided here to save space.

‘elder same-sex sibling(s), cousin(s)’, and [mokopuna] <mokopuna> ‘grandchild/grandchildren’.

Like all minor plural formation rules, exactly what belongs in the ‘kinship’ class is somewhat capricious and fluid. For example, *whaea* has lengthening in some dialects and not others (Bauer 1993: 354).

There are two problematic words for this analysis: [tuahine] <tuahine> ‘sister (of male)’ and [tuakana] <tuakana> ‘older sibling (same sex)’. Both words have more than three moras and so lengthening should not occur, yet it does: their plurals are [tuaːhine] and [tuaːkana] respectively. It is possible that these forms are suppletive, similar to [ta.mai.ti] ‘child’~[ta.ma.ɾi.ki] ‘children’. Certainly, other four-mora roots do not undergo lengthening, as listed above.

2.1. Minor passive formation

There is another NCR morpheme that accompanies the passive suffix in a particular class of words, first suggested in de Lacy (1996). Such forms involve lengthening the first mora in the passive form, but only in trimoraic words. Notice that all the words below in (4) have the same output shape in the passive: [(C)Vː(C)V(C)V]. There are no lengthened bimoraic or four-mora passive forms.

(4) *Passive lengthening (Harlow 1991: 118-120, 2007: 117; Keegan 1996: 63)*

Active		*Passive*		*Gloss*
[a.ko]	<ako>	[aː.ko.-na]	<ākona>	teach
[ɸai]	<whai>	[ɸaː.i.-a]	<whāia>	chase
[ɸa.ka-ɾe.ɾe]	<whakarere>	[ɸa.ka-.ɾeː.ɾe.-a]	<whakarērea>	reject
[hu.ti]	<huti>	[huː.ti.-a]	<hūtia>	hoist
[ki.-ki]	<kiki>	[kiː.ki.-a]	<kīkia>	kick
[ku.me]	<kume>	[kuː.me.-a]	<kūmea>	pull
[ku.ti]	<kuti>	[kuː.ti.-a]	<kūtia>	cut
[mi.-mi]	<mimi>	[miː.i.-a]	<mī.ia>	urinate
[pa.ki]	<papaki>	[paː.ki.-a]	<pākia>	slap
[po.ki]	<poki>	[poː.ki.-a]	<pōkia>	cover over
[pu.-pu.hi]	<pupuhi>	[puː.hi.-a]	<pūhia>	shoot
[ɾi.ɾi]	<riri>	[ɾiː.ɾi.-a]	<rīria>	scold
[ta.-ta.ɾi]	<tatari>	[taː.ɾi.-a]	<tāria>	wait
[ti.ki]	<tiki>	[tiː.ki.-na]	<tīkina>	fetch

Lengthening happens in the passive for the same reason as in kinship plural formation. The NCR morpheme accompanying the passive in these words carves out a foot’s worth of material from the passivized form: e.g. /poki+PASS+NCR/ → [po.ki.a+NCR] → [po.ki.a]. The remnant [po] is stranded and subminimal, and so much lengthen for the same reason as in the kinship plural forms: [{poː}{kia}].

Notice that it is the shape of the *output* that matters, not of the input. Almost all the roots above are /(C)V(C)V/ underlyingly because suffixing the passive typically adds a mora,

resulting in a trimoraic form that the NCR can then circumscribe. However, some roots are other sizes underlyingly. For example, 'urinate' is underlyingly /mi/. In the singular, it is augmented to minimal word size by a reduplicant: [{(mi+mi)}]. However, reduplicants are typically lost in the passive (as in *tatari~tāria* above), so the NCR morpheme ends up circumscribing the passive morpheme alone, leaving the root to augment: /mi+PASS+NCR/ → [mi.i.a+NCR] → [mi.i.a] → [{(miː)}{(i.a)}], *[mīa].

Not every trimoraic verb undergoes lengthening in the passive. In fact, the usual situation is to not lengthen: e.g. [kati]~[katia], *[kaːtia] <kati> 'shut', [numi]~[numia], *[nuːmia] 'fold' (de Lacy 2004). However, all of the verbs that lengthen have the same shape: they form [CVːCVCV] in their passived output form. *Kiki* 'kick' is interesting as it has two passive options: [kikia] and [kiːkia] (Keegan 1996: 64). In present terms, the different passive forms for this word depend on whether the NCR morpheme is present: i.e. [ki.ki-a] without the NCR, and [{kiː}{kia}] with the NCR. The variation is due to *kiki*'s variable class membership.

Finally, the NCR also appears with the gerund of some stems: e.g. [a.ko]~[aː.ko.-ŋa] 'learner', [ɾei]~[ɾeː.i.ŋa] 'leap', [ta.ɾi]~[taː.ɾi.-ŋa] 'wait', [ɸai]~[ɸaː.i.-ŋa] 'follow'.[3] However, such stems seem to form a different class from those that take the NCR in the passive as apparently some NCR-passive forms do not take the NCR in the gerund: e.g. <hutinga> 'raising', *<hūtinga> (cf. <hūtia>); <wāhi puhinga> 'shooting target', <riringa> 'anger', <taringa> 'ear'.

2.2. Base of affixation

Māori's third NCR morpheme is found in combination with its reduplicants, as argued in de Lacy (1996, 1999a). The NCR serves as the reduplicants' locus of affixation. An example is provided in (5) for <maranga> 'rise up' and its reduplicated form <mārangaranga> 'rise up one by one, bob up and down'. Importantly, the reduplicative morpheme prefixes to the left edge of the NCR morpheme – [ɾ]. Consequently, the reduplicant cuts the root /maɾaŋa/ in two, and the remnant [ma] must lengthen, just as with the passive and kinship plural.

(5)	Input	/REDUP-maɾaŋa-NCR/
	NCR merger	[REDUP-maɾaŋa]
	Reduplicative alignment	[ma-REDUP-ɾaŋa]
	Reduplication	[ma-ɾaŋa-ɾaŋa]
	Subminimal lengthening	[{maː}{ɾaŋa}{ɾaŋa}]

As with the passive and kinship plural, using an NCR as the locus of reduplicant prefixation makes several predictions. One is that there will be no lengthening in longer forms: e.g. [haɾa-ŋote-ŋote] 'piecemeal', *[haɾaː-ŋote-ŋote], *[haːɾa-ŋote-ŋote]. Accordingly, in Keegan (1996)'s list of 672 trimoraic and four-mora stems with an infixed Ft size reduplicant, all infixed reduplicated trimoraic stems undergo lengthening, but no four-mora stems do.

[3] Keegan (1996: 64) lists [ɸa.ti]~[ɸa.tiː.a.ŋa] <whatīanga> 'angle'. However, the verb *whati* 'flee' is listed with the nominalized form *whatinga* in Williams (1957). *Whatīanga* may be an unrelated form.

The NCR morpheme can also appear with Māori's shorter reduplicant, too. It has the same lengthening effect on trimoraic roots: e.g. [kanono]~[kaː-no-nono] *Coprosma australis*; [ma.nei]~[maː-ne-nei] 'waver'; [pakini]~[paː-ki-kini] 'ache'.

Māori's reduplicants can also appear without a circumscriptive morpheme. When alone, they prefix to the stem: e.g. [ha.wa-ha.wai] 'hillocks', [ku.i-ku.i.a] 'elderly women', [ma.ne-ma.ne.a] 'satisfied', [ma-mao.a] 'steam'. For more on reduplication, see de Lacy (2006) and Keegan (2006).

Without the NCR, it is difficult to explain why and where the reduplicant infixes. The NCR provides a boundary internal to the root's segments which serves as the locus of reduplicative prefixation. It also explains why infixation only applies to trimoraic or longer roots, and not bimoraic ones (e.g. there are no forms like [pata]~*[pa-ta-ta]).

Alternative methods of explaining the locus of Māori reduplicative infixation present challenges. The reduplicant clearly cannot prefix to the derivational base's foot because the foot is word-initial in some words and non-initial in others, as shown in (6) (foot structure is from de Lacy 2004).

(6)

a.	[ho(púː)] 'be swollen'	[{(hóː)}{puː}{puː}] 'blistered'
b.	[hu(tói)] 'stunted'	[{huː}{toi}{toi}] 'stunted'
c.	[(háe)re] 'go'	[{haː}{e.re}{e.re}] 'wander about'
d.	[(ŋói)o] 'wheezing'	[{(ŋóː)}{io}{io}] 'weak'
e.	[(má.ɾa)ke] 'bald'	[{maː}{ɾake}{ɾake}] 'bald'

In other cases of infixation, morphemes have been argued to appear inside their stems to either avoid a phonological problem (such as a syllable with a coda), or to attach to a particular prosodic element or edge (Ussishkin 2007). The fact that there are both prefixing and infixing versions of reduplication in Māori means that there can be no phonological motivation for reduplicative infixation: i.e. there is nothing phonologically ill-formed about [{(ma.ɾa)}-{(ma.ɾa)ke}].

It is clear that the Māori infixing reduplicants do not seek to prefix to a particular output prosodic constituent, either. There is certainly a prosodic similarity in the outputs of reduplicated forms (all reduplicants end up with shape […RED+{Ft}]). However, this infixation cannot be motivated by an output requirement that the reduplicant prefix to a foot because this would be more faithfully satisfied by merely prefixing: e.g. [{(ma.ɾa)}-{(má.ɾa)ke}] – notice that such a form has the added advantage of being faithful to underlying vowel length and contiguity. The Māori reduplicative infixes are classic cases of 'circumscription' (McCarthy & Prince 1986) – morphological operations that involve carving out prosodic constituents, hence the need for a special 'circumscriptive' morpheme like the one proposed here.

To conclude, Māori has three NCR morphemes.[4] One is the kinship plural, the other

[4] Keegan (1996: 61ff) lists 31 words that have variable initial syllable length (also see Harlow 1991). However, these forms are not obviously morphologically related; they seem to be variant

accompanies a small class of words in the passive form, and the third accompanies reduplicants. Their effects are similar: they circumscribe part of the stem they attach to, forcing any remaining segments to form their own PrWd, which then causes lengthening if the remainder is subminimal. For reduplicants, the NCR is the reduplicant's base of prefixation. The NCR analysis explains why only trimoraic roots are affected in the plural, and why the form of the lengthened output in passivized forms is always [(C)V:(C)V(C)V].

3. Coextensive circumscriptive morphemes

Māori also has a *coextensive* type of circumscriptive morpheme – 'CCR', not discussed in de Lacy (1996, 1999a). Like the Māori NCRs, the Māori CCR is one foot in size. Unlike the NCRs, *both* of the CCR morpheme's edges must coincide with its stem's edges. So, its edge requirements mean that it only appears with foot-sized (i.e. bimoraic) roots. For example, the output of /pai-CCR/ is [pai] where the CCR is both foot-sized and aligned with both edges of the root. In contrast, for /taŋata-CCR/ → [taŋata], the CCR is foot-sized, but its left edge does not align with the base's left edge.

The CCR's presence is detectable in Māori because it conditions suppletive allomorphy. For example, the tense marker *ka* has two allomorphs [ka] and [ka:] (Biggs 1969: 28; Bauer 1993: 243pdf). The long [ka:] appears when the rest of the phrase contains two morae, otherwise the short allomorph [ka] appears. This allomorphy can be explained by using the CCR. *Ka* has two lexically-listed (suppletive) allomorphs: /ka:+CCR/ and /ka/ (Mascaró 1996). The allomorph [ka:] appears when it can attach to the CCR morph, and [ka] appears elsewhere. So, in /'ka' mataku/, the output [ka mataku] wins because the alternative [ka mataku] does not have a coextensive CCR morpheme. In contrast, for /'ka' pai/, the output [ka: pai] can win because [ka:] can attach to the CCR morph.

There are a number of monomoraic particles in Māori that do *not* undergo lengthening, such as the indirect object marker *ki*. In the present approach, the difference between *ka* and *ki* is that *ki* has only one allomorph in the Lexicon: /ki/.

The CCR also conditions the imperative morpheme. The imperative is [e], but only if the following phrase consists of two morae: e.g. [e tu:] <e tū> IMP+stand 'Stand up!' (Bauer 1993: 30). If the phrase has more than two morae, *e* is not used: e.g. [hae.re a.tu] 'go away!', *[e hae.re a.tu]. In present terms, the imperative has two suppletive allomorphs: /e+CCR/ and /∅/. /e/ appears whenever CCR can be satisfied – i.e. with a bimoraic base.

So, CCR morphemes can be used to condition allomorphy. They are not useful for Māori alone: this same conditioning environment occurs in many English dialects for the comparative *–er*. For example, in my speech (an idiolect of New Zealand English), /-ɨɻ/ <er>

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pronunciations: e.g. <aki>~<āki> 'to encourage', <hou>~<hōu> 'new, recent, fresh'. Several of the forms are not Trimoraic, and where they lengthen is unpredictable: e.g. <tuara>~<tuarā> 'back', cf. <tauhou>~<tauhōu> 'strange', <tawere>~<tāwere> 'hang'. These forms clearly do not show the effect of an NCR morpheme – there is no clear morphological process here, and their length variants are unpredictable, indicating that they are suppletive (lexically listed).

comparative only suffixes to bases that consist of a foot: e.g. [(gɻiːn)-ɨ] <greener>, [(pɜp)l-ɨ] <purpler>, [(klɛ́v)ɻ-ɨ] <cleverer>, [(hǽ.pi)-jɨ] <happier>, [(mɔ́d)n-ɨ] <moderner>. It doesn't suffix to longer bases: *[(ʔɛ́.lɨ)gɨnt-ɨ] <eleganter>, *[dɨ(láit)fɨl-ɨ] <delightfuller>, *[(zɛ́l)ɨs-ɨ] <zealouser>, *[ɨ(mɛ́ns)-ɨ] <immenser>. As with the Māori imperative and *ka*, the comparative's allomorphs are conditioned by whether the base is bimoraic, and the CCR provides a way to account for such sensitivity.

4. Theory and typology

It is likely that any theory that implements morphological haplology as coalescence (e.g. de Lacy 1999b) and has some way of dealing with templatic morphology will permit haplologizing reduplicants.

In theories with templates (e.g. Marantz 1982), haplologizing morphemes have the same underlying shape as reduplicative templates. Instead of being filled in by spreading/copying, they merge (or, in serial terms, they reduplicate then haplologize).

In Generalized Template Theory, templatic shape is due to the emergent effect of markedness constraints on morpheme size and prosodic alignment. In serialist Optimality Theories, circumscriptive reduplicants may be implemented as involving reduplication, followed by morphological haplology. A greater challenge is found in one-level theories, like classical Optimality Theory (Prince & Smolensky 2004).

In one-level OT with Generalized Template Theory, circumscriptive morpheme shape is due to the emergent effect of markedness constraints. In Māori, stem edges must align with PrWd edges. So, in /wahine+NCR/, where NCR is a stem, a candidate such as [{(wá<u>hi)ne</u>}] will fatally violate stem-PrWd edge alignment constraints because the left edge of the NCR is not at the left edge of a PrWd. In contrast, both the winner [{(wáː)}{(<u>hine</u>)}] and loser *[{<u>wahine</u>}] have PrWd boundaries at both left and right edges of both stems – *wahine* and NCR. The crucial distinction between these candidates involve constraints that favor a smaller size of PrWd (for a constraint-based analysis of Māori PrWds, see de Lacy 2003).

Formally, there is probably no difference between coextensive and non-coextensive circumscriptive morphemes. The sensitivity of suppletive allomorphy to coextensiveness in section 3 can be ascribed to the constraints that select for particular suppletive allomorphs. Those constraints favor faithfulness and small PrWds, so selecting allomorphs with a circumscriptive morph for foot-sized stems, and allomorphs without the circumscriptive morph for smaller or larger stems.

Cross-linguistically, circumscriptive morphemes should have the kinds of effects discussed above: serving as the locus of infixation, and conditioning edge-sensitive phonological processes.

Yu (2003) has argued that infixes attach to a variety of constituents. For example, the KiChaga intensive is formed by prefixing /n-/ to the final syllable of a stem: e.g. /muili-n/ → [mui-n-li] 'white+intensive' (Yu 2003: 32). Such 'pivots' could instead be analysed as circumscriptive morphemes. So, the KiChaga intensive would consist of /n/ and a NCR that

is σ-sized (an 'affix' in Generalized Template Theory). The NCR merges with the final syllable, and the /n-/ prefixes to it: /muili-n-NCR/ → [mui-n-li].

Circumscriptive morphemes could come in even smaller forms when their template specifies it (e.g. they are /C/) or when constraints compress them. Such cases would appear as involving infixation to initial consonants or subsyllabic constituents. For example, the Atayal animate actor focus suffix can be seen as suffixing to a circumscriptive prefix that is forced to a minimal size: e.g. / NCR-m-qul/ → [q-m-ul] 'snatch' + animate actor focus (Yu 2003: 13). The famous Tagalog *um* infix could be reanalyzed as infixation to an NCR that spans the first onset: e.g. [gr-u.m-ad.wet]. In such an analysis, phonological constraints do not motivate infixation; instead, *um* suffixes to an NCR (cf. Prince & Smolensky 2004, McCarthy 2003, Yu 2003: 23).

If circumscriptive morphemes exist, it may be possible to conceive of all morph concatenation as involving attachment to morpheme edges or prosodic heads. Cases where infixes seem to attach to other prosodic constituents would really involve attachment to circumscriptive morphemes. In such an approach, there is no role for direct phonologically-driven affixation, where phonological restrictions determine the position of morphemes (see also Yu 2003, Zimmerman & Trommer 2013).

In terms of the phonological effects of circumscriptive morphemes, Māori shows that alignment of PrWd and circumscriptive morpheme edges can affect vowel length. It is likely that other detectable effects will be side effects of cutting stems in two, as in Māori. The visible phonological effects of circumscriptive morphemes, then, will most obviously be those restrictions and processes that apply at certain constituent edges – the PrWd in the case of larger circumscriptive morphemes.

5. Conclusions

I have argued here that there are morphemes that have no segmental material of their own, but merge with their stems both coextensively and non-coextensively, building on de Lacy (1996, 199a). Such 'haplologizing reduplicants' can have both phonological and morphological effects, and account for Māori's lengthening and reduplicative infixation. It is possible that such 'circumscriptive' morphemes are found in many other phonological systems, and may in fact be present in all cases of infixation.

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