Circumscriptive Morphemes
and Reduplicative Haplology[*,♦]

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1 Empty Morphemes

The aim of this talk is to explore the consequences of a question:

➢ What can happen to underlyingly empty morphemes?

There are 3 options: the first 2 are well-attested, the 3rd hasn't been discussed at all.

1. Remain empty: *zero morphs*

SHEEP' + PLURAL' → SHEEP' + PLURAL'

/ʃ i p/ ∅ [ʃ i p]

Second option: M demands output material and **copies** to get it.

2. Copy: *reduplicants* (McCarthy & Prince 1994, 1995)

PATA' + RED → PATA' + RED

/p a t a/ ∅ [p a t a] [p a t a]

RED needs output material and copies to get it.

3. Coalesce/Merge: *a new sort of morpheme*: a 'circumscriptive morpheme'

PATA' + CR → PATA' + CR

/p a t a/ ∅ [p a t a]

* Thanks to John McCarthy, Lisa Selkirk, and Catherine Kitto for their comments. Also thanks to Peter Keegan for commenting on an earlier related paper (de Lacy 1996). This work was supported by the National Science Foundation under grant SBR-9420424.

♦ This talk was originally supposed to be – as advertised – about life, the universe, and everything. I recently found, though, that this topic has already been dealt with in a definitve manner (see Douglas Adams (1982) "Life, the Universe, and Everything." London: William Heinemann Ltd.), hence the change in topic.

Like RED, it needs output material. But it gets it by sharing or 'coalescence'. This sort of M I'll call 'circumscriptive', for reasons that'll become clearer later.

CR and RED both need output phonological material.
The difference is in how they get the material.

Aim: To give evidence for CR's existence.

Structure of talk:

§2: What CR is, and how it works in OT.
§3: To show what it can be used for by looking at two phenomena in Maori:
(1) Lengthening.
(2) 'Parsing out' circumscription.

TIME = 1.30 MINUTES

2 What is CR?

Descriptively speaking, CR combines aspects of two different types of morphemes:

- It is 'reduplicative' because it is dependent on another morpheme for its material.
- It is 'haplologizing' because it coalesces with another morpheme (for haplology as coalescence, see de Lacy 1998a).

A normal case of haplology is found on your handout with the Japanese [kanaʃi]… Notice here that the [ʃi] of the root and [ʃi] of the affix have the *same* output correspondents.

- Its *reduplicative aspect* can be captured by requiring it to correspond to a base. Constraints that require it to correspond to a Base can be invoked, just like MAX-BR requires the empty morpheme RED to be in correspondence.

As for its

- *Haplologizing aspect*:

A morpheme haplologizes when the need to minimize structure (*STRUC) outweighs the need to have unique output material. The desire to have unique segments is expressed by MORPHDIS (McCarthy & Prince 1995):[1]

Haplology happens when the desire to avoid structure outweighs the need to avoid coalescence.

The constraint that tells us to avoid coalescence is:

MORPHDIS = $*M_1 \quad M_2$ "A single segment shouldn't belong to more than one M."

$$\begin{array}{ccc} *M_1 & & M_2 \\ & \diagdown\ \diagup & \\ & x & \end{array}$$

The first tableau shows how these requirements interact: the normal RED: patapata has no Morphdis violations because each seg only belongs to one morpheme. But it violates the anti-structure constraint *STRUC a lot more than the coalesced *pata* – coalescence is shown by italics. Since they're in conflict, permuting the ranking gets the opposite result: tableau 2. This shows a haplologized reduplicant: CR is a morpheme that, like RED, must correspond to something, but unlike RED ends up coalescing with that thing.

- Ɇ = Empty Morpheme.
- Coalescence is shown by *italics*.

(1) ||MORPHDIS» *STRUC||: Normal Reduplicant (RED):

/pata + Ɇ/	MORPHDIS	*STRUC
☞ patapata		xxxx
pata	xxxx!	

[1] UNIFORMITY was used in de Lacy (1998), but cannot be used here since UNIFORMITY is only sensitive to the output coalescence of two input segments. See the final section of this handout for an argument that both UNIFORMITY and MORPHDIS are needed.

(2) ||*STRUC » MORPHDIS||: Haplologized Reduplicant (CR)

/pata + E/	*STRUC	MORPHDIS
patapata	xxxx!	
☞ *pata*		xxxx

- RED = empty morpheme where ||MORPHDIS » *STRUC||
- CR = empty morpheme where ||*STRUC » MORPHDIS||

This is how the CR morpheme works, in brief: it is a haplologizing reduplicant.

So, CR is a haplologizing reduplicant.

Final point: Haplology is morpheme-specific (Stemberger 1981).
It is not a property that is derivable from phonological shape.

To express this, assume that either MORPHDIS or *STRUC are relativised to specific morphemes.[2]

This means that CR and RED can coexist in the same grammar, just as haplologizing and non-haplologizing morphemes can coexist.

TIME: 5.30 minutes

3 Haplologizing Reduplicants in Maori

So, now that we know that CR is a haplologizing reduplicant, what's it good for?.

What is CR good for? The aim of this section is to answer this question by looking at the Polynesian language Maori (spoken in New Zealand).

There are two processes in Maori that give independent evidence for CRs existence:

(1) morphologically conditioned lengthening in Plural formation

(2) Parsing out circumscription in Reduplicative Infixes

[2] See de Lacy (1998). One possible ranking is ||UNIFORMITY, MORPHDIS(RED) » *STRUC » MORPHDIS||. UNIFORMITY stops underlyingly contentful morphemes from coalescing and MORPHDIS(RED) stops reduplicants from coalescing. This leaves CR alone to coalesce.

TIME: 6 minutes 15 seconds

3.1 Kinship Plural Formation – [CR + Root]

The first case is morphologically conditioned lengthening.

Aim of this section: To show that CR can induce lengthening.

A number of forms undergo change to mark plurality (Williams 1971):

taŋata → ta:ŋata ‘men/people’
matua → ma:tua ‘parents’
wahine → wa:hine ‘women’
teina → te:ina ‘younger siblings (same sex)’
tupuna → tu:puna ‘ancestors’

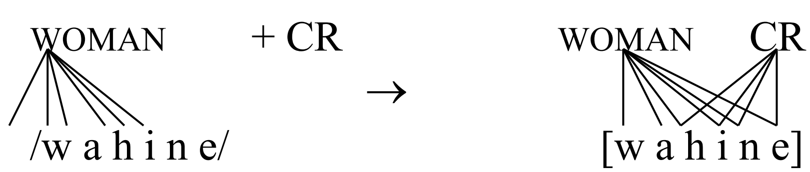
- *Points to Note*:
  - Obvious: The first vowel lengthens.
  - Non-Obvious: This only happens to underlyingly *trimoraic* forms

    cf 2μ: tama → tama ‘son(s), nephew(s)’, *ta:ma

    4μ: taokete → taokete ‘brother(s)-in-law’, *tao:kete

- *Explanation in Brief*:
  - The Plural is formed by adding the circumscriptive morpheme CR.
  - CR is bimoraic in size (more on this later).

CR is bimoraic so it only takes what it needs – i.e. [hine].



Draw PrWd structure on the board.

This may seem to be fairly innocuous except:

- PrWds: roughly speaking Every morpheme edge corresponds with a PrWd edge (i.e. ‘{ }’).

e.g. poro 'cut' + pepa 'paper' → {poro}{pepa}

whaka 'causative prefix' + kite 'see' → {whaka}{kite}

- <u>Consequence</u>: There must be a PrWd boundary at CR's left edge. This effectively cuts *wahine* in two: wa {*hine*
- The remnant *wa* is forced to form a PrWd on its own. Since every PrWd is minimally bimoraic, *wa* is forced to lengthen.
- This produces {wa:}{hine}
- <u>So lengthening is a side-effect of PrWd formation</u>.

- <u>Explains why non-trimoraic do not have lengthening:</u>

(I) Bimoraic: /tama/ + CR → {*tama*}

<u>CR coalesces with the whole thing. So, there's nothing legt over to lengthen.</u>

- Since *CR* coalesces with /tama/ in its entirety, both can coexist within the same PrWd.

(II) 4μ: /taokete/ + CR → {tao}{*kete*}

- Since CR is monomoraic, it merges with *kete*.
- This leaves [tao] to form an independent PrWd. .
- There is no need for [tao] to lengthen since it is already bimoraic.

<u>Now, to flesh out one or two issues this analysis raises.</u>

<u>Why is CR bimoraic? The same reason that certain REDs are bimoraic: it's TETU – low ranked constraints conspiring to make their effects felt in REDs, as McCarthy & Prince 1994,1995 point out. This is effected by identifying CR as a root. A number of Cs require roots to be a PrWd, and the best PrWd is a minimal one – hence bimoraic. This is shown in the tableau below.</u>

- **<u>Issues</u>:**
- *Position*: CR appears to the right edge of the root.
- *Size*:
  - CR is a *Root*.

➢ The Size of empty Roots is due to Emergence of the Unmarked (TETU- McCarthy & Prince 1994, also see Urbanczyk 1996).

1. Roots are optimally a PrWd in size (STEM=PRWD – M&P 1994; or RT=FT – Urbanczyk 1996:89). Emergent effect of ALIGN-E(Lex, PrWd) (Selkirk 1995, etc.).

2. To satisfy the constraints ALL-FT-L and PARSE-Σ fully, PrWds optimally contain one foot, and no unparsed syllables.

3. To satisfy FTBIN, feet must be bimoraic. Therefore, PrWds are bimoraic, and Roots consist of bimoraic PrWds with a single foot:

/mataku + CR/	FTBIN	PARSE-Σ	DEP
a) {(máta)ku}		x!	
b) {(máta)ku}		x!	
c) {(má)}{(táku)}	x!		
☞ d) {(má:)}{(táku)}			x

As shown , the best form is one where CR=2μs, and forms a PrWd on its own.

I won't say anything much about this result except that it is to be expected that the size of CR morphemes results from the same mechanisms that RED size does: after all, they're both the same: empty morphemes that require phonological material.

❑ Another candidate: [(mata)][(ku:)]

Problem: This candidate doesn't violate any of the constraints shown, and violates DEPIO as much as (d).

Solution: Reduplicants in Maori only correspond to Root material – they never copy affixes (see Urbanczyk 1996:105 for a similar case in Lushootseed and the constraint MAX-BR-Root). The epenthesized mora in [ku:] is not Root material, so CR cannot correspond to it.

One other thing this raises, though is the definition of Base: What is the Base for the CR morpheme?

McCarthy & Prince say it is the material to which the reduplicant is attached. obviously, we need to be a little more precise, now that CR is in the picture: after all, CR corresponds to the material that it *is*.

- *The Base*

  ☞ Base= "The phonological material to which the reduplicant is attached." Preceding for suffixes … following for prefixes. (M&P 1994:6).

- Haplologizing Reduplicants require a slight reformulation:[3]

Base = The nearest accessible string.

"Nearest accessible string to M" is the string that either
M is affiliated to,
or is adjacent to M's material.

Condition: RED can't copy material that belongs solely to itself.
(i.e. the material must have some other morphological affiliation).

The condition is there to prevent self-copying. After all, the most accessible string to something is the string that the material governs itself. Self-copying trivially satisfies all faithfulness constraints, so we'd end up with maximally unmarked material. We need the condition (except see Kitto & de Lacy 1999) for related comments.

- In /puka + CR/ → [*puka*], the Base for CR is the nearest accessible string – i.e. the string that CR is affiliated to – [puka].
- In /RED + puka/ → [pupuka], the Base for RED is the string adjacent to RED's pu. It cannot be RED's material since that material belongs solely to RED.

- The Condition: In a normal case of reduplication, the nearest string for the RED is the RED itself. If RED copied RED, though, this would lead to vacuous satisfaction of FAITH, so every RED would consist of [ta(ta)] or [ʔiʔi], or some maximally unmarked string.

In short, CR is like REDs in that its size results from TETU, but this requires a slight refinement of the definition of Base.

[3] This definition is more like the 'dynamic' base proposed for epenthesis by Kitto & de Lacy (1999) – the base is the most optimal string that can be copied – i.e. ~ the nearest string.

TIME: 14.40

3.2 Infixing Reduplication in Maori

Aim of this section:

- ❑ To show that CR can serve as a locus of affixation, so explaining the position of infixed reduplicants in Maori.
- ❑ More generally, To show that CR can mimic the effects of 'parsing out' circumscription.

- ❑ Maori has six different reduplicative morphemes (de Lacy 1996, Keegan 1996):

There are three prefixed and three infixed morphemes, we're going to focus on the infixed versions.

- ❑ Three are prefixes:

Shape	Examples
CV	peke → pepeke panoko → papanoko
CV:	peke → pe:peke kanapa → ka:kanapa
(C)V(C)V	peke → pekepeke tapahi → tapatapahi

- ❑ Three are infixes:

Shape	Examples
CV	pakini → pa:kikini
CV:	kapiti → ka:pi:piti
(C)V(C)V	pakini → pa:kinikini

The issue we want to worry about is Position. Position gives independent evidence for CR.

Position: The reduplicants infix to the final two moras of the root.

- ➢ *Issue*: Why do the infixed reduplicants end up where they do?

- *Parsing-Out Circumscription*

If we didn't know about CR we would be tempted to propose:

Q: Why not say that the reduplicants simply prefix to the head foot?

This is exactly what happens in Samoan: a(lófa) → alo(lófa)

A: Problem: The head foot in Maori is leftmost: [(táwe)ke], so there is no inducement to appear inside the root.

- The bigger problem here is that This is a case of *parsing out* circumscription (M&P 1986, 1990, 1995, McCarthy 1997): A prosodic constituent that isn't already there must be 'cut out' of the root by the circumscription operation: [(táwe)ke] → [(ta || we)ke].
- This is problematic in OT since the 'parsing out' operation relies on the creation of a constituent that does not arise from the constraints of the language. This creates a contradiction in constraints: the 'normal' hierarchy demands feet to be leftmost, but circumscription requires them to be rightmost.

So, parsing-Out Circumscription crucially relies on a phonological constituent that wouldn't end up there due to the normal phonological constraints of the grammar.

- *CR Parsing Out.*
- Proposal: Reduplicants simply prefix to CR (if it present).
- Implementation:

1. /pakini/ + CR → [pa*kini*]
2. RED_{CVCV} attaches to CR → [pakini*kini*]
3. PrWds: {pa:}{kini}{*kini*}

Draw the PrWd structure.

- ❑ So, the inducement to appear inside the root is the requirement that RED prefix to CR. This is a morphological requirement, not a phonological one.
- ❑ Parsing out circumscription **should** result from a morphological requirement . THis is **necessitated is** by the fact that phonological requirements cannot produce parsing out circumscription.

So, this gives entirely independent evidence for CR, quite apart from the lengthening.

In short, infixing reduplication happens when CR is part of the input: Root + CR + RED → infixed RED.

I won't talk about why things lengthen: this is for the same reasons as for the plural – i.e. PrWd formation. {SKIP TO THE CONCLUSION}

- ❑ A Note on Lengthening:
- ❑ Lengthening takes place where we would expect it: there are PrWd boundaries at the left edge of all reduplicants, so the remaining material of the root must form a PrWd on its own, as in /pakini/ → pa:kini*kini*.
- ❑ Lengthening does not take place with longer roots since the remaining material is already sufficient to form a PrWd:

  e.g. /whaupaku/ → [whaupaku*paku*], *[whau:pakupaku].
- ❑ There is no infixation in bimoraic roots since CR encompasses the entire root:

  e.g. /noho + CR + RED_{CV}/ → no[*noho*]

- ➢ The reduplication facts give independent evidence for CR. It is not simply that CR can be used to explain them, but that other – phonological – approaches won't work.
- ➢ Here's why:
- ➢ How else can we deal with parsing out circumscription? If it is to receive a phonological answer, we must identify some constraint(s).
- ➢ McCarthy (1997) has dealt with some parsing out cases by employing prosodic faithfulness constraints.

- Prediction: If prosodic faithfulness motivates infixation, the infixed form must be *more* faithful to the paradigmatic/reduplicative base than the prefixed form.
- Data:

  Paradigmatic Base: {(táwe)ke}

  Prefixed reduplicant: {(táwe)}{(táwe)ke}

  Infixed reduplicant: {(tá:)}{(wéke)}{(wéke)}

- the prefixed reduplicated form is far more faithful to the paradigmatic base than the infixed reduplicated form.

- the prefixed reduplicant and infixed reduplicant are equally identical to their reduplicative bases.

- So, the infixed reduplicant is not more faithful than the prefixed form, therefore there is no motivation to infix.

So, without a phonological answer, we are left to find a morphological one: i.e. CR.

4 Summary

My aim was to introduce a 'new' morpheme, and to give evidence for its existence by showing its effects. Doing so showed that:

- Reduplicants can haplologize.
- The definition of 'Base' must be refomulated to:

  "The Base of *x* is the nearest most accessible string to *x*."
- CR can be used to explain (at least some cases of) parsing out circumscription.

5 Implications

What else can CR be used for?

- ❑ Other cases of 'parsing-out' circumscription (M&P 1986, etc.).
- ❑ CR is not limited to the ROOT in size. It could be an *affix*, producing different effects. Also, it could affect a variety of other phonological processes depending on other constraints in the language, esp. those that apply to morpheme boundaries.
  - ❑ Size-conditioned allomorphy.
    (i) e.g. if allomorph α appears next to bimoraic bases and allomorph β next to larger bases, the allomorphy environment could be stated as 'adjacent to CR'.
  - ❑ Truncation and Subtractive Morphology.
    (i) if a morpheme M is not parsed into morphological structure, it cannot be realised (Prince & Smolensky 1993).
    (ii) if CR *is* parsed into morphological structure and adopts some of M's material, though, that material would be realised.
    (iii) This would seem like only part of M is being realised – hence truncation, subtractive morphology.

TIME: 21 minutes

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