Prosodic morphology

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Background

- In the last few classes of this course, we will be mainly concerned with the interaction between phonology and morphology.
- Today, we are mainly concerned with so-called *prosodic morphology*.

1 Basic tenets of prosodic morphology

A very popular topic of discussion in the phonological literature of the past few decades, has been the study of *Prosodic Morphology*, the types of morphology which refers to elements of prosodic structure, such as morae, syllables and feet. Examples of prosodic morphology are infixation and reduplication. One basic claim of Prosodic Morphology is (McCarthy & Prince, 1998):

(1) Morphological processes use the same prosodic structures as ordinary phonology: morae (μ), syllables (σ), feet (Ft) and phonological words (ω).

The following is an example of reduplication from Ilokano. As in many languages, reduplication expresses plurality on nouns:

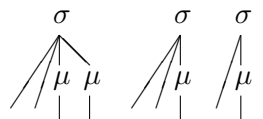
(2)	káldíŋ	'goat'	*kál*-káldíŋ	'goats'
	púsa	'cat'	*pús*-pusa	'cats'
	kláse	'class'	*klas*-kláse	'classes'
	jyánitor	'janitor'	*jyan*-jy'anitor	'janitors'
	róʔot	'litter'	*ro*ː-róʔot	'litter (pl.)'
	trák	'truck'	*tra*ː-trák	'trucks'

In these examples, the copied part (the **reduplicant**) has been highlighted. It is easy to see that this reduplicant is a heavy syllable $\sigma_{\mu\mu}$ in all cases. The idea is that the plural suffix in Ilokano takes this shape: it is an 'empty' heavy syllable which has to be materially filled with segments from the base. Note, by the way, that the mora theory is a convenient way to express this.

Notice that it is not the case that we just copy the first syllable of the stem. The first syllable of *pusa* presumably is *pu*. In order to fill the heavy syllable template, however, we have to add the *s* which is part of the second syllable. The reason why the vowel is lengthened in *ro*ː*-róʔot* and *tra*ː*-trák* has something to do with preferences of syllable structure, which we will not discuss here.

We thus imagine the derivation of a reduplicated plural in Ilokano in the following way:

(3)

Input	*Output*
	
$\sigma_{\mu\mu}$ 'plural' + klase 'class'	k l a s k l a s e

Languages can also choose to specify light syllables (σ_{μ}) as the reduplicant, and as a matter of fact Ilokano provides an instance of this as well, in a suffix which meens 'covered with':

(4)

buneŋ	'buneng'	si-*bu*-buneŋ	'carrying a buneng'
jyaket	'jacket'	si-*jya*-jyaket	'wearing a jacket'
pandiliŋ	'skirt'	si-*pa*-pandiliŋ	'wearing a skirt'

Again, this is not just a process of copying a syllable, witness the last example: we do not copy all material from the heavy syllable *pan*, but only just enough to fill the light syllable template.

Higher-order structure can also function as a template for reduplication. In Diyari we copy a Foot (or a minimal phonological word) to derive various morphological effects:

(5)

wiḻa	*wiḻa*-wiḻa	'woman'
kanku	*kanku*-kanku	'boy'
kulkuŋa	*kulku*-kulkuŋa	'to jump'
tʲiplarku	*tʲilpa*-tʲiplarku	'bird species'
ŋankaṇṭi	ŋ*anka*-ŋankaṇṭi	'catfish'

Again, we see that it is not just the first two syllables (or the first foot) of the word which are copied: the final syllable of the reduplicant is always open, even if the second syllable of the base is not.

Reduplication can also sometimes be total: we then copy the whole (phonological) word. Indonesian plural formation is a case in point:

(6)

wanita	woman	wanita-wanita	women
mašakarat	society	mašakarat-mašakarat	societies

However, even in these cases where we copy a phonological word, restrictions may show up on the reduplicant. For instance, in Axininca Campa we find the following pattern:

(7)

kawosi-*kawosi*	'bathe'
koma-*koma*	'paddle'
osampi-*sampi*	'ask'
osaŋkina-*saŋkina*	'write'

If the stem starts with a consonant, it is completely reduplicated; if it starts with a vowel, it is reduplicated except for the vowel. The reason for this presumably is syllable structure: by not copying the initial vowel, we avoid 'unnecessary' violations of the constraint ONSET, requiring every syllable to start with an onset consonant.

(8) REDUPLICATEMAX (RM): Reduplicate all material from the stem.

(9) a.

/osampi/+RED	NODELETION	ONSET	RM
o.sam.pi.o.sam.pi		**!	
☞o.sam.pi.sam.pi		*	*
sam.pi.sam.pi	*!	*	

b.

/kawosi/+RED	NODELETION	ONSET	RM
☞ka.wo.si.ka.wo.si			
ka.wo.si.wo.si			*!*

We see a very important effect here, which distinguished OT in a favourable way from parametric theories. In a theory of the latter type, we would need to say that the ONSET parameter is set 'on' in Axininca Campa: witness words such as *osampi*, the language allows onsetless syllables. But then we cannot explain why we all of a sudden find a restriction on them in reduplicated forms.

In OT, the situation is different: the constraint ONSET is sufficiently low-ranked — below the relevant faithfulness constraint — in order to make its effect invisible in ordinary words. But in reduplicated words, faithfulness is no longer important (the first vowel of *o* is present anyway), so that now all of a sudden we can see the universal constraint ONSET can be seen at work.

This is called an effect of *the emergence of the unmarked* (TETU), and it is at present the strongest argument in favour of OT over parametric theories.

TETU effects abound in reduplicative systems. For instance, Sanskrit usually allows complex onsets, but when these onsets are reduplicated (in the perfective forms of verbs), they are simplified:

(10) a. *pa*-prat^h-a 'spread'
b. *ma*-mna:-u 'note'
c. *sa*-swar 'sound'
d. *da*-d^{h}wans-a 'scatter'

The constraint which shows up here in the reduplicated form is the one against complex onsets:

(11) a. RED=σ_μ: The reduplicative suffix is a monomoraic syllable.
b.

RED + /prat^h/	NODELETION	*COMPLEX	RED=σ_μ	RM
pra.pra.t^{h}a		**!		t^{h}a
☞pa.pra.t^{h}a		*		rt^{h}a
pa.pa.t^{h}a	*!			t^{h}a
pa.t^{h}a.pra.t^{h}a		*	*!	

I introduced a small piece of new notation in this tableau: in the last column, I list the segments which violate the constraint. I could just as well have given one asterisk for every segment, but this notation gives slightly more insight into what is actually going on.

We also find TETU effects at the level of segmental structure, for instance in Akan (the facts have been slightly simplified):

(12) siʔ → *si*.siʔ 'stand'
(13) seʔ → *si*.seʔ 'say'
(14) buʔ → *bu*.buʔ 'bend'
(15) soʔ → *su*.soʔ 'seize'

This pattern looks very much from what we have seen for reduction. In terms of Element Theory we could state the following markedness and faithfulness constraints:

(16) a. NOCOMPLEXVOWEL: Only allow primary vowels (markedness)
b. KEEPA: Don't delete the element A

These constraints again interact to get a TETU effect:

(17)

RED + /seʔ/	KEEPA	NOCOMPLEXVOWEL	RM
se.seʔ		**!	
☞si.seʔ		*	|A|
si.siʔ	*!		

2 Infixation and shape restrictions

A second well-known example of a prosodic morphological process is infixation. Consider the placement of the third person singular masculine possessive suffix *-ka* in Ulwa (a language from Nicaragua):

(18)	*bas*	'hair'	*bás-ka*	'his hair'
	ki:	'stone'	*kí:-ka*	'his stone'
	su:lu	'dog'	*sú:-ka-lu*	'his dog'
	asna	'clothes'	*as-ka-na*	'his clothes'
	sana	'deer'	*sana-ka*	'his deer'
	amak	'bee'	*amak-na*	'his bee'
	sapa:	'forehead'	*sapa:-ka*	'his forehead'
	siwanak	'root'	*siwa-ka-nak*	'his root'
	ana:la:ka	'chin'	*ana:-ka-la:ka*	'his chin'

At first sight it looks as sometimes *-ka* behaves as a suffix, but sometimes it is also inserted inside the word. On closer inspection, the generalisation is that *-ka* comes after the first syllable of the word, if it is heavy, and otherwise it comes after the second syllable. An insightful way to see this, is to say that the possessive is a suffix to the first (iambic) foot of the word.

Infixation is also often used to show the advantages of Optimality Theory. Look at the following examples from Tagalog with the infix *-um*:

(19)	*um-alis*	'leave'
	t-um-awag	'call PERF. ACTOR TRIGGER
	gr-um-adwet	'graduate'

In this case, *um* sometimes looks like a prefix, and sometimes it looks like an infix; the generalisation is that it is prefixed if the word starts with a vowel and infixed otherwise. Within OT, we can give a nice and elegant description of these facts: by infixing, we prevent an unnecessary violation of the constraint NOCODA. We do this at the cost of violating a (new) instance of an Alignment constraint, one forcing the left edge of the affix to be aligned to the left edge of the word; in other words, making the affix to behave like a *pre*fix.

(20) a. ALIGN(*-um-*, L, ω, L): The left edge of *-um-* should correspond to the left edge of the word (count violations in segments).

b.

/um+tawag/	NODELETION	NOCODA	ALIGN
um.ta.wag		**!	
☞tu.ma.wag		*	*
ta.wu.mag		*	**!*
u.ta.wa	*!*		

c.

/um+alis/	NODELETION	NOCODA	ALIGN
☞u.ma.lis		*	
a.um.lis		**!	*
a.lu.mis		*	*!*
u.ma.li	*!		

Notice that it follows from the principles of the theory that there is a relation between the shape of the infix — VC — and its infixal behaviour. We predict that there could not be a language where an affix *mu* could display the same behaviour:

(21) Non-existing language:
   a. mu+alis → a.mu.lis
   b. mu+tawag → mu.ta.wag

The reason is that infixation in this case does not help:

(22)

/mu+alis/	NOINSERTION	ONSET	ALIGN
☞mu.a.lis		*	
a.mu.lis		*	*!

No matter where we place the infix, there will always be a violation of the constraint ONSET; and this hypothetical language will allow onsetless violations, since it has hypothetical words of the shape *alis*.

Infixation and reduplication are sometimes combined. For instance, in Samoan the σ_μ reduplicant is prefixed to the stress foot:

(23) a. fa.náu → fa.*na*.náu 'be born'
   b. a.lófa → a.*lo*.lófa 'love'

The following paradigm (from Timugon Murut) is also of interest in this connection:

(24) a. bulud → *bu*-bulud 'hill/ridge'

b. dondo → *do*-dondoʔ 'one'
c. indimo → in-*di*-dimo 'five times'
d. ompod → om-*po*-pod 'flatter'

This example is of interest, since it seems to violate a generalisation we just made: that there are no phonological infixes of the shape CV. The reason is that in cases of infixed reduplication we *do* avoid unnecessary violations of the constraint ONSET:

(25) a.

/ompod/+RED	NOINSERTION	ONSET	ALIGN
om.om.pod		**!	
☞om.po.pod		*	om

b.

/bulud/+RED	NOINSERTION	ONSET	ALIGN
☞bu.bu.lud			
bu.lu.lud			bu!

A third process of prosodic morphology is nick-name (**hypocoristics**) formation. In many languages, shorter versions can be used of personal names, for instance to express affection. In these cases, the hypocoristics assume the shape of some well-described prosodic constituent:

(26)

Name	Hypocoristic	
ti	tiičan	
šuusuke	šuu-čan	*šuusu-čan
yoosuke	yoo–čan	*yoosu-čan
taizoo	tai-čan	*taizo-čan
kinsuke	kin-čan	*kinsu-čan
midori	mii-čan	*mi-čan
	mit-čan	
	mido-čan	
wasburoo	waa-čan	*wa-čan
	wasa-čan	
	sabu-čan	
	wasaburo-čan	*wasabu-čan

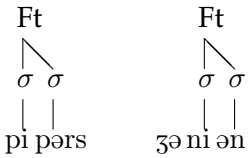
The Japanese hypocoristic consists of a shortened version of the original name plus the suffix *-čan*. These examples show is that not just any shortening will do; we can observe that all the correct hypocoristics consist of an even number of morae, whereas the wrong versions all have an odd number of morae. In terms of the typology of stress feet from the previous class, this implies that the base to which *-čan* is attached will consist of a number of moraic trochees.

The restriction to bases of a certain shape is something we may observe outside the domain of hypocoristic formation. For instance, Dutch has two productive plural suffixes, *-ən* and *-s*. The first one is generally chosen after stems ending in an unstressed syllable, and the second one after a stressed syllable (underlining marks stress):

(27)	a.	*genie*	'genius'	*genieën*	'geniuses'
		fabriek	'factory'	*fabrieken*	'factories'
	b.	*familie*	'family'	*families*	'families'
		piepер	'potato'	*piepers*	'potatoes'

Why do we observe this distributional paradigm? Notice that because of this effect, all plural words tend to end in a (syllabic) trochee: a stressed syllable followed by an unstressed syllable.

(28)



There is an importance difference between the Japanese hypocoristics suffix *-čan* and the Dutch plural suffix: the former requires its input to take a specific trochaic shape, whereas the latter makes sure that the output has this particular shape.

Bibliography

McCarthy, John & Alan Prince (1998). 'Prosodic Morphology'. In: Spencer, Andrew & Arnold M. Zwicky (eds.), *The Handbook of Morphology*, pp. 283–305. Oxford: Blackwell.

Exercise