

Doubled up all over again: borrowing, sound change and reduplication in Iwaidja

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Abstract

This article examines the interactions between reduplication, sound change, and borrowing, as played out in the Iwaidja language of Cobourg Peninsula, Arnhem Land, in Northern Australia, a non-Pama-Nyungan language of the Iwaidjan family. While Iwaidja traditionally makes use of (various types of) right-reduplication, contact with two other left-reduplicating languages – one Australian (Bininj Gun-wok) and one Austronesian (Makassarese) – has led to the introduction of several (non-productive) left-reduplicating patterns. At the same time as these new patterns have been entering the language, the cumulative effect of sweeping sound changes within Iwaidja has complicated the transparency of reduplicative outputs. This has left the language with an extremely varied and complicated set of reduplication types, for some of which the analysis is no longer synchronically recoverable by children.

Keywords: Australian languages, Iwaidja, language contact, directionality, Makassarese, reanalysis

1. Introduction

Despite growing interest in language contact on the one hand, and reduplication on the other, there has been little research to date on how diachrony and language contact impact upon reduplicative patterns.¹ In this article I examine precisely this theme, as played out in the Iwaidja language of Cobourg Peninsula, Arnhem Land, in Northern Australia, a non-Pama-Nyungan language of the Iwaidjan family spoken by around 150 people now mostly living on and around Croker Island in the Northern Territory (see Evans 2000 for a survey of this family). I will show that while Iwaidja traditionally makes use of right-reduplication only, contact with two other left-reduplicating languages – one Australian (Bininj Gun-wok) and one Austronesian (Makassarese) – has led to the introduction of several (non-productive) left-reduplicating patterns. At the same time as these new patterns have been entering the language, the cumulative effect of sweeping sound changes within Iwaidja has complicated the transparency of reduplicative outputs. This

¹ For example, the comprehensive survey of contact phenomena in Aikhenvald & Dixon (2001) contains no reference to reduplication in the index, and conversely the authoritative recent survey of reduplication by Inkelas & Zoll (2005) makes no mention of either language contact or diachrony.

has left the language with a varied and complicated set of reduplication types, for some of which the analysis is no longer synchronically recoverable by children.²

1.1 Sound system

Iwaidja has a fairly typical north Australian phoneme inventory (see Table 1), with paired stops and nasals at five points of articulation, approximants at four, and no fricatives. In presenting examples I will first give the unsegmented word in practical orthography, then a morphemically segmented version using a phonemic representation for each morpheme in standard IPA symbols. Note that voicing is allophonic only, though the practical orthography uses a mixture of voiced and voiceless stop symbols. For fuller details see Pym & Larrimore (1979), Evans (2000) and Birch (in prep.)

[Table 1 about here]

Morphophonemic alternations between oral and nasal stops, and/or approximants at the same point of articulation will play an important part in the argumentation below (for brevity I will use ‘stop’ for ‘oral stop’ and ‘nasal’ for ‘nasal stop’ for the rest of the paper). The most striking feature of Iwaidja’s phoneme inventory is the large set of liquids, numbering six (seven if the apico-retroflex approximant is added): contrasting apico-alveolar and apico-retroflex taps, ‘regular’ apico-alveolar and apico-retroflex laterals, and a third complex set that was characterised by Pym and Larrimore as ‘flapped laterals’ but which recent electropalatographic studies (Butcher et al 2007) suggest are more accurately analysed as laterals with a tapped release. There is a simple triangular three vowel system without distinctive length. Consonant clusters cannot decrease in sonority during the cluster, and even where they have equal sonority, the set of combinations is heavily restricted in line with Hamilton’s (1996) ‘articulator hierarchy’, so that while *kp* and *tp* are allowed, for example, *pk* and *pt* are impossible.

1.2 Major external influences

Since we will be mentioning two other languages in this article, brief comments on their phonemic inventories are in order here.

² For a comprehensive survey of reduplication in Australian languages, see Fabricius (1998). Note that Iwaidja is certainly not alone among Australian languages in having both left- and right-reduplication, and among those languages having both directions it is not always the case that borrowing is the source of one type. In Mparntwe Arrernte, for example (Wilkins 1989) verbs exhibit reduplications of the stem in both directions, reflecting different types of iconic relation. I am thus certainly not claiming that borrowing is the only way that multiple directions of reduplication can arise, but merely that it is one possible source.

Bininj Gun-wok (Evans 2003), henceforth BGW, is an Australian language belonging to the Gunwinyguan family. Its best-known dialects, in the linguistics literature, are Kunwinjku, Mayali and Gun-djeihmi. It has a large speaker population (for Aboriginal Australia) of around 2000 speakers. Spoken just to the south of Iwaidja and in intense contact with it through marriage ties and ceremonial connections, it has had considerable influence upon Iwaidja through hundreds of lexical loans. But the basic typologies of the respective languages differ in many ways and they belong to only distantly related language families.

The phoneme inventory of Bininj Gun-wok differs from that of Iwaidja in the following ways:

(a) paired short and long stops; the short stops are voiced intervocalically, voiceless syllable finally, and vary in word-initial position, while the long stops, which are limited to medial position, are normally voiceless

(b) a glottal stop

(c) a much smaller liquid inventory than that in Iwaidja (/l/, /ɭ/, /r/ and /ɻ/)

(d) no /uɟ/

(e) five vowels – /i/, /e/, /a/, /o/, /u/, again without contrastive vowel length

(f) much more elaborate coda possibilities. BGW phonotactic patterns deliver a large number of coda types, and there are virtually no combinatorial restrictions between the coda of one syllable and the onset of the next, whereas there are strong mutual restrictions of this type in Iwaidja. Clusters like *pm*, *pk*, *pl* and *tl*, for example, are all permitted in Bininj Gun-wok but not in Iwaidja.

(g) a rich set of complete and partial reduplicative processes (see Evans 2003), all of which involve left-reduplication

Makassarese (Jukes 2006) is a Western Austronesian language of around a million speakers. Since around the eighteenth century, seafarers from the Indonesian port of Makassar, known to Aboriginal people as Macassans and speaking a mixture of Makassarese and Malay, made annual visits to the coasts of Arnhem Land to gather trepang, tortoiseshell, sandalwood and other products. They employed Aboriginal people for the wet season before catching the southeast monsoon back to Macassar – see McKnight (1976) on the history and Evans (1992, 1997) on the linguistic impact in Western Arnhem Land. Ongoing, stable relationships were established between the Macassans and Aboriginal groups for perhaps two centuries, until the South Australian government put an end to the visits in 1908 by imposing punitive taxes on the Macassans. Local tradition reports that speakers of Iwaidja and most other coastal languages of Arnhem Land readily added Makassarese to the already sizeable repertoire of languages in which they could converse. Makassarese and Malay have contributed sizeable numbers

of loanwords to Iwaidja and many other languages of Arnhem Land, in semantic domains that included seafaring technology, wind terms, non-traditional material items, and also occasional body parts.

Makassarese has stops and nasals at four points of articulation (subtracting an apico-retroflex series from the five found in Iwaidja), plus a glottal stop. It includes voiced and voiceless stop series, in addition to a singleton vs. geminate contrast – though, unlike in Bininj Gun-wok, the best phonological analysis of geminates is as clusters. Makassarese is well-known for its heavy restrictions on syllable codas, limiting them to a three-way contrast between zero, an underspecified stop (assimilating place to following stops, and otherwise realised as a glottal stop) and an underspecified nasal (again assimilating place to following segments, and otherwise realised as a velar nasal). Like Bininj Gun-wok it has five vowels. It has a number of full and partial reduplication patterns, again all to the left.

1.3 Three key features of Iwaidja historical phonology and morphology

Iwaidja phonology and morphophonemics has been shaped by a number of reconstructable sound changes which can leave surface forms far from obviously related to their underlying or historically original forms. These changes can conceal the underlying formal identity between the two parts of a reduplicated structure, so it is helpful to briefly summarize them here. For brevity's sake I give only the broad outlines, and will sometimes use idealised forms; see Evans (1997, 1998) and Teo (2007) for the details and actual etyma. Most of these changes have also affected the closely related languages Mawng and Ilgar; Mawng has taken a couple of the changes further as shown in Table 2.

[Table 2 about here]

(a) the most important diachronic change – possibly several related changes – can be called the

great Iwaidjan consonant shift. This was a chain shift affecting intervocalic consonants, which produced (to simplify somewhat) the changes shown in Table 2. Long stops became short stops (e.g. **kap:al* 'floodplain' > *kapal*), short stops lenited to corresponding approximants, and approximants were lost. (Additional complications were the loss of the laminodental series, with **ɬ* descending as a flapped alveolar lateral, and the loss of initials descended from **t* in most environments, plus further assimilations

of the velar approximant to palatal and labiovelar approximants before the corresponding high vowels).

Since these changes were largely confined to pure intervocalic environments, and since many stop-initial roots also occurred after nasals which protected them from lenition, the effect was to create many morphophonemic alternations where an etymologically original stop is found after nasals, but lenites to an approximant after preceding vowels. Illustrating from the closely-related Ilgar, which has more nasal-final prefixes such as 3rd feminine *in-*, compare ‘her head’ /*inpaɣa*/ but ‘my head’ *ɲawaɣa* (*ɲa-* ‘my’).

The effect of these changes is to produce the following modern shapes on (hypothetical) inherited reduplicates:

- *palapala > palawala³
- *palap:ala > palapala
- *walawala > (walaala>) walala

(b) assimilatory fortition. Whereas stops lenite in intervocalic position, nasals wedged between a stop and a vowel harden to the corresponding stop: $N_{\alpha \text{ place}} > S_{\alpha \text{ place}} / S_V$. (Recall that the sequence VSNV is possible in Bininj Gun-wok, and almost certainly was in proto-Iwaidjan as well, but is not possible in Iwaidja, Ilgar or Mawng).

Examples of this change involve certain verb formatives, widespread in north Australian languages, of the form *mij* ‘became (past tense)’ or *maɲ* ‘take’. Whereas in Bininj Gun-wok these forms can follow stops as well as nasals (*kimukmij* ‘got big’, *wokmaɲ* ‘record, get a word’), in Iwaidja there is an alternation between *mij* or *maɲ* when not following a stop, and *mij* or *paɲ* after a stop: cf *l’uwundunmaɲ* ‘discussed’ but *maɲutpaɲ* ‘peeped’, *unmij* ‘counted’ but *wujakpij* ‘became an owner’.

Applied to reduplicants ending in a stop, the effect of morphophonemic fortition is to turn a nasal initial into a stop, e.g. %*maɲkatmaɲkat*% > *maɲkatpaɲkat*.

(c) initial mutation. This change is found in Iwaidja only, though a more transparent form of the alternation is preserved in Mawng. An ancient neuter prefix *aK-*, ending in a morphophoneme normally designated K, of unknown place, triggered a number of fortition-like changes. In Iwaidja this prefix became generalized as a third person singular marker both within the nominal and verbal systems (see Evans 1998), followed by loss of

³ Further altered by subsequent lenition of initial bilabial stops to /w/ – see §3.1.

the (unstressed) *a-* unless the host was a monosyllable. This left mutation-style alternations as illustrated by the following series.

pauqał	‘(his/her) head’	< K-wauqał	a-piŋ	< aK-miŋ	‘(s)he said/did’
awauqał	‘their heads’		a-miŋ		‘they said/did’
ŋawauqał	‘my head’		ŋa-miŋ		‘I said/did’

For words like this, where the prefix is in productive opposition to other forms, the underlying form can still be detected, by linguist or language-learner, by comparing different person/ number values. However there are many words which, for semantic reasons, only occur in the third person singular, e.g. parts of trees, animals or artefacts. In these cases there is an orphaned mutated form whose underlying initial is no longer synchronically recoverable.

Combined with morphophonemic fortition, this can camouflage or distort reduplicative sequences in the following way (again using schematized examples):

K-maŋkmaŋk	>	paŋkpaŋk
K-marmar	>	parmar
K-walapala	>	palapala
K-walawala	>	palawala

2. Iwaidja reduplication types: the synchronic view

Iwaidja is striking for the large number of reduplication types it attests, factorizable into five dimensions:

Direction: right vs. left⁴

Completeness: full vs. partial

If partial: one vs. two syllables copied

Prespecification: pure reduplication vs. reduplication with prespecified segments

Productivity: fully productive vs. confined to closed class vs. lexical formative

⁴ Note that for many types of complete reduplication the direction cannot be determined by inspection, though I follow a general heuristic that if, for a given process, all incomplete reduplications are in a single direction, then complete reduplications can be treated as an unprovable example of the same type.

All known combinations of these factors are exemplified and briefly characterised in Table 3; more detail on the various types will be given in the rest of this section. Note that the above typology is concerned only with form, not with meaning or combinatorics, though notes on these are given in the second last column.⁵

[Table 3 about here.]

2.1 Iterative: right one-syllable reduplication with prespecified *k*

This pattern, found on verbs, is at the same time the most productive and the most distinctive. It generally marks iterative action.⁶

Iwaidja verb stems generally terminate in a ‘thematic’ CV sequence, which can then be followed by a TAM inflection (typically a nasal). Examples (with the thematic underlined) are *atpa* ‘cook’, *unma* ‘count’ and *l’aujaralkpi* ‘move through air: jump, fly etc.’. The basic pattern for iterative is to suffix a *k*, followed by a copy of the thematic CV, adjusted where necessary to conform to the fortition rule in 1.3b above (thus %*kma*% > *kpa*, %*kwu*%⁷ > *kpu*, etc.). Examples are:

- | | |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <p>(1a)⁸ <i>awartban</i>
 aw-at<u>pa</u>-n
 1>3-cook-NPst
 ‘I cook it’</p> | <p>(1b) <i>awartbakban</i>
 aw-at<u>pa</u>-kpa-n
 1>3-cook-ITER-NPst
 ‘I keep on cooking it, cook a lot’</p> |
| <p>(1c) <i>runma</i>
 .ɽi-un<u>ma</u>
 3m>3-count(NPst)
 ‘He counts it’</p> | <p>(1d) <i>runmakba</i>
 .ɽi-un<u>ma</u>-kpa
 3m>3-count-ITER(NPst)
 ‘He keeps on counting it’</p> |

⁵ One anonymous referee asked if there is ever reduplication within the adverb class. Of the two dozen adverbs of various types currently listed in our lexical data-base, just three are formally reduplicated: *durdu* ‘still’, *kawarrkawarrk* ‘quickly’ and *mangkadbangkad* ‘spying on, sneaking’. All follow the ‘complete reduplication’ template (§2.4), with morphophonemic fortition of *m* to *b* in the last case, and (presumed) degemination from *kawarrkawarrk* in the second.

⁶ With a few verbs this pattern of reduplication can indicate duality of the subject. The exact conditions on which verbs allow this option have yet to be formulated satisfactorily, and since our focus is on form rather than meaning I will simply refer to this as the iterative, bracketing out the semantic complication of the dual reading.

⁷ Though note that in this case, the %*kwu*% is an artificial analytic step: historically, *kpu* retains the original unlenited form of the root, namely *pu*, which has lenited to *wu* in the unreduplicated form.

⁸ The following non-standard abbreviations are used: f = feminine, inc = inclusive, ITER = iterative, m = masculine, NPst = non-past, nsg = non-singular, PL = (derivational) plural, > = ‘[subj.] acts on [obj.]’, e.g.

- | | |
|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <p>(1e) <i>raharralkbin</i>
 K- l'auṯaralkpi-n
 3-move.through.air-NPst
 ‘It flies, jumps’</p> | <p>(1f) <i>raharralkbikbin</i>
 K-l'auṯaralkpi-kpi-n
 3-move.through.air-ITER-NPst
 ‘It hops (e.g. a kangaroo)’</p> |
| <p>(1g) <i>wurluwun</i>
 K-u uṯu-n
 3-poke.for.honey-NPst
 ‘(S)he pokes for honey’</p> | <p>(1h) <i>wurluwukbun</i>
 K-u uṯu-kpu-n
 3-poke.for.honey-ITER-NPst
 ‘(S)he pokes about for honey’</p> |

This basic template becomes simplified, in certain phonological environments:

(a) if the theme is preceded by a nasal, resulting in a nasal plus bilabial stop cluster (NpV), the expected *-kpV* usually simplifies to *-pV*:⁹

- | | |
|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| <p>(2a) <i>kawinybun</i>
 ka-wiŋpu-n
 3f> 3-wash-NPst
 ‘She washes it.’</p> | <p>(2b) <i>kawinybubun</i>
 ka-wiŋpu-pu-n
 3f> 3-wash-ITER-NPst
 ‘She repeatedly washes it.’</p> |
|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|

However, forms with the full *-kpV* form are occasionally attested in careful speech, e.g.:

- (2c) *dangkadbinybukbun*
K-taŋkat-wiŋpu-kpu-n
3sg-arm-wash-ITER-NPst
‘(S)he washes her arms.’

1>3 ‘first singular subject acts on third singular object’. Singular is not overtly marked in glosses, for the sake of compactness.

⁹ This bears some resemblance to the process of ‘nasal cluster dissimilation’ discussed for Gurindji in McConvell (1988): both avoid a succession of two clusters. However, in Gurindji it involves successive nasal + stop clusters, whereas in Iwaidja the first is a nasal + stop cluster and the second a stop + stop cluster, and in Gurindji it is the first.

(b) where a phonotactically impermissible consonant cluster (e.g. kc or kɿ) would result from the regular rule, the second element is eliminated, leaving the reduplicative suffix as -kV:

- | | |
|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(3a) <i>awajun</i>
aK-acu-n
1 > 3-wait-NPst
'I wait for him/her.'</p> | <p>(3b) <i>awajukun</i> (*<i>awajukjun</i>)
aK-acu-ku-n
1 > 3-wait-ITER-NPst
'I keep waiting for him/her.'</p> |
| <p>(4a) <i>arrurari</i>
aruK-l'aɿj
1 inc.pl-put.inside(NPst)
'We put it inside.'</p> | <p>(4b) <i>arrurariki</i> (*<i>arrurarikri</i>)
aruK-l'aɿj-ki
1 inc.pl-put.inside-ITER-Npst
'We load it in, put it right in.'</p> |

(c) A few verbs change the V of their thematic for some TAM values, e.g. *wingka-n* 'appear-NPST' but *wingku-ng* 'appear-PST'. Such verbs copy the appropriate vowel for the TAM value, suggesting the iterative reduplication process is based on the inflected root minus the suffix: *wingka-ka-n* 'appear:ITER-NPST' but *wingku-ku-ng* 'appear:ITER-PST'.

2.2 Total reduplication with prespecified *n*-

This is a more limited pattern, occurring with a few verbs and one adjective, and signalling duality (with verbs) or non-singularity more generally (with adjectives). From a root X it derives a reduplicant X-n-X; the origin of the inserted nasal segment is not known. Since the reduplication is total it is not possible to determine definitively whether the reduplication is to the left or to the right. However, I shall segment the words below as if they were right-reduplicants, simply because it is more parsimonious to assume the same direction of reduplication for semantically related processes.¹⁰ Stress placement, which in many languages would be a good guide, is not helpful here, since each element is potentially accentable and the decision as to which is more heavily stressed is entirely dependent on higher-level prosodic factors.

¹⁰ And of course it would also be possible to claim, as one referee suggested, that this construction is neutral with respect to direction. This would release us from the need to answer the directionality question, but at the cost of adding a third value for 'direction'.

(5a)	<i>rirri</i>		(5b)	<i>aldirrinidirri</i>	
	K-l'iri			a-l'iri-n.l'iri	
	3sg-cheeky			3pl-cheeky-REDUP	
	'(S)he is cheeky.'			'They are cheeky.'	
(6a)	<i>abiny</i>	(6b)	<i>aminy</i>	(6c)	<i>aminminy</i>
	aK-mi-ŋ		a-mi-ŋ		a-mi-n.mi-ŋ
	3sg-say-Pst		3pl-say-Pst		3pl-say-REDUP-Pst
	'(S)he said.'		'They (>2) said.'		'They (2) said.'
(7a)	<i>adbajun</i>	(7b)	<i>arbjajunmajun</i>		
	ar-macu-n		ar-macu-n.macu-n		
	1nsg.inc-die-NPst		1nsg.inc-die-REDUP-NPst		
	'We are sick.'		'We two are sick.'		

Note in passing that although (7b) may suggest that the dual simply repeats the inflected form of the verb (i.e. that inflected macun 'die:NPst' is simply reduplicated) this is incompatible with (6c), since the form would then need to be aminmijŋ, with two palatal nasals (which is perfectly well-formed phonotactically) rather than the attested aminmij.

2.3 Left partial reduplication

A clear pattern of partial left reduplication is found with a closed set of social category terms denoting matrimoieties (a division of the social universe into two halves, inherited matrilineally) and subsections (a further division of the social universe into eight categories that serve as a summary of kinship relationships). This pattern left-reduplicates the first two syllables of the root:

(8a)	<i>namartkurr</i>	(8b)	<i>namartkurrmartkurr</i>
	na-maʔkur		na-maʔkur-maʔkur
	Masc-matrimoiety.name		Masc-PL-matrimoiety.name
	'male of Martkurr matrimoiety'		'group of Martkurr matrimoiety males'
(9a)	<i>nangarrajku</i>	(9b)	<i>nangarrangarrajku</i>
	na-ŋaracku		na-ŋara-ŋaracku

Masc-matrimoiety.name	Masc-PL-matrimoiety.name
‘male of Ngarrajku matrimoiety’	‘group of Ngarrajku matrimoiety males’

This pattern appears to have been borrowed from BGW, which uses an almost identical pattern for plural subsection and matrimoiety terms – and in fact the Iwaidja terms themselves have been borrowed, with some phonological modifications (Evans 1997). (Evidence for the direction of borrowing comes from the prefixes *na-* and *ngal-*, which are productive in BGW but confined to this lexeme set in Iwaidja, and from the reduplication pattern itself, which is productive in BGW and found with both nouns and verbs (see Evans 2003: 116) but in Iwaidja is limited to this lexical set.

Left partial reduplication is thus an example of a borrowed pattern confined to the borrowed words it appears in. The only phonological difference between the Iwaidja and BGW forms is that in BGW a glottal stop appears at the end of the left reduplicant. The BGW equivalent of (9b), for example, would be *na-ŋaraʔ-ŋaracku*. Since Iwaidja lacks a glottal stop, this discrepancy simply reflects phonological adaptation of incoming loan words.

2.4 Reduplicative lexical formatives

A large proportion of nominal lexemes exhibit some form of reduplication. In most cases there is no corresponding unreduplicated form, so it is not possible to assign independent meanings either to the root or to the reduplicative process. The comments below are thus exclusively concerned with the form that the reduplicative process takes. Both left and right reduplicative patterns are attested, and reduplication may be either partial or total (in which case the directionality is again undeterminable). In the case of partial reduplications there are strong correlations between the direction of reduplication and the native vs. loaned status of the lexical item: right reduplication characterises native words and left reduplication characterising loans from Makassarese.

(a) *partial right reduplication*. With one possible exception these are all native Iwaidja words.

The reduplicant may be one syllable (10a) or two (10b).

(10a) *adbiljuju* /atpilcu.cu/ ‘lump caused by mosquito bite’

alakuku /alaku.ku/ ‘mangrove sp.’

burnmumu /puŋmu.mu/ ‘forefin cut from green turtle’

burruldakuku arrilily /purul'aku.ku/ ‘xxxo beat of clapsticks’;

cf *^ldaku* ‘cut’, *burru* ‘beat, speed, pace’]
warnaju /waŋacu/ but also *warnajuju* /waŋacu.cu/ ‘winding, crooked’

(10b) *birrurkurlanyurlany* /piru[k.u]aŋ.u]aŋ/ ‘smooth scales’ (cf *birrurk* /piru[k/
‘scales’)

bakirrikirri /pa.kiri.kiri/ ‘handsaw; serrated spearhead’. This latter is probably a somewhat distorted Makassarese loan, from Mkr *kikkiri*’ or Malay *kikir* ‘file’)
(Cense 1979:326)

(b) **partial left reduplication**. There is only one case of this, a Makassarese borrowing:

(11) *burruburrukang* /puru.purukaŋ/ ‘dilly bag’ (< Mkr *purukaŋ* ‘money bag’)

Note that since the reduplication of this particular lexical item is not reported for Makassarese this may be a ‘foreignizing’ reduplicative pattern rather than reflecting the original.

However, two-syllable left-reduplications (with glottal stop closing the reduplicant) are found in Makassarese with other lexical items:

barumbuŋ ‘grey’ > *baru?barumbuŋ* ‘greyish’

tettere? ‘fast’ > *tette?tettere?* ‘quite fast’ (Jukes 2006:104)

This makes it possible that *purupurukaŋ* is in fact an authentic borrowed reduplication which happens not to be mentioned in Cense’s dictionary (nor in Arief’s Makassarese - Indonesian dictionary).

(c) **complete reduplication**. Complete reduplications are found among both native (12a) and borrowed (12b) vocabulary.

(12a) *jurtjurt* /cuʈcuʈ/ ‘osprey’

ambarrkambarrk /amparkampark/ ‘everyone’

arnanarnan /aŋanaŋaŋ/ ‘smilax vine’

birrijurkbirrijurk /piricu[k]piricu[k]/ ‘green-backed gerygone (bird)’

- (12b) *bajubaju* /pacupacu/ ‘dress, shirt’ < Mkr *bajubaju* ‘shirt’
balabala /palapala/ ‘table, bed etc: furniture with raised surface’ < Mkr
balla?balla? ‘cottage; small-house; couch’
karlikarli /kaɭikaɭi/ ‘boomerang’ < Burarra and BGW *karlikarli* ‘sacred
ceremonial boomerang’ (ultimately borrowed from Central Australian languages
where the term is unreduplicated, e.g. Warlpiri *karli*)
bikibiki ‘pig’ < English *piggy*, or possibly from an already-reduplicated English
or Kriol form *piggy-piggy* / *bigibigi*.

3. Lexical reduplication and diachrony

We have already seen, in §1.2, that the transparency of many reduplicative patterns has been affected by a range of sound changes. On the one hand, this makes reduplications a valuable source of information about historical phonology, a topic I discuss briefly in §3.1. On the other, it can greatly complicate the assignment of a word to a particular formal pattern, and the determination of the reduplicative base, as I will discuss in §3.2.

3.1 Value of reduplications in internal reconstruction

Some of the evidence for the sound changes discussed in §1.3 comes from external evidence, in the form of cognates. However, in a part of the world where levels of shared vocabulary between neighbouring languages tend to be low, the number of cognate sets that can be recovered is inevitably small. Complementary evidence comes from internal reconstruction, and reduplication is a good source of evidence for a range of sound changes. Fuller exemplification of this point can be found in Evans (1997); here I confine myself to a few examples pertaining to one further change not discussed in §1.2, namely the lenition of *p* > *w* word initially. (This appears to be a relatively old change, and initial *p* has since been replenished by many *p*-initial loanwords).

Three examples of external cognates (either true jointly inherited words, or very old loans) are given in (13a), and three examples of lexical reduplications providing evidence of the same initial lenition are given in (13b):

- (13a) *wula* /wula/ ‘earthquake’; Jawoyn *bula* /pula/
wirturrk /wiɽurk/ ‘stone spear’; BGW *birdurrk* / piɽurk / ‘quartz spearhead’
wirrhala /wiruɽala/ ‘throwing stick’; BGW *birrkala* /pirkala/ ‘boomerang’

- (13b) *wirlidbirlid* /wi|itpi|it/ ‘peewee’
warnangbarnang /waŋaŋpaŋaŋ/ ‘lizard sp.’
wudbud /wutput/ ‘pheasant coucal bird’

3.2 The impact of diachrony on reduplication environments

Both for the language-learning child and the historical linguist, interpreting evidence from reduplicated forms in Iwaidja is confusing and not always determinate. Just considering alternations involving at least one bilabial segment, we have the very large set of possibilities given in Table 4, for lexical reduplicands of the form C_1XC_2Y :

[Table 4 about here]

This plethora of formal types, and complex relations between surface and underlying forms, results from two types of diachronic process:

(a) old sound changes, and the morphophonemic changes which they gave rise to. In some cases – those where morphophonemic alternations allow us to determine the underlying form of the root – the evidence is still recoverable internally. In others, however, the evidence has been lost, for example where $/*p:/ > /p/$ root-internally; the comparative evidence on which it is based is not normally accessible to the language-learning child.¹¹

(b) borrowings, which entered the language too late for the sound changes in (a) to apply. These borrowings introduce new relationships between the initials of base and reduplicant, e.g. $p...p...$ in a word like *purupurukanj*. Surface patterns of this type would have been removed from inherited items through the operation of historical lenition processes. Additionally, as we have seen, the influx of loanwords appears to have added some left reduplication patterns to what was originally a system with only right-reduplication. Disyllabic partial reduplication, for example – both grammatical for forming plurals of social category terms, and lexical in a couple of items – appears only in loan words. The loaned patterns, however, do not appear to have spread beyond the borrowed words containing them.

¹¹ Though we do know that multilingual speakers of Aboriginal languages are often highly aware of sound correspondences between the languages they speak (Alpher & Nash 1999). This means that in principle bilingual speakers of Iwaidja and Bininj Gun-wok, for example, may have available to them the same information and general reasoning processes that historical linguists employ. As yet we have no relevant data on whether such metalinguistic reasoning actually occurs among Iwaidja speakers, however.

A further and more subtle consequence of new loaned structures is that it may motivate the reanalysis of complete reduplicated forms. As discussed above, these are consistent with either a left- or a right-reduplication analysis. As long as the clear cases in the language only involved right-reduplication – which appears to be the case if we remove all the loaned patterns – parsimony would favour the folding in of these patterns to the general analysis as right-reduplications. But once left-reduplications enter the language through loanwords, the parsimony of this analysis is diminished, since now both left and right reduplications exist anyway. Though we lack relevant data at this stage, it is not implausible that the possibility of reanalysing these structures as a type of left-reduplication could enter the language inside the trojan horse of borrowed left-reduplicating patterns on other items. Though the effects of this change would be invisible, at our present level of knowledge of the language, they might be detectable as subtle prosodic changes showing up in rapid speech, or through favouring the generalisation or emergence of other left-reduplicating patterns.

4. Conclusion

The effects of borrowing on other aspects of phonological systems (phoneme inventories; phonotactics) are well-known and have engendered a huge literature. The evidence considered in this paper shows that the impact of borrowing can also extend to reduplication, adding new types without displacing older ones, although so far no borrowed patterns extend further than closed lexical sets. At the same time, the camouflaging effects of some sound changes mean that at least some reduplication patterns can no longer be motivated synchronically, and can only be understood in the light of a language's historical phonology and the morphophonemic rules it leaves behind. The data reported here remain rather preliminary. A full grammar and dictionary of Iwaidja are still some way off,¹² we need further and more detailed comparisons with the other languages of the family as well as with Makassarese sources, and more data from younger learners of Iwaidja would be very revealing. Nonetheless, I hope at least to have demonstrated how important both regular sound change and the impact of linguistic contact are in shaping the form reduplication takes in this complex and cosmopolitan language.

¹² Data-gathering and analysis is continuing, by Bruce Birch and myself; our goal is to produce an initial dictionary of some 6,000 lexical items by 2011 and a full grammatical description soon after that.

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Tables

Table 1: Iwaidja phoneme system (practical orthography in square brackets)^a

	Bilabial	Apico-Alveolar	Apico-Retroflex	Lamino-palatal	Velar
Stop	p [b]	t [d]	ɽ [rt]	c [j]	k [k]
Nasal	m [m]	n [n]	ɳ [rn]	ɲ [ny]	ŋ [ng]
Approximant	w [w]		ɻ [r]	j [y]	ɥ [h]
Tap		r [rr]	ɽ [rd]		
Lateral		l [l]	ɭ [rl]		
Flapped lateral		l̥ [ld]	ɭ̥ [rld]	Vowels:	i, a, u

^a I ignore a few loanwords with initial interdental stops, all of recent origin (from Makassarese or Malay).

Table 2: The great Iwaidjan consonant shift

*Long stop	p̥	(t̥)	t̥	ɽ̥	e̥	k̥
Short stop	p	*t̥	t	ɽ	c	k
Approximant / liquid	w	@l̥ ^M (> l)	r / ø	@ɽ ^M (> ɻ)	y	ɥ (> y, w / i_i, u_u)
Zero	ø				ø	

@ = new phoneme

e = whole series lost

* = individual reconstructed phoneme, no longer present synchronically

^M(> l, ɻ) = with subsequent change as indicated in Mawng^b

^b In Evans (1997) I postulated a different direction for the change between flapped and regular laterals, proposing that the regular laterals of Mawng preserve the older situation, then becoming flapped in Iwaidja. For reasons too involved to give here, I now believe that analysis to have been mistaken, and that the actual direction of change is that given in Table 2.

Table 3: Typology of reduplication types in Iwaidja (forms in square brackets in column two are nonce bases unattested outside the reduplications they occur in)

Sample redup. form	Base	Template	Discussed in section	Type	Word class and semantic category	Source
-atpakpa 'keep cooking'	-atpa 'cook'	-kCV	2.1	Partial right redup with prespecified -k	Verbs: (a) iterative (b) dual	Native
-l'irindiri 'cheeky, dangerous (dual)	-l'iri 'cheeky, dangerous'	-nX	2.2	Complete right redup. with prespecified -n- (though directionality arguable)	Adjectives and some verbs: dual	Native
-mat[kurmat]kur -ɲaraɲaracku	[mat[kur , ɲaracku]	σσ-	2.3	Partial left reduplication (first two syllables)	Pluralised section and moiety terms	BGW
purupurukaɲ 'type of string bag'	[purukaɲ]	σσ-	2.4	Partial left reduplication (first two syllables)	Nouns	Makassarese
wanaçucu 'winding, crooked'	wanaçu 'crooked'	-σ	2.4	Partial right reduplication (last syllable)	Lexical formation of some nouns	Native
aɲanaɲan 'smilax vine'	[aɲan]	(-)X(-)	2.4	Complete reduplication, direction undeterminable, with morphophonemic adjustments of first and/or second initial consonant	Nouns, a few adverbs	Native, Makassarese, BGW

Table 4: Patterns of complete lexical reduplication, their environments and sources; loaned patterns are shaded. As explained in 1.3c, K represents an underlying morpheme triggering fortition of the following segment. S_f represents a fortition-triggering oral stop in the coda of the preceding syllable.

Synchronic form		Hypothesised source		Example(s)	Language source	
C ₁	C ₂	C ₁	C ₂			
m	m	m	m	<i>murkaɲmurkaɲ</i> <i>makamaka</i> <i>mal' aɲmal' aɲ</i>	'fighting sticks' 'aunt' 'new baby'	Iwaidja
m	p	(V)m	XS _f -m	<i>a-maɲkaɲpaɲk</i> <i>mal' aracpaɲ^r arac</i>	'soft (3pl.)' 'bush onion'	Iwaidja
p	m	K-m	V-m	No examples, though theoretically possible		
p	p	K-m N-p	XS _f -m XS _f -p	<i>paɲkaɲpaɲk</i> <i>mal' imputput</i> <i>manpirippirip</i>	'soft' 'heel' 'legs of crab'	Iwaidja
p	p	p	(V/)p(V)	<i>pacupacu</i> <i>palapala</i> <i>purupurukaɲ</i> <i>pikipiki</i>	'shirt' 'table' 'dilly bag' 'pig'	Makassarese English
p	w	K-w	XV(r)-w	<i>purwur</i> (3pl <i>awurwur</i>)	'young'	Iwaidja
w	p	p	p: ~ pp XC-p	<i>wulupulu</i> < * <i>pulup:ulu</i> <i>wiripirip</i> < * <i>pirippirip</i> ~ * <i>pirip:irip</i> ^c <i>wiɬtɬpiɬt</i> <i>wilpil</i> <i>wimunpimun</i> <i>yirwaɲpaɲ</i>	'mother's mother's mother' 'bird sp.' 'peewee' 'dance type' 'clever people' Snake character	Iwaidja (cf <i>pulup:ulu</i> in mainland languages)

w	w	p	V-p	<i>wilawila</i>	'pipe tree'	Iwaidja
w	w	w	w	<i>wilamwilam</i>	'big dish' (cf <i>wilam</i> 'bark canoe', a loanword from BGW <i>wirlam</i> 'stringybark canoe')	BGW
m	w			None - impossible		
w	m			None- impossible		
w	k	k/_u	XC-k	<i>wuŋku</i> / <i>kuŋku</i> / <i>wutkut</i>	'tadpole' 'power'	Iwaidja
k	w			None, but would be theoretically possible from an old reduplication of original K-wuXwuX		

^c In at least some Gunwinyguan languages there is a phonological and phonetic difference between long stops and double occurrences of a single stop – see Evans (2003). It is not presently clear whether such a contrast should be reconstructed for proto-Iwaidjan, which is why I note both possibilities here.