

Loanwords between the Arandic languages and their western neighbours: Principles of identification and phonological adaptation

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This paper¹ summarises the characteristics of loanwords, especially the ways in which they are adapted to the structure of the borrowing language, and surveys the various tests that have been provided in both the general historical linguistics literature and Australianist literature for identifying the fact and direction of borrowing. It then provides a case study of loanwords out of and into the Arandic languages; the other languages involved are especially Warlpiri but to some extent dialects of the Western Desert language. The primary focus is on the phonological adaptation of loanwords between languages whose phonological structure differs especially in the presence vs. absence of initial consonants, in consequence of earlier changes whereby Arandic languages lost all initial consonants. While loanwords out of Arandic add a consonant, it is claimed that loanwords into Arandic include two chronological strata: in one the source consonant was preserved but the other (older) pattern involved truncation of the source consonant. Reasons for this twofold behaviour are presented (in terms of diachronic and contrastive phonology), and the examples of the more radical (older) pattern

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are individually justified as loanwords, using the criteria discussed earlier in the article.

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1. Introduction and overview

In Australian historical-comparative linguistics loanwords are discussed predominantly in quantitative terms, i.e. the extent to which shared vocabulary is explicable in terms of borrowing vs. genetic relationship or which lexical categories are more likely to be borrowed (Heath 1981, Alpher & Nash 1999, Black 2007, McConvell 2009, Breen 2011). There have been fewer studies that identify actual loanwords or describe the methods for discovering them (but see sections of Koch 1997a, Nash 1997). This paper discusses the methodology of identifying the fact and direction of borrowing between Australian languages which are assumed to be genetically related to one another, with reference to the literature of both general historical linguistics and Australian linguistics. It then applies these principles to words judged to have been borrowed between the Arandic languages and their western neighbours: Warlpiri and dialects of the Western Desert language. Attention is given to the phonological adaptation of the loanwords, especially with regard to the treatment of initial consonants. The loanwords are called, from the perspective of the Arandic languages, "out-loans" and "in-loans". Sufficient examples of each are given in §3.2 and §3.3 to illustrate the different phonological patterns. There is not space to give here the particular reasons for judging the members of each set as loanwords.² A second pattern of in-loans is illustrated in §3.5; this involves the truncation of the initial consonant of the foreign word. The examples of this pattern are mostly taken from the vocabulary of kinship and social categories. Each is discussed in terms of the tests for loanword status that were given in §2.3—since this section is likely to be most controversial part of the paper. Apart from the treatment of initial consonants they follow the pattern of adaptation of the in-loans given in §3.3. §3.4, intervening between the presentation of the two sets of in-loans, shows why this different phonological treatment is expected as a consequence of the Arandic

² See Koch (1997a, and 2013) for further details on some of the examples.

historical sound changes. This second pattern of adaptation is argued to represent an earlier chronological layer of borrowing than of §3.3. The justification of these two separate patterns of adaptation of loanwords is a major aim of the paper.

2. General principles of adaptation of loanwords

2.1 Desiderata in loanwords

Borrowed words include certain requirements determined by the adopting language structure. These involve phonetic, phonological, grammatical, and semantic considerations. They must be pronounceable in the borrowing language. Each word requires a phonological analysis in terms of distinctive units of borrowing language (phonemes), as well as an analysis in terms of sequences of units (i.e. phonotactics). Each must belong to a given word class; moreover a borrowed word typically takes the inflections characteristic of its adopted word class. With respect to word formation, the borrowed word need not have the internal morphological structure of its model or be derivationally related to other words. In terms of semantics, a borrowed word needs to have a clear sense; this sense will be related to the semantics of other lexemes in the language.

2.2 Adaptation/adjustment

The borrowing process typically involves some adjustment in phonology, both of the segments and their sequences. In cases of segmental mismatch between the phonological systems of the two languages, borrowing typically involves the substitution of the closest equivalent phone of the borrowing language. This has been called “adaptation” by Campbell (2004: 66). A similar substitution may be required with respect to the permissible sequence of segments (i.e. the phonotactics). This has sometimes been described by a separate term “accommodation” (Campbell 2004: 66). As a consequence of adaptation, the copy of a borrowed word may differ from its model in the following ways. Its segmental phones may not belong to equivalent phonemes (the replacement patterns may have been one to one, one to many, or many to one). Its phonotactic sequences may differ. The copy may have a different morphological analysis from the original (e.g. may lack the analysis of its source word).

Semantically, the copy may have a different (especially narrower) sense from the original.

2.3 Tests for identifying the fact and direction of borrowing

This section surveys the kinds of tests that have been proposed for identifying the fact and direction of borrowing. We also point out the factors that interfere with the application of these tests. Of course, if the words being compared are close enough in their semantics and they can be related formally by the regular phonological correspondences that are found in cognates, they can be identified as cognates, i.e. reflexes of the same reconstructible protoform; then there is no need to suspect borrowing as an explanation for their similarities or to apply any of the following tests.

2.3.1 Aberrant phonological structure

Anttila (1989: 167) claims that “loanwords often do not comply with the rest of the rules of the language and can be spotted accordingly”, citing the example of the lack of voicing alternation between *f* and *v* in the French loanwords *chief(s)*, *faith(s)* vs. *knives*, *sheaths*. This fact provides a criterion for loanword identification. The aberrancies may involve either the kind of segments or the patterns they enter into. “Words containing sounds which are not normally expected in native words are candidates for loans” (Campbell 2004: 69). “Words which violate the typical phonological patterns (canonical forms, morpheme structure, syllable structure, phonotactics) of a language are liable to be loans” (Campbell 2004: 70). The reason for this phenomenon is that sometimes foreign phones and phonotactic patterns are introduced through loanwords; i.e. the loanwords are not fully adapted phonologically. It should be noted, however, that this test from aberrant phonology has not been used much in Australia, where it appears that loanwords are typically adapted more thoroughly; this could be attributed to both the widespread bilingualism of Aboriginal people and the typological similarity of many of the languages.

2.3.2 *Non-unique phonological matchings*

Anttila (1989: 159) discusses the “phonetic criterion” of “sound correspondences”, which easily settles the question of the direction of borrowing between Germanic and Finnic shared vocabulary items. Noting that three phonemes of Germanic, *p*, *b*, and *f*, correspond to just *p* in Finnic languages, he states: “[o]ne can predict the Finnish sound, given the Germanic one, but not vice versa, and thus one has to choose the Germanic...as original”. Koch (1997a: 34–35) uses this test to establish the direction of borrowing between Warlpiri and Kaytetye words involving matchings between *w* and *b* (this grapheme denotes an unrounded velar approximant in Arandic languages) and between plain nasals (N) and prestopped nasals (TN), which are characteristic of Arandic languages but not Warlpiri. Thus it is assumed that Warlpiri and Kaytetye would both reproduce *w* in borrowed words as *w*, since both languages have this phoneme, but that Kaytetye would be unlikely to reproduce Warlpiri *w* as *b*, whereas Warlpiri would need to replace Kaytetye *b* with the nearest phoneme in its own language, which would be *w*—since *b* is virtually an unrounded *w*. The caution which applies to this test is that hypercorrection sometimes leads to the wrong result in situations of non-unique phonological matching.

2.3.3 *Non-cognate correspondences*

The term “correspondence” is especially used with respect to the phonological relations found in cognate lexical items. I use the term “non-cognate correspondences” to distinguish this sense from that of the non-unique phonological matchings discussed in the previous section. Nash (1997: 191) discusses this “test from phonological correspondences” in identifying loanwords. Phonological correspondences that are inconsistent with those established for cognates betray borrowing. Two interfering factors, however, need to be considered. First, heavy borrowing sometimes leads to separate sets of correspondences, one of which applies to cognates and another that is found in loanwords. Think of English *f* in *father* vs. French *p* in *père* (cognates) vs. *p* : *p* in *paternal* and *paternel* (related by borrowing). A second interfering factor is the phenomenon of “correspondence mimicry” (Nash 1997: 191, Alpher and Nash

1999: 14), whereby phoneme matches in loanwords are modelled on those found in cognates.

2.3.4 *Morphological analysability*

The relative degree of analysability of a word may provide a clue to the directionality of borrowing, the language in which the word is analysable being the source of the borrowing (Anttila 1989: 159-160). Anttila gives the example of English *aardvark*, which is unanalysable, whereas the form is interpretable as ‘earth pig’ in the source language Afrikaans. Nash (1997: 195) provides the example of Eastern Mudburra ‘wild orange’, *bunayingmi* vs. Jingulu *bunaring-mi*, where *-mi* is a suffix found on plant names. A caution applies to this test, however: “it is possible that folk etymology interferes with this principle” (Anttila 1989: 160). Thus a word may by this process come to have an unetymological analysis; e.g. English *cray-fish* vs. Fr *crévisse*, which is not a compound.

2.3.5 *Derivational connectedness*

A somewhat related criterion is implied by Anttila (1989: 159-60), when he discusses the extent to which a term takes part in a network of derivational relationships or is isolated derivationally in its language. Relative isolation may be an indication of recency. On the other hand, the borrowing of a number of derivationally related forms may result in apparent derivational connectedness of borrowed words (cf. English *paternal*, *paternity*). Furthermore, over the course of time even borrowed words can be expected to be used as the base for the development of more derivationally related words.

2.3.6 *Semantic domain*

The semantic domain in which a word is found has often been considered to be relevant to deciding whether terms are likely to be cognate or borrowed (e.g. Breen 2011). Campbell (2004: 74), however, treats this as a minor criterion. “A...weaker kind of inference...can sometimes be obtained from the semantic domain of a suspected loan.” Semantic domains that are considered most liable to

borrowing in Australia are: social categories, affinal kin, ceremonial, cultural artefacts, flora and fauna. Two kinds of factors interfere with the application of this principle. Alpher and Nash (1999) address the issue of “local words”, found in a group of adjacent languages, where the fact of borrowing is considered likely but its direction, hence the exact source language, cannot be established. Somewhat related is the problem of the “Wanderwort”, defined as “[a] word which has been borrowed from language to language, across a significant geographical area” (Trask 2000: 366), whose distribution may end up being similar to that of true cognates.

2.3.7 *Synonymy*

Another possible test that can be invoked is the presence of synonyms in one of the languages. If there are two terms of nearly equivalent meaning in a language, one of them may be suspected of being a loanword. This depends on the assumption that a term would have been borrowed out of necessity, i.e. because the language lacked a term now considered essential. However, it is known that many words are borrowed for reasons other than necessity, without displacing a term already found in the language. Given the high degree of synonymy that exists in some traditional Australian languages, this cannot be regarded as a safe criterion.

2.3.8 *Narrower semantic sense*

It seems to be reasonable to assume that a word is borrowed primarily in a single sense. The borrowed word then would lack the full range of senses found in the source language. The comparison of the respective semantic scope of the words in the languages in question may provide a hint concerning the direction of borrowing. As a caution it should be considered, however, that the borrowing language may generalise the sense of the borrowed word to include all the senses of its inherited synonym. There is apparently not enough available evidence to be certain that this situation can be used as a diagnostic of borrowing.

2.3.9 *Distribution across lects*

This criterion includes genealogical as well as geographical dimensions. The genealogical factor is emphasised by Campbell (2004: 72), who talks in terms of related languages and “sister languages of one family”. The geographical aspect of distribution might be expressed in the following terms. If a word is found in most languages (or dialects) of a subgroup A but of the languages in subgroup B only in the lect adjacent to subgroup A, it can be inferred that the A languages are the source of the isolated term in B. Again, various historical events can interfere with the application of this test. A loanword may spread to most varieties of the second genealogical group, resulting in a distribution that would appear to justify its reconstruction to the proto-language of this second group. Furthermore, the term might have been lost from some of the lects of the donor group. In either situation, the fact of borrowing may thus be missed by the comparativist.

2.4 *Multiple criteria*

Conclusions regarding borrowing are most safely made when these are based on a number of separate but mutually reinforcing criteria.

3. **Borrowing between Arandic languages and their neighbours**

This section presents three sets of terms that have been judged to be loanwords from the vocabularies of Warlpiri and the Arandic languages, in particular Kaytetye and Anmatyerr.³ It builds on earlier studies on Arandic historical phonology (Koch 1997b, 2004, 2007), loanword analysis (Koch 1997a, section “Loanword analysis”), and the reconstruction of Arandic kinship terminology (Koch 2013). The main languages and their sources used are as follows: Arandic languages: Anmatyerr (Green 2009), Kaytetye (Turpin and Ross 2012), Eastern and Central Arrernte (Henderson and Dobson 1994), Alyawarr (Green 1992), Western Arrernte (Breen 2000); Warlpiri (Hale 1995); Western Desert lects:

³ The following language abbreviations are used: Aly: Alyawarr, Anm: Anmatyerr, Arc: Arandic, ECAR: Eastern and Central Arrernte, K: Kaytetye, P/L: Pintupi/Luritja, P/Y: Pitjantjatjara/Yankunytjatjara, WAr: Western Arrernte, WD: Western Desert, Wlp: Warlpiri.

Pintupi/Luritja (Hansen and Hansen 1992) and Pitjantjatjara/Yankunytjatjara (Goddard 1996).

3.1 Contrastive phonology

Table 1 contrasts the phoneme inventories of Warlpiri and Kaytetye, using the orthographic conventions of the respective languages. In the table boldface indicates phonemes that are common to both languages, whereas the phoneme (*rd*) that is uniquely Warlpiri is given in italics.

	Labial	Ap-	ic-	al	Lami-	nal	Dorsal
Stop	p	t	rt	yt	th	ty/j	k
Nasal	m	n	rn	yn	nh	ny	ng
Prestopped nasal	pm	tn	rtn	ytn	tnh	tny	kng
Lateral		l	rl	yl	lh	ly	
Tap/trill		rr	<i>rd</i>				
Glide	w		r			y	h

Table 1. Consonant inventories of Warlpiri and Arandic

The differences in phoneme inventory can be summarised as follows. Arandic languages have two sets of laminals, a dental (spelled using digraphs *Ch*) and a palatal set (with digraphs *(C)y*), whereas Warlpiri has only one set (the stop is spelled *j*). Only Arandic languages have a series of prestopped nasals (*TN*), which involve a delayed nasal onset. Arandic languages have a dorsal approximant, spelled *h*, which is absent from Warlpiri. Some Arandic languages, including Kaytetye but not Anmatyerr, have a set of prepalatalised apicals (*yT*), which are possibly analysable in terms of a cluster of *y* plus an apical consonant (Harvey 2011). Arandic languages additionally have a set of rounded consonants (spelled *Cw*) that are not shown in the table—except that *w* is the rounded counterpart to *h*. Warlpiri has a retroflex tap *rd* that has no counterpart in Arandic languages. Warlpiri has three vowels, *i*, *u*, and *a*; in Arandic languages *i* and *u* are rare (in fact *u* is not recognized as a phoneme of Kaytetye and only word-initially in some varieties of Anmatyerr), but the most common vowel is a central, shwa-like vowel spelled *e*.

There are considerable differences in phonotactics. Word-initially, Warlpiri permits only a single consonant, whereas vowel-initial words are common in Arandic languages, but some words begin with a consonant, and some with a (homorganic) consonant cluster. Word-finally, Warlpiri allows any of the three vowels, *a*, *i*, *u*—albeit with harmony of the high vowels. There is some evidence that in the not too distant past Warlpiri permitted final sonorant consonants, but in the modern language these all involve a final syllable *pa*. Arandic languages require all words to end in the vowel *e*.⁴ Word-stress in Warlpiri is on the first syllable; in Arandic language stress is usually on the first syllable with an onset, which usually means the second syllable of the word. The contrasting phonotactic structures (of a three-syllable word) can be summarised in terms of a Warlpiri schema #C¹VCVCV# vs. an Arandic schema #(V)'CVCe# (where C can include a cluster but the C¹ of Warlpiri is restricted to a single consonant).

3.2 Out-loans: Arandic to Warlpiri

This section examines some of the clearest examples of what I call out-loans,⁵ i.e. words borrowed from Arandic to Warlpiri, and makes observations about the kinds of phonological adaptation that have taken place. Many examples can be cited which demonstrate that an initial consonant has been added in Warlpiri. This consonant is required to meet the phonotactic constraints of Warlpiri. At the same time, in the interests of replicating the Arandic word as faithfully as possible, the consonants chosen to meet this target are ones that minimally distort the pronunciation—they are the two glides *y* and *w* and the velar nasal *ng*. Table 2 compares words that have added a consonant in Warlpiri to Arandic words beginning with an initial vowel. The Arandic words are cited from Anmatyerr, or Kaytetye if marked with a K. The gloss of the Arandic word, if different from that of Warlpiri, is given in the fourth column. Note that ‘ironwood’ has apparently

⁴ According to another analysis, justified primarily in Breen and Pensalfini (1999, cf. Breen 2001) and represented in the orthography of the Alyawarr and Anmatyerr dictionaries, all except monosyllabic words end in a consonant, and the final vowel that is sometimes pronounced is the result of a phonological rule of insertion. In this paper I represent all Arandic words with a final *e*, for the sake of comparability across the lects.

⁵ As noted in the abstract and introduction, this paper consciously takes an Arandocentric point of view, since the focus is on identifying loanwords into and out of the Arandic languages. It is of course only from the Arandic perspective that the words in question are “out-loans” or “in-loans”.

been adapted (perhaps in different parts of the Warlpiri territory) once with initial *w* and once with *y*. The data in Table 2 is ordered according to: initial *w*, *y* and *ng* before *a*; *y* before initial *i* (there are no good examples of *w* or *ng* being added before *i*); *w* and *y* before *u*. In some cases the *u*-initial form of the Anmatyerr word has been altered in the modern language (presumably subsequent to its borrowing) by the deletion of the initial vowel and its integration as a roundedness feature of the following consonant.

gloss	Wlp	Anm	Arc gloss
ironwood	<i>wajarnpi</i> , <i>yajarnpi</i>	<i>atyarnpe</i>	
tip of tail/wing	<i>wakirdi</i>	<i>akerte</i>	end, edge, point
MBCh especially of male	<i>wankili</i>	<i>ankele</i>	male cross-cousin
mulga	<i>wardiji</i>	<i>artetye</i>	
father's father	<i>warringiyi</i>	<i>arrange.ye</i> ⁶	
creeper, <i>Boerhavia diffusa</i>	<i>wayipi</i>	<i>ayepe</i>	tarvine, <i>Boerhavia schomburgkiana</i>
sky	<i>yalkiri</i>	<i>alkere</i>	clear sky
emu	<i>yankirri</i>	<i>ankerre</i>	
white	<i>yarltiri</i>	<i>arltere</i>	
hip(bone)	<i>yardipi</i>	<i>artepe</i>	back
Alyawarr	<i>Yalyawarri</i>	<i>Alyawarre</i>	
Anmatyerr	<i>Yanmajirri</i>	<i>Anmatyerre</i>	
women's ritual	<i>yawulyu</i>	<i>awelye</i>	
crested pigeon	<i>ngapilkiri</i>	<i>pelkere</i> ⁷	
emu tailfeathers	<i>ngardarri</i>	<i>artarre</i>	
rock pigeon	<i>ngarntipi</i>	<i>arntepe</i>	bronzewing pigeon
budgerigar	<i>ngatijirri</i>	<i>atetherre</i>	
in-law avoidance behavior	<i>yikirrinji</i>	K <i>ikerrentye</i>	
love-magic ritual and songs	<i>yilpinji</i>	<i>ilpentye</i>	
echidna	<i>yinarlingi</i>	<i>inarleng</i>	

⁶ The final *-ye* is a separable augment; in Kaytetye it is a suffix indicating 'my'.

⁷ The corresponding form in Kaytetye is *apelkere*.

bean tree	<i>yinirnti</i>	<i>inernte</i>	
back of neck	<i>yirtarngi</i>	<i>rtarnnge,</i> <i>rternnge</i>	back of head where neck joins
creek(bed)	<i>wulpayi</i>	<i>ulpaye,</i> <i>lpwaye</i>	
hare wallaby	<i>yukarlpi</i>	<i>kwarlpe</i> <i>(*ukarlpe)</i>	
bone	<i>yungkurnu</i>	<i>ngkwerne</i> <i>(*ungkerne)</i>	
mulga scrub	<i>yuwurrku</i>	<i>werrke</i> <i>(*uwerrke)</i>	scrub
(European) house	<i>yumarli</i>	<i>warle</i>	

Table 2. Out-loans with prothetic consonant in Warlpiri

Table 3 illustrates some non-initial adaptations. The Arandic lamino-dental is copied as the only laminal stop of Warlpiri, which does not distinguish dental from palatal. Of the phones without a close parallel in Warlpiri, prestopped nasals are rendered by the corresponding plain nasal and the dorsal approximant *h* by the rounded labial-velar approximant *w* of Warlpiri.

gloss	Wlp	Anm	Arc gloss
green grass	<i>wajirrki</i>	<i>atherrke</i>	
budgerigar	<i>ngatijirri</i>	<i>atetherre</i>	
to pluck	<i>walji-rni</i>	<i>althe-me</i> ⁸	
star	<i>wanjilypiri,</i> <i>yanjilypiri</i>	<i>anthe(r)lpere</i>	morning star, Venus
friendly, loving; fellow	<i>yulkajirri</i>	<i>ilkwatherre</i> <i>(*ulkatherre)</i>	keeping company
supplejack	<i>nganyiri</i>	<i>atnyere</i>	
wooden scoop	<i>yumari</i>	<i>pmware</i> <i>(*upmare)</i>	
plains kangaroo	<i>wawirri</i>	<i>aherre</i>	

⁸ *-rni* and *-me* are tense suffixes occurring in the citation forms of the verbs.

wild plum	<i>yawakiyi</i>	<i>ahakeye</i>	native currant
woma python	<i>ngawininyi</i>	<i>abenenhe,</i> <i>abenenye</i>	

Table 3. *Adaptation of word-internal consonants in Warlpiri***3.3 In-loans: Warlpiri to Arandic, with C_1 preserved**

This section shows how (recent) loanwords into Arandic languages are treated. The first examples, in Table 4, involve the treatment of final vowels, which are necessarily collapsed in Arandic into *e*, which is the only permitted final vowel. The last two examples show that the rounded quality of final *u* may be interpreted as a feature of the consonant when the preceding vowel is *a*.

gloss	Wlp	Anm	Arc gloss
boil, sore	<i>japirnpa</i>	<i>tyapernpe</i>	
thin clouds after rain	<i>kajara</i>	<i>katyare</i>	small, high wispy clouds
pubic tassel	<i>majardi</i>	<i>matyarte</i>	
desert rose	<i>pinamparli</i>	K <i>penamparle</i>	
dingo	<i>warnapari</i>	K <i>wanapare</i>	
not liking	<i>jukuru</i>	<i>tyekwere</i>	
duck	<i>jipilyaku</i>	<i>tyepelyakwe</i>	
billycan	<i>kartaku</i>	<i>kartak(w)e</i>	

Table 4. *Final vowels $\rightarrow e$ in Arandic*

Internal vowels are copied more faithfully. The treatment of internal *a* and *i* is displayed in Table 5. The low vowel *a* is reproduced as *a*, except that, as rows 5 and 6 indicate, an *a* vowel in second syllable, between syllables with primary and secondary stress respectively, may be copied as the non-low central vowel *e* of Arandic.⁹ This presumably reflects the fact that in this environment /a/ is high enough to be identified phonetically with the Arandic /e/ phoneme. Internal Warlpiri *i* is normally rendered by Arandic *e*.

⁹ Note that this has not happened in the second syllable of *manangkarre* in the previous row. A further example of *a* $\rightarrow$ *e* is seen in the last row of Table 5.

gloss	Wlp	Anm	Arc gloss
single-men's camp	<i>jankayi</i>	<i>tyangkaye</i>	
overcast sky	<i>matayi</i>	<i>mataye</i>	cloud
shaman's healing powers	<i>ngangkayi</i>	<i>ngangkaye</i>	traditional healer
spinifex plain country	<i>manangkarra</i>	<i>manangkarre</i>	
small wooden tool used in picking fruit	<i>kajalarra</i>	<i>katyellarre</i>	tool used for cleaning seeds out of fruits
spouse, brother-in-law	<i>kalyakalya</i>	<i>kalyekalye</i> ¹⁰	
whistling eagle	<i>kirkkirlanji</i>	K <i>kerrkerlantye</i>	brown falcon
moon	<i>marilpi</i>	K <i>arelpe</i>	
mountain devil	<i>mirnirri</i>	<i>mernerre</i>	
nosebone	<i>marrapirnti</i>	<i>marrepernte</i>	

Table 5. Word-internal *a* and *i*

Table 6 shows that Warlpiri word-internal *u* is rendered as *e* but with rounding reflected on an adjacent consonant. This is comparable to the treatment of final *u* seen in ‘duck’ and ‘billycan’ in Table 4. If the vowel preceding an internal *u* is also *u*, as in *jukuru* in Table 4, the rounding is normally marked on only one consonant of the Arandic word. The second part of Table 6 indicates that word-initial *Cu* is reflected in Arandic as a rounded consonant followed by the vowel *e*.

gloss	Wlp	Anm	Arc gloss
tobacco	<i>janyungu</i>	<i>tyanywenge</i>	
bandicoot	<i>pakuru</i>	K <i>pakwerre</i>	
down for body decoration	<i>mardukuru</i>	K <i>martekwere</i>	
desert oak	<i>kurrkara</i>	<i>kwerrkare</i>	
fighting stick	<i>kuturu</i>	<i>kwetere</i>	
oppositie patrimoiety	<i>kurdungurlu</i>	<i>kwertengerle</i>	ceremonial role in relation to mother's country
diamond dove	<i>kurlukuku</i>	<i>kwerlekweke</i>	peaceful dove,

¹⁰ The dictionary indicates this word as belonging to the Baby Talk register.

ball of hairstring	<i>purlja</i>	<i>pweltye</i>	diamond dove
			traditional game played
			with hairstring ball
clapsticks	<i>tururru</i>	<i>twererre</i>	
blue-tongue lizard	<i>lungkarda</i>	<i>hwengkarte</i>	

Table 6. *Word-internal and -initial u reflected in rounded consonant*

The final syllable *pa* that is assumed to have been added to consonant-final stems in recent Warlpiri history is sometimes reflected in Arandic loanwords. Thus *kirlilkirlilpa* ‘galah’ is copied as Anm *kerlelkerlelpe* (cf. also ‘boil, sore’ in Table 4). But this augment is not reflected in Kaytetye *penangkale* ‘learned, expert’, copied from *pinangkalpa*, presumably before *pa* became a fixed part of the stem in Warlpiri.¹¹

3.4 Effects of Arandic sound changes

This section summarises the ways the Arandic historical changes (described in Koch 1997b, 2004, 2007) altered the phonological structure of Arandic words, in particular those of three syllables. Any word that ended in a consonant (e.g. *nungkarn ‘bone’) acquired a final vowel. The change of all final vowels to *e* (shwa) had the result that there are no vowel contrasts word-finally. The loss of all initial consonants led to a situation where there were (for a certain length of time) no words beginning with a consonant. The reduction of all short vowels of non-initial syllables to *e* made *e* the most prevalent vowel except in initial syllables.¹² These changes would have altered the typical Arandic phonotactics of a trisyllabic word from #C¹VCVCV# to #VCVCe#, with V₂ usually being *e*. Table 7 gives examples of some etymologically trisyllabic words whose medial vowel has become *e*. The words in the last rows involve a presumed intermediate stage with an *u*-initial form that was altered by a later sound change. This involves the loss of the *u*-vowel, whose roundedness feature is preserved on the following consonant

¹¹ A further (morphological) indication of the Warlpiri source of this word is that it is based on Warlpiri *pina* ‘wise’, but is totally unanalysable within Kaytetye.

¹² I now think that Proto-Arandic might have had some word-internal long vowels that did not change to *e*; e.g. *anatyē* ‘yam’ and its cognate in Wakaya *menaji*, both of which seems to reflect an earlier *manaatyī (cf. also *manaji* in Warumungu, which however does not directly reflect vowel length in non-initial syllables).

(cluster) unless it is a single lamino-dental or apico-alveolar consonant. The circumstances in which an initial *a* appears are not fully understood.

Pre-Arandic	intermediate	modern	gloss
*tartapa		<i>artepe</i>	back
*karlaya		<i>arleye</i>	emu
*kaperli		<i>aperle</i>	father's mother
*kilantyi		<i>ilentye</i>	galah
*tyatyirti		<i>atyerte</i>	quoll
*kayirra-		<i>ayerre.re</i>	north
*pankulV		<i>ankele</i>	cousin
*nungkarn	*ungkerne	<i>ngkwerne</i>	bone
*ngumparna	*umperne	<i>mpwerne</i>	wife's brother
*rumarV	*upmere	<i>mwere</i> ¹³	wife's mother
*kurrparu	*urrpere	<i>arrpwere</i>	magpie
*kutharra	*utherre	<i>atherre</i>	two
*ngunharri	*unherre	<i>anherre</i>	husband's mother

Table 7. Phonological change in trisyllabic words

3.5 In-loans with *C*₁ truncation

3.5.1 Adaptation possibilities

It is worth considering the consequences of the main Arandic sound changes for borrowing into the Arandic languages from languages like Warlpiri that retained their traditional phonotactic structure. At the stage after the loss of all initial consonants and before the later loss of some initial vowels, there would have been a situation in which all Arandic words began with a vowel, whereas all Warlpiri words began with a consonant. What would we expect to be the fate of Warlpiri *C*₁ in borrowed words? There are three possibilities. (1) A prothetic vowel could be added. There is little evidence that this ever happened. (2) The Warlpiri words could be borrowed with their *C*₁, and the Arandic phonotactics would in consequence be altered to allow *C*₁. Although this situation later

¹³ Here I posit an irregular replacement of the prestopped with the plain nasal (cf. Koch 2013: 180)

obtained, after the new initial V was lost by subsequent sound changes, it is not certain that initial consonants were retained at the early stage in question. (3) The initial consonant could be truncated. This solution was favoured, I would claim, by the pattern found both in out-loans, where Warlpiri had added a prothetic *m*, *y*, or *ng* (see §3.2 above), and in cognates, such as *ngumparna* vs. *umperne ‘wife’s brother’ and *kurrparu* vs. *urrpere ‘magpie’ (Table 7) or Western Desert *kaparli* ‘grandmother’ vs. *aperle* ‘father’s mother’. I propose that the convention of initial truncation in loanwords may have continued after the loss of V₁ made initial consonants possible again in the Arandic languages. Then later, loanwords were adopted without truncation. The examples offered in §3.3 above represent this later layer of loanwords.

Evidence for an early stratum of in-loans borrowed with truncation of the initial consonant comes from several sources. First, there are doublets, pairs of Arandic forms with and without truncation. This variability in the treatment of initial consonants may represent separate borrowings, in different parts of the Arandic-speaking territory, or early borrowing with truncation followed by a later updating of the loanword to better approximate the Warlpiri model. Second, the same kinds of phonological adaptation (especially those involving word-internal vowels) are found in truncated as in non-truncated loanwords. Third, the candidates for borrowing with truncation satisfy other tests for loanword status. The following section presents some candidates for truncated borrowing and offers arguments for the loanword status of each.

3.5.2 Examples of truncated loanwords

Warlpiri *marliyarra* ‘advanced initiate’ is echoed in Arandic languages as a term for a ‘newly initiated man’. Anm has a form with truncation, *arleyarre*, which is also found in ECAr. But the equivalent in WAr, and a variant in ECAr, is *marleyarre*, with C₁ retained. The vowel adaptation pattern is the same in both variants. Note that the semantic domains of ceremony and social categorisation are ones that favour borrowing. I conclude that the term has been borrowed from Warlpiri. It also occurs in Warlpiri’s neighbours Warlmanpa and P/L (spelled *maliyarra* in the latter). The facts are best explained by assuming that the Arandic languages first borrowed the term with truncation of *m*, then later, in the early twentieth

century, updated the term to include the initial consonant. The term is attested in (Central) Arrernte since 1896, spelled *erleara* in Gillen's letters (Mulvaney et al. 1997: 132) and *urliara* in Spencer and Gillen (1899: 271). In their second edition, however, Spencer and Gillen (1927: 223) give the term with its variant, “*Urliara* or *Maliera*”--reflecting the recent updating of the term. Strehlow (1947: 103) likewise gives the variants *iliara* and *maliera* for the dialect he calls “Northern Aranda”.

A term for ‘native tobacco, pituri’ has been borrowed from the Western Desert language; cf. P/L *mingkulpa*, P/Y *mingkul(pa)*. Although the *pa* syllable is considered a relatively recent addition (as in Warlpiri), it is present in the Arandic loanwords, ECAr *ingke(r)lpe* and Anm *ngkwerlpe*. Note that the treatment of internal *u* as *we* conforms to the pattern of changes in loanwords rather than that of inherited words (where *u* becomes just *e*). The semantic domains of both flora and tradegoods are ones in which loanwords are expected.

Of similar phonological structure is another term borrowed from Western Desert, a social category meaning ‘of opposite generational moiety’. Generational moieties are of particular importance in the culture of Western Desert people. The P/L term is (y)*inyurrpa*, and P/Y *inyurr(pa)*. The term is *nywerlpe* in Anm, Aly, and K, and *nyurrpe* in ECAr and WAr. Note the treatment of internal *u* as *we/u* and the inclusion of the *pa* syllable. It should be noted that some WD dialects have loss of initial *y*. In this word it must be assumed that the word-initial vowel has been lost in all Arandic lects after the word was borrowed. Note that the distribution of this term within Arandic might suffice to reconstruct it to Proto-Arandic, but the internal rounding and final syllable are explained more easily from its Western Desert origin.

Another social category term, Warlpiri *makurta* ‘opposite matrimoiety’, is reflected in Anm *kwernte* ‘they (people in opposite matrimoiety); brother-in-law’, Aly *akwente* ‘brother-in-law’, K *akwernte* [older speakers], *makwernte* ‘brother-in-law’ (presumably reflecting recent updating). Note the variability of C₁ in Kaytetye. The treatment of internal *u* as *we* is normal for loanwords. The semantic domain of affinal kinship is one where borrowing is expected. There appears to be semantic narrowing, except in Anm, with a social category term being used only for certain affinal kin.

Somewhat related semantically is the case of Wlp *jurdalja* ‘member of wife’s patriline’, which is reflected in Arandic by Anm/ECAr *urtaltye* and Anm, Aly, K *rtwaltye*. The Arandic terms have a more restricted sense ‘wife’s mother/female’s daughter’s husband’. The recency of the term in Arandic is indicated by the (morphological) fact that it lacks the person-marking inflections characteristic of kinterms. The treatment of internal *a* as *a* follows the pattern of borrowing rather than that of inheritance. The presence of a presumably inherited synonym *mwere* (see Table 7) further supports (weakly) the claim that this is a loanword.

Another borrowed affinal term is reflected in K *ayletye* ‘wife’s mother/female’s daughter’s husband’. This appears to be related to Warlpiri/Warlmanpa *mali.rdi* ‘wife’s mother’s brother’ (*-rdi* is a marker of some kinterms). The source for the Kaytetye term seems to be a form **mali-tyi* that is not attested in modern Warlpiri or Warlmanpa. The stem *mali* in Ngumpin languages closely related to Warlpiri and Warlmanpa sometimes occurs with an enclitic =*tyi* ‘my’. It appears that such a morphologically analysable form, earlier occurring in Warlpiri or Warlmanpa, was the source of this Kaytetye loanword. Here the test of morphological analysability helps in the identification of a loanword.

Another affinal kinterm, *arrkare* ‘spouse of someone in speaker’s generational moiety’, is found in a number of Arandic lects. The source is apparently either Warlpiri or P/L *marrkari*. Note that the treatment of internal *a* as *a* follows the borrowing rather than the inherited pattern.

Western Desert *nyarrumpa* is presumed to be the source of the term *arrwempe* ‘opposite-sex sibling’ found in several Arandic lects. The semantics of this term is more characteristic of the Western Desert than of the Arandic kinship system. The semantics of the Arandic term is variable, especially in whether it applies to cousins. Phonologically, the treatment of internal *u* as *we* is characteristic of loanwords. If the term was inherited within Arandic, we would have expected the internal *u* vowel to have become *e*, the nasal+stop cluster to have been reduced to just a nasal, and the initial *nya* to have become *i*; the result would have been **irreme*. The lectal distribution perhaps gives a further clue to the recency of the

term, since it is absent in the north-eastern Alywararr and in the northern Kaytetye, except in its most modern varieties.¹⁴

Another Western Desert kinterm, *kangkuru* ‘elder sister’, is reflected in most Arandic lects as *angkwere*, or WAr *ngkwere* (with later initial vowel loss). Note the treatment of internal *u* as *we* as is usual in loanwords. This term has to some extent displaced a synonymous *jaye* which is reconstructible to proto-Arrernte (Koch 2013: 173, 177).

3.5.3 Truncated subsection terms

Subsection (“skin”) names are a closed set of social category terms that are widely used in central and northern Australia. The terms and system are known to have spread widely and recently in Australia (McConvell 1985). The terms are thought to have spread to the Arandic languages from the north and west (McConvell 1985, 1996). Hence the terms are presumably loanwords. The Anmatyerr names were presumably borrowed from Warlpiri, and from Anmatyerr they were transferred to lects spoken further south (Koch forthcoming).¹⁵ Several of the Kaytetye terms, on the other hand, appear to have been borrowed from Warlmanpa or Warumungu (Koch forthcoming). Table 8 presents the names as they occur in Warlpiri and modern Anmatyerr as well as the presumed form in earlier Anmatyerr, before the initial vowel was lost. (These initial vowels are still variably pronounced in some Arandic lects.) The Warlpiri terms are the names of males; there is also a set of terms for females, which begin with *n* instead of *j* (but the female Napurrurla corresponding to Jupurrurla has a different first-syllable vowel as well).

¹⁴ See discussion in Koch (2013: 173).

¹⁵ There is evidence that there were two waves of diffusion, the first of which involved only four “section” terms; a second set of four terms spread later. There does not, however, appear to be any difference in the phonological adaptation patterns of the two sets (Koch forthcoming, *pace* McConvell 1996: 131).

Wlp	*Anm	Anm
<i>Jakamarra</i>	<i>*akemarre</i>	<i>Kemarre</i>
<i>Japanangka</i>	<i>*apenangke</i>	<i>Penangke</i>
<i>Japangardi</i>	<i>*apengarte</i>	<i>Pengarte</i>
<i>Japaljarri</i>	<i>*apeltharre</i>	<i>Peltharre</i>
<i>Jampijinpa</i>	<i>*ampetyane</i>	<i>Mpetyane</i>
<i>Jangala</i>	<i>*angale</i>	<i>Ngale</i>
<i>Jupurrurla</i>	<i>*uperrerre</i>	<i>Pwerrerre</i>
<i>Jungarrayi</i>	<i>*ukngarraye</i>	<i>Kngwarraye</i>

Table 8. Subsection names in Warlpiri and Anmatyerr

I claim that the subsection names follow the pattern of borrowing with truncation that has been described earlier in this section. Note in the first four rows that the Warlpiri word-internal *a* vowels are reflected in Arandic as *a*, except when they occur in Warlpiri in the second syllable of a four-syllable word; here the /a/ phoneme between primary and secondary stresses presumably had an allophone that was high enough to be perceived by Arandic speakers as closest to their /e/ phoneme. (Internal *a* of the trisyllabic Jangala, on the other hand, is reflected as *a*.) These four names establish for the Anmatyerr names a vowel pattern *a-e-a-e*. This is relevant to the explanation of Jampijinpa. First, it should be noted that the Wlp *pa* syllable is not reproduced in Anmatyerr. It must be assumed that the Warlpiri term was borrowed before *pa* became a fixed part of the stem; thus the source was *Jampijin, and a final vowel *e* was added to the word to make it conform to Arandic phonotactics. One would expect, however, that the Arandic form would be *ampetyene, since the third vowel of the Warlpiri form is *i*. I suggest as an explanation of the *a* of *ampetyane that the *a-e-a-e* vowel pattern of the first four terms was extended to this term first borrowed as *ampetyene. This extension of a pattern in a closed terminological set could be understood as similar to the kind of changes that occur in morphological paradigms. It is also worth noting that, while the Wlp laminal stop *j* is reflected as the lamino-palatal *ty* in *ampetyane, it is treated as the lamino-dental *th* in *apeltharre. This reflects the allophonic differences in the two words; it can be assumed that in Japaljarri the *j* had a more front articulation conditioned by the following *a* than in *Jampijin

before *i*.¹⁶ The reflexes of Jungarrayi present a problem: one might expect rather *ungerraye, with *e* in the second syllable (but note the exceptional *manangkarre* in Table 5 above). More serious is the presence of a prestopped nasal copying the Warlpiri plain nasal. I suggest that this is an instance of hypercorrection; i.e the application of the matching pattern N : TN instead of N : N (cf. §2.3.2).

3.5.4 Untruncated junior subsection terms

In contrast to the subsection names just discussed, there is in Anmatyerr and Kaytetye a set of junior subsection names. Unlike the main terms, these are differentiated according to the sex of their bearer. Furthermore they preserve the original consonant of the corresponding Warlpiri term. They have obviously been borrowed, and their Arandic form follows the pattern of recent in-loans without C₁ truncation that is described in §3.3. The masculine terms of Warlpiri and Kaytetye are shown in Table 9.

Warlpiri	Kaytetye
<i>Jakarra</i>	<i>Tyakarre</i>
<i>Jampirka</i>	<i>Tyamperlke</i>
<i>Japayardi</i>	<i>Tyapeyarte</i>
<i>Janama</i>	<i>Tyaname</i>
<i>Japalya</i>	<i>Tyapalye</i>
<i>Jangkarli</i>	<i>Tyangkarle</i>
<i>Jukurdayi</i>	<i>Tywekertaye</i>
<i>Jurlama</i>	<i>Tywerlame</i>

Table 9. Junior subsection names in Warlpiri and Kaytetye

In Koch (forthcoming) I explore further the details of borrowing of subsection terms within the Arandic languages, including the dates of earliest attestation of the forms. In this paper, however, my concern has been to establish the phonological patterns that characterise the different chronological layers of Arandic loanwords.

¹⁶ McConvell (1996: 131) rather assumes that the different treatments of Wlp *j* reflect different chronological strata.

4. Summary and conclusions

We have surveyed the kinds of evidence that allow for identifying loanwords between genetically related Australian languages. The focus of attention has been on the words borrowed between the Arandic languages and their western neighbours, primarily Warlpiri but also to some extent Western Desert. We have shown how the phonological adaptation has been motivated by the differences of phonology that result primarily from a distinctive set of historical changes in the Arandic languages. Three sets of loanwords have been discussed: “out-loans” from Arandic to Warlpiri, which have added an initial consonant to their vowel-initial model; an earlier chronological stratum of “in-loans”, which have truncated the initial consonant of their Wlp or WD model; and a recent stratum of in-loans that have preserved the initial consonant of their western model. Loanwords of the second type, being the most controversial, have been given individual discussions of their borrowing status (in §3.5). A major finding has been the two distinct patterns of loanword adaptation in the Arandic languages.

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