

*Aboriginal
Linguistics*

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edited by

Nicholas Evans & Steve Johnson

1988

On the status of the feature rhotic in some languages of the north-west of Australia

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1. INTRODUCTION*

As is well known, the majority of Australian Aboriginal languages have two *r* sounds: a retroflex frictionless continuant, normally written *r* (IPA ɽ); and an apico-alveolar tap or trill, usually written *rr* (IPA ɽ̣). Some languages even distinguish a third *r* sound. For instance, Warlpiri has a retroflex flap (written *rd* in Warlpiri practical orthography), and Murrinh-patha has an apico-alveolar continuant [ɽ̣].

The two *r* sounds are of course dialectal variants in English, the tap occurring in some dialects, the continuant in others. It is not surprising then that the earliest workers on Australia languages did not always distinguish between these two *r* sounds. This may also, I suggest, be part of the reason why Australianist linguists, while distinguishing them as distinct phonemes, have tended to group the two *r* sounds together, referring to them as 'rhotics', a term invented in 1972 according to Dixon 1980:144 (see for example Dixon 1977:32, 1980:144-145, Tsunoda 1981:23, Rumsey 1982:1, Heath 1984:12, and Stokes 1982:14). Indeed, Dixon 1980:191 has suggested 'rhotic' to be a binary phonological feature — i.e. [±rhotic], valid for all Aboriginal languages.

My aim in this paper is to evaluate Dixon's suggestion, and more particularly to show that the feature opposition [±rhotic] does not provide for useful phonological generalisations in some languages of the north-west of Western Australia. I will argue for an alternative analysis in these languages, proposing that /r/ be grouped together with the semi-vowels /w/ and /y/ by the feature [glide] or [-liquid], and /rr/ be associated with the laterals by the feature [+liquid], but distinguished from them by the more delicate opposition [lateral] vs. [tap]. These ideas are not, of course, entirely novel. A number of other Australianist linguists, for example Alpher 1988, Blake 1987:11, Capell 1962:54, 1967:86, Capell & Coate 1984:xii, Goddard 1985:20, Hudson & Richards 1969:171, Nash 1980:66, and O'Grady, Voegelin & Voegelin 1966:139, have proposed a similar analysis, whereby /r/ is grouped together with the semi-vowels, and /rr/ is distinguished uniquely as a tap/flap. However,

with the exception of Alpher 1988, none of them have provided detailed justification for their proposal, or explored the implications. Nor, to my knowledge, has any suggested a higher order feature to encompass just the laterals and the tap/flap.

2. DIXON'S EVIDENCE FOR THE FEATURE [±RHOTIC]

While rejecting it as impossible on *a priori* grounds to specify a limited universal set of feature oppositions from which every language will choose (1980:181), Dixon (180-194) has suggested that all, or at least the majority of Australian phonologies may be accounted for in terms of a single system of feature oppositions. This is possible, he claims (1980:181), because of the similarities in Australian Aboriginal phonologies. Most oppositions will occur in all of the languages, but some may be absent from particular languages. Dixon (1980:181) proposes the following criteria for feature systems in Australian languages: (i) they should permit the most economic and general statements of phonotactic patterns; (ii) they should yield the most perspicuous statement of allomorphic alternations; (iii) they should give the most straightforward statement of historical changes; and (iv) they should explain areal correspondences, and the way in which loans are expressed in different phonologies. Now I endorse Dixon's view that phonological feature oppositions are language specific, and the reasons he puts forward for proposing particular oppositions. I would, however, add a further criterion, that (v) the feature system should ideally provide for an illuminating (if partial) description of allophony.

In this paper I am calling to question the universality (in Australia) of one of the feature oppositions that Dixon proposes, the privative opposition [±rhotic]. I begin in this section by outlining the reasons Dixon adduces for this feature opposition. I will then discuss the situation for a number of languages of the north-west of Australia, proposing a different feature analysis, preferable on the basis of Dixon's general criteria. I will then discuss some historical-comparative and areal phenomena which lend support to my proposals.

Dixon (1980:186) contends that the apico-alveolar tap or trill, /rr/ and the apico-post-alveolar continuant /r/ fit into the same apical series as set up for stops, nasals and laterals. Presumably this provides some (rather indirect) evidence that the two phonemes should be grouped together by the feature rhotic. Dixon's evidence is as follows. Firstly he notes a phonetic correlate of [+rhotic]: the sides of the tongue touch the top of the mouth, and air escapes through a groove in the middle. Although there is an obvious difference in manner of articulation, Dixon regards this as minor:

"...the most important factor appears to be not manner but PLACE of articulation. /r/ is always articulated FURTHER FORWARD in the mouth than /r/; then, as a concomitant feature, /r/ is always, or almost always a trill and /r/ is frequently a grooved continuant." (his emphasis) (1980:145; cf. p.186.)

That is, Dixon attributes the difference in manner as a consequence of the difference in place of articulation (cf. Heath 1984:13 who suggests that the main difference between *r* and *rr* in Nunggubuyu is not place of articulation, but manner). Cross-linguistically, of course, apical taps or trills do tend to have alveolar articulation, whilst apical frictionless continuants tend to have more retracted, even post-alveolar articulation. These cross-linguistic tendencies, however, do not strongly support the proposed analysis within particular languages, and the existence of Australian languages which have apico-alveolar grooved continuants (e.g. Murrinh-patha, see Walsh 1976), and languages with retroflex taps or trills (e.g. Warlpiri, see Nash 1980), indicates that the manner-place correlation is no better than an unmarked association. This sort of reasoning based on universal tendencies is not even alluded to in Dixon's own criteria, in which language specific evidence only is mentioned.

The second piece of evidence Dixon cites is an alternation /rd/ ~ /r/ in certain grammatical environments in some languages, e.g. Yir-Yiront (Cape York) (see Dixon 1980:186 and Alpher 1988). As we will see, such alternations do not necessarily lend support to Dixon's position, especially in the absence of corresponding alternations /d/ ~ /r/. Thirdly, in Nyawaygi, *d > r /V__u, but *d > rr elsewhere, and this parallels the conditioning factors in the original apical split whereby proto-Australian *d became /rd/ intervocally preceding /u/, but /d/ elsewhere, in those modern languages with two apical series. And fourthly, /r/ shows some of the markedness properties of the other apico-postalveolar consonants /rd, rn, rl/. Word initially the apical contrast is neutralised in the majority of Australian languages, and for stops, nasals and laterals the most marked articulation, the retroflex, predominates. This is paralleled by the fact that in the majority only /r/ occurs word initially. However, as I will show later, these facts cannot be taken as unequivocal support of neutralisation between /rr/ and /r/, and ultimately for the privative feature opposition [±rhotic].

Other, this time more direct, supporting evidence includes allophony and certain processes of historical phonology. In Ungarinyin, for example, word finally /rr/ can dissolve into a fricative [ʀ] (Rumsey 1982:5). And it has been claimed that there is a single *r*-sound with tap and resonant allophones in the Jaminjung languages (Cleverly 1968:10, Bolt, Hoddinott & Kofod nd a:6, 10, and nd b:6, 10).¹ Similarly, Dixon (1980:186) has suggested that [r] and [ʀ] were possibly allophones of a single phoneme in proto-Australian. Finally, Dixon 1980 points to a number of historical phonological processes relevant to the

identification of [±rhotic]. In Banjalang (Northern New South Wales) original /r/ and /rr/ have fallen together to a flap /r/ (Dixon 1980:145, 147).

3. THE STATUS OF [±RHOTIC] IN GOONIYANDI

I will begin by discussing the situation in Gooniyandi, a non-Pama-Nyungan language of the southern-central Kimberley, Western Australia, the language with which I am most familiar. I will first argue against Dixon's proposed feature [±rhotic], then I will suggest an alternative analysis (cf. McGregor 1984:28-29). Having done this, I will turn more briefly, in section 4, to a number of other languages of the north west of Australia, demonstrating that similar circumstances obtain in them.

As against Dixon's view, I note firstly that the opposition between /r/ and /dd/ (the digraph representing the apical tap in my proposed Gooniyandi orthography for academic purposes)² is *not* parallel with the opposition between apico-post-alveolar and apico-alveolar articulation in stops, nasals and laterals. It is true that only /r/, and not /dd/, occurs word initially, and only /dd/ occurs syllable finally in root medial syllables. However, this does not by itself constitute evidence that the distinction between these two phonemes is neutralized in these positions, any more than is the fact that /r/ and /ly/ share these identical distributional patterns evidence for the neutralization of the opposition between them. In clear contrast with the situation for /dd/ and /r/, in word initial position both alveolar and post-alveolar articulations of the stops, nasals and laterals are heard, with the *former*, not the latter predominating (the post-alveolar usually occurs only when the initial consonant of the second syllable of the word is a post-alveolar). It follows that /r/ and /dd/ differ not only in terms of place of articulation, but also in terms of manner. Secondly, no phonotactic patterns or sandhi processes group these two segments together; nor does this grouping serve in any useful phonological generalization in Gooniyandi.

For both phonetic and phonological reasons /r/ belongs with the glides /w/ and /y/.

(a) Phonetically, /r/, /w/ and /y/ differ from all other consonants in not involving contact between the two articulators. /r/ is pronounced as a vocoid in which the tongue points towards the alveolar ridge, usually in the post-alveolar region; however, the articulation is rarely, if ever as far back as the articulation of the retroflex stop, nasal and lateral. (This seems to be confirmed by spectrographic analysis, which shows that the degree of separation between the second and third formants of /r/ is intermediate between that of the apico-alveolar and the apico-postalveolar stops, nasals and laterals — McGregor 1984:41.) Sometimes, in fact, the tongue points towards a point on the alveolar

ridge at which the non-retroflex apicals make contact. There is also an allophone [ə] of /r/.

(b) Phonotactically, /r/ occurs in ranges of structural positions almost identical with those for /w/ and /y/, and differs considerably from the tap /dd/ in terms of these ranges. /r/, /w/ and /y/ are rare word finally, while /dd/ is common in this position (in verbal words), and they occur only as the second member of consonant clusters, whereas /dd/ occurs only as the first member.

Phonotactically /dd/ behaves very much like the laterals, occurring in an almost identical range of consonant cluster types, as can be seen by an inspection of table 1. All of these clusters have the lateral or /dd/ initially, followed by /b/, /j/, /g/, /m/, /ng/, or /w/, although not all of the possible combinations of these phonemes actually occur (it is, however, probable that the two gaps are accidental); there are also two exceptional combinations, involving glides as second members, /dd-r/ and /rl-y/. For this reason I group them together as liquids. In articulatory terms liquids involve partial or instantaneous contact between the articulators, and in this way are distinct from the glides, which involve no contact.

Table 1 *Gooniyandi intervocalic consonant clusters*

	F i r s t m e m b e r																		
	b	d	rd	th	j	g	m	n	rn	nh	ny	ng	l	rl	ly	dd	r	w	y
b			x		x	x	x	x	x		x		x	x	x	x			
d			x				x												
rd								x											
th									x										
S	j	x	x					x	x		x		x	x	x	x			
e	g		x		x			x	x		x	x	x	x		x			
c	m								x	x	x	x	x	x	x	x			
o	n																		
n	rn																		
d	nh																		
	ny																		
m	ng							x	x	x			x	x		x			
e	l																		
m	rl																		
b	ly																		
e	dd																		
r	r																		x
	w												x	x	x	x			
	y																		x

Inspection of the table will reveal that the non-peripheral nasals also occur in a very similar range of consonant clusters. This may suggest support for the universal features [coronal] (= [-peripheral]) and [continuant] (embracing all consonants bar the stops and glides (which are taken to be vocalic)) of generative phonology. This would allow a generalisation to the effect that clusters consisting of coronal continuants followed by peripheral stops, nasals, and the lamino-palatal stop, occur. However, on the whole /dd/ and the laterals behave more like one another than either behaves like nasals. Firstly, stops and nasals, as against the laterals and /dd/, may occur as the second member of a consonant cluster; laterals and /dd/ must be the first. Secondly, homorganic nasal-stop clusters occur, but homorganic lateral-stop are vanishingly rare, and tap-stop clusters do not occur. Thirdly, laterals and /dd/ may precede glides in clusters, but nasals may not. And fourthly, although the apical nasals, as well as the laterals and /dd/, are rare word initially, one coronal nasal, /ny/, is not rare in this position. This justifies grouping /dd/ and the laterals, and separating them from the nasals.

Glides regularly alternate with stops at morpheme boundaries, but the only example of alternation between a liquid and a stop at a morpheme boundary is within the verbal classifier complex (McGregor 1984:161), where the morphophonemic processes at work are more powerful than elsewhere (see section 5 below for discussion). This lends further support to my proposed feature analysis, and suggests that glides are unmarked with respect to liquids, and the two may perhaps be distinguished by the opposition [±liquid]. However, as there are no examples of alternations or neutralizations of the [±liquid] opposition, evidence that it is privative is not particularly compelling. Within the [+liquid] segments, /dd/ is distinguished from the others by the equipollent opposition [lateral]/[tap]. (I suggest the feature [tap] even though /dd/ has trill allophones: these may be regarded as sequences of taps. Alternatively, one might suggest the more accurate feature label [instantaneous contact], which would account for each of the main allophones, and distinguish them from all other consonants in the language.)

4. EVIDENCE FROM OTHER NORTH-WESTERN LANGUAGES

When we turn to other languages of the north-west, we find that in many of them /r/ clearly patterns phonotactically like /w/ and /y/, and unlike /rr/. There is also evidence from morphophonemic alternations in some languages showing that /r/ alternates with /rt/ (and sometimes with /t/) at certain morpheme boundaries, in the same way as /p/ and /k/ alternate with /w/ and /j/ alternates with /y/. Although /rr/ and /t/ sometimes alternate at morpheme boundaries, this alternation seems to be always qualitatively different from the /rt/ ~ /r/

alternation (see below). This clearly indicates that the putative feature opposition [\pm rhotic] has little explanatory adequacy in these languages. As to my second generalisation, that /r/ and the laterals should be grouped together as liquids (and more specifically as [+liquid]), there is less clearcut evidence. Certainly /r/ behaves phonotactically like the laterals. But, just as in Gooniyandi, these segments also behave quite similarly to the non-peripheral nasals in the majority of other languages in the region. I cannot always argue as strongly in the case of other languages as I can for Gooniyandi, due in part to the lack of adequate detailed information. It also seems that, depending on the language, there is sometimes more, sometimes less support for the specific grouping of the laterals with the /r/, and against the nasals.

The Northern Kimberley language Ungarinyin (a non-Pama-Nyungan language of the Worrorran family), has the apical tap or flap /r/, and the retroflex frictionless continuant /r/. According to Rumsey (1982:6), the relation between /r/ and the retroflex consonants /rd, rn, rl/ is phonetically the same as the relation between /y/ and the palatals /j, ny, ly/: phonetically, /r/ is the vocoid [ə].

Aside from this admittedly inadequate phonetic correspondence between /r/ and the semivowel /y/ in Ungarinyin, there is some rather weak evidence from phonotactic patterning that /r/ should be grouped with the semivowels, while /rr/ should be grouped with the laterals. The laterals and /rr/ occur only as the first member of word medial consonant clusters, except in the homorganic cluster /dl/ (Rumsey 1982:15). Furthermore, there is a restriction on the liquids /rr/ and /ly/ occurring word initially. The glides /r/ and /w/ occur as the second member of word medial clusters, but only /y/ occurs as the first member (in a single cluster type). In terms of occurrence in consonant clusters, /rr/ and /r/ are quite different (see the table in Rumsey 1982:15). Although there is some similarity in phonotactic patterning between the laterals, /rr/ and the non-peripheral nasals, an inspection of the table just referred to reveals that /d/ and /rd/ also behave similarly. It is clear that the generalisation to capture is that apicals (except for the apical glide) may precede peripheral stops and nasals. The potential and frequency of occurrence word initially and finally, the types of homorganic clusters that occur, and the fact that only laterals and /rr/ may occur in clusters in which the second member is a peripheral glide, would seem to justify grouping /rr/ with the laterals.

But the clearest evidence for grouping /r/ with /w/ and /y/ comes from the morphophonemics. Rumsey 1982:17 shows that certain morphophonemic alternations can be accounted for by strengthening on a sonorance hierarchy. Among these are the strengthening of the glide /r/ to /rd/ following a consonant, paralleling the strengthening of /w₁/ to /b/, /y₁/ to /j/, /y₂/ to /d/, and /w₂/ to /g/ (Rumsey 1982:17). (In fact, /r/ almost always strengthens to /d/ — the retroflex

stop occurs only when following a retroflex consonant. Thus, it would appear that the glide /r/ corresponds to the apical stops, and not specifically to the retroflex stops alone.)

Taylor & Taylor (1971:100) group /r/ together with /w/ and /y/ as semiconsonants in Kija (a non-Pama-Nyungan language of the Jarrakan family, spoken in the east Kimberley) and set /rr/ off by itself as a vibrant. The phonotactic patterns seem to strongly support the first grouping: these three do not occur word finally, except in preverbs, where /r/ can be final, and /r/, /w/ and /y/ do not appear to occur as the first members of consonant clusters. As usual, /rr/ and /ly/ do not occur word initially, but both may occur word finally. There are a number of consonant clusters with initial lateral or flap, followed by a peripheral stop or nasal, or a laminal stop, and a single instance of /l-w/. The apical stops and nasals also occur in at least some clusters of all but the last of the above types, and the lamino-palatal stop and nasal occurs in a few of these clusters. However, for exactly the same reasons as given above for Gooniyandi, the flap may be grouped with the laterals.

Furthermore, there is some morphophonemic evidence for this grouping in Kija. According to Patrick McConvell (p.c.), when a *p* or *k* initial suffix is attached to a stem ending in *rr* or a lateral, the initial stop deletes. For example, *tumurr-pe* (chest-neuter:plural) → *tumurrwe* → *tumurru* 'chests' (the change in vowel quality being accounted for by vowel harmony).

In Walmajarri (a Pama-Nyungan language of the Ngumpin subgroup, spoken in southern central Kimberley), /r/, /w/ and /y/ pattern alike in not occurring word finally, unlike /rr/ and the laterals; conversely, word initially /rr/ and /ly/ are not permitted, and /l/ is rare. Walmajarri allows a fair number of consonant clusters with an initial lateral or tap followed by /p/, /j/, /k/, /m/, or /ng/, but /r/ occurs in only two clusters: /r-p/ and /r-k/ (/w/ and /y/ do not occur as first member of any clusters). Although most of the corresponding clusters with initial /n/, /rn/ and /ny/ also occur, a number of facts overwhelmingly support the proposed grouping of /rr/ with the laterals. Among these are: (i) nasals, but not laterals or /rr/, may occur as the second member of a consonant cluster; (ii) homorganic nasal-stop clusters occur, but only one homorganic lateral-stop and no tap-stop clusters; and (iii) although the apical nasals, the apical and laminal laterals, and /rr/ are rare word initially, the laminal nasal /ny/ is not rare in this position. Furthermore, Walmajarri shows one piece of morphophonemic evidence supporting the proposed feature liquid: the initial /rl/ of the ergative and locative case suffixes is lost following a lateral or /rr/ (Hudson 1978:11).³

The neighbouring language, Jaru, which belongs to the same subgroup as Walmajarri, is quite similar phonotactically. As far as restrictions relating to structural position in words go, the only difference is that Jaru allows word final /r/ (Tsunoda 1981:37), though it must be extremely rare (see Tsunoda 1981:41).

Jaru shows virtually the same range of clusters with initial lateral or tap as does Walmajarri, but /r/ occurs initially in only one cluster, /r-j/, and finally in one, /t-r/. The non-peripheral nasals (and to a lesser extent stops) also occur in a similar range of clusters, but we can group /rr/ with the laterals for the same reasons as were adduced above for Gooniyandi.

Examination of McKelson (nd a) reveals a similar pattern in the closely related language Karajarri (Pama-Nyungan, La Grange region), which belongs to a different subgroup, the Marrngu subgroup. In terms of distribution of the laterals and tap vs. the glides the usual inverse pattern obtains: /rr/ and /ly/ may not begin a word, /l/ is rare, and /r/ occurs word finally only rarely, while /w/ and /y/ never end words. A fairly small number only of consonant clusters are permissible word medially, all of which have two members. There are lateral-stop and tap-stop (where the stop is peripheral or laminal) clusters, and lateral-nasal and tap-nasal clusters (for the bilabial nasal only), and the rare /rr-w/ cluster. No clusters begin with /r/, /w/ or /y/. Another member of the same subgroup, Mangala, seems to be very similar phonotactically, on an inspection of the words given in McKelson (nd b). The same restrictions apply at word initial and final position, and /rr/ behaves similarly to the laterals in clusters, always occurring first, and before peripheral or laminal stops, and peripheral nasals and glides. There is, however, an exceptional sequence /r-m/, which occurs once only in the data. In both languages, then, there is strong support for grouping /r/ with /w/ and /y/, and /rr/ with the laterals. (Although clusters with initial apical nasal followed by /p/, /j/, or /k/ do occur in both languages, there is a range of differences between the apical nasals and the laterals and /rr/ which resembles those found in Walmajarri, which argues for the feature [liquid].)

Moving further afield to the languages traditionally spoken in the Pilbara and Centre, we find that in a number of them /r/ is quite clearly grouped together with /w/ and /y/, but the grouping of /rr/ with the laterals to the exclusion of the non-peripheral nasals is perhaps less warranted: this grouping accounts for fewer generalisations.

Warlpiri (Pama-Nyungan family, Ngarrka subgroup), spoken to the south-east of Jaru and into Central Australia, has three *r*-like sounds: /r/, /rr/ and /rd/ (a retroflex flap). Nash (1980:66) groups /rr/ and /rd/ together as flaps, and /r/ with /w/ and /y/ as glides; he also groups together the flaps and laterals in a natural class by the universal features [+sonorant, -nasal]. The facts are as follows. No words in Warlpiri begin with /ly/ or /rr/, though some begin with /rd/. Nash (1980:71) rightly accounts for the occurrence of /rd/ and not /rr/ word initially as an instance of neutralisation between the apical and retroflex series in word initial position (compare the discussion regarding /r/ and /dd/ word initially in Gooniyandi). Warlpiri shows no word final consonants. Medial consonant clusters in Warlpiri include nasal-stop (where the two are

homorganic, or a non-peripheral followed by a peripheral, or an apical followed by a laminal), lateral-stop (where the stop is homorganic, or otherwise peripheral or laminal), *rr*-stop (where the stop is peripheral or laminal), *rr*-nasal (where the nasal is peripheral). The glides /r/, /w/ and /y/ do not normally occur in clusters, except that /w/ occurs rarely in /rr-w/ and /l-w/ (Nash 1980:72). Nash (1980:73) hypothesises that the absence of initial /rd/ in consonant clusters is an accidental gap. The above evidence all seems to point clearly to a grouping of /r/ with the semivowels. However, the occurring clusters do not convincingly support a grouping of the laterals with the tap, or any other subgrouping. In some respects the laterals behave more like the nasals (all homorganic nasal-stop and lateral-stop clusters are found, but /rr/ never precedes an apical stop), and in other respects it is the tap which behaves more like the nasals (non-peripheral nasals and /rr/ but no laterals may precede peripheral nasals). The fact that only stops and nasals may be the second member of clusters, and laterals and /rr/ must be the first member of a cluster, lends but minimal support to a grouping of /rr/ and the laterals. (No morphophonemic processes seem to shed further light on these matters.)

There is one phonotactic generalisation in Warlpiri that cannot be accounted for in these terms: in a CVC sequence both C's cannot be identically /rr/, /r/, or /rd/.⁴ However, the importance of this generalisation is open to question: not only does Nash (1980:76) note two possible exceptions, but also it does not hold as a valid generalisation across morpheme boundaries (1980:77).

In Warumungu (Pama-Nyungan, Warumungic group, spoken in the Tennant Creek region), words may end in /rr/, /l/, /rl/, /ly/, /n/, /rn/, and /ny/, but never in /r/, /w/ and /y/. And in consonant clusters, only members of the first group may occur initially, never members of the second group (Jane Simpson, p.c.). These observations clearly support grouping /r/ with /w/ and /y/; but there is inadequate evidence regarding possible subgroupings within the first group.

Goddard (1985:20) places /r/ with the semivowels /w/ and /y/ in Yankunytjatjara (a Centralian dialect of the Western Desert chain), arguing that in this language /r/ patterns phonotactically like these two, and unlike the tap /r/ these continuants (namely /r/, /w/ and /y/) may occur word initially, but not finally, or in consonant clusters. Goddard also points out that this grouping is plausible on phonetic-articulatory grounds. Although he places /r/ by itself as a tap (Goddard 1985:20), this segment shows striking phonotactic likeness with the non-peripheral nasals, and the laterals: these are the only permissible word final consonants, and all of them occur as the initial member of consonant clusters. These include: homorganic nasal-stop and lateral-stop clusters; clusters of non-peripheral nasals, laterals and /r/ preceding peripheral and laminal stops; and clusters of non-peripheral nasals and /rr/ (but no laterals) preceding peripheral

nasals. This range is virtually identical with the range of clusters in Warlpiri, and similar remarks regarding my proposed feature [liquid] apply.

The most north-westerly dialect of the Western Desert chain, Yulparija (presently spoken in La Grange), also shows similar phonotactics. /r/ and /ly/ do not occur initially, and /r/, like the semi-vowels, does not occur finally. Only intervocalic consonant clusters are permitted, and these are either homorganic nasal-stop, homorganic lateral-stop, or non-homorganic clusters in which a non-peripheral nasal, a lateral, or /r/ precedes a peripheral stop or nasal, or the laminal stop. (Unfortunately O'Grady, Voegelin & Voegelin 1966:150 do not list the occurring clusters, and it is not clear whether every cluster satisfying these conditions actually occurs.) As was argued for Warlpiri, this evidence suggests that /r/ should be grouped together with the semi-vowels, but does not support a grouping of the laterals with /rr/ to the exclusion of the non-peripheral nasals. Similar remarks seem to apply to Nyangumarta, a neighbouring Pama-Nyungan language, belonging to the Marrngu subgroup (to which Karajarri (see above) belongs). In this language /rr/ and /ly/ are not permitted word initially, and word finally /r/, /w/ and /y/ do not occur. There are homorganic lateral-stop and nasal-stop clusters; in non-homorganic consonant clusters, /rr/, the laterals, and the non-peripheral nasals may precede /p/, /j/, /k/, /m/, /ng/, and /w/ (see Hoard & O'Grady 1976).

In Jiarwarli (Southern Pilbara, Western Australia), according to Peter Austin (p.c.), word final consonants do not occur. Stems and roots ending in /l/, /r/, /ly/, and /rr/ take *-pa* to make them vowel final, while roots ending in nasals take *-ma*. Furthermore, this same segment, *-pa*, is inserted after laterals and /rr/ at morpheme boundaries to prevent certain inadmissible consonant clusters. For instance, it is inserted between a stem final lateral or /rr/ and the ergative suffix *-lu*, as illustrated by *ngathal* 'cousin' and *ngarlirr* 'barb', the ergative forms of which are, respectively, *ngathjal-pa-lu* and *ngalirr-pa-lu*.

5. HISTORICAL AND COMPARATIVE EVIDENCE

McConvell (1985:4) speaks of a lenition rule which takes the form of a conversion of /p/ and /k/ to /w/, and /j/ to /y/, usually intervocalically, in a number of languages of the East Kimberley, and neighbouring areas of the Northern Territory. These include the two Pama-Nyungan languages Jaru and Gurindji, and languages of the Bunuban, Jarrakan, and Jaminjungan families. Many of these languages also show an exactly parallel lenition of /rt/ to /r/.⁵ For example, corresponding to the Walmajarri subsection terms *jangkarti* and *nangkarti*, are the terms *jaangari* and *nangari* in Kija, and *jangari* and *nangari* in Jaru. Clearly the original form of these terms involved */rt/ in the final syllable (cf. this has changed to /rd/ in Warlpiri, by a regular process */rt/ > */rd/ — see

above).⁶ It seems that in Jaru this rule of lenition still applies, but not with complete regularity. /r/ and /rt/ alternate in some words: *karu* ~ *kartu* 'wife', *kariya* ~ *kartiya* 'white person', etc. (Tsunoda 1981:31).

Gooniyandi is another language in which the lenition rule applies (or once applied). If we compare Gooniyandi with its immediate southern neighbour Walmajarri, with which there is no demonstrated genetic relation, we can find a reasonable number of borrowings. Within these borrowings two correspondences stand out as relevant to our discussion: where Walmajarri has the retroflex stop, Gooniyandi usually has the apical continuant; and where Walmajarri has the apical flap, Gooniyandi often has the apico-alveolar stop. Some illustrative examples are:

Walmajarri	Gooniyandi	
/rt/	/r/	
<i>jangkarti</i>	<i>jawangari</i>	[subsection term]
<i>jilpirti</i>	<i>jilwiri</i>	'intestines'
<i>kartany</i>	<i>garanyi</i>	'hot cooking stones'
<i>ngartak</i>	<i>ngarag</i>	'make'
<i>kartu</i>	<i>garingi</i>	'wife'
<i>mirtal</i>	<i>mirali</i>	'hip'
/rr/	/d/	
<i>kamangkirr</i>	<i>gamanggidi</i>	[a type of spear]
<i>pilangkirr</i>	<i>bilanggidi</i>	'blanket'
<i>lamparr</i>	<i>lambadi</i>	'wife's father'

At first glance these correspondences might seem to lend support to Dixon's claim that /r/ and /rr/ differ only in terms of place, and not in manner of articulation: a rule might be written which changes an apical stop to the corresponding rhotic. However, closer examination reveals that this is not so. Observe that in the first correspondence the rhotic is in Gooniyandi and the stop is in Walmajarri, while in the second the rhotic is in Walmajarri, the stop in Gooniyandi. It can be demonstrated that in each case Gooniyandi has been the innovator. Firstly, the correspondence between /rt/ and /r/ is restricted to the intervocalic environment,⁷ where lenition of a stop — and certainly not fortition of a continuant — would be expected. And this rule of lenition parallels the rules of lenition of other stops. This correspondence tends to support a close connection between /r/ and the retroflex series. This is however at best an unmarked connection, and does not support [+retroflex] as a *distinctive* feature of /r/. Thus, I have found at least one example in which Walmajarri /t/ corresponds to Gooniyandi /r/ in *wangkiti* ~ *wanggiri* 'crow'. (Compare also the correspondence between Karajarri (a Pama-Nyungan language not too distantly

related to Walmajarri *watawu* and Gooniyandi *warawoo*, both of which are exclamations of surprise.)

Secondly, the correspondence /r/ vs. /d/ is restricted to the word final syllable. My hypothesis is that at some earlier stage in the development of modern Gooniyandi these words had final /dd/, which is still retained in Walmajarri. This later hardened to /d/ by a rule of fortition which applied to final taps only. Still later on, there was a prohibition on final consonants, and a harmonic high vowel was added to all consonant final words, /i/ if the preceding vowel was /i/ or /a/, /oo/ otherwise. Other comparative data can be adduced to support this hypothesis. Firstly, elsewhere within words /r/ in Walmajarri (and also in some other languages) corresponds to /l/ in Gooniyandi (see below).

Secondly, compare the following items shared with Kija, the north-eastern neighbour of Gooniyandi, which is again not definitely known to be genetically related to Gooniyandi (I am grateful to Patrick McConvell for this information):

Kija	Gooniyandi	
<i>tumurr</i>	<i>doomoodoo</i>	'chest'
<i>nyumpurr</i>	<i>nyoomboodo</i>	'nose, snout'
<i>pinkirr</i>	<i>bin.gidi</i>	'feather'

(Cf. Unggumi *ngarlgurru* 'three' and Gooniyandi *ngarloodoo* 'three'.)

On the other hand, a number of preverbs with final /r/ in Kija correspond to verbal roots with final /dd/ in Gooniyandi. However, these are not necessarily exceptions to the above generalisation; for, in Gooniyandi, the root final /dd/ would not be absolutely final: the root is always followed by what I refer to (McGregor 1984) as a classifier complex. Compare: in other positions, /r/ in shared words does not harden: e.g. *yamparra* (Kija) 'hair' corresponds with *yambadda* (Gooniyandi) 'hair'.

The hardening of a flap to a stop word finally is perhaps on the face of it more likely than lenition of a stop to a flap in that position. There is, however, solid evidence that the direction of change was from the flap to the stop. This comes from internal evidence, and from the only close genetic relative of Gooniyandi, Bunuba. Compare the nominative forms of the non-singular pronouns of Gooniyandi and Bunuba:⁸

	Gooniyandi	Bunuba
1R	<i>ngidi</i>	<i>ngiyirri</i>
1U	<i>yaadi</i>	<i>yarri</i>
2pl	<i>gidi</i>	<i>yinggirri</i>
3pl	<i>bidi</i>	<i>birri</i>

It is clear that the /r/ in the Bunuba non-singular pronouns reflects the /r/ found in non-singular pronouns throughout the non-Pama-Nyungan languages

of northern Australia (see e.g. Blake 1988). Comparative evidence suggests also that these pronominals were monosyllabic, with /r/ a plural-marking augment. If we look elsewhere in Gooniyandi we do find the original /dd/, unchanged by phonological processes. The oblique forms of the Gooniyandi pronominals, and the underlying forms of the nominative pronominal prefixes to the verb classifier, are shown below:

	Oblique free pronouns	Nominative forms of bound pronominal prefixes
1R	<i>ngiddangi</i>	<i>jidd-</i>
1U	<i>yaddangi</i>	<i>jadd-</i>
2pl	<i>giddangi</i>	<i>nggidd-</i>
3pl	<i>biddangi</i>	<i>bidd-</i>

The oblique forms show clear evidence of a former dative augment *-angi*; the root final /dd/ would not have been lost in this position. Similarly, the /dd/ in the bound pronominal prefixes remains unchanged when followed by a vowel (see also below).

We may conclude from this discussion that the changes that have gone on in Gooniyandi are not conveniently or economically accounted for in terms of the feature opposition [\pm rhotic]. We have seen that there was at some stage in the development of the modern language a process whereby intervocalic /rd/ (and possibly also /d/) changed to /r/. This is just one aspect of more general processes of lenition, in which intervocalic stops changed to the corresponding glides: */b/ > /w/; */j/ > /y/. Note, however, that */g/ did not, apparently, lenite to /w/ (although such a lenition is found at certain morpheme boundaries). And there was also at some stage a rule of fortition which strengthened final flaps to the apico-alveolar stop. That /dd/ did not strengthen to the retroflex stop is explicable in terms of the fact that /dd/ is not marked for retroflexion, not that it is negatively marked as [-retroflex]. /dd/ also strengthened to /d/ and /n/ at certain morpheme boundaries in the verb, when it preceded stops or nasals respectively.

Admittedly, the features [+liquid] and [tap] do not readily account for the historical change /dd/ to /d/ in Gooniyandi. I do not, however, see this change as motivating the grouping together of /dd/ and /d/ into a 'natural' class. This process seems to be phonetically natural, but not accounted for in the feature system. It is perhaps more explicable in terms of the alternative feature [instantaneous contact] than [tap].

In fact, this correspondence is by no means restricted to Gooniyandi. In the Worroric subgroup of the Worroran family, for instance, we have the same correspondence word finally, between Worrorra and Yawijibaya (I am grateful to Howard Coate for the Yawijibaya data):

Worrorra	Yawijibaya	
<i>garnanggurri</i>	<i>garnanggud</i>	'dog'
<i>yagaarri</i>	<i>yagaadi</i>	'another'
<i>debarr</i>	<i>debad</i>	'die'

(Note also that in Worrorra the final /rr/ of the plural pronominal prefixes to verbs or nominals hardens to /d/ when preceding a stop or nasal. For instance, from underlying *arr-banngalim* 'their-chest' derives the occurring form *adbanngalim* (Love 1934). (Unlike Gooniyandi (see above), Worrorra shows progressive denasalisation, rather than regressive nasalisation.)

A few other sporadic instances may be quoted. Word final /d/ of Nyulnyul sometimes corresponds to a /rr/ in the final syllable in other Nyulnyulan languages. For instance, Warrwa *kajurra* 'ashes' is clearly cognate with Nyulnyul *kajud* 'ashes'. And Eastern Warlpiri seems to have undergone a sound change whereby /rr/ and /l/ change to /d/ before /j/ (Nick Evans, p.c.). For instance, corresponding to Western Warlpiri *ngurrju* 'good' is Eastern Warlpiri *ngutju* 'good'.

Finally, I comment on a number of correspondences between the apical lateral /l/ and /rr/ (/dd/ in Gooniyandi). The following pairs from Gooniyandi and Ungarinyin are suggestive:

Gooniyandi	Ungarinyin	
<i>riddig</i>	<i>rulug</i>	'shift'
<i>thiddu</i>	<i>yali</i>	'kangaroo'
<i>thadda</i>	<i>dila</i>	'dog'
<i>thiddi</i>	<i>ajela</i>	'anger'
<i>widdgali</i>	<i>algud</i>	'green'

Unlike the correspondence between the tap and the apical stop, which is restricted to word final and syllable final position (when preceding stops and nasals), this correspondence occurs, we may hypothesise, word internally between vowels, and/or before certain consonants. Compare also Unggumi *lalgari* 'boab' with Gooniyandi *laddgardi* 'boab'; Walmajarri *yarndili* 'divining stone (used in inquests)' with Gooniyandi *jarndiddi* 'divining stone'; Walmajarri *mali* 'wife's mother', with Gooniyandi *maddiyali* 'wife's mother'; and Walmajarri *purruku* 'old man' with Gooniyandi *boolga* 'old man'.⁹

These correspondences may be accounted for in a natural way under the assumption that laterals and the tap belong to a natural class, defined by the feature [+liquid]. Note also the Ungarinyin metronym *-ali ~ -yali*, which may possibly correspond to the formative *-addi* in many male names in Gooniyandi and neighbouring Pama-Nyungan languages (e.g. Walmajarri and Warlpiri, where the shape *-yarri* also occurs); it is also found in the Miriwung name

Banggayarri (Banggaiyerri), made famous in the recent biography of this man (Shaw 1983).

Some sporadic examples of /rr/ vs. /l/ correspondences are also found in the Nyulnyulan languages of Dampier Land, and within the Pama-Nyungan family, for example:

	Bardi	Nyulnyul	Nyikina
'tongue'	<i>niyangarra</i>	<i>niyangarl</i>	
'climb up'	<i>lakal</i>	<i>lakal</i>	<i>lakarr</i>
	Gurindji	Walmajarri	
'north'	<i>kayirra</i>	<i>kayili</i>	

It is also interesting that the common Pama-Nyungan form for the third person dual pronominal is *pula* (usually, but not invariably a free form), while most non-Pama-Nyungan languages have some reflex of **bVrr* (where V is a high vowel) both as the third person non-singular free pronoun, and third person non-singular pronominal prefix. The phonological and semantic similarity is striking, and it may be that the forms are genetically related. This might be taken to be an isolated and accidental correspondence were it not for the fact that a similar correspondence can be set up in the first person non-singular between the pan-Pama-Nyungan inclusive dual *ngali* and *ngarr* (or something very like it), which recurs throughout the non-Pama-Nyungan area as a first person non-singular form. It seems reasonable to assume that **rr ~ *l* was a marker of a non-singular category, which either specialised to dual in the Pama-Nyungan languages, or generalised to all non-singulars in the non-Pama-Nyungan languages. This is not, however, the place to explore the implications of this suggestion.

6. CONCLUSION

In this paper I have suggested that, in a number of languages of the north-west of Australia, /r/ and /rr/ should not be grouped together as rhotics: /r/ patterns like the semi-vowels, and /rr/ more like the laterals. I most emphatically do not suggest that these apply to *all* Australian languages.¹⁰ I believe these to be areal features, which find their centres within the north-western region of Australia, although they are also found here and there in other parts of the continent. (Note however that data from many languages is either unavailable or inadequate, and the actual extent of these features is not known; nor is it clear whether the languages showing these features form (or ever formed) a contiguous geographical area across which they spread.)

The evidence which Dixon (1980) adduces seems to support the feature opposition [\pm rhotic] in eastern Australian languages. Dyrirbal phonotactics

(Dixon 1972:272-273) do not appear to strongly support a closer association of /r/ with /w/ and /y/, and of /rr/ with /l/. In Kayardild (Bentinck and Mornington Islands) /r/ and /rr/ also behave similarly phonotactically: they may be the first member of a consonant cluster, never the second member. They both pattern reasonably similarly with the lateral /l/, and quite unlike the semivowels. The evidence suggests that these three segments should be taken to be liquids, with rhotics a sub-system (cf. Evans 1985:513). This grouping is supported by the correspondence between initial /r/ in Kayardild and initial /l/ and /rl/ in the related language Yukulta.

However, in a number of eastern languages the feature [±rhotic] does not seem to be justifiable, and /r/ patterns more like the glides than like /rr/. One such language is Yir-Yiront (see Alpher 1988 for detailed discussion). Another is Yuwaalaraay (northern New South Wales), where *r > y between non-identical vowels, and *r > ø between identical vowels in disyllables. For example, Yuwaalaraay *maa* corresponds with Kamilaraay *mara* 'hand'; Yuwaalaraay *nguu*, with Kamilaraay *nguru* 'he'; and Yuwaalaraay *yiya* with Kamilaraay *yira* 'tooth' (see Austin, Williams & Wurm 1980). Even in Dyirbal things are not completely clearcut: there is *some* alternation between /rr/ (but not /r/) and /l/, and only /r/, /w/, and /y/, not /l/ and /rr/, may begin words. (And Schmidt 1985:195 notes that /rr/ is perceived as /d/ amongst Dyirbal non-speakers, a relatively common association in dying Australian languages.)

On the other hand, even within the north-west region not every language shows the identification of /r/ and the semivowels, and /rr/ with the laterals. In the Nyulnyulan language Nyikina (spoken in the south-west Kimberley), /rr/ and /ly/ are, as usual, prohibited word initially. There are a good number of clusters involving continuants, including a homorganic lateral-stop cluster, /ly-j/; /l/ followed by all stops and nasals bar apicals; /rl/ and /ly/ with some peripheral stops and nasals; a few examples of lateral-continuant clusters, namely /l-r/, /l-w/ and /rl-w/; /rr/ followed by peripheral stops, nasals, /j/ and /w/; /r/ followed by /b/, /m/, /w/, and /y/ followed by /b/, /m/, /k/ (see Stokes 1982). Nyikina also has some tri-consonantal clusters: /l/ and /rr/ followed by a homorganic peripheral nasal-stop cluster, and /ynd/ once in a personal name. Word finally the clusters /l-k/, /rr-b/, /rr-g/ and /r-b/ occur. The phonotactic evidence in Nyikina does *not* strongly suggest grouping /rr/ with the laterals, or /r/ with the semi-vowels.

Further afield, Wordick 1982:10 groups /r/ and /rr/ together with the glides /w/, /y/, and /yh/ in Yinjibarndi (Pilbara), but later distinguishes /r/ and /rr/ as rhotics (1982:13). The latter association appears to be justified for Yinjibarndi. On the whole /r/ and /rr/ behave similarly in consonant clusters, occurring as the first member, with the second member a peripheral stop; there is also a rule of rhotic dissimilation which has the effect of preventing a sequence of identical rhotics if there is only a short vowel between them (Wordick 1982:13-14).

There are also clusters in which /rr/ is followed by /w/ or /y/. On the whole, however, there seems little phonotactic reason to group the rhotics with the semivowels /w/ and /y/, or /rr/ with the laterals. In each case there is a single cluster only in which a glide or lateral behaves like the rhotic or /rr/ respectively.

A priori, there would seem to be no reason why the same set of oppositions should be appropriate to (or optimal for) the description of synchronic phonotactics, morphophonemics, allophony, and diachronic phonological changes; and it might seem too much to expect that a single system should adequately describe everything. And indeed, some of the smaller patterns found in some languages cannot be accounted for in any obvious way in terms of the general system of oppositions. I recall for instance the rule of rhotic dissimilation in Warlpiri, and the historical process of rhoticisation */rt/ > /rd/ (which did not however affect /t/). However, on the whole, it seems that the predominant patterns in each area are reasonably well accounted for in terms of a single system. In the areas of eastern Australia in which the feature opposition [±rhotic] is useful for the phonotactics, it also tends to explain some historical change; and where /r/ and /rr/ are not grouped phonotactically, there tend to be few if any historical or morphophonemic processes that require the feature [rhotic]. We have seen that in an area of north-west Australia /r/ groups with /w/ and /y/, while /rr/ groups with the laterals, in terms of phonotactic and morphophonemic patterns, and in terms of historical processes. And at least the former grouping has been found in eastern Australian languages.

I believe that there may be an explanation for the two different treatments of /r/ and /rr/. We have seen that /rr/ and /ly/ virtually never begin words in Australian languages, while the plain apical lateral is quite rare. But these segments are quite common word and syllable finally. By contrast, /r/ and the semivowels occur word initially not infrequently (although /r/ is significantly rarer in this position than the semivowels, this being no doubt attributable to the general rarity of apicals word initially), and are generally rare word and syllable finally (cf. Dixon 1980:175-177). Given these general tendencies, either of two things could happen: (1) /rr/ could be grouped with the phonemes (laterals, and perhaps non-peripheral nasals) which it most resembles in terms of phonotactic properties, and likewise for /r/ with the semi-vowels; or (2) the fact that /rr/ and /r/ are in complementary distribution word initially could take priority, and this could then be interpreted as an instance of apical neutralisation, which occurs for word initial stops and nasals in most Australian languages. The two phonemes would then be identical in manner. It seems that languages normally make one or the other of the groupings (1) and (2). However, it is conceivable that both might be made in a language, in which case a strong case might exist for establishing a higher order grouping of [continuant] to embrace laterals, glides, /rr/ and /r/. In

such a language it would appear to be necessary to characterise /r/ and /r/ as, respectively, [liquid, rhotic], and [glide, rhotic] (the characterisation of /r/ being redundant).

NOTES

- * I am grateful to Peter Austin, Barry Blake, Patrick McConvell, Alan Rumsey, Jane Simpson, and David Wilkins for their comments on an earlier version of this paper and/or additional information. I would also like to thank the editors, Nick Evans and Steve Johnson, for their helpful information and references, and for their editorial assistance. I alone, of course, am responsible for any errors of fact or interpretation. I am also grateful to the Australian Institute of Aboriginal Studies for partly financing my field trips to Fitzroy Crossing in 1980 and 1982, when most of the original information mentioned in this paper was gathered. My greatest debt is of course to my language teachers, including particularly Jack Bohemia, Dave Lamey, Carmel Charles, Buru Goonack and Daisy Utemarrah, who provided me with original information on their languages, and to Howard Coate, who over the past eight years has generously shared his linguistic data with me.
1. However, it is possible that this analysis of Jaminjung is mistaken (Patrick McConvell, p.c.).
 2. In this paper I employ the recommended standard practical orthographies for writing example words in each language, where such orthographies exist; otherwise I use the orthography of the source. There is one exception: for transcribing Gooniyandi words I use a modification of the practical orthography developed by Street & Chestnut 1984. This modified system is fully described in McGregor 1986; however, since it employs some unusual symbols they are tabulated below.

Consonants

	Bilabial	Apico-alveolar	Apico-domal	Lamino-dental	Lamino-palatal	Dorso-velar
Stops	b (p)	d (t)	rd (rt)	th	j	g (k)
Nasals	m	n	rn	nh	ny	ng
Laterals		l	rl		ly	
Tap		dd (rr)				
Glides	w		r		y	

	Vowels	
	Front	Back
High	i	oo (u)
Low		a, aa

In citing phonemes in general, and not in reference to particular languages, I use the Walmajarri system, augmented where necessary, as my standard. The letters used in this system are, with a few exceptions, as shown above for Gooniyandi. Where a different letter is used, it is given in brackets following the Gooniyandi letter.

3. This may not perhaps seem to be entirely convincing evidence for the grouping of the lateral and /r/: in Jaru the loss of the /r/ is apparently conditioned by a preceding lateral or rhotic (Tsunoda 1981:55). Presumably this means that /r/ is lost following /r/ — but no examples are given. Thus it could be suggested that the conditioning factor in Walmajarri is the same as in Jaru, the difference being due to the fact that /r/ does not occur word finally in Walmajarri. I do not find such a line of argument very convincing.
4. It could hardly be expected that every phonotactic generalisation should be accounted for in terms of a synchronic system of feature oppositions. Some are no doubt the residue of earlier periods in the history of the language, which are discernible once distribution in the modern language is taken into account (cf. Dixon 1980:182). For instance, at an earlier period, the feature opposition [\pm rhotic] may have obtained in Warlpiri.
5. McConvell notes this weakening of /rt/, but does not seem to regard it as an instance of the lenition rule (1985:5).
6. Note that Warlpiri does not show lenition of other stops to glides, or of /t/ to /rr/, so the change of /rt/ to /rd/ does not contradict the identification of /r/ with /w/ and /y/.
7. In fact, not all instances of intervocalic /rt/ in Walmajarri correspond to /r/ in Gooniyandi: for example, Walmajarri *kartiya* 'white person', *warta* 'star', *jurtu* 'dust', etc. correspond to *gardiya*, *warda* and *joordoo* respectively with the same meaning in Gooniyandi. Thus it seems that the process of lenition ceased to apply at a certain time in the history of Gooniyandi.
8. Gooniyandi and Bunuba show a unique system in the first person non-singular, making a RESTRICTED (which encompasses the traditional categories dual and plural exclusive as well as the dual inclusive) vs. UNRESTRICTED (which covers just the plural (greater than two) inclusive) distinction. These categories have been abbreviated 1R and 1U respectively.

2pl and 3pl of course signify second person plural and third person plural respectively.

9. Compare, on the other hand, the correspondence between *l* in Gooniyandi and *rr* in Warrwa, as exemplified in *ngalangala* 'bank' (Gooniyandi) vs. *ngarrangarra* 'bank' (Warrwa).
10. A number of commentators on a draft of this paper suggested that the scope of the paper should be extended to a general critique of [\pm rhotic] as a phonological feature in any Australian language. However, it seems to me, as I will elaborate below, that the feature is more justified in the case of some eastern Australian languages, and indeed, even for some languages of the Kimberley. To cite yet one further example, according to David Wilkins (p.c. and in preparation) the phonological feature [rhotic] does make a useful grouping — for phonetic and phonotactic reasons — in Mparntwe Arrernte. However, in this language [rhotic] is defined rather differently to Dixon 1980, and groups together all retroflexes and the tap/trill /r/. Furthermore, as I point out, the alternative feature analyses I propose do not, on present evidence, seem to be universal throughout the continent. It seems pointless to reject [\pm rhotic] and replace it with nothing.

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