PART II

Distributions in time and space
Who inherits what, when?
Toward a theory of contact, substrates, and superimposition zones*

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There has been much discussion on the kinds of linguistic traits that can be borrowed, and under what circumstances, and the relationship of different kinds of contact to areality. This article suggests that phonological aberrancies, in terms of the family to which a language belongs, in the core phonology are indicative of an older substrate, while morphosyntactic aberrancies indicate superimposition. A case study of Australian phonological systems is analyzed in terms of the typology presented, which when correlated with other nonlinguistic evidence reveals insights into human prehistory in that continent.

1. Areality and contact

The existence of geographically defined regions in which a linguistic variable is present (or absent) at frequencies different to those found outside the region, and which may cut across genealogical boundaries, has been widely recognized, under a variety of names, in the literature. While it is acknowledged that (almost?) any linguistic variable can be borrowed, and thus participate in an areality relationship with other languages, it is also clear that not all variables show an equal propensity for being shared and that different features appear to be more prone to sharing than others in different areas: what is an individual-identifying feature in one part of the world may well be an areally distributed variable elsewhere.

Thomason and Kaufman (1988) evoke a scale of borrowing (and borrowability) that describes the kinds of linguistic variables that are likely to be borrowed under different kinds of contact situations, summarized as Table 1.

* Thanks are first due to Johanna Nichols, who created the models and methodologies that have made this paper possible, and second, to insightful reviews of this paper by two referees who spotted many subtle, and many obvious, flaws with the presentation in an earlier draft.
Table 1. Thomason and Kaufman’s scales of borrowing

<table>
<thead>
<tr>
<th>Type of contact:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lexical traces</td>
<td>Casual</td>
<td>Slightly more intense</td>
<td>More intense</td>
<td>Strong cultural pressure</td>
<td>Very strong cultural pressure</td>
</tr>
<tr>
<td></td>
<td>non-basic content words</td>
<td>more content words, functors</td>
<td>adpositions, derivational morphology, pronouns, numerals</td>
<td>any</td>
<td>any</td>
</tr>
<tr>
<td>Structural traces</td>
<td>none</td>
<td>(phonemes), new functions</td>
<td>full phonemes, word order changes</td>
<td>phonemic contrasts, inflections, new cases</td>
<td>any</td>
</tr>
</tbody>
</table>

While the parameters described in Table 1 are intriguing, they suffer from the fact that the social scale is one-dimensional and, even more importantly, is under-explicated. More recently, Aikhenvald (2007:43ff.) examines the different kinds of linguistic outcomes that can be expected from different kinds of relationships that might pertain between the two (or more) languages involved in a contact situation. While valuable for raising the question of the predictability of language-contact outcomes, Aikhenvald’s work does not address the different kinds of linguistic effects that might be expected from different contact scenarios and simplifies the kinds of contact scenarios that might hold between two societies in contact (also see Enfield 2009 for discussion).

Table 2. Aikhenvald’s contrast between equal and dominant contact scenarios

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Balanced contact</th>
<th>Displacive contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationships between</td>
<td>roughly equal, or involving a traditional hierarchy; stable</td>
<td>dominance; unstable</td>
</tr>
<tr>
<td>languages</td>
<td>rise in complexity; gain of patterns</td>
<td>loss of patterns; potential simplification</td>
</tr>
<tr>
<td>Linguistic effects</td>
<td>language maintenance</td>
<td>potential replacement of one language with another</td>
</tr>
</tbody>
</table>

In this article, I address the question of the kind of structural features that can be expected to be borrowed in different kinds of contact scenarios and which contact scenarios are more likely to result in language shift. I illustrate the theoretical model proposed in Section 2 with a study of social histories and linguistic change in precolonial Australia in Sections 3–6, in which we can see the differences in contact effects between different languages based on relative population size and relative socioeconomic positions.
2. Kinds of contact events

I shall not discuss contact scenarios that could be described as approximately *even* or *balanced*, since I assume that these situations are governed by too many additional variables and complexities that determine the long-term stability or instability of the local linguistic ecology. As such, these scenarios, complex in their balance, are beyond modeling in the abstract terms adopted here. Additionally, I shall not address lexical change, or lexical borrowing, not for a lack of interest in the topic, but for reasons of space I shall discuss *unbalanced* (and unstable) contact scenarios in terms of three binary variables, described in (1)–(3). Any of these variables could, and most probably should, be broken down into a series of multivalued variables or else turned into a series of smaller-scale variables that together map out the continua. For the purposes of illustrating the different kinds of contact events, however, they can be treated as simple binary variables.

(1) Population Mobility

**intruder:**
a linguistically distinct population that moves into an area that was not (traditionally) part of its range

**local:**
a linguistically distinct population that has existed for the relevant historical period in its range

(2) Societal Hierarchy

**dominant:**
a society that, for political or economic reasons, controls the kind of social interaction and economic production that is modal in an area

**subordinate:**
a society with a traditional interaction style and economic pattern that is no longer modal in its area

(3) Population Size

**intruder populous:**
a relatively large number of people associated with the society, compared with other societies they come in contact with; large-scale human migration

**intruder minority:**
a society with a small population; economic or political agents without associated migration

The effects of these different variables interacting are shown in Table 3. The effects described for each intersection of sociopolitical and population variables are the most “typical” outcomes, and – given longer or shorter timeframes – either more extensive or more devastating scenarios can be imagined. Table 3 should then be taken as an
outline of likely outcomes, rather than a prescription of results; it is also obvious that
the different between a language with a phonology substrate and predictable morpho-
syntax and one with a morphosyntax overlay and unchanged phonology is a subtle
one at best and cannot be determined by examining individual languages. Rather, the
methodology must involve different populations of languages in particular study areas.

Table 3. Results of different superimposition scenarios on local inhabitants

<table>
<thead>
<tr>
<th>Sociopolitics</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intruder populous</td>
</tr>
<tr>
<td>Intruder dominant</td>
<td>1. intruder L largely unchanged</td>
</tr>
<tr>
<td></td>
<td>2. local languages lost</td>
</tr>
<tr>
<td>Intruder subordinate</td>
<td>5. intruder L acquires morphosyntax overlay from local L</td>
</tr>
<tr>
<td></td>
<td>6. local L acquires phonology substrate from intruder L</td>
</tr>
<tr>
<td></td>
<td>3. intruder L acquires phonology substrate from local L</td>
</tr>
<tr>
<td></td>
<td>4a. local languages lost or</td>
</tr>
<tr>
<td></td>
<td>4b. local L acquires morphosyntax overlay from intruder L</td>
</tr>
<tr>
<td></td>
<td>7a. intruder languages lost or</td>
</tr>
<tr>
<td></td>
<td>7b. intruder L acquires morphosyntax overlay from local L</td>
</tr>
<tr>
<td></td>
<td>8. local L largely unchanged</td>
</tr>
</tbody>
</table>

Table 4 offers examples of the four scenarios of language change described in
Table 3. There is no indication that any of these scenarios are rare, although we cannot,
in all cases, know explicit details of the social context of the contact event.

Wichmann and Holman (2009) point out that different linguistic variables show
different degrees of diffusability (or, conversely, stability) in different areas; the schema
above suggests that different kinds of interaction are associated with the different kinds
of borrowing events that we can detect; consequently, given knowledge of a social his-
tory, we can untangle the grammatical features of a language. Here, I have offered sug-
gestions as to how these different social histories might be (very broadly) categorized.

It is most likely no accident that we can detect large contiguous “blocks” of lan-
guages in which similar or identical patterns of word order are found or in which
certain phonological traits dominate. These “blocks” represent spread areas (Nichols
1992, 1997) for a particular feature. Note that I am using the term spread area in a
slightly different sense than that utilized by Nichols, in that the term refers here to
the spread of a feature, rather than necessarily of a linguistic ecology, as is implied by
Nichols’s use. By confining the use of the terms areas and areality to particular features,
the congruence of which might define a linguistic area, we can discuss different rates
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of spread for different kinds of features and construct separate histories for them. For instance, Map 1 shows the distribution of VO and OV order in main clauses (Dryer 2005). While we can clearly define zones in which one or the other order is dominant (e.g. northeast Eurasia for OV, and Southeast Asia for VO), without a theory of the relative diffusability or stability of this feature we cannot know whether or not to use it to define linguistic areas. What we can do is note that in spatially defined regions the order is dominant regardless of the linguistic affiliation of the languages in that region. Equally, there are parts of the world, such as in much of South America, in which languages with the different word orders are spatially mixed, and so we cannot define regions on the basis of this syntactic feature.

Just as we can define word-order “blocks” globally, so too can we find phonological “blocks,” based on one or another phonological feature. To give just one example, Map 2 shows the distribution of languages according to the size of their vowel-quality inventories. There are regions in which lower than average inventories are the norm – such as Australia, the Andes, and northern North America – and other regions in which larger than average inventories dominate, such as equatorial Africa and Southeast Asia. Again, there is not much mixing of these two values, although within these larger “blocks,” or on the borders between them, we can find relic areas in which presumably earlier patterns are preserved.

<table>
<thead>
<tr>
<th>Observable linguistic effect</th>
<th>Example(s)</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intruder largely unchanged</td>
<td>Indo-European in Europe</td>
<td>1</td>
</tr>
<tr>
<td>Intruder acquires morphosyntax overlay</td>
<td>Austronesians in Southeast New Guinea acquire SOV order Refugee populations everywhere</td>
<td>5, 7b</td>
</tr>
<tr>
<td>Intruder acquires phonology substrate from local L</td>
<td>Austronesian in mainland SEAsia Indo-European in India Initial Bantu expansion in Southern Africa</td>
<td>3</td>
</tr>
<tr>
<td>Intruder languages lost</td>
<td>Some colonial languages in postcolonial countries (e.g. Dutch in Indonesia)</td>
<td>7a</td>
</tr>
<tr>
<td>Local languages lost</td>
<td>(Largely) Irish, and many more</td>
<td>2, 4a</td>
</tr>
<tr>
<td>Locals acquires phonology substrate from intruder L</td>
<td>Basque in western Europe Dravidians in southern India</td>
<td>3, 6</td>
</tr>
<tr>
<td>Locals acquire morphosyntax overlay from intruder L</td>
<td>Khoi-San in South Africa (Relic populations everywhere?)</td>
<td>4b</td>
</tr>
<tr>
<td>Locals largely unchanged</td>
<td>Austro-Asiatic speakers in Southeast Asia</td>
<td>8</td>
</tr>
</tbody>
</table>
Perhaps most unsurprising is the fact that there is little, if any, correspondence between those areas with large (or small) vowel-quality inventories and the order of object and verb. This is not surprising but is, nonetheless, significant, since it indicates that whatever factors underlie the distribution, in most cases cross-cutting language family boundaries – of OV~VO order and of high or low numbers of contrastive vowel qualities – these factors are independent. In terms of the typology sketched at the beginning of this section, we would infer that there are multiple, separate substrata indicating distinct and different contact events in the histories of different areas.
In the next section, I examine the distribution of phonological traits in Australia, arguing that the phonological “aberrancy” of the northwest of that continent can best be explained by reference to an earlier substrate and a contact event of the “intruder dominant, but in minority” kind.

3. Pama-Nyungan languages

The great majority of the continent of Australia is home to Pama-Nyungan languages, a group of languages that most linguists believe was a relatively recent spread (e.g. Bowern & Koch 2004). The northwest and northcentral parts of the continent contain languages collectively known as “non-Pama-Nyungan”; while they might ultimately be found to be related to the Pama-Nyungan languages (e.g. Evans 2003, 2005), this would be at a very remote time depth.

Map 3. Pama-Nyungan and non-Pama-Nyungan languages in Australia

The Pama-Nyungan languages occupy approximately 90 percent of the area of Australia, south and east of the line delimiting the north and northwest of the continent. With respect to Maps 8–15, note that Cape York is just as Pama-Nyungan, and not known to be any “higher” or “lower” in the family tree, than any other part of the continent that contains the Pama-Nyungan family.
The Pama-Nyungan languages are characterized by their uniformity; over the more than 4,000 kilometers in distance from the far southwest to the far northeast of the continent, the morphological and syntactic typology of the languages is largely uniform and in sharp contrast to the picture presented by the diverse non-Pama-Nyungan languages. This point is illustrated with (4)–(9), all showing the encoding of a bivalent clause. In all of the (admittedly selected, but nonetheless representative) Pama-Nyungan languages, we find a dependent-marking typology, overt ergative case-marking, and only tense marked on the verb. In non-Pama-Nyungan languages from the central north of the country, we see that the verb encodes agreement for both arguments, which show no case marking. (Examples are presented in the orthographies used in the original sources or are adapted toward an ASCII-friendly general Australianist orthography.)

*Tjutju-ngku mayu patja-rna.*
dog-erg child bite-pst
'The dog bit the child.'

*Guliny-a djilba-dju walert.*
man-erg kill-3sg.pst possum
'A man killed a possum.'

(6) Pama-Nyungan: northeast, Dyirbal (Dixon 1972:390)
*Gayga banggul mangga-n.*
eye CLASS1:erg pick.up-nfut
'He picked up an eye.'

(7) Pama-Nyungan: northwest, Wangkajunga (Jones 2002:270)
*Parnaparnti-lu tuju mara paja-rnu.*
goanna-erg woman hand bite-pst
'The goanna bit the woman's hand.'

(8) Pama-Nyungan: center, Warlpiri (Hale 1992:64)
*Karnta-ngku ka yarla karla-mi.*
woman-erg aux yam dig-nonpast
'The/a woman is digging yams.'

(9) Non-Pama-Nyungan: Nunggubuyu (Heath 1984:549)
*Ngangu-jir-wanyja-' ngarra-waayin.*
1sg>3sg.fem-feather-uproot-pst fem-emu
'I removed feathers from the emu.' (~ 'I plucked the emu.')
Some of the frequently cited characteristics that are used to delineate, typologically, the Pama-Nyungan and non-Pama-Nyungan languages are evidenced in the clauses in (4)–(9), and are summarized in Table 5.

Table 5. Typical characteristics of different Australian languages

<table>
<thead>
<tr>
<th>Pama-Nyungan</th>
<th>Non-Pama-Nyungan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suffixing</td>
<td>prefixing</td>
</tr>
<tr>
<td>No grammatical gender</td>
<td>grammatical gender</td>
</tr>
<tr>
<td>± (Second position) clitics</td>
<td>± agreement prefixes</td>
</tr>
<tr>
<td>No /</td>
<td>have /</td>
</tr>
<tr>
<td>No manner contrasts in obstruents</td>
<td>no manner contrasts (or lenis-fortis, or fricative, contrasts)</td>
</tr>
<tr>
<td>Three vowels</td>
<td>three, or four to five vowels</td>
</tr>
</tbody>
</table>

In addition to this, we can easily define the Australian languages – Pama-Nyungan and non-Pama-Nyungan – as typologically distinct from most languages outside the continent. Table 6 lists a number of phonological characteristics that, while rare globally, are normal within Australia. Note that some of the traits that tend to distinguish some non-Pama-Nyungan languages from Pama-Nyungan languages are not present as high enough frequencies to affect the overall picture of Australian distinctness on a global scale.

Table 6. Typical characteristics of Australian languages

<table>
<thead>
<tr>
<th>Australian norm</th>
<th>Non-Australian norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two or more laterals</td>
<td>one lateral</td>
</tr>
<tr>
<td>Four or more liquids</td>
<td>two liquids</td>
</tr>
<tr>
<td>No contrastive fricatives</td>
<td>contrastive fricatives</td>
</tr>
<tr>
<td>Contrastive retroflex plosive series</td>
<td>no retroflex plosives</td>
</tr>
<tr>
<td>No manner contrast in plosives</td>
<td>manner contrast in plosives</td>
</tr>
<tr>
<td>Three vowels</td>
<td>five vowels (or more)</td>
</tr>
</tbody>
</table>

4. Australian phonological norms

Australian languages show phonological systems that are remarkably at variance with global norms. Around the world, it is modal for a language to contrast four places of articulation and three series of obstruents, typically a voiced and voiceless stop, and a fricative series. A typical system is shown in (10) (extrapolated from Maddieson 1984),
to which one of \( z \ y v d \) can be added depending on the language, with no strong preferences pertaining. Note that a nasal corresponding to each obstruent place is modal.

(10) p t \( \mathbf{\tilde{t}} \) k
    b d \( \mathbf{\tilde{g}} \)
    m n \( \mathbf{\tilde{n}} \) \( \mathbf{\tilde{\eta}} \)
    f s \( \mathbf{\tilde{h}} \)
    l
    r
    y w

A system like this, or minor variants on it, is attested almost nowhere in Australia, where, for a start, multiple series of obstruents, such as contrastive \( t \neq d \neq s \) in (10), are very rare. Examining just the different places of articulation used, we find that modally Australian languages utilize five places of articulation – most typically \( p \ t \ \mathbf{\tilde{t}} \ c \) and \( k \) – although having a lamino-dental stop, rather than a retroflex stop, is also very common.¹ A consonant system such as that in (11) is common, being attested in languages such as Djaru, Ngarla, Wangkajunga, and many other languages of the center (and especially the west, as we shall see) of Australia.

(11) p t \( \mathbf{\tilde{t}} \) c k
    m n \( \mathbf{\tilde{n}} \) \( \mathbf{\tilde{\eta}} \) \( \mathbf{\tilde{\eta}} \)
    l
    r \( \mathbf{\tilde{r}} \)
    y w

Note that, in addition to having a nasal corresponding to each place of articulation used for the oral stops, there is a lateral corresponding to each non-peripheral place (that is, the coronally and laminally articulated places, not including bilabial or velar places). The presence of a nasal for each oral place of articulation is not that unusual, being attested in most languages of Southeast Asia and absent in large proportions only in New Guinea and areas east, where the velar nasal is typically absent, as shown in Map 4.² The presence of laterals corresponding to each non-peripheral place of

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1. Here and elsewhere, statements about modal distributions and proportions of languages are based on the POPS database (Donohue forthcoming).
2. Of 1,801 languages in the POPS database, 961 (53%) have as many nasal places as oral places, and 75 percent have a velar nasal. The distribution of languages that both have a 1:1 (or higher) ratio of nasal to oral places and lack a velar nasal is highly skewed: 24 languages have the 1:1 ratio without having a velar nasal, compared with 422 languages that lack a velar nasal and have less than a 1:1 nasal:oral-stop place ratio. This merely confirms that the velar nasal is less common than the bilabial or coronal one (although more common than the palatal nasal), a finding somewhat at odds with the contention that a velar nasal can be considered to be unmarked in terms of place features (e.g. Bakovic 2000).
articulation is not usual outside Australia. We shall refer to a “full” lateral inventory such as that seen in (11) as showing a saturated lateral inventory (12). The distribution of these languages in Australia is shown in Map 5. (See Appendix I for the number of contrastive lateral phonemes in Australian phonologies, compared with other regions in the world.)

(12) Lateral Saturation
Lateral saturation is the ratio of the number of places used to contrast lateral phonemes divided by the number of non-peripheral places used to contrast obstruent phonemes.

Map 4. The distribution of languages with the same number of nasal places as oral-stop places

Map 5.
Another frequently cited hallmark of Australian phonologies (Dixon 1980, 2002; Evans 1995) is the lack of contrastive manners in the obstruents. Frequently a single series of phonemic obstruents is used, and the VOT contrasts, or fricative contrasts, that typify the languages of the world (seen earlier in (1)), are found in only 35 percent of the languages of Australia, and those overwhelmingly in a sharply delimited northern area. This is in sharp contrast to global norms; Maddieson (2005b, 2005c) shows that only 7 percent of the languages of the world lack both voicing contrasts and fricatives (not counting [h] as a fricative) and that this 7 percent shows a strong areal skewing toward Australia and is otherwise just scattered across Melanesia, Polynesia, and South America, as shown in Map 6; the Australian distribution is shown in Map 7.

Another major variant of a five-place system is found in Australia. Languages of this type have either a retroflex series or a palatal series but not both. There are two subtypes: in the first, there is no retroflex contrast, but there is a laminal contrast. This is shown in (13). This system is found in languages such as Biri or Ngiyambaa, toward the east coast. Note that, in contrast to the saturated lateral inventory of the system seen in (11), there is only one lateral. In terms of the metric in (12), the system in (11) has a value of 1.0, while that in (13) scores 0.33, since there is only one lateral place utilized in a system with three non-peripheral places of articulation.

\[
\begin{align*}
(13) \quad p & \quad t & \quad c & \quad k \\
\quad m & \quad n & \quad n & \quad n \\
\quad l & \\
\quad r & \quad \bar{t} \\
\quad y & \quad w
\end{align*}
\]

Map 6. The global distribution of languages with neither voicing nor fricative contrasts. The 41 languages shown in black in Map 6 are the languages from Maddieson (2005b, 2005c) that lack obstruent contrasts. They can be divided into four groups: (1) Australian, (2) Melanesian, (3) Far Oceania, and (4) South America (Amazon fringe)
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Map 7. The Australian distribution (in black) of languages with neither voicing nor fricative contrasts

The other common variant of a five-place system is shown in (14). This is similar to (13) but involves a lamino-dental series rather than a (lamino-)palatal series. Here, unlike the system in (13), there are a large number of contrastive laterals and a lateral saturation ratio of 1.0. This rare system is found in languages such as Gudaga, Pitjantjatjara, or Walmatjarri.

(14) p ̃ t t ʈ k
m ɳ n ɲ ŋ
l ɭ
r ɽ
y w

Languages with six contrastive places of articulation typically have saturated lateral inventories, as shown in (15), though a not insignificant number of languages that lack a lamino-dental lateral, and several languages with six contrastive places contrast only two laterals, most typically an alveolar lateral and a retroflex lateral.

(15) p ̃ t t ʈ ɕ k
m ɳ n ɲ ɳ ɲ ɳ
l l ŋ
r ɽ
y w

It is clear that retroflex is the privileged contrast in terms of predicting the number of laterals in a system and is also the privileged place in terms of being preserved when a languages uses fewer contrasts than is possible for its laterals.

The languages exemplified in (13) would, if they followed the pan-Australian pattern of lateral saturation shown in (12), be expected to have a laminal lateral as well,
contrasting with the apico-alveolar l. This gap is unexplained; examining the spatial distribution of the relevant languages, however, leads us toward a hypothesis. Developing this hypothesis further by examining nonlinguistic data suggests a nuanced history of linguistic and cultural interaction in northeastern Australia.

5. (North)(east)ern Australia

There is good evidence of substratal effects in some of the “fringe” Pama-Nyungan languages, particularly in the northeastern region of Cape York. The “aberrant” nature of these Pama-Nyungan languages is highly skewed: the morphological categories and syntactic typology of the languages conform to pan-Australian Pama-Nyungan norms, but the phonologies are highly irregular (see articles in Sutton 1976 for examples and discussion). Maps 8–15 show the distribution in Australia of these phonological traits, which are common among the languages of Cape York but are atypical for the languages of most of Australia.

It is clear that there is a peripheral locus to the appearance of these traits, showing concentrations in the north and in the east (of course, some traits have more restricted or more widespread distributions). I focus on the appearance of lateral consonants, which show unusual distributions in Cape York and all down the east coast of Australia.

Australian languages utilize more places to contrast lateral consonants than is normal around the world. While the average number of places of articulation used contrastively for laterals in a language globally is 1, in Australia the average is 2.4, with nearly half the languages of the continent employing three or more lateral places and some having double this number of laterals, counting flapped phonemes (Evans 2000). The proportion of lateral places utilized in different regions is shown in Figure 1, based on a 1340-language sample.

Columns indicate the proportion of languages with different numbers of contrastive places for laterals in different regions. White indicates no or one lateral, gray shows two contrastive places, and black indicates three or more contrastive places for laterals.

Although the continent as a whole shows a large number of laterals, the distribution of laterals is very uneven (e.g. Map 8) and does not match the system symmetry that characterizes Australian phonologies, in terms of maximizing the use of a particular manner of articulation across different contrastive places. Almost all Australian languages have a symmetrical relationship between oral and nasal stops, in that there is typically a nasal stop for each place of articulation in which an oral stop is attested. Dixon (2002: 589) draws a parallel with this pattern for laterals, observing that “[a]ll languages have an apico-alveolar lateral; some languages with two apical series of stops and nasals extend this to laterals, and some languages also have one or
Maps 8–15. The distribution of Cape York phonological features
two laminal laterals. It seems that in many ways lateral apicals and laminals behave like the corresponding stops and nasals” (emphasis mine). This statement is true but requires areal qualification: Dixon earlier notes (2002: 549) that

almost all languages in the eastern third of the continent have just one lateral. … Those in the remainder of Australian generally have a lateral in each non-peripheral series, although there are a number of gaps. … There are just two languages outside the eastern strip for which a single lateral is reported – … Wagiman, and the adjoining…Ngan-gi-tjemerrri.

To the two languages that Dixon mentions, we could add Wanyi, Kayardild, Waray, Ngangityemerri, and a number of other languages from the Daly River area, such as Marrithiyel and Emmi (see Map 8). Furthermore, also from the Daly River area, we have the example of Maranungku, with no lateral phonemes but two contrastive rhotics, [l] and [r]. This is similar to the situation reported for Warrgamay on the east coast, in which [r] contrasts with a phoneme that varies between [l] and [I] but which is not a dedicated lateral phoneme (Dixon 1981). The distribution of single-lateral languages in Australia is shown in Map 8. From Map 9, we can see that there is a strong correlation with the absence of retroflex contrasts in the same languages.

Importantly, Dixon highlights the fact that the east coast is different in terms of phonological organization from the rest of the continent. This is the point that I address here: the unusualness of the east coast of Australia with respect to Australian phonological norms and a possible scenario of language shift, and the retention of a substrate that is, with respect to the phonology of laterals in Australia, atypical.

We have seen that the distribution of languages lacking lateral saturation is strongly skewed to the east coast and that this distribution corresponds to the distribution of
a number of other phonological traits, traits that have been ascribed to the “aberrant”
languages of Cape York.

According to the typology sketched in Section 2, a phonology substrate should
be attributable to a contact event with either a populous local population influencing
a dominant intruder language or a local language with a small population acquiring
features of a numerically superior intruder language. From the overwhelming corre-
spondences in lexical items, cognate morphemes, and morphosyntactic regularity, we
know that the languages of Cape York, and indeed the entire east coast of Australia,
are Pama-Nyungan languages with an origin further west, near the border with non-
Pama-Nyungan languages (e.g. articles in Evans 2003, Bowern & Koch 2004). We must
therefore conclude that the phonological aberrancies are not due to their transport to
the area by the Pama-Nyungan–speaking peoples but rather represent a relic of a prior,
non-Pama-Nyungan population.

6. A pre-Pama-Nyungan history for Cape York

What can we say about this putative prior population? Linguistically, it is character-
ized by the presence of a consonant system resembling in at least some respects that
seen in (16) and probably five or six vowels. This represents a system quite atypical for
Australia but not unexpected for New Guinea (Pawley 2005:82).

(16) p t tʃ k ʔ
mb nd ndʒ ng
m n n ɲ
f/v s ɬ
r
y w

Importantly, we must search for any additional strands of evidence that suggest a pre-
Pama-Nyungan culture in Cape York. The evidence is intriguing: numerous genetic
studies indicate that central Australia and New Guinea are quite distinct but that the
northeastern reaches of Australia, including Cape York, show more affinities with
populations in New Guinea (e.g. Gruhn 1980; Birdsell 1993:43, 440; Adcock et al.
2001; Kayser et al. 2001; Hudjashov et al. 2007). This is suggestive of a cultural (and
linguistic) overlay from the more central parts in Australia dominating the Cape
York area some time in the past but not replacing the pre-Pama-Nyungan popu-
lation. Another piece of evidence that leads to the conclusion is compelling: Cape
York is also that part of Australia with the greatest concentration of food plants that,
immediately to the north in New Guinea, are cultivars. The presence of these plants
extends across the north (yams and taros) and down the east coast (yams and, to a lesser extent, bananas) and correlates very closely with the distribution of the features described in Maps 8–15.

Denham et al. (2009) note the distribution of the plant species and challenge the assumption that Australia has always been a continent of hunter-gatherers (after Jones & Meehan 1989). Invoking the cultural model for the spread of Pama-Nyungan proposed by Evans and Jones (1997), Cape York is set out as a possible “province” of earlier “horticultural experimentation.” Following Evans and Jones, the earlier experimentation with cultivars was lost to a cultural revolution that spread, along with the Pama-Nyungang languages and a revolution in food production, across the face of most of Australia.

The data presented in this paper suggests that, in addition to human genetic and horticultural evidence, we can also identify overt cultural evidence, in the form of a linguistic substrate, that indicates the presence of an earlier society in (parts of) Australia that did not exclusively rely on a hunter-gatherer economy.

7. Conclusions

The kind of substrata that we can detect gives us insight into the past contact event that led to the development of that substrate. This is hardly surprising; the fact that we have detected a substrate in the first place means that we have detected a prior contact event and that we have clear notions about what modal values are found in the language family outside the contact/superimposition zone. When we isolate aberrant features in the phonology, we can reach different conclusions about the nature of the earlier contact event than if we were to detect aberrant features in the morphology.

Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFUT</td>
<td>non-future</td>
</tr>
<tr>
<td>NONPAST</td>
<td>non-past</td>
</tr>
</tbody>
</table>

References


Donohue, Mark. Forthcoming. Patterns of Pacific sounds.


**Appendix 1.** Number of contrastive lateral phonemes in Australian phonologies, compared with other regions in the world

<table>
<thead>
<tr>
<th>Number of laterals</th>
<th>New Guinea</th>
<th>Pacific SE Asia</th>
<th>East Asia</th>
<th>Island SE Asia</th>
<th>Mainland SE Asia</th>
<th>South Asia</th>
<th>Formosa</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>39%</td>
<td>18%</td>
<td>11%</td>
<td>4%</td>
<td>(n=1)</td>
<td>3%</td>
<td>(n=1)</td>
<td>1%</td>
</tr>
<tr>
<td>0.5</td>
<td>8%</td>
<td></td>
<td></td>
<td>(n=1)</td>
<td>(n=1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>49%</td>
<td>77%</td>
<td>72%</td>
<td>93%</td>
<td>82%</td>
<td>57%</td>
<td>59%</td>
<td>34%</td>
</tr>
<tr>
<td>1.5</td>
<td>1%</td>
<td></td>
<td></td>
<td>(n=1)</td>
<td>(n=1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2%</td>
<td>5%</td>
<td>14%</td>
<td>2%</td>
<td>16%</td>
<td>36%</td>
<td>29%</td>
<td>17%</td>
</tr>
<tr>
<td>2.5</td>
<td></td>
<td></td>
<td></td>
<td>(n=1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>(n=2)</td>
<td>(n=1)</td>
<td>2%</td>
<td>(n=1)</td>
<td>2%</td>
<td>4%</td>
<td></td>
<td>30%</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16%</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1%</td>
</tr>
<tr>
<td>Average:</td>
<td>0.62</td>
<td>0.85</td>
<td>0.92</td>
<td>1.01</td>
<td>1.14</td>
<td>1.25</td>
<td>1.31</td>
<td>2.31</td>
</tr>
<tr>
<td>Sample:</td>
<td>624</td>
<td>276</td>
<td>105</td>
<td>352</td>
<td>130</td>
<td>116</td>
<td>17</td>
<td>279</td>
</tr>
</tbody>
</table>

“Number of laterals” is the number of contrastive lateral phonemes. A 0.5 value indicates a liquid phoneme that has an unconditioned lateral allophone; thus a value of 1.5 indicates that there is one dedicated lateral phoneme and another liquid with variation between rhotic and lateral realization. When only a small number of languages attest a particular pattern, the number itself is shown (thus, “n=1” indicates that only one language has that pattern). The number at the bottom indicates the number of languages in the sample for each area.