12 Dental discrepancies and the sound of Proto Austronesian

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1 Dental and alveolar places
Languages almost universally include oral plosives in their inventory of consonants, and of the oral consonants labial, coronal, and dorsal places of articulation can be reckoned to be the most ‘basic’, in terms of consistently appearing in use in different languages, and showing more contrasts than other places that are used. Coronal, in particular, covers a wide range of articulatory ground, and contrasts of place within the larger description of ‘coronal’ are not uncommon. Although such a contrast is rare in the languages of Europe, it is far from unheard of. The plosives of Hula, an Oceanic language of southeast New Guinea, are shown in (1), and here it is clear that dental stops contrast with alveolar ones.

(1) Hula: p t t k q

Other languages utilise just the dental place, or more commonly just the alveolar place; the examples in (2) and (3) show the plosives of Eivo (Rapoisi) and Momu (Fas), two non-Austronesian languages of Papua New Guinea (from Bougainville and North-Central New Guinea, respectively).2

(2) Eivo: p t k q

(3) Momu: p t k q

A small number of languages, such as Hawaiian (with just p k and q), have no coronal stops; these cases will not be further considered here. When a language involves more than one contrastive manner of articulation with each stop series, the same three

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1 I take great delight in offering this small piece of research as a footnote to some of the work that Malcolm Ross has undertaken over the years. In addition to being an inspiration for careful, accurate and topical research, Malcolm’s temperament in other areas of his life, his graciousness in dealing with all that comes his way, and his generosity of spirit in all ways that I have seen, represent a goal that I would like to aspire towards, but realise that I am unlikely to achieve. Much of my own work owes not only its direction, but also much of its intelligibility, to Malcolm’s patient tutoring. Much of the clarity of the work here presented is due to the insightful comments of two anonymous reviewers, and the rest follows from the editor’s attention to detail. I also wish to thank David Gil for valuable discussion of the data.

2 Regrettably a great many grammars and phonological descriptions do not specify these phonetic details. In the discussion that follows I can only follow the description given by the sources I have consulted, and so probably under-represent the number of languages showing discrepancies of the sort investigated here. Equally, however, there is no reason to believe that under-representation is any more or less prevalent in any particular family, such as Austronesian, or any particular area, such as Island Southeast Asia, and so the use of statistical evaluation of different populations can be justified.
basic possibilities are found: contrastive in both dental and alveolar places, contrastive only for the dental place, or contrastive only for the alveolar place. In (4) - (6) we can see the plosive systems of Kala Kawaw Ya (Pama-Nyungan; Australia), Bilbil and Gumawana (both Austronesian, Papua New Guinea)

(4) Kala Kawaw Ya
\[
\begin{array}{ccc}
p & t & \text{k} \\
b & \text{d} & \text{g} \\
\end{array}
\]

(5) Bilbil
\[
\begin{array}{ccc}
p & t & \text{k} \\
b & \text{d} & \text{g} \\
\end{array}
\]

(6) Gumawana
\[
\begin{array}{ccc}
p & t & \text{k} \\
b & \text{d} & \text{g} \\
\end{array}
\]

Yet another possibility is found, in which both dental and alveolar places are used, but not contrastively. Bauzi (Geelvink Bay; western New Guinea) exemplifies this pattern (note that Bauzi also displays a gap for /p/, a trait not uncommon in languages of northern New Guinea).

(7) Bauzi
\[
\begin{array}{ccc}
p & \text{t}^h & \text{k}^h \\
b & \text{d} & \text{g} \\
\end{array}
\]

This last is a very rare (or, possibly, under-reported) pattern globally; Maddieson (1984) lists only 3 languages, 1% of his worldwide survey show this pattern – one of these is Austronesian, Sundanese (Malayo-Polynesian; Java), the others being Gâ from Ghana and Guahibo from Colombia. Nonetheless, this pattern is prominent in Austronesian languages, appearing in fully 3% of the Austronesian languages sampled. We can speculate on some phonetic motivations for the contrast: voiceless stops typically have a longer closure than do voiced ones, and the supralaryngeal air pressure will more easily be accommodated with a more anterior closure, thus motivating a more front point of articulation for the voiceless coronal than for the voiced one. This argument does not, however, account for the lack of reports of more palatal articulation for voiceless dorsal, compared to their voiced counterparts, and we must conclude that a purely phonetic explanation will not account for the observed frequencies. Similarly we can speculate on a possible enhanced contrast for the coronal pair, involving a non-optimal set of feature specifications (contra Clements 2003); such feature+manner bundles are not uncommon (eg., Ladefoged and Maddieson 1996, §3 of this paper), but we still have no account for the absence of, for instance, \(pb\ \text{t} \, d \, k^l \, g\) systems, in which the dorsal stops are similarly phonetically differentiated. To what extent is the appearance of this pattern inherited, or acquired by other means?

The discrepancy, at its most constrained, can be defined as follows:

(8) A dental discrepancy can be described in a consonant system if:

- there is a contrast in terms of manner (VOT, prenasalisation, laryngeal contrast) between stops in at least some places
- for coronals there is a discrepancy between contrastive stops in terms of place (within the coronal space)

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3 Axelson and Oliver list the coronal plosives for Bilbil/Bilibil as \(t\) and \(d\) but describe them as ‘LabDent’ and ‘Dent’. Malcolm Ross (pers. comm. 28 October 2008), who has collected data from the Bilbil language, does not report labio-dental stops.
We have already seen this system in Bauzi. Another plosive system that satisfies these conditions can be seen in Gã, a Niger-Congo (Kwa) language of Ghana. The plosive system of the language is shown in (9). There is a contrast, between voiceless and voiced, in all places (in most cases the voiceless series is aspirated). For the two coronal stops the contrast is not just one of VOT (here voiceless aspirated vs. voiced), but also one of place, with the voiceless stop described as dental, while the voiced one is alveolar.

(9) Gã  
\[
\begin{array}{ccccccc}
\text{p}^h & \text{t}^h & \text{tʃ}^h & \text{k}^h & \text{kp} \\
\text{b} & \text{d} & \text{dʒ} & \text{g} & \text{gb}
\end{array}
\]

I would like to introduce a further qualification in describing dental discrepancies, concerning the ‘direction’ of the imbalance. In (7) and (9) we have seen plosive systems in which the dental stop is voiceless, while the voiced counterpart is alveolar. In (10) we can see that in Waffa, from eastern New Guinea, it is the voiceless stop that is alveolar, while its (prenasalised) voiced counterpart is dental.

(10) Waffa  
\[
\begin{array}{cccc}
\text{p} & \text{t} & \text{k} & \text{ʔ} \\
\text{b} & \text{n̩} & \text{g}
\end{array}
\]

Systems of the kind exemplified by Waffa are less frequent (and, as we shall see, more geographically constrained) than the more typical system with a dental discrepancy. This is described in (11).

(11) The prototypical dental discrepancy involves two coronal stops such that the stop with the greater VOT is articulated more to the front than is the other coronal stop; non-prototypical systems are found when the stop with the greater VOT has the more anterior articulation.

I shall refer to systems such as that seen in Waffa as representing a ‘reversed dental discrepancy’, since the position of the two contrastive stops is reversed from the more common type of dental discrepancy.

Some work suggests that the place contrast is in fact primary; in Malay, for instance, there is neutralisation for the feature [voice] in final position, with the consequence that /t1/ and /d/ are distinguished only by place. Thus the pair of stops (in analogous environments) found in the final coda of /wujud/ ‘face’ and /rmbut/ ‘hair’ contrast in terms of the place of their final segment: [wudʒʊt] vs. [rmbʊt] (eg., Abu Bakar et al 2007). Blust (1999:325-326) similarly describes in careful detail the preservation of place contrasts between /t/ and /d/ when word-final devoicing occurs. The rest of this exploration addresses the question of the distribution of languages that have been reported to have a dental discrepancy, addressing the question of the evidence for reconstructing this discrepancy to Proto Austronesian.

2. Dental and alveolar places in Austronesian

Ross (1992:31) follows Haudricourt (1965:321) in reconstructing the plosive system of Proto Austronesian as shown in (8), with the sort of dental-alveolar mix for simple the coronal series that we have just examined.
There are degrees of controversy associated with some of the phonetic values of these reconstructions, but none with most of them. In this comment I shall focus on the attribution of the voiceless coronal stop to a dental place while the other coronal obstruents are thought to have been alveolar, examining the grounds for reconstructing this contrast this far back in Austronesian linguistic history. I shall call this type of disparity between the voiced and voiceless members of a coronal opposition a ‘dental discrepancy’.4 Ross (1992:44) is quite explicit about the dental-alveolar discrepancy in Proto Austronesian:

\[
\begin{array}{cccccccc}
\text{PAn} & *t & *d & *k & *q & *ʔ \\
\text{b} & \text{d} & \text{j} & \text{g} \\
\text{ts} & \text{dz}
\end{array}
\]

Haudricourt reconstructed the difference in places of the coronal stops in part to explain the contrast between dental and retroflex stops in Javanese (now thought to owe at least some of its provenance to Indic influence), and to offer an account for the fact that PMP *t and *d did not merge in Proto Oceanic, while the labial and velar stops did.5 Presaging some of the conclusions to be presented in §5 onwards, we should note that both Javanese and (probably) Proto Oceanic are southern Austronesian languages.

3. Kinds of coronal mixes

Although we are concentrating here on languages involving a dental-alveolar mix for the ‘same’ series, it is possible for stops in the coronal space to show mixed places for a ‘pair’ of contrasting plosives in other ways. Table 1 presents examples of other mixes involving non-contrastive variation in the specification of the place of articulation for what is phonologically a single series of coronal stops. In all cases the paradigm of contrasts for the coronal place is split between two areas of articulation, most commonly involving the dental and alveolar places, but sometimes with one of the places being described as retroflex. We can see here that, while simple VOT contrasts are the most frequent contributor towards distinguishing the stops, prenasalisation, preglottalisation, implosion or creakiness are also possibilities. We can also see that in some cases a language distinguishes more than two coronal stops; note particularly the case of Muna, with four alveolar stops and one dental stop.

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4 It is, of course, quite possible for a discrepancy to appear with other stop series. In Yawa (West Papuan; western New Guinea), for instance the plosives are \(p t k b d dʒ\), where \(dʒ\) substitutes for the expected \(g\) (Jones 1986). Discrepancies such as these, not involving dental/alveolar mixes, are not considered here.

5 We note, however, that a dental discrepancy as described here is not reported with any significant frequency for Austronesian languages of the Oceanic subgroup, and is confined to two subgroups of Oceanic, suggesting that any place difference among the coronal stops was widely lost very soon after the breakup of Proto Oceanic.
Table 1: Kinds of coronal mixes

<table>
<thead>
<tr>
<th>Kind of mix</th>
<th>Example language</th>
</tr>
</thead>
<tbody>
<tr>
<td>dental-alveolar</td>
<td>t d</td>
</tr>
<tr>
<td>(‘dental discrepancy’)</td>
<td>tʰ d</td>
</tr>
<tr>
<td></td>
<td>Sundanese</td>
</tr>
<tr>
<td></td>
<td>Gā</td>
</tr>
<tr>
<td></td>
<td>Thao</td>
</tr>
<tr>
<td></td>
<td>Selayar</td>
</tr>
<tr>
<td></td>
<td>Kyaka Enga</td>
</tr>
<tr>
<td></td>
<td>Huli</td>
</tr>
<tr>
<td></td>
<td>Palu’e</td>
</tr>
<tr>
<td></td>
<td>Tama</td>
</tr>
<tr>
<td></td>
<td>Guahibo</td>
</tr>
<tr>
<td>(‘reversed dental discrepancy’)</td>
<td>d t</td>
</tr>
<tr>
<td></td>
<td>ñd t</td>
</tr>
<tr>
<td></td>
<td>Galela</td>
</tr>
<tr>
<td></td>
<td>Upper Asaro</td>
</tr>
<tr>
<td></td>
<td>Muna</td>
</tr>
<tr>
<td></td>
<td>Tinrin</td>
</tr>
<tr>
<td>dental-retroflex</td>
<td>t d</td>
</tr>
<tr>
<td></td>
<td>Yami, Gorum</td>
</tr>
<tr>
<td></td>
<td>Siona</td>
</tr>
<tr>
<td></td>
<td>Somali</td>
</tr>
<tr>
<td>alveolar-retroflex</td>
<td>t d</td>
</tr>
<tr>
<td></td>
<td>Lelemi</td>
</tr>
<tr>
<td></td>
<td>Awngi</td>
</tr>
</tbody>
</table>

The relevant points in a consideration of the question of dental discrepancies are:

- where do we find any dental stops in languages?
- where do we find languages with dental-alveolar contrasts?
- where do we find languages with dental mixes?
- to what level, in the Austronesian tree, should we reconstruct dental discrepancies, and to what should we attribute their appearance?

I shall address these questions in the following sections, following a discussion of the data that I shall draw on.

4. Data on dental discrepancies in the extended Austronesian world

I examined 1680 languages, a subset of the sample in Donohue (in preparation), approximately divided as follows:

- 680 Austronesian languages, from all areas where Austronesian languages are spoken;
- 450 ‘Papuan’ languages from most genetic groupings in and near New Guinea;
Mark Donohue

• 250 languages from Australia;
• 300 languages from mainland Asia, concentrating on Indochina but extending north to East Asia and into the Himalayas.

These languages represent a maximal sample of the languages in the ‘extended Austronesian’ area – that region in which Austronesian languages are found, and the languages on the fringes of this smaller region. The languages in the sample are shown in Map 1; as can be seen, coverage is quite exhaustive.

Map 1: The languages (and variant dialects) in the current sample.

5. The distribution of dental stops

The different ways in which a language may contain a dental stop in its inventory, as attested in the current sample, as well as their relative frequencies, are shown in Table 2. Because of the appearance of a number of unusual patterns that are attested only in Australia, we shall consider the sample without the Australian languages for the purposes of determining significant skewings of the distributions. From Table 3 we can see that 3% of Austronesian languages show a \( t \sim d \) dental discrepancy; this is significantly higher than would be expected, based on the fact that 2% of the languages in the sample have this type of dental discrepancy.

We have seen earlier that only 1% of languages in Maddieson’s (1984) global sample has this pattern. In the 1690-language sample this figure is replicated amongst the non-Austronesian languages, where we find that 1% have the dental discrepancy; compared to this, the 3% of Austronesian languages with a dental discrepancy is striking. This difference in frequency represents a statistically significant difference, much greater than can be assigned to chance (\( p = 0.002 \) on a two-tailed chi-squared test).

6 Some justification for their exclusion can come from the fact that dental articulation in Australia is typically lamino-dental, not apico-dental, thus representing a different type of opposition to that discussed here, which involves apical contrasts. Furthermore, the fact that there is a complete lack of languages with a dental discrepancy in Australia might be said to justify their exclusion from the count since Australia is clearly outside the area in which dental discrepancies are found.
Table 2: Occurrences of different types of dental stops in languages in the survey

<table>
<thead>
<tr>
<th></th>
<th>Austronesian</th>
<th>non-Austronesian</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only dental stops</td>
<td>27</td>
<td>31</td>
<td>58</td>
</tr>
<tr>
<td>Only alveolar stops</td>
<td>599</td>
<td>678</td>
<td>1277</td>
</tr>
<tr>
<td>No coronal stops</td>
<td>7</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Dental ≠ Alveolar</td>
<td>5</td>
<td>62</td>
<td>67 a</td>
</tr>
<tr>
<td>Dental ≠ Retroflex</td>
<td>4</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>Alveolar ≠ Retroflex</td>
<td>18</td>
<td>103</td>
<td>121</td>
</tr>
<tr>
<td>Dental ≠ Alveolar ≠ Retroflex</td>
<td>–</td>
<td>105</td>
<td>105 b</td>
</tr>
<tr>
<td>Dental discrepancy</td>
<td>22</td>
<td>6</td>
<td>28</td>
</tr>
<tr>
<td>Reversed dental discrepancy</td>
<td>5</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>683</td>
<td>1008</td>
<td>1691</td>
</tr>
</tbody>
</table>

a Largely Australian pattern.

b Purely Australian pattern.

Table 3: Occurrences of different types of dental stops in languages in the survey
(Australia excluded)

<table>
<thead>
<tr>
<th></th>
<th>Austronesian</th>
<th>non-Austronesian</th>
<th>Total</th>
<th>p (X^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only dental stops</td>
<td>27</td>
<td>29</td>
<td>56</td>
<td>0.92</td>
</tr>
<tr>
<td>Only alveolar stops</td>
<td>599</td>
<td>642</td>
<td>1241</td>
<td>0.67</td>
</tr>
<tr>
<td>No coronal stops</td>
<td>7</td>
<td>5</td>
<td>12</td>
<td>0.51</td>
</tr>
<tr>
<td>Dental ≠ Alveolar</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>0.94</td>
</tr>
<tr>
<td>Dental ≠ Retroflex</td>
<td>4</td>
<td>6</td>
<td>11</td>
<td>0.54</td>
</tr>
<tr>
<td>Alveolar ≠ Retroflex</td>
<td>18</td>
<td>21</td>
<td>39</td>
<td>0.73</td>
</tr>
<tr>
<td>Dental discrepancy</td>
<td><strong>22</strong></td>
<td><strong>6</strong></td>
<td><strong>28</strong></td>
<td><strong>0.002</strong></td>
</tr>
<tr>
<td>Reversed dental discrepancy</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>0.94</td>
</tr>
<tr>
<td>Total</td>
<td>683</td>
<td>719</td>
<td>1407</td>
<td></td>
</tr>
</tbody>
</table>

Examining the distribution in space of languages with dental stops is not particularly enlightening. As can be seen in Map 2, they are found across most of the extended Austronesian area and beyond, being significantly absent only from mainland East Asia and parts of Australia (predominantly in the east, but also including substantial areas in the western desert), and also appearing sporadically throughout most of New Guinea. Most of these dental stops represent the sole coronal stop (or stop series) found in the language in question, and so are do not indicate a contrast, phonemic or phonetic, with another coronal stop. While it is more common for a sole coronal series to be alveolar, rather than dental, it is not so rare to find dental articulation in a language.
The distribution in space of languages with a dental discrepancy is much more revealing. Map 3 shows the languages with the $t \sim d$ dental discrepancy pattern, and it is immediately apparent that this pattern is not evenly distributed across the Austronesian world. While there is a more-or-less continuous, though scattered, realisation of this contrast in the languages of Indonesia and New Guinea, reports of this contrast are lacking for languages in the Philippines (where some languages, such as Cebuano, are reported with dental stops, but with both members of the coronal voice opposition showing dental articulation) and in Remote island Melanesia, where less languages are reported as showing any use of dental articulation and almost none with a dental discrepancy.\footnote{One reviewer notes that ‘[t]he picture for the Philippines may be largely a result of under-reporting.’, and mentions Aklanon as having an unreported (in the published literature) dental discrepancy. It is quite likely that such lack of attention to detail underlies many phonetic descriptions, not just of Austronesian languages and not just those of the Philippines.}

Map 2: Languages with any dental stops.

Map 3: Languages with a dental discrepancy ($t \sim d$)
The occurrence of languages with a dental series that contrasts with another coronal series is shown in Map 4. The trend is quite clearly for languages with dental contrasts to cluster closer to Australia, especially in New Guinea but also as far as Madurese (on Java) and Muna (in Southeast Sulawesi). Only Nancowry Nicobarese in the west, and Grand Couli from New Caledonia in the east go against this generalisation. Significantly, the area with contrastive (lamino-)dental stops is immediately south of the area in which dental discrepancies are found, suggesting strongly that dental discrepancies can be thought of, in some sense, as being a ‘fringe’ version of a dental contrast (see the discussion of Blust 1999 and Abu Bakar et al 2007 in §2).

Map 4: Languages with phonologically contrastive dental stops

The reversed dental discrepancy is also found to the north of the dental contrast area, but in less languages and scattered across a more constrained dispersal. The region in which reversed dental discrepancies are found is almost perfectly described as the limits of the spread and influence of Papuan languages; Donohue (2007) describes the possible classification of Tambora, found just west of the westernmost diamond in Map 5, as ‘Papuan’, and some of the arguments for considering a Papuan substrate in remote Melanesia, Vanuatu and New Caledonia, are presented in Blust (2005, 2008) and Donohue and Denham (2008a). The significance of this more restricted distribution, compared to the more common ‘normal’ dental discrepancy seen in Map 3, and their appearance with respect to the dental contrast languages shown in Map 4, will be discussed in the following section.

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8 Dental discrepancies of the dental-retroflex pattern are also found immediately west of the map in the Austro-Asiatic Munda languages Gorum and Gutob, and to a lesser extent in Gua'i, and possibly others in South Asia. This suggests that the pattern in Khmer is ancient, and not recently acquired through contact.
Map 5: Languages with a reversed dental discrepancy ($d \sim t$)

6. The distribution of dental discrepancies

The data in the maps are open to various interpretations, but one that appears probable, and which takes account of the different facts presented as well as other knowledge about the likely prehistory of the region, involves the following observations:

1. The ‘homeland’, in the Pacific area, for languages with phonemic contrasts between dental and alveolar stops is Australia. We can identify a fringe of languages nearby in southern New Guinea showing similar contrasts, and only a small number of others away from Australia.

2. Dental discrepancies primarily occur immediately to the north of Australia in New Guinea and Indonesia, with only minor appearances to the west, east and north.

3. Reversed dental discrepancies are even more restricted to being found close to Australia (plus some outliers in northern Vanuatu and New Caledonia) than are normal dental discrepancies.

On this basis, we would, on geographic grounds alone, make the following suppositions to attempt to explain the distribution of the dental discrepancy pattern:

1. The appearance of dental contrasts and reversed dental discrepancies in just the areas for which we must suppose evidence of a significant pre-Austronesian linguistic presence implies that Australia and its northern environs are a centre for dental discrepancies.

2. While reversed dental discrepancies are found in both Austronesian and non-Austronesian languages with equal frequency, languages with normal dental discrepancy are much more frequent in Austronesian languages. This implies that, if they are not original to the family but have been acquired through contact, the distribution and type of dental discrepancies in Austronesian reflects a ‘founder effect’. Austronesian languages, in other words, display only a subset of the diversity that is associated with dental stops.

3. Within the Austronesian languages large areas, mainly in the Philippines and Solomons, are found in which dental discrepancies are not reported. It is thought that these areas represent recent expansions that effectively...
wiped out potential earlier diversity (eg., Blust 1991, 2000), possibly including an earlier dental discrepancy. Perhaps more significantly, only three languages in the northern part of the Austronesian area are reported with a dental discrepancy (Pazeh, Thao and Southern Ivatan), and only two that are not Malayo-Polynesian (see Figure 1).

4. A parsimonious explanation of the presence and distribution of dental discrepancies in Austronesian languages should suppose that, rather than being an inherited feature (and thus worthy of reconstruction to Proto Austronesian), it is an acquired one in the Malayo-Polynesian languages.

An obvious problem with the preceding account is the presence of a dental discrepancy in the two northern languages. Southern Ivatan can be explained: although it is found very far to the north in the Malayo-Polynesian area, there is no linguistic evidence that allows us to assume that Southern Ivatan is any ‘higher’ in the Austronesian tree than any other Malayo-Polynesian language (Ross 2005), just as there is no linguistic evidence for the Malayo-Polynesian spread across island southeast Asia to have proceeded north-to-south (Donohue and Denham 2009; I grant, of course, that it proceeded from Taiwan to the islands to the south, but the nature of the dispersal within the islands is unresolved). The same contact (or, more likely, language shift) scenario that resulted in the acquisition of dental discrepancies can also be invoked to account for the dental discrepancy in Southern Ivatan. We know that we must posit contact from the south through the Ivatan region because of the presence of Proto Austronesian reconstructions for items (*CebuS ‘sugarcane’, and *manuk/*qayam ‘chicken’) that are known not to be original to Taiwan, but to have been transported there (presumably prior to the breakup of Proto Austronesian) (Donohue and Denham 2009).

Pazeh and Thao, in central Taiwan, are not so simply dismissed. Figure 1 shows the Austronesian family tree, following Donohue and Grimes (2008) on the removal of the Central-Eastern Malayo-Polynesian and Central Malayo-Polynesian nodes, with the relative positions of the dental discrepancy languages shown in the abstract with dots; Pazeh and Thao are the only first-order branches of Austronesian with a dental discrepancy.

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**Figure 1:** The Austronesian family tree
7. Interpretation

On basic principles we should, as per Ross (1992), reconstruct the dental discrepancy to Proto Austronesian; it occurs in two widely separated primary subgroups of Austronesian, Thao (or Pazeh) and Malayo-Polynesian, and so should be reconstructed. But is this the whole story?

There are just two witnesses outside Malayo-Polynesian, Pazeh and Thao, and certainly no evidence that they have ever been in the area in which non-Austronesian languages elaborate the use of the dental place of articulation. But that does not necessarily mean that the area in which non-Austronesian languages elaborate the use of the dental place of articulation cannot have come to central Taiwan.

While Taiwan is home to the Austronesian languages, not all that is Austronesian finds its home in Taiwan. It is well-known that sugarcane, for example, is indigenous to New Guinea (Grivet et al. 2004); yet sugarcane is one of only three food crops that can be reconstructed to Proto Austronesian (as *CebuS). If the plant term can be reconstructed to Proto Austronesian, its appearance in the proto-language must be presumed to predate the dispersal of Malayo-Polynesian languages across Island Southeast Asia. On the other hand, if the plant itself cannot be assumed to be indigenous to Taiwan, it must be presumed to have been brought to Taiwan before the Malayo-Polynesian dispersal in order to be incorporated in the lexicon of Proto Austronesian. This accords with our developing understanding of the role of maritime interaction and trade prior to the Austronesian dispersal (eg., Torrence and Swadling 2008, Donohue and Denham 2008b, Denham and Donohue 2009, Denham, Donohue and Booth 2009), which suggests that prior to the dispersal of the Malayo-Polynesian languages in Southeast Asia there was already a robust mosaic of trading cultures, transporting obsidian and food crops about the archipelago, and in some cases into the Pacific.

As noted in §5, the distribution of dental discrepancies is essentially found (erratically) in Indo-Malaysia and New Guinea (Map 3), forming a fringe north of the area in which dental stops contrast with other coronals (Map 4). Reversed dental discrepancies are even more geographically restricted, found only in the fringe area that evidences a Papuan presence (Map 5). This geographic clustering is unlikely to have arisen by chance, and strongly suggests that the existence of stops in two coronal places, whether or not they form a phonemic contrast, is areally predicted. The fact that Australia is the centre of this area clearly reflects facts about the human population prior to the arrival of Austronesians; and if this is true, then the appearance of this pattern in the Austronesian languages of the area similarly reflects the acquisition of this pattern as a substrate by the languages of the most recent polity to arrive in the area, that associated with the Austronesians. Numerous other linguistic facts attest to the presence of robust substratal influence in this area (eg., Donohue and Denham 2009), and the fact that there is no known or proposed subgrouping that contains the languages with a dental discrepancy means that we must invoke some kind of geographically-driven explanation.

If we assume that dental discrepancies (and dental contrasts) are not an originally Austronesian feature, then we must explain how a dental discrepancy came to be found in Pazeh and Thao, and why the reverse discrepancy is not much less frequent in Austronesian. The second point can simply be attributed to a founder-effect; while dental discrepancies (of either direction) might have been (relatively) common in pre-Austronesian Indo-Malaysia, this feature did not spread into Austronesian ‘evenly’, but
through initial exposure to (socially influential) languages with ‘normal’ dental discrepancies. The appearance of a dental discrepancy in Pazeh and Thao is, on first impression, not easily ascribed to external factors: both languages have been spoken in the middle of Taiwan, not close to any coasts (at least during the ‘ethnographic present’). On the other hand the modern demography of Austronesian Taiwan bears little resemblance to what was first encountered 400 years ago, let alone 4,000. It is not implausible to suggest that a linguistic precursor to one of these (currently geographically close) languages acquired a dental discrepancy from an external trading language, spoken by members of an influential and prestigious social group, and that this pronunciation spread in a limited area. It might be that we do not need to reconstruct a dental discrepancy to Proto Austronesian after all; or even to assume that the Thao and Pazeh cases represent independent innovations.

Appendix: data and sources

Languages with a (‘normal’) dental discrepancy: Non-Austronesian languages: Bauzi (Geelvink Bay, Indonesia; Briley 1976), Duna (Duna-Bogaya, New Guinea; San Roque pers. comm.), Gorum (Anderson and Rau 2008), Gta? (DeArmond 1976, Griffiths 2008), Gutob (DeArmond 1976, Anderson 2008), Huli (Engan, Papua New Guinea; Rule 1977), Khmer (Austro-Asiatic, Cambodia; John Ohala via David Gil, pers. comm. 9 April 2009), Kyaka Enga (Engan, New Guinea; SIL-PNG), Palaung (Austro-Asiatic, Burma; Shorto 1960), Semelai (Austro-Asiatic, Malaysia; Kruspe 2004).

Austronesian languages: Ambae (Austronesian, Vanuatu; Hyslop 2001), Bauan Fijian (Austronesian, Fiji; Geraghty 1995a), Duau (Austronesian, Papua New Guinea; SIL-PNG), Fordata (Austronesian, Indonesia (east); Marshall and Marshall 1992), Indonesian (Austronesian, Indonesia (west); own notes), Iwatan (Southern) (Austronesian, Philippines (Northern); Heye and Hidalgo 1967), Kayan Kenyah (Austronesian, Indonesia (Borneo); Sorriente 2006), Kayan, Uma Juman (Austronesian, Indonesia (Borneo); Blust 1977), Konjo (Austronesian, Indonesia (central); Friberg 1995), Lom (Austronesian, Indonesia (west); Nothofer 1994), Ngaju Dayak (Austronesian, Indonesia (west); Brunelle and Richl 2002), Pendau (Austronesian, Indonesia (central); Quick 2008), Putoh (Ôma l¹nggh) (Austronesian, Indonesia (Borneo); Sorriente 2006), Selako (Austronesian, Malaysia (Borneo); Adelaar 2005), Selayar (Austronesian, Indonesia (central); Mithun and Basri 1986), Sundanese (Austronesian, Indonesia; Clynes 1995), Thao (Austronesian, Taiwan; Li 1978, Blust 2003), Tondano (Austronesian, Indonesia (central); Sneddon 1975), Tonsawang (Austronesian, Indonesia (central); Sneddon 1978), Western Fijian (Austronesian, Fiji; Geraghty 1995b), Wetan (Austronesian, Indonesia (east); De Josselin de Jong 1987).

Other languages cited: Awngi (Afro-Asiatic, Ethiopia; Hetzron 1969), Bilbil (Austronesian, Papua New Guinea; SIL-PNG), Eivo (Rapoisi) (South Bougainville, Papua New Guinea; SIL-PNG), Gà (Kwa, Niger-Congo, Ghana; Ablorh-Odjidja 1968), Galela (West Papuan, Indonesia; Wada 1980), Guahibo (Guahiban, Colombia; Kondo and Kondo 1967), Gumawana (Austronesian, Papua New Guinea; SIL-PNG), Hawaiian (Austronesian, USA; Elbert and Pukui 1979), Hula (Austronesian, Papua New Guinea; Short n.d.), Kala Kawaw Ya (Pama-Nyungan, Australia; own notes), Kyaka Enga (Engan, Papua New Guinea; SIL-PNG), Lelemi (Kwa, Niger-Congo, Ghana; Hofmann 1971), Momu (Kwomtari, Papua New Guinea; SIL-PNG), Muna (Austronesian, Indonesia; van den Berg 1989), Palu’e (Austronesian, Indonesia; own fieldnotes), Siona (Tucanoan, Colombia; Wheeler and Wheeler 1962), Somali (Afro-Asiatic, Somalia;
Armstrong 1964), Tama (Nilo-Saharan, Chad; Tucker and Bryan 1966), Tinrin (Austronesian, New Caledonia; Osumi 1995), Upper Asaro (Gorokan, Papua New Guinea; SIL-PNG), Yami (Austronesian, Taiwan; West 1995).

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