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The phonetic nature of PAN *j

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Abstract: This paper brings evidence from Campidanese Sardinian and other languages to support and refine the author’s earlier proposal that PAN *j was a palatal nasal whose modern reflexes arose through an episode of palatal glide fortition. It clarifies the evolutions of *j in Formosan, responds to some criticisms and details the circumstances leading to loss of the nasal component after glide fortition. It concludes that where an alveolar or palatal nasal is in correspondence with [g], [j] or [d], the default historical interpretation is out of the nasal.

Keywords: Proto-Austronesian phonological reconstruction, Campidanese Sardinian, palatal glide fortition, prenasalized stops.

1. INTRODUCTION.¹ It is well known that a sound correspondence exists among Formosan languages between [n] in Siraya, Kavalan, Basay, Trobiawan and Amis, [g] in Atayal and Rukai, [d] in Favorlang, Paiwan, and Puyuma, [z] in Pazeh and Saisiyat, [ð] in Thao, [l] in Kanakanabu, and zero in Bunun and Tsou (Table 1).

	rice	how many	navel	bile	know	name
PAN (Blust)	*pajay	*pija	*puja	*qapeju	*bajaq	*ŋajan
Kavalan	n <i>panay</i>	—	—	—	—	<i>ŋanan (<M)</i>
Basai	n —	—	<i>puna</i>	—	—	<i>nanan</i>
Amis	n <i>panay</i>	<i>pina</i>	<i>pona</i>	—	<i>fana?</i>	<i>ŋaŋan (<A)</i>
Siraya	n —	<i>-pina</i>	—	<i>parno</i>	<i>vana-vana</i>	<i>nanang</i>
Atayal	g <i>pagai</i>	<i>piya</i> ²	<i>puga</i>	—	<i>bak !</i>	—
Rukai	g <i>pagai</i>	—	—	<i>pagu</i>	<i>vaga</i>	<i>naganə</i>
					‘language’	

¹ Thanks to Sander Adelaar, Eva Büchi, William Baxter, Isabelle Brill, Guillaume Jacques, John Wolff and to three anonymous reviewers for useful discussion. Any errors are mine alone.

² Atayal and Kanakanabu have a special reflex after *i.

Favorlang-Babuza	d	<i>adda</i>	<i>na-ida</i>	—	—	<i>ma-bada</i>	—
Paiwan	d	<i>paday</i>	<i>pida</i>	—	<i>qapedu</i>	<i>vadaq</i>	<i>ɲadan</i>
Puyuma	d	—	<i>pida</i>	—	<i>ʔapədu</i>	—	<i>ɲadan</i>
Pazeh	z	<i>pazay</i>	—	<i>puza</i>	<i>apuzu</i>	<i>baza</i>	—
Saisiyat	z	<i>pazay</i>	<i>pizaʔ</i>	—	<i>pæʔzoʔ</i>	<i>bæzæʔ</i>	—
Thao	ð	<i>paðay</i>	<i>piða</i>	<i>puða</i>	—	<i>faðaɣ</i>	—
Bunun	0	<i>paað</i>	<i>pia</i>	—	—	—	<i>ɲaan</i>
Tsou	0	<i>pai</i>	—	—	—	—	—
Kanakanabu	1	<i>palay</i>	<i>pia</i>	—	—	<i>valáʔə</i>	—

Table 1. Formosan reflexes of PAN *j. Sources: Austronesian Comparative Dictionary, Wolff (2010); Adelaar (2011) for Siraya.

Austronesianists attribute this correspondence to a PAN phoneme for which the symbol *j has become standard. This phoneme is the PAN precursor of PMP *j [g^j], part of a series of palato-velars (*hintere Palatale*) in Dempwolff's system. In both MP and Formosan, d and g reflexes occur, pointing to an original palatal articulation. An important difference is that nasal reflexes occur in Formosan, while MP has none. That *j never gives nasals in MP, a group of c. 1,200 languages, while 5 out of 25 or so Formosan languages reflect it as n, in itself suggests a phonetic difference, involving nasality, between the PAN and PMP stages of this phoneme.

Like Dempwolff, authors on PAN interpret *j phonetically as a voiced obstruent in the palatal or dorsal region: [ɟ] (Dahl 1981:152); [g] (Wolff 1988, 2010); [ɣ^j] or [j] (Ross 1992, 2015); [g^j] (Blust 1999). As already mentioned, [d] and [g] reflexes occur in both MP and Formosan. The other reflexes, such as [z], [ð], [j], [l] and zero, can be viewed as somehow derived. The [n] reflexes are more problematic: cross-linguistically sound changes producing n directly out of ɟ, g^j, g, ɣ^j, z or ð do not appear to be attested. Paths of evolution involving multiple steps could lead to n; but a simple alternative exists.

2. PALATAL GLIDE FORTITION. Fortition of palatal glides to palatal affricates and stops is cross-linguistically well attested. Examples applying to singleton [j] are known from e.g. northwestern Basque (Egurtzegi 2013:158); from Kiput, a MP language (Blust 2002:402).

Fortition of [j] following a consonant occurs in Kirundi after b, v, r : /ja-raab-je/ [jara:vje] ‘s/he looked’, /ku-vjuura/ [kuvju:ra] ‘to wake up’, /ku-ri-a/ (> rj) [kuɾja]~[kuja] ‘to eat’ (Kochetov 2016). For Tibetan, Li Fang-kuei’s second law (Li 1959, Hill 2011) has pre-Tibetan [rj]³ regularly evolving to Written Tibetan རྩ [rj] or [rgj]: *bryad > *brgyad* ‘8’, *bryah > *brgyah* ‘100’, *ryu > *rgyu* ‘to flow’, *rya > *rgya* ‘net’; compare Old Chinese (OC) 八 *p^hret > peat > bā ‘eight’, 百 *p^hrak > paek > bǎi ‘hundred’, 流 *ru > ljuw > liú ‘flow (v.)’, 羅 *r^haj > la > luó ‘kind of net’, without -j-.

Specifically after n, j-fortition will result in a prenasalized consonant. Lai (2022) observed a correspondence in Gyalrongic, a Sino-Tibetan group, whereby Krhoskyabs, a language within the western branch, has ɟ against n or nj in the other Gyalrongic languages, whether western or eastern. Lai argued that in Khroskyabs, “*nj is fortified into ɟ- in initial position and the original nasality is preserved when preceded by a vowel”. He posited the sequence *nj > *ⁿɟ > ɟ (Lai 2022: 219). Cited examples are few, however, and come from different Gyalrongic languages. The clearest examples of palatal fortition after n come from Sardinian dialects (Lausberg 1976, Puddu 2000-2022). Latin *nĭ and *nĕ merge to evolve to [ɲ] in Campidanese⁴ and to the variants [nz] ~ [ndz] in Logudorese (Table 2). The nasal component is preserved, as prenasalized voiced stops are licit word-internally.

	Campidanese	Logudorese
Lat. vīnĕa ‘vineyard’	<i>bíngia</i> id.	<i>bintza, binza</i>
Lat. extrānĕus ‘foreign’	<i>istràngiu</i> id.	<i>istranzu</i>
Lat. mūnĭa ‘duties, functions’	<i>múngia</i> ‘weariness, strain’	<i>munzaj</i>
Lat. mǎnĕ ‘morning’ + suffix -anu	<i>mangianu</i> id.	<i>manzanu</i>
Lat. ad+cum+pānĕ-are ‘accompany’	<i>acumpangiai</i> id.	<i>acumpanzai</i>
Frankish *bisunni ‘need’ + suffix -u	<i>bisóngiu</i> id.	<i>bisonzu</i>

Table 2. Palatal glide fortition in Sardinian dialects. Source: Puddu, M. (2000-2022)

³ Where -j- is intrusive, from an unknown source.

⁴ Lausberg (1976:330) transcribes Campidanese -ngi- as [ñg], equivalent to [ɲ] in the current version of the IPA.

3. PAN *j AS A NASAL. Aiming for a phonetically more realistic account of the PAN consonant system and of the evolutions of PAN *j, Sagart (2004:429) proposed to reinterpret *j as a palatal nasal *n^j [n^j], evolving to [ɲ] through palatal glide fortition, Campidanese-style. This has the advantage of accounting for the nasal reflexes without the need for an unattested [g^j] > n sound change. It also makes the consonant system more balanced—as [g^j], *j lacks a voiceless counterpart.

Wolff's reconstruction of *j as [g], which has a voiceless counterpart in PAN *k, avoids the imbalance issue. He notes that PAN *g and *j as understood by other scholars are complementarily distributed: the former does not occur word-medially and is extremely rare, or inexistent, word-finally, while the latter does not occur word-initially. Wolff's PAN *g thus stands for both *g and *j of other scholars. However his account requires *g [g] to palatalize between any two vowels, whether palatal or not. This is phonetically curious. A more common evolution for an intervocalic -g- would be to lenite to [ɣ]. As it happens, *g is also in complementary distribution with *y: like *j, *y does not occur word-initially. It is possible, then, that pre-PAN intervocalic *-g- evolved to PAN -y-, leaving a gap in the distribution of *g. I find the -g- > -ɣ- > -j- explanation better supported than Wolff's: intervocalic -g- leniting to -ɣ- does not require a palatal context, and neither does further lenition of [ɣ] into the approximant -j-. The evolution -g- > -ɣ- > -j- in intervocalic position is attested in northern and southern Italian dialects: Piemontese, Tessinese, Tarento (Kümmel 2007:85). As to why PAN *j does not occur word-initially, I take PAN *j to originate in pre-PAN *n preceded by a palatal segment such as *i or *y. This explains its absence word-initially: as there was no preceding segment, evolution to *j [n^j] was not possible.

4. CLASH WITH *ñ. Blust (2014: 359-361) argued that the reinterpretation of *j as *n^j in Sagart (2004) clashes with *ñ, a palatal nasal he takes to be reconstructible to PAN. *ñ was first reconstructed by Dempwolff for the proto-language we now call PMP. Impressed by Tsuchida's observation (1976) that Dempwolff's *ñ is reflected as [ɲ] in Kananabu, Blust projected PMP *ñ back to PAN apparently without verifying that this putative proto-phoneme has a single set of reflexes in Formosan languages. In fact, in those Formosan languages which distinguish *n and

*N, putative PAN *ñ occurs in *two* mutually exclusive sets of words: one with the reflexes expected of *n, and another with the reflexes of *N. This can be shown using Blust’s own PAN reconstructions (Table 3):

	adrift	dew	tasty	taste (v.)	sea turtle	rinse, wash	wash (body)	wash
PAN (Blust)	*qañud	*ñamuR	*ñamñam	*tañam	*peñu	*ñawñaw	*bañaw	*Siñaw/Señaw
PAN (Sagart)	*-Niu-	*Nia-	*Nia-	*Nia-	*-niu	*nia-	*-nia-	*-nia-
Saisiyat	<i>ɔaelor</i>	<i>lamoL</i>						
Pazeh				<i>mu-talam</i>				<i>si-sinaw</i>
Atayal				<i>talam</i>				
Seediq	<i>qəlul-i?</i>							<i>sinao</i>
Thao			<i>zamzam</i>	<i>tazam</i>				<i>sh<m>inaw</i>
Rukai	<i>mu-á uDu</i>							<i>ɔəna-ɔənu</i>
Tsou	<i>ŋ-ohcu</i>							
Saaroa	<i>m-u-alhusu</i>							
Paiwan	<i>qalʷudj</i>						<i>ma-vanaw</i>	
Puyuma	<i>m-u-a-laHud</i>				<i>penu</i>			

Table 3: Two sets of Formosan reflexes for Blust’s *ñ in the ACD (accessed July 7, 2015). Columns 2-5 (‘adrift’ through ‘taste’) have the reflexes of *N; columns 6-9 (‘sea turtle’ though ‘wash’), those of *n.

It appears, then, that PMP *ñ originates in two PAN phonemes: PAN *N and *n, when *followed* by a palatalizing context, here noted as a diphthong of unstressed i plus a stressed vowel: *niV and *NiV. In PMP *n and *N merged as *n at a time when *iV strings were still intact: so *niV and *NiV merged as *niV, which then palatalized to *ñV. Kanakanabu independently followed the same evolution, and further velarized [ñ] to [ŋ]. This is the reason why most of the evidence adduced in support of putative *ñ by Tsuchida and Blust comes from two languages that merge *n and *N: PAN and Kanakanabu. Outside of Kanakanabu, Formosan languages appear to have reduced the iV diphthong to V following *n and *N, so that where *niV and *NiV merge, they do so as nV, feeding into inherited *nV, without producing a reflex distinct from that of *n.

As already evident in Wolff (2010), PAN *n and *N (Wolff’s *n and *ɭ) are sufficient to account for the range of phenomena earlier attributed to *ñ. Thus Wolff (2010) has PAN *qáɭuj opposite

Blust's *qañud 'adrift' but *peniyu opposite Blust's *peñu 'sea turtle'. Putative PAN *ñ is superfluous: therefore reinterpreting *j to *n^j does not entail a clash with another PAN palatal nasal.

5. EVOLUTION OF *n^j IN FORMOSAN. Emending PAN *j to a palatal nasal undergoing fortition to [ɲ] introduces a prenasalized phoneme into a sound system lacking such consonants. The new consonant was thus poorly integrated. Different paths were available to remove the oddity:

-by removing the nasal component, to [j];

-by removing the stop component, to [ɲ];

-via progressive nasalization and degemination [ɲ] > [ɲɲ] > [ɲ].⁵

Taokas, Atayal, Rukai, Favorlang, Papora, Paiwan, Puyuma chose the first path. The resulting [j] lacked a voiceless counterpart and, even after denasalization, was poorly integrated. As a result [j] was regularized across the board: no modern Formosan language reflects *j as [j]. The main avenues to regularize [j] were to [d] (Favorlang, Paiwan, Puyuma, Papora), [t] (Taokas) and [g] (Atayal, Rukai). The change j > g occurs in Danish and Egyptian Arabic (Kümmel 2007: 242).

Siraya, Basai, Trobiawan, Kavalan and Amis followed the second or third path, and the resulting palatal nasal then merged with *n. There is no ground for supposing that the phonetically trivial n/ɲ merger occurred only once.

Denasalization itself cannot be modeled as a single innovation: the denasalizing shifts often motivated by the need to fill gaps in the consonantal system. Thus in Atayal, where PAN *g devoiced to k-, [ɲ] evolved to g-. In Amis, where *d shifted to r, [ɲ] went to d. In Paiwan, where *d changed to dj, [ɲ] went to d. In Thao, PAN *C went to θ, and [ɲ] changed to ð, providing θ with a voiced counterpart. These episodes of denasalization must be independent.

The final denasalizing event occurred before PMP, where *j was [g^j] or similar, as proposed by Dempwolff.

⁵ Lausberg (1976:330) states that the change of Lat. -N̄- to [ɲ] in western Romance occurred through a [ɲɲ] interstage, still observable in southern and central Italian dialects.

Chinese provides us with a parallel for the loss of secondary prenasalization in a language without prenasalized stops. Like all Old Chinese (OC) nonpharyngealized initial consonants, OC *n developed a medial palatal glide in late OC (Baxter-Sagart 2014). In the first and second centuries CE, it served to transcribe Sanskrit /ñ/ (Coblin 1983:56). It is generally thought to have been a palatal nasal in Middle Chinese: Baxter (1992) symbolizes it as ny- in Early Middle Chinese (around 550-600 CE). Based on its modern dialect reflexes, Karlgren (1915) saw it as a prenasalized fricative [ńź] (= [nj]) in (Late) Middle Chinese (c. 8th-10th centuries CE). In most modern varieties of northern Chinese, such as Beijing, this consonant has lost its nasal character, but a number of southern Chinese dialects reflect it as a nasal:

	OC (Baxter-Sagart 2014)	MC	Beijing	Wenzhou	Meixian
人 person	*ni[nj]	nyin	zən	ɲiaŋ	ɲin
肉 meat	*k.nuk	nyuwk	zou	ɲəu	ɲiuk
熱 hot	*C.nat	nyet	zɿ	ɲi	ɲiat

Table 4: reflexes of OC nonpharyngealized *n in Beijing, Wenzhou, Meixian (tone marks omitted)

We can exclude that Beijing z_ɿ fricativized directly out of an earlier palatal glide: z_ɿ < j < j: if so, the glide would surely have merged with Middle Chinese y- [j] along the way. But MC y- and ny- are not merged in Beijing, with MC y- retaining its phonetic quality as a palatal glide:

引 MC yinX > Beijing jin ‘draw the bow’

育 MC yuwk > Beijing jy ‘breed, produce’

拙 MC yet > Beijing je ‘to pull’

The evolution, therefore, occurred through a prenasalized fricative [nj] interstage, as Karlgren thought: *nj > nj > j > z_ɿ. MC palatal obstruents regularly become retroflex in Beijing: the Beijing reflex is, in effect, the regular outcome of an earlier prenasalized fricative, denasalized. There were in early Mandarin no prenasalized consonants: the oddity was removed through a denasalizing change turning [nj] into [j] and ultimately [z].

CONCLUSION. A palatal nasal value [ɲ] of PAN *j provides a realistic solution to the problems associated with this phoneme. In general, where n is in correspondence with voiced stops like g, d and ɟ, the default historical interpretation is out of the nasal, *via* palatal glide fortition.

ABBREVIATIONS

- OC Old Chinese (c. 1000-200 BCE)
MC Middle Chinese (c. 550-600 CE)
LMC Late Middle Chinese (c.700-900 CE)
MSC Modern Standard Chinese
PAN Proto-Austronesian
PMP Proto-Malayo-Polynesian
MP Malayo-Polynesian

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