Towards a Reconstruction of Proto-Paniai Lakes

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Abstract

In this paper, I reconstruct the consonant system of Proto-Paniai Lakes, the ancestor language of a branch of the Trans New Guinea languages spoken in the highlands of the Indonesian province Papua. By positing a series of systematic changes to each of the daughter languages—Mee, Wodani, and Moni—, I argue that the comparative method can be applied to Papuan languages.

1 Introduction

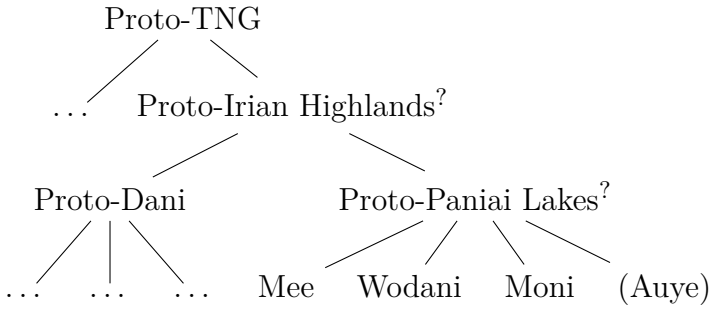
Researchers sometimes claim that the comparative method cannot be used as a tool for understanding Papuan Language history. For example, Foley (1986, 268) mentions, "the immense problems [...] diffusion can create for determining the genetic affiliations [...] of Papuan languages" and finds that Papuan languages "provide a challenge for the tools of comparative linguistics unmatched by any language family or linguistic area" and "some major rethinking of the method may be needed for these languages."(Foley, 1986, 206,210). Similarly, Hammarström (2012) argues that the reconstruction of Proto-Trans New Guinea pronouns by Ross (2005) fails to rule out chance as a possible explanation, because of the areal feature of small consonant inventories in Papuan languages. Even Ross (2005, 36) himself claims that for some subgroupings, like his Western-Trans New Guinea Linkage (which includes Proto-Paniai Lakes) no discrete Proto-language can be reconstructed. These researchers arrive at this conclusion because of the consequences of ongoing intense languages contact and the scarcity of data. This would decrease the general credibility of the comparative method if areal effects and language contact rendered the method useless for some linguistic areas (i.a. Kalyan and François 2018). Nevertheless, the comparative method has been successfully applied in other areas of the world where language contact has also been extensive, e.g. continental Europe. Therefore this should in fact not pose a problem. For this reason, I focus on the Paniai Lakes branch of the Trans New Guinea language family and argue that the comparative method can be successfully applied for reconstructing the consonant inventory of the proto-language with a series of regular and systematic changes.

In (1), I present an overview of the Trans-New Guinea family tree. Proto-Irian Highlands is one branch of Proto-TNG[1] (other branches not discussed here include Finisterre-Huon and Madang). Proto-Dani and Proto-Paniai-Lakes are two daughter languages of

[1]I will use the following abbreviations in this paper: C consonant, D (non-dorsal) voiced stop, N (non-dorsal) nasal, PPL Proto-Paniai Lakes, TNG Trans New Guinea, T (non-dorsal) voiceless stop, V vowel.

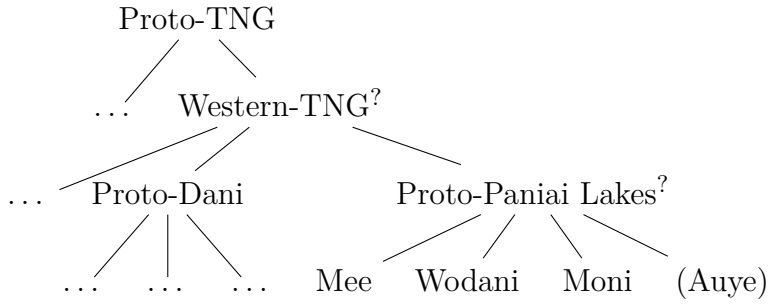
Proto-Irian Highlands. Mee, Wodani, and Moni, are daughters of PPL. The fourth daughter is Auye. It is set in parentheses, because it will be discussed seperately for the lack of empirical data. A superscripted questions mark is used to indicate that Proto-Irian Highlands and Proto-Paniai Lakes reconstructions have never been conducted.

(1) Missing steps in the reconstruction of Proto-TNG



Larson and Larson (1972) first posited the Paniai Lakes language family, which is also known as the Wissel Lakes family. Moxness (2011) adds Auye to this family, but until now no other information has been published about the language. Larson (1977) was the first to propose a higher order order grouping Proto-Irian Highlands (now sometimes referred to as Proto-West Papuan Highlands) based on lexicostatistics evidence, which includes Paniai Lakes languages and Dani languages. This view is retained in more recent literature, e.g. Foley (2000). The common consensus among contemporary researchers is that all these language families are included in the Trans New Guinea family as the highest order family, reconstructed in Ross (2005); Pawley (2005, 2012). The only other proto-language reconstructed in this tree is Proto-Dani (Bromley, 1961, 1967). Ross (2005) uses evidence from pronouns to establish an alternative, flatter grouping with a Western TNG Linkage that encompasses the Paniai Lakes family as well as the Dani family and several other families such as the geographically rather distant East Timor languages. The correspoding tree is given in (2). Since Hammarström (2012) argues convincingly against pronouns as evidence for such groupings, I do not consider this hypothesis. In subsection 4.2, I offer some putative evidence that favors the Proto-Irian Highlands hypothesis over Ross's grouping.

(2) Alternative Grouping (Ross, 2005)



I will argue for a reconstruction of PPL using the comparative method. The comparative method can be summarized as follows: Regular sound correspondences are identified in a set of phonologically similar words with similar meanings from a number of languages that are assumed to be related. For each of these correspondence sets a proto-phoneme is

posited and the sound changes that are needed to derive the actual sounds in the daughter languages. From these proto-phonemes one can reconstruct a proto-phonology and proto-forms (cf. Trask and Millar 2015, see also Fox 2015; Kessler 2015).

For PPL, the first and second step are already described at length in Larson and Larson (1972). I modified their cognate sets slightly by excluding pronouns (cf. subsection 4.1) and supplementing their list with data from Takimai (2015) and Larson and Larson (1958). I additionaly modified their phonological transcription to fit IPA transcription. I will present these correspondence sets in section 2, preceded by a synchronic overview of the phonology of the three Paniai Lakes languages, Mee, Wodani, and Moni in subsection 2.1. The resulting reconstructed proto-phonemes and proto-forms are described in section 3, including the sound changes required to derive the forms in each languages. The discussion in section 4 will elaborate on the applicability of the comparative method and compare this reconstruction to work on related languages before I conclude in section 5.

2 Sound Correspondences between Paniai Languages

This section will start with an overview of the synchronic phonology of Mee, Wodani, and Moni. In subsection 2.2 I will present ten correspondence sets that are central for the reconstruction of the consonants of Proto-Paniai Lakes. The last subsection discusses sporadic and non-representative correspondences.

2.1 Synchronic Overview of Mee, Wodani, and Moni

In this section I will lay out the synchronic phonology of the three languages compared. For each language I give the consonant inventory and describe some basic allophony. I also include some notes on syllable structure, but I will refrain from describing vowels and stress or tone, since these are not immediately relevant for the reconstruction.

In (3), I give the consonant phoneme inventory of Mee. Here and in the following, the three places of articulation labial, coronal, and dorsal are given as colums, whereas the phonemes are organized in rows with regard to manner of articulation. When applicable and constrastive, voiceless sounds are placed before there voiced counterparts. Sounds in paranthesis indicate that these phonemes are only contrastive in some dialects. The Mee inventory includes nasal stops at the labial and coronal place of articulation as well as voiced and voiceless plain stops at all three places of articulation. Glides only occur at two places of articulation.

(3) Mee consonant phoneme inventory (Doble, 1987)

	Labial	Coronal	Dorsal
Nasal stops	m	n	
Plain stops	p b	t d	k g
Glides	w	j	

This inventory does not include any fricatives, which is crosslinguistically rare (Maddieson, 2013), but also a property of related languages. In comparison to the sister languages Wodani and Moni (see below), the lack of prenasalized stops is especially evident. Doble (1987) also describes several further instances of allophony. The dorsal plain stops /k/ and /g/ are labialized before rounded vowels. The voiced dorsal stop /g/ is laterally released with variying degrees of laterality. The palatal glide /j/ can be fortified to a fricative

[ʒ] before /i/. Larson and Larson (1972) additionally note that the voiced stops /d/ has an implosive allophone [ɗ] in utterance initial stressed position. The syllable structure in Mee is (C)V(V), i.e. the onset of a syllable is optional and simple when present. There are no coda consonants, but diphthongs are allowed.

The Wodani inventory in (4) adds more manners of articulation, namely prenasalized stops at all places of articulation and a coronal sibilant. Voicing is not contrastive here. Additionally, a glide /h/ fills the place of a back glide. This is probably best described as glottal or placeless and filed in a glottal place of articulation columns for ease of exposition.

(4) Wodani consonant phoneme inventory (Larson and Larson, 1972)

	Labial	Coronal	Dorsal	Glottal
Prenasalized stops	^{m}b	^{n}d	^{ŋ}g	
Nasal stops	m	n		
Plain stops	p b	t d	k g	
Sibilants		(s)		
Glides	w	j		h

Again, it is notable that fricatives are completely missing from some dialects, whereas other dialects have a contrastive coronal sibilant /s/. Larson and Larson (1972) note that all voiceless plosives have an aspirated allophone [p^h t^h k^h], but only the coronal stop in dialects without /s/ has affricate and fricative allophones [tʃ] and [ʃ]. In the other dialects it is /s/ that has [tʃ] and [ʃ] allophones. In all dialects the voiceless velar stop /k/ has a voiced fricative allophone [ɣ]. The voiced velar stop can again be laterally released [g^l]. Whereas the voiced labial stop /b/ only has an additional implosive allophone [ɓ], /d/ exhibit a wide range of allophony. It can be realized as an implosive [ɗ] utterance initially when stressed, yet intervocalically a flap [ɾ], a lateral, a laterally released stop [d^l], and a voiced stop [d] are in free variation. The glides /w/ and /j/ have fricative allophones [β] and [z ʒ] respectively, depending on the quality of surrounding vowels.

The Moni consonant phoneme inventory, given in (5), consists of prenasalized, voiced, and voiceless plain stops at all three places of articulation. Nasal stops are labial and coronal. The coronal sibilant is a phoneme in all dialects. Glides are labial, coronal and glottal as in Wodani.

(5) Moni consonant phoneme inventory (Larson and Larson, 1958, 1972)

	Labial	Coronal	Dorsal	Glottal
Prenasalized stops	^{m}b	^{n}d	^{ŋ}g	
Nasal stops	m	n		
Plain stops	p b	t d	k	
Sibilants		s		
Glides	w	j		h

Larson and Larson (1958) describe the labial and coronal voiceless plain stops /p t/ as occuring only ever aspirated [p^h t^h]. The dorsal plain stop /k/ on the other hand is aspirated [k^h] only word-initially – in word medial position it occurs either as a voiced dorsal stop [g] or a voiced dorsal fricative [ɣ]. Furthermore, the dorsal stops, both prenasalized and plain, occur as palatalized [g^j k^j $^{ŋ}g^j$] or labialized [g^w k^w $^{ŋ}g^w$], depending on surrounding vowels. Similarly, /n/ has a palatalized allophone [n^j]. Voiced plain stops /b/ and /d/ again have implosive allophones [ɓ ɗ] in utterance initial position. Larson and Larson (1972) additionally mention a voiced labial fricative allophone [β] for /b/. Larson and Larson (1958) give a detailed description for the allophony of /d/ varying between a

voiced stop [d], a lateral [l], a laterally released voiced stop [d^l], and a flap [ɾ] depending on the quality of surrounding vowels. Prenasalized stops on the other hand are shortened word initially and lengthened elsewhere. Similar to Wodani, the glides /w/ and /j/ have fricative allophones [β] and [z ʒ] respectively, depending on the quality of surrounding vowels. Additionally, the coronal sibilant /s/ exhibits a similar allophone [ʃ]. The syllable structure is given as (C)V(V)(V) in Larson and Larson (1958), therefore allowing optional simple onsets but no codas and up to three vowels per syllable. Nevertheless, this is not a morpheme structure constraint, i.e. some stems end in a consonant, but it only surfaces when followed by a vowel initial suffix.[2]

Several generalizations will become important for the reconstruction. First, in several instances the phonemes at the dorsal place of articulation behave differently from other places of articulation, e.g. all three languages lack the dorsal nasal stop /ŋ/ and Moni also lacks a plain voiced stop /g/. Diachronically, I argue, that the dorsal consonants have often undergone exceptional changes, too. Secondly, Mee neither contrasts any prenasalized stops nor a glottal glide /h/, whereas Wodani and Moni do. I argue that Mee lost prenasalized stops by merging them with nasal stops and plain stops and similarly lost *h. Thirdly, only Moni consitenly distinguishes a phonemic sibilant /s/. I take this as an innovative split from the plain voiceless stop *t. In all of the following, I will give only phonological transcriptions, ignoring allophony unless otheriwse explicitely stated.

2.2 Correspondence Sets

In this section, I present a series of cognate sets, for which I established regular sound correspondences between the three languages. Here and below I present data in three columns. Forms from Mee are listed in the first column. Wodani examples are presented in the second column and Moni data follow in the third columns. The list of glosses in the fourth column indicates that these forms share a common meaning. Corresponding segments are marked in boldface. Synchronic morpheme boundaries are indicated by a hyphen.

(6) Set 1: N-N-^{n}D

Mee	Wodani	Moni	
ne-**n**i-i	ne-**n**i-na	ni-$^{\mathbf{n}}$**d**i-ja	‘give me’
ani**m**aka-i	ani**m**aka-na	a$^{\mathbf{m}}$**b**iki-ja	‘to sit’
e**n**i-i	he**n**e-na	hi$^{\mathbf{n}}$**d**i-ja	‘to say’

From the correspondence set in (6), it can be observed that the Mee and Wodani nasals [m] and [n] correspond regularly to prenasalized voiced stops in Moni at labial and coronal places of articulation. The corresponding consonant can occur both word initial or word internal.

The second set is split into two subsets. The data presented in Set 2a in (7-a) include forms where the corresponding sound precedes a stressed syllable. In contrast, the cognate set in (7-b) exhibits the cognate sounds only before unstressed syllables.

[2]For alternating verb stem final consonants in Moni, I established /k/ as the most likely underlying form, again based on Larson and Larson (1958).

(7) Set 2: T-T/^{n}D-^{n}D

a. Set 2a: stressed syllables

Mee	Wodani	Moni	
tani	**^{n}d**ani	**^{n}d**ani	‘hot’
e-**t**i-i	-	**^{n}d**i-ja	‘to say’
i**t**á	hi**^{n}d**á	-	‘road’

b. Set 2b: unstressed syllables

Mee	Wodani	Moni	
u**t**oma	u**t**uma	o**^{n}d**oma	‘all’

This set includes cognates, where Mee has a coronal voiceless stop, but the Moni cognate shows a corresponding voiced prenasalized stop. The Wodani cognates differ depending on stress: /^{n}d/ before stressed vowels or word initially and /t/ before unstressed ones. Note that this correspondence set overlaps with the preceding one for Moni, because both include a prenasalized stop for this language. Consider also the non-representative correspondence set 11, for a similar pattern with the labial stops.

Set 3 includes cognates that have a /g/ in Mee, a /^{ŋ}g/ in Wodani, but that are split between /k/ and /^{ŋ}g/ in Moni. We find only word internal consonants in this correspondence set. It is remarkable that the velar stops act differently here from all other stops. Note also that a velar nasal, that could be expected as a correspondent in Mee and Wodani for Moni /^{ŋ}g/, judging from Set 1, is absent from the consonant inventory of all three languages (cf. subsection 2.1).

(8) Set 3: g-^{ŋ}g-^{ŋ}g/k

Mee	Wodani	Moni	
o**g**o	o^{ŋ}**g**ooto	o**k**o tagi	‘neck’
di**g**ii	di^{ŋ}**g**i	di^{ŋ}**g**i	‘black, dark’

Set 4 shows sets where a word initial /h/ in both Wodani and Moni corresponds to an onsetless syllable in Mee.

(9) Set 4: ∅-h-h

Mee	Wodani	Moni	
oma	**h**uma	**h**oma	‘stone’
eni-i	**h**ene-na	**h**i^{n}di-ja	‘to say’
ijo	**h**ijo	-	‘feather’
itá	**h**i^{n}dá	-	‘road’
egó	**h**ego	-	‘tooth’
edi	**h**idi	-	‘rain’

An /s/ in Moni always corresponds to a /t/ in Mee and Wodani. These forms are included in Set 5. They occur word internally as well as word initially. It stands out that all of these occurences are followed by a high vowel in the Mee and Wodani cognates.

(10) Set 5: t-t-s

Mee	Wodani	Moni	
tinee	**t**ina	**s**ena	‘belly, body’
u**t**u	-	u**s**a	‘fire’
-	pa**t**uka ti-na	pa**s**uk-ija	‘full’

In several cognates a /k/ in Mee and Wodani corresponds to either an intervocalic glide

or no consonant at all, with other segments being equal. Again, this correspondence is not dependent on the position of the consonant. These cognates are pooled in Set 6.

(11) Set 6: k-k-∅/j

Mee	Wodani	Moni	
ma**k**ai	ma**k**i	mai	'earth'
kagu	**k**agu	aka	'knee'
e**k**a	e**k**ada	e**j**e	'name'
po**k**ado	po**k**ode	po**j**a	'white'
u**k**a	u**k**a	-	'louse'
kado	-	ada	'bark, skin'

Despite the correspondence set given above, Moni still features phonemic /k/. This corresponds to instances of /g/ in Mee and Wodani. These cognates are summarized in Set 7. This is another cognate set that is not restricted to either word initial or word medial contexts.

(12) Set 7: g-g-k

Mee	Wodani	Moni	
na-**g**i-i	na-**g**i-na	nu-**k**i-ja	'to kill'
-pa**g**i	pi**g**i-na	pu**k**ija	'to walk, FUTURE'
a**g**oo	a**g**oo	-	'moon'
bi**g**i	-	be**k**a	'bird'
e**g**aa	-	e**k**a	'blood, related by blood'
ta**g**i	-	ta**k**i	'root, sweet potato'

The next three sets contain sounds that are assumed to have been stable, i.e. the corresponding sounds are identical. These stable nasal and plain stops serve two purposes in the argumentation. For one, they are a strong argument for the close genealogical relationship between the three languages. Secondly, they block the reconstruction of certain sounds as nasal or plain stops, whenever they are not in complementary distribution. They will not be described in detail in the reconstruction section, because I take them to be common retentions, and thus they do not require any sound changes. In Set 8 in (12), forms with corresponding nasals in all three languages are listed. These occur word-initial as well as word-medial and are not restricted by the quality of surrounding vowels.

(13) Set 8: N-N-N

Mee	Wodani	Moni	
a**m**a	a**m**a	a**m**a	‘breast’
ta**n**i	^{n}da**n**i	^{n}da**n**i	‘hot’
uto**m**a	utu**m**a	o^{n}do**m**a	‘all’
mee	**m**e	**m**e	‘man’
má	**m**á	**m**á	‘what’
mei-me	**m**í	**m**í	‘who’
u**n**o	u**n**u	u**n**u	‘sleep’
o**m**a	**h**uma	**h**oma	‘stone’
ti**n**ee	ti**n**a	se**n**a	‘belly, body’
makai	**m**aki	**m**ai	‘earth’
me-i	**m**e-na	**m**i-ja	‘to come’
na-i	**n**o-na	**n**u-ija	‘to eat, to drink’
e**m**o	e**m**o	-	‘blood’
mitoo	**m**itoo	-	‘bone’
ju**m**a	ju**m**a	-	‘nose’
mani	**m**ani	-	‘root’
u**m**i-i	u**m**i-na	-	‘to sleep’
e**n**a	**n**aa	-	‘one’
joo**n**i-i	ji**n**i-na	-	‘to stand’

Similarly, plain voiced stops at the labial and coronal place of articulation correspond between all three languages in the forms listed in (13) as Set 9. This can be compared to Set 7, where the plain dorsal voiced stop /g/ in Mee and Wodani corresponds to the plain dorsal voiceless stop /k/ in Moni. In this instance, we thus see special behaviour for the dorsal place of articulation. Again, the forms in (13) include word-medial and word-initial contexts and are not restricted to certain surrounding vowels.

(14) Set 9: D-D-D

Mee	Wodani	Moni	
digii	**d**i^{ŋ}gi	**d**i^{ŋ}gi	‘black, dark’
ba**d**o	**b**a**d**o	**b**a**d**o	‘foot’
e**b**o, i**b**u	e**b**o, i**b**u	o**b**o	‘big, round’
be**d**o	**b**i**d**o	-	‘bird’
boka-i	**b**oko-na	-	‘to die’
do-u	**d**u-na	-	‘see’
bo**d**i-ja	**b**i**d**a	-	‘fire’
e**b**a	e**b**ada	-	‘skin, bark’
e**d**i	hi**d**i	-	‘rain’
bigi	-	**b**eka	‘bird’
ka**d**o	-	a**d**a	‘bark, skin’
-	ta**d**i	ta**d**ida	‘sand’
-	**b**a^{m}ba	**b**a^{m}ba	‘fat’

Finally, plain voiceless stops at the labial and coronal place of articulation are in a correspondence relationship between all three languages. The exempt plain voiceless dorsal stop /k/ (cf. Set 6) is analogous to the voiced stops as mentioned above. This is another instance of special behavior of the dorsal stops. The distribution in this set is not

limited by position. The main regular sound correspondences are summarized in (16).

(15) Set 10: T-T-T

Mee	Wodani	Moni	
pokado	**p**okode	**p**oja	'white'
te-	**t**áu	**t**awa	'not'
pagi	**p**igi-na	**p**ukija	'to walk, FUTURE'
e**p**i	i**p**i	-	'to know'
pija	**p**ija	-	'three'
mi**t**oo	mi**t**oo	-	'bone'
tagi	-	**t**aki	'root, sweet potato'
-	**t**adi	**t**adida	'sand'

(16) Sound correspondences in Paniai Lakes languages

	Mee	Wodani	Moni
Set 1	N	N	^{n}D
Set 2	T	T/^{n}D	^{n}D
Set 3	g	^{ŋ}g	^{ŋ}g/k
Set 4	∅	h	h
Set 5	t	t	s
Set 6	k	k	∅
Set 7	g	g	k
Set 8	N	N	N
Set 9	D	D	D
Set 10	T	T	T

In this section I have identified seven main correspondence sets and three stable sets for the reconstruction of the Proto-Paniai Lakes consonant systems. The main challenges were overlapping correspondence sets and a few minor irregularities. In the next subsection, I will continue with sets where the relation between the cognates is less clear, because they do not include enough forms.

2.3 Non-representative Sets

In this section I will describe data sets, for which I do not have enough data to conclusively reconstruct a proto-form and sound changes. I will explain this decision for each set and derive some putative conclusions from the present evidence. It should be noted that these words number far less than the ones that can be dervied by systematic and regular sound changes. 51 cognates only show regular correspondences as mentioned in section 2.2. On the other hand, 4 cognates show both representative and non-representative correspondences and 9 cognates only show non-representative correspondences. I take this to be a strong argument in favor of this reconstruction.

One of these non-representative sets concerns the labial stops. One might expect a symetrical partner to Set 1 and Set 2, where then a voiceless stop in Mee would correspond with a prenasalized voiced stop in Moni and Wodani. There are only two partial cognate sets given in (17).

(17) Set 11: p-^{m}b-^{m}b

Mee	Wodani	Moni	
punugu	**^{m}b**utugu	-	'round'
-	ba**^{m}b**a	ba**^{m}b**a	'fat'

As one can see, neither of these cognate sets is complete and the first one includes irregular sound correspondences [n]-[t] in addition. There is only one instance of this correspondence, compared to the stronger generalization in Set 1. The regularity of these can thus be questioned.

The next minor set concern the class of glides, given in (18). In absolute numbers these do not figure prominently enough to allow for regular correspondences to be established. In some instances a glide in Mee and Wodani correspondes to no consonant in Moni (cf. *ijo* : *ijo* : *iu*), in others these correspond to an /h/ in Moni (cf. *wijá* : *wijá* : *hija*). In yet other instances, all three languages show a corresponding glide (cf. *waja-i* : *waja tena* : *waja-ija*). Since for each of these correspondences there is only one complete cognate, it is not possible to draw definite conclusions. Based on the data from the incomplete cognates, I will however assume that glides in general were stable, similar to the correspondences in Set 8, 9, and 10. The two cognates *ijo : ijo : iu* and *wijá : wijá : hija* are then treated as exceptional.

(18) Set 12: J-J-J/∅/h

Mee	Wodani	Moni	
i**j**o	i**j**o	iu	'seed'
wijá	**wij**á	**h**i**j**a	'two'
wai**j**a-i	**w**a**j**a te-na	**w**a**j**a-ija	'to bite; to rob'
juma	**j**uma	-	'nose'
pi**j**a	pi**j**a	-	'three'
u**w**o	u**w**o	-	'water'
jooni-i	**j**ini-na	-	'to stand'
i**j**e	i**j**e	-	'leaf'
u**w**i-i	-	-u**w**a	'to go; to intent'

A more interesting cognate set links velars in Moni with the labiovelar glide in Mee. This will only become important for comparison at a higher level of comparison with Proto-Dani in section 4. Set 13 only has a sole member up to now.

(19) Set 13: w-∅-k

Mee	Wodani	Moni	
ju**w**i-i	ju-na	ju**k**-ija	'to hear'

3 A Reconstruction of Proto-Paniai Lakes

In this reconstruction, I will focus on the consonants of Proto-Paniai Lakes. After establishing the regular correspondence sets in 2, I will proceed by assigning proto-phonemes to the sets given in the previous section and thereby reconstructing the proto-forms. Their accuracy will be demonstrated by deriving all cognates in the daughter languages by a small set of sound changes.

3.1 Proto-Phonemes, Proto-Forms, and Sound Changes

The analysis will start with prenasalized stops. Here and below I present data in three columns. Forms reconstructed for Proto-Paniai-Lakes are listed in the first column. Mee and Wodani examples are presented in the second and third column respectively and Moni data follow in the fourth columns. The list of glosses in the fifth column indicates that these forms share a common meaning. As before, corresponding segments are in boldface.

(20) Set 1: *^{n}D > N-N-^{n}D

PPL	Mee	Wodani	Moni	
*$^{\mathbf{n}}$**d**i-	ne-**n**i-i	ne-**n**i-na	ni-$^{\mathbf{n}}$**d**i-ja	'give me'
*ani$^{\mathbf{m}}$**b**akai	ani**m**aka-i	ani**m**aka-na	a$^{\mathbf{m}}$**b**iki-ja	'to sit'
*he$^{\mathbf{n}}$**d**e	e**n**i-i	he**n**e-na	hi$^{\mathbf{n}}$**d**i-ja	'to say'

For Set (1), I reconstruct voiced prenasalized stops *^{m}b and *^{n}d as the proto-phonemes, because this can easily account for the outcomes in all three languages. Only Moni inherits this voiced prenasalized series, whereas it merges with the nasal stops in Mee and Wodani. This violation of the majority principle[3] deserves commenting here. It is difficult to derive the prenasalized stops from the nasal stops, because there is (a) no conditioning factor and (b) there are regular correspondences between nasals in all three languages for all positions (cf. Set 8). The combination of these two facts make a change from nasals to prenasalized stops in Moni improbable if not impossible.
The first change has to turn prenaslized voiced stops into nasal stops. As shown in (21), this change applies prenasalized voiced stops at the labial and coronal place of articulation in Mee and Wodani.

(21) Mee-Wodani Non-Dorsal Nasal Merger: *^{m}b, *^{n}d > m,n

This change already derives the actual Wodani forms for Set 1. Some of the Mee forms have to undergo an additional change of Mee h-Loss. A change from prenasalized voiced stops to nasal stops is phonetically plausible – a similar change has been proposed for the development from Proto-Hmong-Mien to East Hmongic Languages (Ratliff, 2015, 41). This change merges the voiced prenasalized stops with the inherited nasal stops.

Recall that the data in set 2 are split with regard to stress, because in Wodani we find a correspondent /t/ in unstressed syllables and a /^{n}d/ in stressed syllables. These are repeated as Set 2a and Set 2b below. Since they are in complementary distribution, we can argue for a single proto-phoneme /^{n}t/.

(22) Set 2: *^{n}T > T-T/^{n}D-^{n}D

a. Set 2a: stressed syllables

PPL	Mee	Wodani	Moni	
*$^{\mathbf{n}}$**t**ani	**t**ani	$^{\mathbf{n}}$**d**ani	$^{\mathbf{n}}$**d**ani	'hot'
*hi$^{\mathbf{n}}$**t**a	i**t**á	hi$^{\mathbf{n}}$**d**á	-	'road'
*$^{\mathbf{n}}$**t**i	e-**t**i-i	-	$^{\mathbf{n}}$**d**i-ja	'to say'

b. Set 2b: unstressed syllables

PPL	Mee	Wodani	Moni	
*u$^{\mathbf{n}}$**t**oma	u**t**oma	u**t**uma	o$^{\mathbf{n}}$**d**oma	'all'

[3]The majority principle dictates that one should choose as a reconstruction the sound that is attested in the majority of daughter languages in the cognate sets.

The voiceless prenasalized series is not actually attested in any of the Paniai Lakes languages, but it captures nicely the correspondence of voiceless stops in Mee and prenasalized stops in Wodani and Moni. The stress conditioned split in Wodani between voiceless stops and voiced prenasalized stops can also be seen as indirect evidence for this reconstruction. Again, this reconstruction violates the Majority Principle, and this is crucially dependent on the reconstruction of Set 1 as voiced prenasalized stops. This blocks a reconstruction of Set 2 as voiced prenasalized stops, since the sets have different reflexes in the daughter languages. Another argument against such a reconstruction is that it would require two changes for Mee, denasalization and devoicing. The present reconstruction only needs one change per language. Note also that the evidence for a labial voiceless prenasalized stop is only very scarce, cf. correspondence set 11.
In (23), I formalize the change in Wodani. In stressed syllables the voiceless prenasalized sound become voiced prenasalized (cf. (23) a.), whereas in unstressed syllables they become plane voiceless stops (cf. (23) b.).

(23) Wodani ^{N}T-Split:
a. $*^{n}T > {}^{n}D$ |_[+stressed]
b. $*^{n}T > T$ |_[-stressed]

The voiceless prenasalized stops thus show a more complex pattern than the voiced prenasalized stops. I assume that this sound change was conditioned by stress and thus constitutes a primary split. Both reflexes in Wodani merged with another already established category: voiceless stops and voiced prenasalized stops. The ordering is crucial here, because these new established voiced prenasalized stops did not merge with nasal stops as the ones in Set 1. The changes are made explicit in (25). A voiceless nasal becomes voiced in stressed syllables but non-prenasalized in unstressed syllables. One might think of this as retention of a marked contrast, i.e. prenasalization, in a prominent position. These changes again correctly derive the syncronic consonants of all cognates from Wodani in this set.
In Mee on the other hand Denasalization takes place. All voiceless prenasalized stops merged with voiceless plain stops in all positions. This is formalized in (24).

(24) Mee Denasalization: $*^{n}T > T$

The second change in Mee is now more regular than the change in Wodai for Set 2. The voiceless prenasalized stops simply merged with the plain voiceless stops. The same change was posited for East Hmongic Languages (Ratliff, 2015, 41). Again, this change yields correct results for Mee, unless another h-Loss step is missing.

In Moni on the other hand, this corresponence set only involves voiced prenasalized stops. Therefore, I posit a merger between voiced and voiceless sounds in (25), turning the voiced prenasalized stops at the labial and coronal place of articulation into voiced prenasalized stops.

(25) Moni Prenasalized Merger: $*^{n}T > {}^{n}D$

This change derives the correct surface forms for all attested reflexes in Set 2, given above. It is similar to the change that applied to the same proto-phonemes in Wodani in stressed syllables.

The dorsal stops form an exception to this reconstruction. I posit for Set 3, that the voicing difference in Moni is inherited from Proto-Paniai Lakes, but the two sounds

merged both in Wodani and in Mee. The reflexes are then /g/ in Mee and /ᵑg/ in Wodani.

(26) Set 3: *ᵑg/ᵑk > g-ᵑg-ᵑg/k

PPL	Mee	Wodani	Moni	
*oᵑ**k**o	o**g**o	oᵑ**g**ooto	o**k**o tagi	'neck'
*diᵑ**g**i	di**g**ii	diᵑ**g**i	diᵑ**g**i	'black, dark'

The third and last sound change needed to derive the Wodani data here concerns the dorsal prenasalized stops. They unconditionally turn into a voiced prenasalized stop. In (27), I term this change Wodani Dorsal Merger.

(27) Wodani Dorsal Merger: *ᵑk > ᵑg

Since the voiced and voiceless prenasalized stops merge into a prenasalized voiced one, one only needs to posit the voicing of the voiceless one (cf. (27)). This might seem like a special instance of the previous sound change in Wodani, but it is in fact different because the Dorsal Merger also applied in unstressed syllables, whereas the Wodani ᴺT-Split distinguished based on stress. We do not need to posit any additional consonantal changes to arrive at the actual Wodani forms.
Similarly, in Mee the two prenasalized dorsal sounds merge into a voiced plain stops. The merger is formalized in (29).

(28) Mee Dorsal Merger: *ᵑg, *ᵑk > g

The dorsal prenasalized stops thus show a different behavior from the other reflexes of the PPL prenasalized stops in Mee. Both of them merge into a plain voiced stop. This is unexpected for the voiceless one, where we could expect plain /k/ in Mee judging from the last sound change. The voiced one could be expected to shift to /ŋ/ but this sound is absent from the Mee consonant inventory as mentioned earlier. Structurally this change is similar to the Dorsal Merger in Wodani, thereby strenthening the closer relation between Mee and Wodani. This change derives actual Mee forms for the whole Set 3.
As in the other two languages, the dorsal prenasalized stops were exempt from this process in Moni. Moni inhereits the voiced dorsal prenasalized stop /ᵑg/ just like it inherits the other voiced prenasalized stops in Set 1. The voiceless stop *ᵑk however does not merge with the voiced version as expected. Instead it denasalizes and is attested as the voiceless stop /k/. The process formalized in (29) derives all actual attested forms in Moni (cf. above).

(29) Moni ᵑk-Denasalization: *ᵑk > k

For Set 4, I posit a proto-phoneme *h that was lost in Mee. The reconstructed PPL forms thus all begin with an *h in (30).

(30) Set 4: *h > ∅-h-h

PPL	Mee	Wodani	Moni	
***h**uma	oma	**h**uma	**h**oma	'stone'
***h**eⁿde	eni-i	**h**ene-na	**h**iⁿdi-ja	'to say'
***h**ijo	ijo	**h**ijo	-	'feather'
***h**iⁿta	itá	**h**iⁿdá	-	'road'
***h**ego	egó	**h**ego	-	'tooth'
***h**edi	edi	**h**idi	-	'rain'

Even though one could assume a position as a conditioning factor here, there is actually no other correspondence set that is in a complementary distribution, i.e. occurs only word medial, and also has a sensible phonetic relation to the reflexes of *h. Instead I will assume that *h only occured word initially in PPL. The posited change for Mee is a simple loss of the sounds *h in (31). An alternative hypothesis would be a process of insertion applying in Wodani and Moni. This cannot be true, since it would – counter to the fact – predict that Wodani and Moni prohibit words beginning with a vowel.

(31) Mee h-Loss: *h > ∅

The input for the last change, h-Loss, will be Stage 2, i.e. words that have already undergone Non-Dorsal-Merger and Denasalization. With this in mind the deletion of *h, yields actual attested forms for the whole Set 4. Loss of word initial /h/ is widely known to be a natural sound change, as exemplified by the development of several Romance languages.

For Set 5, repeated in (32), I assume a secondary split from *t, since there is a conditioning factor, i.e. Moni /s/ only appears where Mee and Wodani cognates include a sequence of a /t/ and a high vowel.

(32) Set 5: *t > t-t-s

PPL	Mee	Wodani	Moni	
***t**ina	**t**inee	**t**ina	**s**ena	'belly, body'
*u**t**u	u**t**u	-	u**s**a	'fire'
*pa**t**uka-	-	pa**t**uka ti-na	pa**s**uk-ija	'full'

The phonemic /s/ in Moni was thus innovated as an allophone of *t before high vowels, but later phonemicized in a secondary split by vowel changes obscuring the context, in this instance a vowel lowering rule. We can thus posit *t as the proto-phoneme for this correspondence set.

(33) Moni t-Assibilation: t > s | _ i,u

Similarly, vowel raising in certain contexts counterfeeds this change by creating contexts which look like the change should have applied, but it actually was too late. Assibilation before high vowels is a well known pattern in diachronic linguistics, see for examples the changes from Proto-Vanikoro to Vano metioned in Ross and Næss (2007). We do not need to posit any intermediate stage here to derive the output consonants.

The /k/s in Wodani and Mee correspond to the absence of a consonant or a glide in Moni. Therefore I reconstruct *k for these forms.

(34) Set 6: *k > k-k-∅

PPL	Mee	Wodani	Moni	
*ma**k**ai	ma**k**ai	ma**k**i	mai	'earth'
*k**k**agu	**k**agu	**k**agu	aka	'knee'
*e**k**a	e**k**a	e**k**ada	e**j**e	'name'
*po**k**a	po**k**ado	po**k**ode	po**j**a	'white'
*u**k**a	u**k**a	u**k**a	-	'louse'
*k**k**ado	**k**ado	-	ada	'bark, skin'

Even though this correspondence might not be exceptionless, it is easier to assume that the k-deletion in Moni was blocked under certain conditions, than to find a context description

for an insertion of /k/ in Mee and Wodani. Similarly, the different results do not require independent sound changes, if gliding applies to prevent an illicit vowel hiatus. The loss of *k in Moni is formalized in the rule in (35).

(35) Moni k-Loss: *k > ∅

This sound change k-Loss is less regular than the previous changes. As seen in forms like **patu**k**a* > *pasu**k**ija* (Set 5) or **ani^{m}ba**k**ai* > *a^{m}bi**k**ija* (Set 1), the change sometimes fails to apply. From the current set of data it is not possible to describe the conditions for the blocking. Another source of irregularity is vowel hiatus. I will assume that the intervocalic glide is only a secondary vowel hiatus resolution strategy and the primary process simply deletes a *k in any position, as formalized in (37). Since some of the outputs of this change require further changes, the result column is labeled stage 2. Interestingly, a similarly sporadic change has been reconstructed for several South Vanuatu languages (Lynch, 2001, 30-39).

This also allows us to reconstruct *g for Set 7, shown in (36). The voiced velar plosive is thus inherited without change in Mee and Wodani, but fortified to /k/ in Moni, as seen in (36).

(36) Set 7: *g > g-g-k

PPL	Mee	Wodani	Moni	
*g**g**i-	na-g**g**i-i	na-g**g**i-na	nu-k**k**i-ja	'to kill'
*pug**g**i	-pag**g**i	pig**g**i-na	puk**k**ija	'to walk, FUTURE'
*ag**g**oo	ag**g**oo	ag**g**oo	-	'moon'
*big**g**a	big**g**i	-	bek**k**a	'bird'
*eg**g**aa	eg**g**aa	-	ek**k**a	'blood, related by blood'
*tag**g**i	tag**g**i	-	tak**k**i	'root, sweet potato'

The difference in meaning between 'to walk' and the bound future morpheme can probably be reconstructed as a free verb, compare the discussion on Proto-TNG in section 4. The merger is schematized in (37).

(37) Moni Dorsal Merger: g > k

In fact, this last sound change is a rather complicated process. Speaking of a fortition from *g to /k/, as in (37), is a necessary simplification, since the allophones of this phoneme in Moni are mainly [k^{h}] word initially and [ɣ] between vowels (cf. subsection 2.1). A more detailed description would be to assume an inherited [ɣ] as an intervocalic allophone of /g/ already from some earlier stage of this language and word initial fortition of *g to [k^{h}] leading to a merger of the two phonemes only in combination with the loss *k. This derives the actual surface forms for Set 7 as shown in (36).

3.2 Summary

Given all the reconstructed forms, phonemes, and sound changes in the last subsections, it is possible to reconstruct all seven correspondence sets. Adding the Sets 11 and 12 this yields 55 cognate sets of which the consonants can be derived by this reconstruction. The reconstructed consonant inventory is given in (38). Proto-Paniai Lakes thus distinguishes four series of stops, voiced and voiceless each in a plain and a prenasalized version. All of these occured at a labial, coronal, and dorsal place of articulation. It should, however, be

noted that the evidence for a voiceless labial prenasalized stop is not as convincing as it is for the other stops. Apart from the two nasals, labial and coronal, the reconstruction only includes three other sound, summarized here as continuants. These include the labial and palatal glide as well as *h.

(38) Reconstructed PPL Consonant Inventory

	Labial	Coronal	Dorsal	Glottal
Prenasalized Stops	?*^{m}p *^{m}b	*^{n}t *^{n}d	*^{ŋ}k *^{ŋ}g	
Nasal stops	*m	*n		
Plain Stops	*p *b	*t *d	*k *g	
Continuants	*w	*j		*h

By stating that *h only occurs word initially in this reconstruction of PPL, we describe a phonotactic property of PPL. As for the restriction on dorsal prenasalized stops to word medial positions, these phonotactic constraints might actually vanish, if we compare more data, since the reflexes of these sounds generally show no restrictions in the daughter languages. The general pattern only allows open syllables of the form (C)V(V), like the daugter languages do.

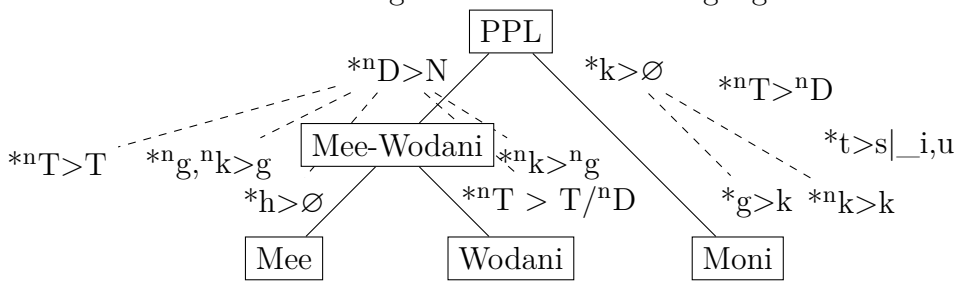
The changes in the daughter languages only modified the manner of articulation or voicing in the daughter languages. The sound changes to each daughter languages are summarized in (39). For more explanation confer the corresponding subsection. To derive the actual forms in Wodani we only have to use three sound changes. Wodani is thus the most conservative language of the three Paniai Lakes languages surveyed here. We need four sound changes to derive the correct forms for Mee, making it slightly less conservative than Wodani. Both languages share the Non-Dorsal Nasal Merger, a common innovation that might serve as a subgrouping argument for future research. Moni is the most innovative of the three Paniai Lakes languges surveyed here. Five sound changes set it apart from Proto-Paniai Lakes, none of which are shared with any of the other languages.

(39) Sound changes from PPL to daughter languages

	...to Mee	...to Wodani	...to Moni
Set 1:	*^{n}D > N	*^{n}D > N	-
Set 2:	*^{n}T > T	*^{n}T > T/^{n}D	*^{n}T > ^{n}D
Set 3:	*^{ŋ}g, *^{ŋ}k > g	*^{ŋ}k > ^{ŋ}g	*^{ŋ}k > k
Set 4:	*h > ∅	-	-
Set 5:	-	-	*t > s | _i,u
Set 6:	-	-	*k > ∅
Set 7:	-	-	*g > k

Some of these changes can be ordered relative to one to another. Relative order is shown in (40) by the vertical dimension for nodes that are connected by a dashed edge.

(40) Relative order of sound changes in Paniai Lakes languages



It is relatively clear that the Nasal Merger as a common innovation of Mee and Wodani is the defining feature of this subgroup. For Mee this is the only ordering relation that can be established, because the other sound changes do not interact. For Wodani the argument for ordering the Nasal Merger before other sound changes is strengthened by a counterfeeding argument. If the ᴺT-Split and the Dorsal Merger produced prenasalized voiced sounds before Nasal Merger we would expect them to merge with nasal stops just like other prenasalized voiced sounds. Since this is not true, ᴺT-Split and Dorsal Merger in Wodani have to be ordered after Nasal Merger. In Moni t-Assibilation and Prenasalized Merger cannot be ordered with respect to any other change, since they do not interact with any of them. It is crucial however that k-Loss precedes both ᵑᵍk-Denasalization and Dorsal Merger since these changes are again in a counterfeeding relation. If one of the two later changes would produce a /k/, this sound would be lost through k-Loss. We can thus exclude this reverse ordering.

4 Discussion

It is beyond the scope of this paper to give a full acount of the discussion concerning the Trans-New-Guinea Family or historical linguistics in Papua. A concise summary can be found in Pawley (2005). Instead I will highlight the discussion about the applicability of the Comparative Method and the Irian-Highlands family. The second subsection will compare the result of the present reconstruction with other related work.

4.1 The Comparative Method for Trans New Guinea languages

Early work on Papuan languages (in the time of the first scientific description of these languages) often relied on lexico-static analysis to uncover diachronic relations between Papuan languages. This was also conducted for Proto-Paniai Lakes (Larson and Larson, 1972) and Proto-Dani (Bromley, 1967), and even Proto-Irian Highlands (Larson, 1977). As Pawley (2005) points out, this choice was mostly due to the lack of data. The necessity of diachronic research based on the comparative method was acknowledged, but postponed (Larson, 1977, 29).

Later discussion was much more pessimistic. Even though low level results were accomplished, researchers remained sceptical for higher level groupings. Exceptionally massive borrowings were often seen as an obstacle for the application of the comparative method and as an alternative explanation for proposed cognate sets (Foley, 1986). Wurm (1982) major work assigned a lot of cognates to possible substrate influences. Language mixing and substrate-superstrate interactions would obscure genetic relations beyond detectability. The comparative method and the tree model would thus be inappropriate.

Recently Pawley (2005, 2012); Ross (2005) have proposed a more top-down approach to the reconstruction of Trans-New-Guinea. Without denying the general applicability of the comparative method, they assume that a top-down approach yields more promising results at this stage of the research. This means that languages from all over Papua are compared to reconstruct a proto-Trans New Guinea language before reconstructing intermediate proto-languages. Ross (2005) focuses on the reconstruction of pronouns, since they (a) are in a paradigmatic relation and (b) show obvious similarities between geographically distant languages. A major problem pointed out by Hammarström (2012) becomes evident when considering the extremely small consonant inventories of many Papuan languages. This drastically increases the probability of similar consonants in pronouns and thus renders some of the results of Ross (2005) statistically insignificant. For exactly this reason I have excluded pronouns from the reconstructions above. Ross (2005) also mentions Paniai Lakes as part of the West Papuan Linkage, stemming from a dialect cluster for which no proto-language can be reconstructed.

In this paper I have argued, that it is possible with the current amount of data on Papuan languges to apply the comparative method to establish subgroupings of the Trans New Guinea family.

4.2 Comparison with Other Work

Auye is a related language, that is usually assigned to the Paniai Lakes family. Unfortunately the only published material on the language is Moxness (2011), a paper that deals mainly with pragmatics and morphosyntax. However, it is possible, from the text examples and the small introduction to Auye phonology given there, to identify some cognates that match the proto-forms established in tis paper. These are given in the table below. There is not enough data to establish regular sound correspondences. Access to more Auye data might allow a more elaborated reconstruction of Proto-Paniai Lakes.

(41) Cognates in Auye

Auye	PPL	
idima	*u^{n}toma	'all'
ama	*ama	'breast'
me(e)	*me-	'to come'
no-/na-	*no	'to eat, to drink'
magaa	*makai	'ground'
wugi	*gi-	'to kill'
mèe	*mee	'man'
asi	*^{n}ti	'to say'
ome	*umi	'to sleep'
wija	*wija	'two'
ma	*ma	'what'
ebo	*ebo	'big'
bedo	*bedo	'bird'
boo	*boko-	'to die'
ije	*ije	'leaf'
ena	*ena	'one'
dee-/di-	*do-	'to see'
digiyoo	*di^{ŋ}gi	black, dark
taa	*tau	'not'
pee-/po-	*pugi	'to go, to walk'

Some slight tendencies can be detected. Some *k are deleted (**boko* > *boo*), whereas others seem to gain voicing **makai* > *magaa*. Prenasalized stops are merged with plain stops, but it is not yet possible to predict their voicing. Moxness (2011) analyzes [s] synchronically as an allophone of /t/ before front vowels. Other consonant correspondences are difficult to determine. If one could get access to the Moxness's unpublished grammar sketch of Auye, cited in several recent works, it might be possible to establish regular correspondences and improve the reconstruction of Proto-Paniai Lakes.

The Greater Dani language family is often seen as closest related to Paniai Lakes (Larson, 1977), the two forming together the Irian-Highlands family. The consonant inventory for Proto-Dani reconstructed in Bromley (1961) is given in (42).[4] Unfortunately Bromley reconstructs just a phoneme inventory and mentions reconstructed proto-forms only in passing. Even though he gives regular correspondences in Bromley (1961) and cognate sets in Bromley (1967) the two works do not match up enough to reconstruct proto-forms based on the descriptions. Future work with access to more resources might yield more details here.

[4]Some adjustments and reinterpretations in terminology and representations have been made: *gingival* has been changed to the contemporary term *alveolar*. The *voiced* stops are represented as prenasalized, following the descriptions in the text. All non-IPA symbols were changed to the corresponding IPA symbols.

(42) Proto-Dani Consonant Inventory (Bromley, 1961, 6-8)

	Labial	Alveolar	Velar	Labio-Velar
Prenasalized stops	*^{m}b	*^{n}d	*^{ŋ}g	*^{ŋ}g^{w}
Aspirated stops	*p	*t	*k	*k^{w}
Voiced implosive stops	*ɓ	*ɗ		
Nasals	*m	*n	*ŋ	
Laterals		*l		
Glides	*w	*j		

Comparing the reconstructed consonant inventories however already shows several similarities. Both proto-languages show a series of prenasalized stops contrasting with both voiced and voiceless stops. The lack of reconstructed fricatives is especially astonishing since for both language families certain daughter languages innovated fricatives.
The differences do not outweigh the similarities. Minor differences are the lack of a dorsal nasal for Proto-Paniai Lakes contrasting with its presence in Proto-Dani. The same is true for the alveolar lateral, where Proto-Paniai Lakes even lacks laterals alltogether. Both of these sounds have merged with other phonemes in several of the Proto-Dani languages (Bromley, 1961). The voiced series in Proto-Dani is additionally imploded; a similar allophonic realization is found in Paniai Lakes languages (cf. subsection 2.1). On the other hand Proto-Dani lacks a velar voiced stop, which can be clearly reconstructed for Proto-Paniai Lakes. A similar comparison can be made for *h. The most obvious difference is however the series of labiovelar stops in Proto-Dani that is compeletely missing in Proto-Paniai Lakes, but recall from section 2 (Set 10, repeated in (43)) that a minor correspondence set in the Paniai Lakes languages might actually hint at some labiovelars in Proto-Paniai Lakes. These two observations – the general similiarity in the reconstructed phoneme inventory and the possibility of labio-velars in PPL can also be taken as a putative argument in favor of a Irian-Highlands family and against a flat structure as assumed in the West-Papuan-Linkage approach by Ross (2005). Future research on the reconstruction of Proto-Irian Highlands might determine if this connection holds up to closer scrutiny.

(43) Labio-Velars in Proto-Paniai Lakes?

PPL	Mee	Wodani	Mee	
*ju**g^{w}**i	ju**w**i-i	ju-na	ju**k**-ija	‘to hear’

The last step shall be a connection to a more top-down reconstruction. Pawley (2005) summarizes a set of proto-forms reconstructed for Proto-TNG. A cursory look at the wordlist provided by Pawley (2005) for Proto-Trans New Guinea reveals several forms, which are stunningly similar to the forms reconstructed here for Proto-Paniai Lakes. Prenasalized stops were adjusted to the IPA notation used above. It is however at this point – due to the scarcity of data – not possible to identify any regular sound correspondences.

(44) Similar proto-forms in Proto-TNG (Pawley, 2005) and PPL

Proto-TNG	PPL	
*amu	*ama	'breast'
*iti	*ije	'leaf'
*ka^{n}dap(u)	*kado	'skin, bark'
*i^{n}da	*utu	'fire'
*maka	*makai	'ground'
*me-	*me-	'come'
*na-	*na-	'eat, drink'
*pu-	*pugi-	'to go, walk'
*^{n}de	*^{n}ti, he^{n}de	'to say'

5 Conclusion

In this paper I have argued that the bottom up comparative method is indeed applicable to Papuan languages and serves to establish higher order subgroupings inside the Trans New Guinea language family. These results weaken the arguments of opponents of the comparative method, who have used exactly these languages, the Paniai Lakes languages, to illustrate their claims. By reconstructing the consonants of Proto-Paniai Lakes this paper also aims to support future researchers to establish higher order groupings and improve the reconstruction of Proto-Trans New Guinea.

References

Bromley, Myron. 1961. *The Phonology of Lower Grand Valley Dani*. 's Gravenhage: Martinus Nijhoff.

Bromley, Myron. 1967. The linguistic relationship of Grand Valley Dani: A lexicostatistical classification. *Oceania* 37(4):286–308.

Doble, Marion. 1987. A desription of some features of Ekari language structure. *Oceanic Linguistics* 26:55–113.

Foley, William A. 1986. *The Papuan languages of New Guinea*. Cambridge: Cambridge University Press.

Foley, William A. 2000. The languages of New Guinea. *Annual review of anthropology* 29(1):357–404.

Fox, Anthony. 2015. Phonological reconstruction. In *The Oxford Handbook of Historical Phonology*, edited by Patrick Honeybone and Joseph Salmons, 49–71. Oxford: Oxford University Press.

Hammarström, Harald. 2012. Pronouns and the (preliminary) classification of Papuan languages. *Journal of the Linguistic Society of Papua New Guinea* Special Issue: Languages and Linguistics in Melanesia(2):428–539.

Kalyan, Siva and Alexandre François. 2018. Freeing the comparative method from the tree model: A framework for historical glottometry. In *Let's talk about trees: Genetic*

Relationships of Languages and Their Phylogenic Representation, edited by Ritsuko Kikusawa and Lawrence Reid, 59–89. Osaka: National Museum of Ethnology.

Kessler, Brett. 2015. Computational and quantitative approaches to historical phonology. In *The Oxford Handbook of Historical Phonology*, edited by Patrick Honeybone and Joseph Salmons, 133–148. Oxford: Oxford University Press.

Larson, Gordon. 1977. Reclassification of some Irian Jaya highlands language families: A lexicostatical cross-family subclassification with historical implications. *Irian* VI(2):3–40.

Larson, Gordon and Mildred Larson. 1958. Preliminary studies in the Moni language. *Bijdragen tot de Taal-, Land -en Volkenkunde* 114(4):406–431.

Larson, Gordon and Mildred Larson. 1972. The Ekagi-Wodani-Moni language family of West Irian. *Irian* 1(3):80–95.

Lynch, John. 2001. *The linguistic history of southern Vanuatu*. Canberra: Pacific Linguistics.

Maddieson, Ian. 2013. Absence of common consonants. In *The World Atlas of Language Structures Online*, edited by Matthew S. Dryer and Martin Haspelmath. Leipzig: Max Planck Institute for Evolutionary Anthropology.

Moxness, Michael. 2011. Morphosyntactic correlates of reference in Auye. *SIL Electronic Working Papers* 3:1–45.

Pawley, Andrew. 2005. The chequered career of the Trans New Guinea hypothesis: recent research and its implications. In *Papuan Pasts: cultural, linguistic and biological histories of Papuan-speaking People*, edited by Andrew Pawley, Robert Attenborough, Jack Golson, and Robin Hide, 67–106. Canberra: Pacific Linguistics.

Pawley, Andrew. 2012. How reconstructible is Proto Trans New Guinea? problems, progress, prospects. *Journal of the Linguistic Society of Papua New Guinea* Special Issue: Languages and Linguistics in Melanesia(1):88–164.

Ratliff, Martha. 2015. Word initial prenasalization in Southeast Asia. In *Languages of Mainland Southeast Asia*, edited by N.J. Enfield and Bernhard Comrie, 31–50. De Gruyter Mouton: Berlin/Boston.

Ross, Malcolm. 2005. Pronouns as a preliminary diagnostic for grouping Papuan languages. In *Papuan Pasts: cultural, linguistic and biological histories of Papuan-speaking People*, edited by Andrew Pawley, Robert Attenborough, Jack Golson, and Robin Hide, 15–65. Canberra: Pacific Linguistics.

Ross, Malcolm and Åshild Næss. 2007. An Oceanic origin for Äiwoo, the language of the Reef Islands? *Oceanic Linguistics* 46(2):456–498.

Takimai, Hubertus. 2015. *Kamus Praktis: Bahasa Mee - Indonesia [Practical Dictionary: Mee language - Indonesian]*. Mimika Baru, Papua, Indonesia: Penerbit Aseni.

Trask, Larry and Robert McColl Millar. 2015. *Trask's Historical Linguistics*. London: Routledge, 3 edition.

Wurm, Stephen. 1982. *Papuan languages of Oceania*. Tübingen: Gunter Narr.