1 Introduction

Bonggi is a Western Malayo-Polynesian language spoken in Sabah, Malaysia. Word-final nasals are either simple [m], [n] and [ŋ], or preploded [ⁿm], [ⁿn] and [ⁿŋ] depending upon the nasalization of the preceding vowel. Word-final nasals are simple if the preceding vowel is nasalized as in (1).

1. (1) onom /ə.nəm/ [ˈɔn̥m] ‘six’
   mien /mi.ən/ [ˈmiŋən] ‘aunt’
   tingaang /ti.ŋə.aŋ/ [tiŋ̥aŋ] ‘scorpion’

Final nasals are preploded if the preceding vowel is non-nasalized as in (2).

2. (2) agubm /a.guːm/ [aɡ̊wɒm] ‘type of shellfish’
   Sandahadn /san.da.kan/ [sənˈdaŋdən] ‘Sandakan’ (city)
   adakng /a.dəŋ/ [að̥kŋ] ‘charcoal’

Nasality is initiated by the articulation of a nasal consonant and continues irrespective of syllable boundaries until checked (Robins 1957:90). Nasality (Robins 1957), nasal harmony (Court 1970) and nasal spread (Walker & Pullum 1999) refer to the spread of the feature [+nasal] to underlying non-nasal segments. As seen in (3), nasal spread persists from a nasal consonant through the word until it is blocked by a word boundary or a non-nasal consonant. Thus, nasal spread nasalizes vowels across syllables. Semivowels, for example, /j/ in (3c) and /w/ in (3d), do not block nasal spread.

3. (3) a. naga’ /na.gaʔ/ [ˈnɑɡɔʔ] ‘dragon’
   b. nana’ /na.naʔ/ [ˈnɑn̥ʔ] ‘pus’
   c. minyen /mi.nə.jen/ [ˈmiŋ̥jen] ‘son/daughter-in-law’
   d. nyawa /nja.wa/ [ˈnɑwɔ] ‘life; soul’

Nasal spread and nasal preplosion occur when affixation takes place as seen in (4) and (5). Nasal spread is illustrated in (4a), (4b), (4c) and (5a), whereas nasal preplosion is illustrated in (4b), (5b) and (5c). The final nasal is not preploded in (4a) and (5a) since the preceding vowel is nasalized.

4. (4) a. naan /ŋ/ + /saan/ [ˈnəŋ] ‘ACT.IND.SOA-carry.on.shoulder’
   b. ngorikng /ŋ/ + /kəriŋ/ [ŋwɔɾiŋ] ‘ACT.IND.SOA-dry’
   c. masa’ /ŋ/ + /ba.səʔ/ [ˈməsəʔ] ‘ACT.IND.SOA-wash’
(5) a. inumun /inum/ + /ɔn/ [i'numɔn] ‘drink-UND.IND.SOA’
b. lebohodn /lobɔk/ + /ɔn/ [lo'bɔchɔn] ‘pound.with.pestle-UND.IND.SOA’
c. atadadn /atad/ + /ɔn/ [ɔ'tadɔdn] ‘bring-UND.IND.SOA’

Nasal spread (e.g. (6a)) and nasal prelosion (e.g. (6b) and (6c)) also occur in monosyllabic words.

(6) a. man /man/ [ˈmɔn] ‘why’
b. bakng /baŋ/ [ˈbɔŋ] ‘if’
c. fudn /pun/ [ˈpʊdn] ‘also’

Since the nasality of the preceding vowel determines whether or not final consonants are simple or preplaced, an important question is, what blocks nasal spread? Different linguists including Robins (1957), Scott (1964), Court (1970), Blust (1997) and Walker & Pullum (1999) have pointed out various phonetic features which block nasal spread. This paper offers an explanation for the occurrence of preplaced nasals in certain Bonggi words. To my knowledge, the explanation offered here has not been previously proposed for any other language. I show that some Bonggi words have an underlying /l/ which blocks nasal spread; the /l/ then metathesizes and palatalizes resulting in forms as in (7).

(7) noidn /oŋ/ + /tolɔŋ/ [nɔidɔŋ] ‘ACT.IND.SOA-swallow’
moindn /oŋ/ + /bɔlun/ [ˈmɔdɔŋ] ‘ACT.IND.SOA-fold.clothes’
neidn /oŋ/ + /salin/ [ˈnɔidɔŋ] ‘ACT.IND.SOA-change.clothes’

In (7), nasal spread is initiated by the word-initial nasal (cf. (4)). The word-final nasals in (7) are preplaced despite the fact that there are no surface phonetic consonants to block nasal spread. Since only vowels occur between word-initial and word-final nasals in (7), one would expect both vowels to be nasalized and the final nasal to be simple as in naan [ˈnɑn] ‘ACT.IND.SOA-carry.on.shoulder’ in (4a). Instead, prelosion occurs in noidn [nɔidɔŋ] ‘ACT.IND.SOA-swallow.something’ and the other forms in (7) just as it does in toidn [ˈtɔidɔŋ] ‘jungle’.

This paper accounts for ‘apparent’ exceptions like those in (7) by showing how an underlying /l/ blocks nasal spread in these forms. Subsequently, the /l/ is metathesized and then palatalized to [i]. This non-nasalized [i] then provides the proper environment for nasal prelosion.

Bonggi has sixteen underlying consonants /p t k ṭ b d g s dʒ m n l r w j/, one of which is borrowed (/dʒ/), and five underlying vowels /i u ə a/. Stress is predictable; it falls on the penultimate syllable of multisyllabic words as in (8).
(8) onsi /ɔn.si/ ['onʃi] 'contents; flesh'
  took /tok/ ['toʃ] 'ripe'
sulufi' /su.lu.pi?/ ['suˌlu.ʃi?] 'small locally-made purse'

2 Elements which block or trigger nasal spread

2.1 Robins (1957)

Nasality in Sundanese is blocked by a word boundary (Robins 1957:90). If word boundaries did not block nasal spread in Bonggi, the vowels in iudn ‘hammock’ in (9) would be nasalized and the final nasal would not be preploded.

(9) Sia m-asakng iudn.8
    sia ŋ-pasaŋ iun
  3SG.NOM ACT.IND.SOA-install hammock
  'He will install a hammock.'

Nasality in Sundanese is blocked by consonants other than /h/ and /ʔ/ (Robins 1957:90). In Bonggi, glottal stop /ʔ/ is restricted to word-final coda position (e.g. /su.lu.pi?/ 'small locally-made purse' in (8)); thus, it is irrelevant for blocking word-medial nasal spread. /k/ weakens to [h] intervocally in unstressed syllables as in (10).

(10) fakahas /pakakas/ [ff̪akah̪as] 'tools; equipment'
tikuhur /tikukur/ [ti̲kuˈuhur] 'spotted dove'
lebohdn /lɔbɔk/ + /ɔŋ/ [lɔˈbɔχdŋ] 'pound.with.pestle-
    UND.IND.SOA'
ngelobok /ŋ/ + /lɔbɔk/ [ŋo̲lɔbɔk] 'ACT.IND.SOA-
    pound.with.pestle'

In Bonggi, [h] blocks nasal spread as in (11).

(11) manahadn /manakan/ [mɔn̪aŋdŋ] 'nephew; niece'
  ngahudn /ŋ/ + /akun/ [ŋaŋ}dŋ] 'ACT.IND.SOA-admit'
  mohodn /əm/ + /okon/ [mɔŋɔŋ] 'ACY-eat'11

Nasal prefixes and infixes trigger nasality in Sundanese (Robbins 1957:93) and in Bonggi. In (12a) and (12d) the final nasal is preploded since the preceding vowel is non-nasalized, whereas the affixes in (12b), (12c), (12e) and (12f) trigger nasal spread which results in the final nasal being simple since the preceding vowel is nasalized.12

(12) a. iudn /iun/ [iudŋ] 'hammock'
    b. ngiun /ŋ/ + /iun/ [ŋiŋən] 'ACT.IND.SOA-swing.in.
      hammock'
    c. iniun /iŋ/ + /iun/ [iŋiŋən] 'REALIS-swing.in.hammock
      -UND.IND.SOA'
2.2 Scott (1964)

A number of Bukar-Sadong forms have word-final preplo- ded nasals even though they are preceded by a nasal consonant with no intervening consonant to block nasal spread. Such forms often correspond to a Malay or Sea Dayak word which contains a word-medial consonant cluster consisting of a nasal followed by a homorganic stop as in (13). "The presence of a stopped final nasal in a word that has a medial nasal consonant always indicates that this medial nasal is not simple" (Scott 1964:434).

(13) 

<table>
<thead>
<tr>
<th>Bukar-Sadong</th>
<th>Malay</th>
<th>Sea Dayak</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. [emudn]</td>
<td>‘dew’</td>
<td>embun</td>
</tr>
<tr>
<td>b. [ena:ugn]</td>
<td>‘prawn’</td>
<td>udang</td>
</tr>
<tr>
<td>c. [banugn]</td>
<td>‘tapioca’</td>
<td>undang</td>
</tr>
</tbody>
</table>

Bonggi has a few forms, including those in (14), which can only be accounted for in terms of Malay correspondences. On the one hand, as we would expect from what has been said thus far, the final nasal in (14a) is preploled since the preceding vowel is non-nasalized. On the other hand, we do not expect the final nasal in (14b) and (14c) to be preploled since the affixes - and -in- trigger nasal spread (cf. (12)). (14b) contrasts with the regular forms in (4a), (12b) and (12e), while (14c) contrasts with the regular forms in (12c) and (12f). Malay /h/ > Ø in Bonggi; e.g., Malay haram ‘forbidden’ is realized as [arəm] in Bonggi. The irregular forms in (14b) and (14c) are accounted for by reference to history because there is no surface consonant to block the nasal spread triggered by the affixes. The presence of /h/ in the protoform blocks nasalization in the following vowel, which in turn provides the proper environment for nasal preplosion.

(14) a. taadn  /taan/ [tɑːdɒn] ‘endure’ (Malay tahan)  
b. naadn  /ɲ/ + /taan/ [nɑːdɒn] ‘ACT.IND.SOA-endure’  
c. tinaadn  /in/ + /taan/ [tɪnɑːdɒn] ‘REALIS-endure-UND.IND.SOA’

Glottal stop [ʔ] does not block nasality in Bukar-Sadong, but in some cases [h], [j] and [w] do block nasality (Scott 1964:435). (11) shows that [h] blocks nasal spread in Bonggi, whereas (15) shows that [j] and [w] do not block nasal spread.
(15) minyen /mi.njen/ [minjen] ‘son/daughter-in-law’
     nyawa /nia wa/ [na wal] ‘life; soul’

Borrowed words are treated like native Bukar-Sadong
words in terms of final nasal consonants (Scott 1964:435). As
seen in (16), many borrowed words in Bonggi are treated like
native words in terms of preplosion. However, as seen in (17),
mono-syllabic borrowed words are not preploled.

(16) garabm /ga ram/ [garbam] ‘salt’ (Malay garam)
     bawakng /ba wan/ [bawak ng] ‘onion’ (Malay bawang)
     Mirihadn /mi ri kan/ [mirihadn] ‘American’
     simin /si min/ [simin] ‘cement’

(17) bing /bin/ [bin] ‘bank’
     bam /bam/ [bam] ‘bomb’ (Malay bom)
     sing /sin/ [sin] ‘zinc’ (Malay zing)

2.3 Court (1970)

Court (1970) discusses phonetic characteristics or ‘nasaliza-
tion laws’ in Western Malayo-Polynesian languages. His first
law maintains that vowels are nasalized following nasal conso-
nants (1970:204) (cf. (3)). Court’s second law of nasalization
states that voiced stops disappear following homorganic nasal
consonants (1970:205). He cites data from a number of
sources including Scott (1964) (cf. (13)). Court’s third law as-
serts that, “When a voiced stop drops out according to the
second law, the nasal consonant never projects its nasality onto
any following vowel” (Court 1970:205). While Court’s third
law provides an explanation for preplosion in the Bukar-
Sadong forms in (13), it does not account for the forms in (14b)
and (14c) since they do not involve the loss of a voiced stop.

Court’s fourth law is, “Nasality may persist until it encoun-
ters an oral contoid. Specifically it may persist through vo-
coids, syllabic and non-syllabic ([w, j]) and laryngeals ([?, h])”
(1970:206). Court distinguishes languages in which semivo-
welks and laryngeals do not block nasal spread from those in
which they sometimes block nasal spread. While Robins
(1957), Scott (1964) and Court (1970) show that [h] does not
block nasal spread, (11) shows it does in Bonggi.

Court’s fifth law claims that where nasality could by law
four run on from a nasal consonant in the penultimate syllable
into the last syllable and yet fails to do so in certain words, the
initial nasal in such words corresponds to a sequence of nasal +
homorganic voiced stop in other languages/dialects
Court’s sixth law states that in some languages final nasal consonants are preploded when preceded by a non-nasalized vowel. His evidence is from a number of Land Dayak languages of Borneo (cf. Topping 1990:262ff.).

2.4 Blust (1997)

Blust (1997) provides the most comprehensive picture to date of nasalization in Borneo. He points out that nasal spread is onset-driven in most Austronesian languages. That is, nasal spread is initiated by a syllable onset. This is the case in Bonggi. If nasality was coda-driven resulting in anticipatory nasalization, then the vowel in the first syllable of the forms in (18) would be nasalized.

(18) Sandahadn /san.da.kan/ [son'dahɔ̃n] ‘Sandakan’ (city)
onsi /ɔn.si/ [ɔnʃi] ‘contents; flesh’
ontokng /ɔn.tɔŋ/ [ɔntɔŋ] ‘type of plant’

Blust (1997:152) shows that in Uma Juman Kayan three types of consonants are transparent to nasal harmony: 1) semivowels /j/ and /w/; 2) glottal stop /ʔ/ and glottal spirant /h/; and 3) the liquid /l/ (Blust 1977:83).

Blust (1997:168) reaches the following conclusions regarding nasal preplosion in Austronesian languages: a) Nasal spread is onset-driven; b) Preploded nasals develop from earlier simple nasals; c) Preploded nasals are only found word-finally; d) Nasal preplosion is suspended in a syllable which begins with a nasal consonant; and e) In time preplod nasal nasals simplify to homorganic voiceless stops. Bonggi meets all of these criteria with the exception of (e).

Blust claims that two phonological conditions have a strong tendency to suspend nasal preplosion. First, preploded nasals do not occur if the syllable onset is a nasal consonant. His explanation is, “If nasal harmony is onset driven it would nasalize the next vowel, and so suspend preplosion in a succeeding nasal” (Blust 1997:172). Second, in some languages preploded nasals do not occur following long vowels. (19) shows that Bonggi meets the first condition, whereas (20) shows that it does not meet the second condition.

(19) onom /ɔ.nɔm/ [ɔnɔm] ‘six’
man /man/ [mɔn] ‘why’
inumun /inum/ + /ɔn/ [i'nʊm wɔn] ‘drink-UND.IND.SOAR’

(20) tingaang /ti.ŋa.ŋ/ [tiŋŋaŋ] ‘scorpion’
gibiidn /gi.bi.in/ [ɡi'biiŋ] ‘afternoon’
fiudn /pu.un/ [fuuŋ] ‘tree’
2.5 Walker & Pullum (1999)

Walker & Pullum (1999) discuss Cohn's (1990, 1993) analysis of nasal spread in Sundanese along with nasal spread in other languages. They consider several potential nasalization hierarchies and conclude that the hierarchy in (21) is best (Walker & Pullum 1999:775).

(21)
Vowels Laryngeals Semivowels Liquids Fricatives Obstruent Stops
← high —— compatibility with nasalization —— low →

Walker & Pullum (1999) locate laryngeals between vowels and semivowels in the nasalization hierarchy. They define laryngeals as a phonological classification of glottal segments, whereas glottal refers to the phonetic segments [ʔ] and [h] independent of their phonological patterning. Following Walker & Pullum’s (1999:776) explanation for Tereno (Arawakan), although [h] in Bonggi is realized phonetically with glottal articulation, it corresponds phonologically to a voiceless stop which is highly incompatible with nasalization, rather than being grouped with the phonological class of laryngeals, which pattern more closely with semivowels.

3 Preplosion in forms without a blocking consonant

3.1 Vowel harmony

Bonggi vowel harmony (VH) has been described in Kroeger (1992). As Kroeger (1992:286) points out, high vowels /i/ and /u/ as well as the mid vowel /ɔ/ can spread in Bonggi. VH operates in terms of the affects of root vowels on affixes; i.e., root vowels are the controlling vowels. Only non-high vowels can be targeted for VH. Spreading is bi-directional.

Kroeger (1992:287) posits two vowel harmony rules. Kroeger's first rule spreads high vowels /i/ and /u/ to replace mid vowels /ɔ/ and /ɔ/. High vowels may spread either from right to left as in (22a) and (22b), or from left to right as in (23a) and (23b) (allophonic alternations are suppressed for simplicity). The suffix vowel in (23a) and (23b) is a copy of the controlling vowel which is the last vowel in the root.

(22) Causative prefix /pɔ/:
  a. /pɔ/ + /biːɲ/ 'to separate' pibiaŋ ‘cause to separate’
  b. /pɔ/ + /buɲuʔ/ 'to fight' puņiʔ ‘cause people to fight’
  c. /pɔ/ + /laŋgu/ 'length' pɔlaŋgu ‘to lengthen something’
(23) Undergoer suffix /ən/ ‘UND.IND.SOA’:
   a. /piliʔ/ ‘to select’ + /ən/ piliin ‘select.someone’
   b. /bunuʔ/ ‘to fight’ + /ən/ bunuun ‘scold.someone’
   c. /abat/ ‘answer’ + /ən/ abaton ‘answer.someone’

Kroeger’s second rule spreads the mid back vowel /ə/ to replace non-high vowels. This rule only applies from left to right as in (24) and (25) (again, allophonic alternations are suppressed for simplicity). Mid vowel right (MidVR) affects both mid vowels as in (24) (cf. (23)) and low vowels as in (25a) and (25b) (cf. (25c) and (25d)).

(24) Undergoer suffix /ən/ ‘UND.IND.SOA’:
   /lobok/ ‘to pound’ + /ən/ lòbokon ‘pound.with.pestle’
   /sokom/ ‘to soak’ + /ən/ sokomon ‘soak.something’

(25) Undergoer imperative suffix /aʔ/:
   a. /lobok/ ‘to pound’ + /aʔ/ lòbokoʔ ‘pound it with pestle!’
   b. /sokom/ ‘to soak’ + /aʔ/ sokomoʔ ‘soak it!’
   c. /dindin/ ‘wall’ + /aʔ/ dindiŋaʔ ‘construct the wall!’
   d. /abat/ ‘answer’ + /aʔ/ abataʔ ‘answer!’

High vowel right (HiVR) is illustrated in (26) by the derivation for inumun [i’nùm’ùn] ‘drink-UND.IND.SOA’. Mid vowel right (MidVR) is illustrated with the derivation for lebohodn [lə’b’w’çoʔd’n] ‘pound.with.pestle-UND.IND.SOA’. VH does not occur if the final vowel of the root is /a/ (e.g. atadadn [ə’tadə’d’n] ‘bring-UND.IND.SOA’ in (26)).

(26) Underlying form /inum/ + /ən/ /lobok/ + /ən/ /atad/ + /ən/
   HiVR inumun lòbokon
   MidVR
   Nasal spread inùmùn
   Stress i’nùmùn lə’b’koʔən a’tdən
   Neutralization lə’b’koʔən ə’tadən
   Final /ə/ weakening ə’tadən
   High vowel laxing i’nùmùn
   Fricativization lə’b’koʔən
   Labialization i’nùm’ùn lə’b’w’çoʔən
   Nasal preplosion lə’b’w’çoʔəd’n ə’tadə’d’n
   Derived form [i’nùm’ùn] [lə’b’w’çoʔəd’n] [ə’tadə’d’n]
The suffix /-a/? is not a target for HiVR as seen by the derivation for *indura?* [in'dura?] ‘move it!’ in (27). However, /-a/? is a target for MidVR as seen by the derivation for *leboho?* [leboho] ‘pound it with a pestle!’. When the final vowel of the root is /a/, neither HiVR nor MidVR apply as seen by the derivation for *etada?* [e'tada?] ‘bring it!’.

(27) Underlying form /indur/ + /a/? /lobok/ + /a/? /atad/ + /a/?
MidVR lobok?
Stress in'dura? lobok? a'tada?
Neutralization lobok? e'tada?
Final /a/ weakening in'dura? e'tada?
High vowel laxing in'dura?
Fricativization loboh?
Labialization lob'woho?
Derived form [in'dura?] [lob'woho?] [e'tada?]

High vowels spread left across morpheme boundaries as in (22) and within the root itself as in (28). As seen in (28), if the last vowel of a root is high, it spreads left onto preceding non-high root vowels when the root is suffixed (allophonic alternations are suppressed for simplicity). High vowels are never targets for vowel harmony in Bonggi.

(28) a. /bagi/ + /on/ bigiin ‘divide.something-UND.IND.SOASOA’
a'. /η/ + /bagi/ maqi ‘ACT.IND.SOA-divide.something’
b. /ampun/ + /on/ umpunun ‘forgive.somone-UND.IND.SOASOA’
b'. /η/ + /ampun/ ηampunu ‘ACT.IND.SOA-forgive.somone’
c. /tulu/ + /on/ tuluun ‘pursue-UND.IND.SOASOA’
c'. /η/ + /tulu/ nulu? ‘ACT.IND.SOASOA-pursue’

High vowel left (HiVL) is illustrated in (29) by derivations for *ifiidn* [i'fiidn] ‘cook-UND.IND.SOASOA’, *biliidn* [bi'liidn] ‘buy-UND.IND.SOASOA’ and *ubungun* [u'bo'wun] ‘surround-UND.IND. SOASOA’.

(29) Underlying form /api/ + /on/ /boli/ + /on/ /abun/ + /on/
HiVR apiin boliiin abunun
HiVL iipiin biliin ubunun
Nasal spread
Stress i'piin biliiin ubunun
High vowel laxing

Fricativization  i'phiin
Labialization  u'b"un'翁
Fronting  bi'liin
Nasal preplosion  i'phiin  bi'liin
Derived form  [i'phiin]  [bi'liin]  [u'b"un'翁]

Geminate vowels cannot precede another vowel in the same word. When a root with geminate vowels is suffixed, the geminate vowels are reduced to a single vowel. Geminate vowel reduction is illustrated in (30) with derivations for tugudn ['tug"翁] ‘dry-UND.IND.SOA’ and fididn ['phiidn] ‘wipe-UND.IND.SOA’. Geminate vowels are illustrated with the derivation for nuug ['nuu̯g] ‘ACT.IND.SOA-dry.something’.

(30) Underlying form  /tuug/ + /ən/ /piid/ + /ən/ /ŋ/ + /tuug/
Consonant coalescence  nuug
HiVR  tuugun  piidin
Nasal spread  nüug
Geminate reduction  tugun  pidin
Stress  'tugun  'pidin  'nüug
High vowel laxing  'tugun  'pidin
Fricativization  'phiin
Labialization  'tuug'翁
Fronting  'phiin
Unrelease  'nüug'
Nasal preplosion  'tug"翁'  'phiidn
Derived form  ['tug"翁]  ['phiidn]  ['nüug']

When roots containing an offglide (a non-high vowel followed by a high vowel) are suffixed as in (31), the underlying high vowel is copied onto the suffix vowel in accordance with HiVR. Then, the high vowel in the root is deleted.

(31) sohudn /sɔ.uk/ + /ən/ ['sohudn]  ‘dip.out-UND.IND.SOA’
gohudn /go.uk/ + /ən/ ['g"ohn]  ‘pester-UND.IND.SOA’
ketidn /kə.it/ + /ən/ ['k'etidn]  ‘hook.with.pole-UND.IND.SOA’

3.2  /r/ metathesis

Bonggi has two liquids, /l/ and /r/, which are fronted to dental position [ʃ ɾ] before front vowels. Both liquids can occur in either the syllable onset or coda. /r/ frequently occurs in the coda as part of a consonant cluster due to metathesis.
/r/ metathesis is both a historical and a synchronic process. The diachronic process is illustrated in (32). /r/ metathesizes with the following vowel in unstressed syllables if the vowel precedes an alveolar which is [-continuant] (i.e., /t d n/). Assimilated, borrowed words also exhibit metathesis (e.g. Malay /surat/ ‘letter’ > Bonggi /suart/).

(32) putative proto-form
/ba.rat/ → /ba.art/ ['baart'] ‘west’ (Malay barat)
/su.rat/ → /su.art/ ['suart'] ‘letter’ (Malay surat)
/tu.rut/ → /tu.urt/ ['tuurt'] ‘following’ (Malay turut)
/pa.nu.ka.ran/ → /pu.nu.ka.arn/ [∅'unū'haar'dn] ‘Panukaran’
/ŋa.ran/ → /ŋa.arn/ ['ŋāār'dn] ‘name’ (Dusun ŋaran)

/r/ metathesis as a synchronic process in Bonggi is supported by alternations with affixes as seen in (33). For example, metathesis occurs in both the base form soord ‘stinger’ and the actor form noord, but not in the undergoer form serodoon.

(33) ajar ['adʒar] ‘to teach’ /adʒar/ + /on/ → [a'ðʒaar'dn]
ansur ['ansur] ‘to dissolve’ /ansur/ + /on/ → [un'suur'dn]
atur ['atur] ‘to arrange’ /atur/ + /on/ → [u'tuue'dn]
biaar [bi'aar] ‘to pay’ /biaar/ + /on/ → [bi'aar'dn]
gambar [gam'bar] ‘picture’ /gambar/ + /on/ → [gam'bbaar'dn]
soord ['sɔɔrd] ‘stinger’ /sɔɔrd/ + /on/ → [sɔ'rɔɔd'dn]
/orod ['ɔɔrd] ‘numb’ /ɔɔrd/ + /on/ → [rɔɔd'dn]

3.3 /l/ metathesis and palatalization of /l/
As seen in (34), /l/ blocks nasal spread in Bonggi.

(34) milakng /ɔm/ + /ilaŋ/ ['mɪlɔŋ] ‘ACY-lie.down’
nulukng /ŋ/ + /tulŋ/ ['nǔlʊŋ] ‘ACT.IND.SOA-assist’

Three processes are involved when the suffix -ɔŋ is added to a root ending in /l/: 1) /l/ metathesizes with the following vowel; 2) /l/ palatalizes to [i]; and 3) vowel reduction occurs. All three processes are illustrated in (35) with derivations for temboidn [tam′bɔidn] ‘patch-UND.IND.SOA’ and buntaidn [b'untaidn] ‘throw-UND.IND.SOA’. /l/ metathesis and palatalization of /l/ do not occur with other suffixes as illustrated by the derivation of buntala? [b'untala?] ‘throw-IMP.UND. IND.SOA’.

(35) Underlying form /tɔmbol/+ /on/ /buntal/+ /on/ /buntal/+ /a?/
MidVR tombolon
/l/ metathesis must be ordered before palatalization of /l/ since palatalization of /l/ blocks /l/ metathesis. Metathesis and palatalization of root-final /l/ in verbs which are suffixed with -n is productive. Historically, some roots which contained /l/ word-medially have also undergone metathesis and palatalization. Thus, the synchronic description reflects diachronic processes. (36) provides examples of nouns which have developed along these lines.

(36) /l/ Proto form metathesis Palatalize Geminate Preplosion
a) *dalaln *daaln /l/ daalin > daaln > daain > dain > [da\textsuperscript{id}n]
b) *palald paald > paaid > paid

c) *taluln tauuln > tauin > [to\textsuperscript{id}n]
d) *bululn buuln > buain > [bu\textsuperscript{id}n]
e) *kulit kuit > kuit
f) *kulat kuait > kuait

Palatalization of /l/ often results in /i/ following a nonhigh vowel and consequently an offglide occurs. /l/ metathesis is also supported by the alternations in (37) in which the /l/ only shows up on the suffixed form.

(37) /m/ + /g/ + /alat/ → [ŋ'g\textsuperscript{a}t'] IRREALIS-PROGRESSIVE-wait
/in/ + /g/ + /alat/ → [ɪ'g\textsuperscript{a}t'] REALIS-PROGRESSIVE-wait
/p\textsuperscript{o}g/ + /alat/ → [pʰ'g\textsuperscript{a}t'] IMP.ACTOR-wait
/ki/ + /alat/ → [kʰ'a'\textsuperscript{a}t'] ‘ask.someone.to-wait
/alat/ + /\textsuperscript{on}/ → [lə\textsuperscript{a}n] ‘wait-UND.IND.SOAA’
In Bonggi, metathesis is prosodically motivated. Both /t/ and /l/ metathesize before alveolar stops and nasals (e.g. (32), (33), (35), (36), (37), (40), (41) and (42)). There are only a few borrowed forms in which metathesis does not occur, e.g. (38).

(38) 

hilun ‘ballon’
falun ‘plan’
gilin ‘container for liquids’ (source: gallon)
nelun ‘nylon’
marin ‘marine’
jualan/jualadn ‘fried bananas’ (source Malay jual ‘sell’)
aludn-aludn ‘road’ (perhaps from Javanese alun-alun)

An alternative to my /l/ metathesis analysis would be vowel deletion, whereby VI Vn → Vln. While vowel deletion can account for the synchronic forms in (35), it fails to provide a diachronic explanation for the /a/ in both buaidn ‘moon’ (36d) and kuait ‘mushroom’ (36f). Furthermore, it weakens a unified account of synchronic and diachronic CV metathesis before alveolars which are [-continuant]. Bonggi CV metathesis is an example of what Blevins & Garrett (1998:509) call “perceptual metathesis.” Perceptual metathesis is limited to certain segment types; for example, liquids in Bonggi.

3.4 Prepositional forms with underlying /l/

As seen in (39) (cf. (7)), a few undergoer forms have a word-medial /l/ which does not occur in actor forms. To derive the undergoer forms in (39) from actor-based roots would require an arbitrary rule that changes /i/ to /l/, thus reversing the process of palatalization described above. However, the source of the /l/ in undergoer forms can be recovered by taking the undergoer forms as the basis for the underlying root and then deriving the actor and undergoer forms accordingly. The derivations for the first three undergoer forms in (39) are shown in (40).

(39)

‘to swallow’ noidn tolnon tolno’
‘to turn over’ miid bildidn bilda’
‘to change clothes’ neidn selnin sehna’
‘to fold clothes’ moidn bolnun bolna’

(40) Underlying form /tolon/ + /on/ /bilid/ + /on/ /salin/ + /on/
HiVR tolön bilidin salinin
MidVR tolöön
Nasal spread tolöön salinin
<table>
<thead>
<tr>
<th>Phonological Process</th>
<th>Underlying Form</th>
<th>Derivation Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>/l/ metathesis</td>
<td>/təlnɔŋ/</td>
<td>[tɔlnɔŋ]</td>
</tr>
<tr>
<td>Geminate reduction</td>
<td>/bildin/</td>
<td>/bildin</td>
</tr>
<tr>
<td>Vowel coalescence</td>
<td>/sailnɔŋ/</td>
<td>[sailnɔŋ]</td>
</tr>
<tr>
<td>Stress</td>
<td>'təlnɔŋ/</td>
<td>['bildin]</td>
</tr>
<tr>
<td>High vowel laxing</td>
<td>'bildin/</td>
<td>'sailnɔŋ</td>
</tr>
<tr>
<td>Fronting</td>
<td></td>
<td>'sailnɔŋ</td>
</tr>
<tr>
<td>Nasal preplosion</td>
<td>'/bildrɗ/</td>
<td>['seldnɔŋ]</td>
</tr>
<tr>
<td>Derived form</td>
<td>['təlnɔŋ]</td>
<td>['bildrɗ]</td>
</tr>
</tbody>
</table>

The derivations for the first three undergoer imperative forms in (39) are shown in (41).

(41) Underlying form: /təlon/ + /aʔ/ /bild/ + /aʔ/ /salin/ + /aʔ/
- MidVR: təlonʔ?
- Nasal spread: təlonɔŋʔ? salinɑʔ?
- /l/ metathesis: təlonɔŋʔ? biildaʔ? sailnɑʔ?
- Geminate reduction: təlonɔŋʔ? biildaʔ?
- Vowel coalescence: selnɑʔ?
- Stress: 'təlonɔŋʔ? 'biildaʔ? 'selnɑʔ?
- Final /a/ weakening: 'bildaʔ? 'selnɑʔ?
- High vowel laxing: 'bildaʔ?
- Fronting: 'seldnɔʔ?
- Derived form: ['təlonɔŋʔ?] ['bildəʔ?] ['seldnɔʔ?]

The derivations for the first three actor forms in (39) are shown in (42).

(42) Underlying form: /ŋ/ + /təlon/ /ŋ/ + /bild/ /ŋ/ + /salin/
- Consonant coalescence: nɔlɔn milid nalin
- Nasal spread: nɔlɔn milid nalin
- /l/ metathesis: nɔlɔn miild nalin
- Palatalization of /l/: nɔɔin miid nãin
- Tensing of mid vowel: nɔooin miid
- Geminate reduction: nɔin miid
- Vowel coalescence: nẽin
- Offglide formation: nɔ'n miid nẽ'n
- Stress: 'nɔ'n 'mïid 'nẽ'n
- Unrelease: 'mïid
Nasal preposision  'n̪ə̆j̝id̝n
Derived form  [n̪ə̆j̝id̝n]  ['m̪̟̊iid̝']  [n̪ə̆j̝id̝n]

While the actor forms in (39) are 'apparent' exceptions to nasal preposision, the derivations in (42) provide an explanation for why preposision occurs in these forms. Nasal spread must be ordered prior to palatalization of /l/ in order for the /l/ to block nasal spread. As seen in (42), the underlying /l/ blocks nasal spread, thus ultimately preventing the palatalized [i] from being nasalized. The word-final nasal is then preposited since it is preceded by a non-nasalized vowel. Whereas (36) shows that /l/ metathesis followed by palatalization of /l/ is the correct path of diachronic change in Bonggi, (42) indicates that both nasal spread and /l/ metathesis must precede palatalization of /l/. The order between nasal spread and /l/ metathesis does not matter in the derivations in (40), (41) and (42).

4 Conclusion

In Western Malayo-Polynesian languages with preposited nasals, word-final nasals are simple if the preceding vowel is nasalized and preposited if the preceding vowel is non-nasalized. While the types of consonants that block nasal spread vary across languages, the mechanism for blocking is the same. Two sorts of exceptions to preposision have been discussed in this paper: 1) borrowed words which have not been assimilated (e.g. (17)); and 2) preposited nasals which follow a nasal with no intervening consonant to block nasal spread.

When preposited nasals follow a nasal with no intervening consonant to block nasal spread, an original blocking consonant has been lost. Three types of consonant loss have been reported: 1) the loss of a voiced stop in Bukar-Sadong from a word-medial consonant cluster consisting of a nasal followed by a homorganic voiced stop (e.g. (13)); 2) the loss of proto /h/ in Bonggi (e.g. (14b) and (14c)); and 3) the loss of /l/ in Bonggi due to metathesis and palatalization (e.g. actor forms in (39)). While the first type of consonant loss has been previously described by others including Scott (1964) and Court (1970), the loss of /h/ and /l/ are potential explanations for aberrant preposited nasals in other Austronesian languages.

The loss of /l/ is particularly interesting. An underlying /l/ blocks nasal spread. This /l/ then metathesizes and subsequently is palatalized as [i]. This non-nasalized vowel then provides the environment for final-nasal preposision. The process is productive and it provides an account for otherwise anomalous
preploded forms in Bonggi. This paper has also provided evidence for both diachronic and synchronic metathesis of liquids.

Notes
1I am grateful to Mike Cahill for his helpful comments on this paper.
2While preploded nasals are more commonly known as pre-stopped nasals (Ladefoged & Maddieson 1996), the term preplosion is used here following Court (1970) and Blust (1997).
3The meanings of affixes are not in focus. Abbreviations include: ACT actor, ACY activity, IMP imperative, IND.SOA induced state-of-affairs, NOM nominative, SG singular and UND undergoer.
4Footnotes describe elements of the phonology which are not directly relevant to the discussion.
5/ɔ/ is realized as [ɔ] when /ɔ/ is followed by a high vowel (/i/ or /u/). Alveolar consonants /t d s n l r/ are fronted to dental position [t ɗ s ɳ l ç] before front vowels.
6[ɔ] only occurs if the last two vowels in the word are [ɔ]. Stops /p t k b d g/ are unreleased [p’ t’ k’ b’ d’ g’] word-finally.
7Voiceless bilabial stop /p/ weakens to fricitive [ϕ] intervocally.
8The prefix /ŋ/ and root-initial voiceless consonants coalesce and are replaced by a nasal homorganic to the root-initial consonant, e.g. /ŋ/ + /pasan/ → /masan/. Root-initial voiced bilabials also coalesce with /ŋ/.
9Voiceless bilabial stop /p/ weakens to fricitive [ϕ] word-initially. Non-high vowels /ɔ ɔ a/ are neutralized as [ɔ] in prestressed position. Final low vowels /a/ which are not geminate weaken to [ɔ] except before liquids /r l/.
10Bilabial consonants /p b m/ are rounded [p̪w φw b̪w β̪w m̪w] and velar consonants /k g η/ are labialized [k̪w g̪w η̪w] before round vowels /u ɔ/. High tense vowels /i u/ are lowered (laxed) to [ɪ ʊ] in syllables which are closed by consonants other than glottal stop [ʔ].
11The infix -əm- is realized as a prefix before vowel-initial roots and the /ɔ/ is lost resulting in m-, e.g. /əm/ + /əkən/ → /məkən/.
12The infix -in- is realized as a prefix before vowel-initial stems, e.g. /in/ + /iun/ → /iniun/ in (12c) (cf. (12f)).
13In realis modality, verbs which index the undergoer in induced states of affairs are Ø marked, e.g. (12c) and (12f).
14Cf. Scott’s (1964:434) explanation for the forms in (13).
While Blust (1997:23) suggests long vowels in Bonggi are likely exceptions to prelosion, my dictionary contains over 70 such forms. /b/ weakens to fricitive [β] intervocally in unstressed syllables.

Glottal stop only occurs word-finally. If a root ends in /ʔ/, the /ʔ/ is deleted when a suffix is added.

Conant (1916/1973) reports on the loss of /l/ in a number of Philippine languages including: *bulan ‘moon’ > buan (Tagalog), fuan (Bontok); *dalan ‘way’ > daʔan (Tagalog); *palad ‘palm (of hand)’ > payad (Tagalog). For the Mandaya language of Southeast Mindanao, Conant (1916/1973:236) describes a process similar to that characterized for Bonggi whereby intervocalic /l/ palatalizes to [i] or [y] (cf. Gallman 1979:7, 12).

References


