Dogon (Berlin (post-Greenberg workshop) Feb 2010)
Jeff Heath (Michigan), schweinehaxen@hotmail.com
Kirill Prokhorov (MAE-RAS St Petersburg and Humboldt-Universität Berlin), bolshoypro@gmail.com

current Dogon and Bangime project (http://www.dogonlanguages.org)
Jeff Heath (northeastern lgs), Kirill Prokhorov (Mombo, Ampari), Abbie Hantgan (Bangime, Kindige). Laura McPherson (Tommo So), †Stephan Elders (Bangime)

wider relationships of Dogon?
overview of previous internal classifications

Plungian & Tembiné 1994
- Central or “So”: Toro so, Dono so, Tommo so
- South-Eastern or “Kan”: Tomo Kan, Togo Kan, Tengu, Jamsay, Toro Tegu
- Northern: All the other languages (incl. Bangime)

SIL survey (Hochstetler et al.) 2004

Roger Blench's websites

typical Dogon structures

NP:

- full form: Poss[NP or pronoun] [[[Noun Adj*] Num] Dem/Def (Pl) ’all’ Topic]
  - referentially restricting elements (Poss, Adj, Dem, sometimes Def) control tone contours on (at least) the noun
  - Poss usually controls {L} or {HL} on at least the following N-Adj sequence
  - Adj usually controls {L} on preceding noun or adjective (recursive) [except Mombo]
  - Dem usually controls {L} on preceding N-Adj and Num

non-referentially restricting elements (Num, ’all’, Topic, sometimes Def) do not control tone contours
  - Noun + Num: no tonal interaction, both Noun and Num have lexical tones
  - (but: Num may be target of tone contour controlled by Dem)

as relative head: (Poss[NP or pronoun]) [[[Noun Adj*] Num] ... verb-Participle [Dem/Def (Pl) ’all’ Topic]
  - i.e. head NP split, with Poss-N-Adj-Num remaining in situ, while late-NP elements migrate to postverbal position
so: NP structure expressed by a) linear order; b) tone-contour controller-target relations; c) breakpoint of relative-head NP elements

clause:

main clause:  \( \text{(Adv)} \quad S[NP] \quad O[NP or pronoun] \quad \text{verb-TA/Neg-subject[pronominal]} \quad \text{Past} \)

relative clause:  subject-inflected verb replaced by participle (sometimes agreeing in features with head NP)

head NP remains in situ but is identified by a) additional tone-contour marking, b) shift of NP-final elements to postverbal position in nonsubject relatives, if subject is pronominal it is expressed by a special set of preverbal clitic pronominals

tones and "intonation"

syllables (<…> notation): <H>, <L>, <HL>, occasionally <LHL>

except in Yanda Dom, each stem ({…} notation) has at least one H-tone element: {H}, {HL}, {LH}, {LHL}, rarely {LHH}, but not #{L}

verbs

derivations: suffixal: Reversive ('un-'), Causative, some Mediopassive/Transitive pairs

tight restrictions on lexical tone contours of verb stems

lexical contour {H} with initial voiceless obstruent, {LH} with initial voiced obstruent, otherwise lexically {H} or {LH}

tone break in {LH} in trisyllabic stems is LHH or LHL, with break near right or left edge, depending on the language

tight restrictions on possible vowel sequences of bisyllabic verb stems

same non-high vowel \{e e a o\} repeated: CaCa, CeCe, CoCo, …

initial high vowel plus mid-height vowel agreeing in back/front and rounding: CuCo, CuCo, CiCe, CiCe

so: total of 9 vowel-quality types for bisyllabic verbs

trisyllabic verb stems may or may not weaken the middle vowel (becoming high)

e.g. CaCaCa or CaCiCa, depending on the language

several languages also have a distinct set of verb stems with final high vowel (CaCi, CaCiCi, etc.), with distinctive paradigms

Bangime versus Dogon

Bangime villages at the end of a long canyon (geographic isolation)

now being studied by Abbie Hantgan

Phonology: an opposition \( w / q \) [high front rounded semivowel]; \( h \) occurs in native vocabulary

Morphosyntax:

- main clause word order:  \( S \text{ Aux O V X / SVO (depending on TAM category)} \)
- isolating verb morphology

(1)  \( n\text{ d\text{á}d k\text{é} n\text{á}w à w\text{é}} \)

1SG IPFV thing give 2SG for

‘I give you something’.
(2) àó dègú à jà:mbé
2PL hit DET child
‘You-PL hit the child’.

✓ relative clause:

(3) à dúwá hù₃ mà: kòré kó péndé
DET tree on 3SG stomach CONJ explode
‘The stomach that fell on the tree explodes’.

✓ lexicon: not more that 10% Bangime cognates in a Swadesh list with any Dogon variety (not less than c.a. 40% for a pair of Dogon languages)

back to Dogon: nominal morphology

many languages have suffixal distinctions (marked on the noun, the adjective, or both)

nominal/adjectival suffixes:

<table>
<thead>
<tr>
<th></th>
<th>Jamsay</th>
<th>Ben Tey</th>
<th>Nanga</th>
<th>Yanda Dom</th>
<th>Toro Tegu</th>
<th>Tommo So</th>
<th>proto</th>
</tr>
</thead>
<tbody>
<tr>
<td>N or Adj</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>human (or animate) Sg</td>
<td>-n</td>
<td>-m</td>
<td>-Ø</td>
<td>-Ø</td>
<td>-rⁿu/-nu/-n</td>
<td>-ne</td>
<td>*-nu (cf. *nu-'person'?)</td>
</tr>
<tr>
<td>human (or animate) Pl</td>
<td>-m</td>
<td>-Ø</td>
<td>-yè</td>
<td>-Ø</td>
<td>-mu</td>
<td>-m(u)</td>
<td>-m</td>
</tr>
<tr>
<td>nonhuman (or inanimate)</td>
<td>-Ø</td>
<td>-Ø</td>
<td>-w</td>
<td>-Ø</td>
<td>-Ø</td>
<td>-Ø</td>
<td>-Ø</td>
</tr>
</tbody>
</table>

languages with weak or no N/Adj distinctions mark Sg/Pl and animacy distinctions (more fully) in following determiners

optional Pl particle late in the NP (usually be), mainly for nouns that have no Pl suffix (kin terms, nonhumans)

notes:

Nanga -ŋ only in yā-ŋ 'woman'; some adjectives have Ben Tey-like distinctions in predicative function;

more complex systems in Najamba-Kindige (aka "Bondu") with some parallels in Mombo (aka "Kolu") and Ampari:
Najamba

objectively inanimate nouns belong to ",(pseudo-)animate", E/E inanimate, or O/E inanimate classes

pseudo-animates include weapons, pointed/bladed implements, stones, vehicles, pants/shoes, fans, musical instruments, 'fan', 'apiary'
only one plant term (*Tribulus terrestris*, a prostrate herb with sharp-pointed fruits)
nouns and adjectives have either clearly segmentable suffixes, or final-vowel mutations (front/back, here "E" vs. "O")

<table>
<thead>
<tr>
<th></th>
<th>suffixes</th>
<th>final-vowel quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>animate Sg</td>
<td>-Ø</td>
<td>E</td>
</tr>
<tr>
<td>animate Pl</td>
<td>-mbo</td>
<td>O</td>
</tr>
<tr>
<td>inanimate Sg</td>
<td>-ŋgo (O/E class), -ŋge (E/E class)</td>
<td>O (O/E class), E (E/E class)</td>
</tr>
<tr>
<td>inanimate Pl</td>
<td>-Ø</td>
<td>E</td>
</tr>
</tbody>
</table>

note that the final-vowel alternation is Sg/Pl E/O for animates, but O/E or E/E for inanimates

adjectives agree with nouns
adjectives with final-vowel mutations are (Sg/Pl) E/O (animate), O/E, or E/E, respecting the class of the noun (or referent)
determiners also agree with nouns

the inanimate "class" system might be innovative (suffixes and final vowels reflect cliticization/fusion of particles)
O/E is the common inanimate class, compare inanimate determiners such as Toro Tegu Sg *ko*, Pl *ke*
E/E class contains
topographic terms (cf. noun *këngë* 'place'), holes, dwellings, time
terms for liquids (cf. *ìngë* 'water')
some body parts ('head', 'body', 'nose', 'wing', ...)
this class may have originated from use of *këngë* 'place' and *ìngë* 'water' as postnominal classifiers (if originally monomorphic)
most stems with final-vowel mutations end in long vowels (suggesting historical contraction)
historical hypotheses

-\( mbo, \) -\( \textit{ngo}, \) -\( \textit{nge} \) suffixes may be frozen combinations of a word-final nasal plus *bo, *go (*ko), *ge (*ke)

Najamba Animate Pl -\( mbo \) may consist etymologically of

Human/Animate Sg suffix *-n (*-nu), perhaps itself < *nu- 'person', plus

Pl particle *bo

Human 3Pl pronoun \( b\dot{o} \) (Yanda Dom), \( b\dot{u}: \) (Beni etc.)

Human 3Pl pronominal-subject -\( b\dot{a}^-ba \) on verb (Jamsay, Beni, …)

cf. widespread nominal Pl particle \( be \) (also 3Pl pronoun as in Toro Tegu)

Najamba Inanimate Sg -\( \textit{ngo} \) (majority class), for some stems just -\( \textit{go} \), may consist etymologically of

a stem-final nasal consonant (resegmented as part of suffix, and partially generalized), plus

*ko/k\( \ddot{o} \) cf. Nonhuman 3Sg pronoun *ko/k\( \ddot{o} \) (Toro Tegu, Jamsay, etc.)

originally reduced from noun 'thing': Beni \( k\dot{\varepsilon}^\prime \), Nanga \( k\dot{\varepsilon}(\eta) \), Najamba \( k\dot{\varepsilon}g\dot{o} (< *k\dot{\varepsilon}g \dot{o})

also in pronominal possessives (Najamba, Nanga): Najamba \( b\ddot{a}^{-}g\dot{o} [m\ddot{i} g\ddot{\check{\varepsilon}}] \) 'my stick'

Najamba final-vowel mutations, e.g. \( n\acute{a}l\acute{a}: / n\acute{a}\dot{\varepsilon}: \) 'good', suggest historical contraction of stem with following CV morpheme

inanimate O/E (majority inanimate pattern), e.g. \( n\ddot{u}m\ddot{a}: \) 'hand', Pl \( n\ddot{u}m\ddot{\check{\varepsilon}}: \)

Inan Sg *ko/k\( \ddot{o} \) and Inan Pl *ke/ke contract with stem to create O/E alternation

animate E/O pattern (front vowels in Sg, back vowels in Pl), e.g \( i\ddot{e}n\dot{e}^\prime \) 'goat', Pl \( i\ddot{e}n\dot{\varepsilon}: \)

Pl *bo contracts with stem to create O type

Sg polarizes to E by analogy to inanimate, if not already polarized to Pl (??)

Najamba Inanimate Sg -\( \textit{nge} \) (minority class) and E/E vowel-mutations: various historical possibilities

a) Inanimate Sg class distinction *ko/k\( \ddot{o} \) versus *ke/ke is ancient and irreducible

b) *-ke variant of Inanimate Sg *-ko due to progressive assimilation, later morphologized

c) -\( \textit{nge} \) and E/E final-vowel mutations reflect contractions with 2 nouns used as postnominal classifiers

Najamba \( k\acute{e}ng\acute{e} \) 'place', \( \acute{i}ng\acute{e} \) 'water'

hypothesis (a) or (b) most likely since Mombo has frozen cases (no longer segmentable) of -\( \textit{nge} \) and -\( \textit{ngo} \)
Mombo singular nouns: -Ø
plural nouns:
- -nge for some human nouns, if added directly to stem
- -ge for other human nouns (and all nonhuman nouns)
g clitic (particle) if separated from noun (by adjective, etc.)

Ampari all nouns: Sg -Ø, Pl clitic ge

apparent frozen Mombo Inan Sg *-nge (arguably fronted from *-ngo after stem-final front vowel)

a) Najamba has -ngo in Sg

'(a) grain'/'millet' Najamba Pl/Coll sé:'grains', Sg sé-ngo
Mombo séngè 'millet' (Pl séngè gè)

'firewood' Najamba Pl/Coll té, Sg té-ngo
Mombo téngè

'peanut' Najamba Pl/Coll élé, Sg élé-ngo
Mombo éléngè [note disharmonic s/e combination]

b) Najamba has -nge in Sg

'cow-pea' Najamba Pl/Coll númeré, Sg númerú-ngoé
Mombo númeré

'blood' Najamba Pl/Coll gèn, Sg gèn-ge
Mombo gèngè

apparent frozen Mombo Singular *-ngo

'tree/shrub' Tommo So tini (also Toro Tegu tirtri, etc.) 'firewood'
Mombo tinìngò 'tree/shrub'

'charcoal' Najamba Pl kùmá, Sg kùmá-ngo
Mombo kéngò

'place' Yanda Dom mò
Mombo óngò

'place, site' Mombo éngò

'(emotional) heart' Mombo dòngò
verbal suffixal morphology (verb-TA/Neg-Subject)
a) various (tense-aspect suffixes with distinct positive and negative forms)

Jamsay: Perfective: unmarked -Ø, marked -li- (most transitives) or -yÈ- (most intransitives)
   Perfective Negative: -li-
   Imperfective: unmarked -Ø (final floating L-tone), marked -arà- and -lÈyÈ-
   Imperfective Negative: -go-

TA/Neg categories (suffixal, but also unsuffixed Imperative) affect form of stem:
   a) stem-wide tone contour, e.g. {L} before Negative suffixes (Jamsay), or:
   b) more limited tonal change, and/or:
   c) stem-wide [+ATR] vocalism

b) final pronominal-subject suffixes (four structural patterns)

<table>
<thead>
<tr>
<th></th>
<th>Jamsay</th>
<th>Ben Tey</th>
<th>Togo Kan (Perfective)</th>
<th>Toro Tegu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Sg</td>
<td>-m</td>
<td>-y</td>
<td>-e</td>
<td></td>
</tr>
<tr>
<td>2Sg</td>
<td>-w</td>
<td>-w</td>
<td>-e</td>
<td>[no suffixes]</td>
</tr>
<tr>
<td>3Sg</td>
<td>-Ø</td>
<td>-Ø</td>
<td>-e</td>
<td></td>
</tr>
<tr>
<td>1Pl</td>
<td>-y</td>
<td>-y:.</td>
<td>-sÈn</td>
<td></td>
</tr>
<tr>
<td>2Pl</td>
<td>-be</td>
<td>-w:.</td>
<td>-sÈn</td>
<td>[no suffixes]</td>
</tr>
<tr>
<td>3Pl</td>
<td>-ba (-bo)</td>
<td>-bo</td>
<td>-sÈn</td>
<td></td>
</tr>
</tbody>
</table>

Imperfective positive paradigm often presents special morphological features (not shown)
Jamsay type: suffixes are essentially autonomous; likewise Najamba-Kindige
Ben Tey: 1Pl and 2Pl formed from corresponding singular by dying-quail intonation (:.), likewise Nanga, Walo
   Sg/Pl likewise distinguished by intonation in independent pronouns
Togo Kan: reduced to Sg/Pl distinction (actual forms vary by TA/Neg category), likewise Tegu Kan
Toro Tegu: no suffixal paradigm, clause-initial particle (1st/2nd person) or postverbal clitic (3rd person); Mombo similar
History: Jamsay type might be archaic (especially core opposition 1Sg, 2Sg, 3Sg, 1Pl)
   3Pl forms highly variable (across languages, and within each language by TA/Neg category)
      -ba/-bɔ forms (Perfective positive) probably from a 3Pl independent pronoun
   2Pl forms also somewhat unstable
      -be perhaps from Pl bé particle in NP
examples of consonantal correspondences

<table>
<thead>
<tr>
<th>'skin'</th>
<th>'millet beer'</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT</td>
<td>gûsû</td>
</tr>
<tr>
<td>Jm, Pr, Gr</td>
<td>gûjû, gûsû, gûsû</td>
</tr>
<tr>
<td>Be, Wa, Nn</td>
<td>gûsû, gûsû, gûsû</td>
</tr>
<tr>
<td>Nj, YD</td>
<td>gûjû, gûzû</td>
</tr>
<tr>
<td>Tm</td>
<td>gûdû</td>
</tr>
<tr>
<td>Tg</td>
<td>gîvé</td>
</tr>
<tr>
<td>Mm</td>
<td>gûjû</td>
</tr>
</tbody>
</table>

word-initial

<table>
<thead>
<tr>
<th>TT</th>
<th>Jm</th>
<th>Pr</th>
<th>Gr</th>
<th>Be</th>
<th>Wa</th>
<th>Nn</th>
<th>Nj</th>
<th>YD</th>
<th>Mm</th>
<th>Tm</th>
<th>Tg</th>
</tr>
</thead>
</table>

1a (before back or low vowel)

<table>
<thead>
<tr>
<th>g</th>
<th>[g g g]</th>
<th>[g g g]</th>
<th>[g g g]</th>
<th>g</th>
<th>g</th>
<th>g</th>
</tr>
</thead>
</table>
* _usu (*) _uju 'skin' (and others)

1b. (before high front vowel)

<table>
<thead>
<tr>
<th>j</th>
<th>[j g/j g]</th>
<th>[g/j j g/j]</th>
<th>[g/j g/j]</th>
<th>-</th>
<th>g</th>
<th>g</th>
</tr>
</thead>
</table>
* _ęm 'black', * _ęme 'pinch', * _ęsų/* _ęsu 'body'
reconstruction: *g, with some palatalization to /j/ before front vowel (1b)

2 z  [j j z] [j z j] [j z j] j j j
* _e(е) 'bring', * _iņe/* _iğe 'twin', * _ńu 'treat (medically)', * _ęye/* _ęņañ 'fight', * _ę 'marry (woman)', * _iye/* _jolio 'take (sth) away', * _ąnga 'pound into dough'
reconstruction: *j (or *z)

similar item with divergent reflex in TT:

<table>
<thead>
<tr>
<th>y (!)</th>
<th>[j j z]</th>
<th>[j z j]</th>
<th>-</th>
<th>-</th>
<th>j</th>
<th>-</th>
</tr>
</thead>
</table>
* _iwa/* _uwo 'fan (sb)'

3. s  [s s s] [s s s] [s s s] s s s
* _sų̝u(ru) 'ear' (and others)
reconstruction: *s
intervocalic (nonnasal)

<table>
<thead>
<tr>
<th>TT</th>
<th>[Jm Pr Gr]</th>
<th>[Be Wa Nn]</th>
<th>[Nj YD]</th>
<th>Mm</th>
<th>Tm</th>
<th>Tg</th>
</tr>
</thead>
<tbody>
<tr>
<td>g</td>
<td>[g g g]</td>
<td>[g Ø g]</td>
<td>[g g]</td>
<td>g</td>
<td>g</td>
<td>g</td>
</tr>
</tbody>
</table>

*de_e 'lick', *pa_a 'tie'

reconstruction: *g (note: intervocalic /g/ pronounced [γ] in Jm, Be in some vocalic environments)

2. s  [j s s]  [s s s]  [j z]  j  d  j

2 *gu_u 'skin', *ku_u 'handle', *ka_u 'calabash', *u_u(ru) 'ask', *pu_o 'grafted plant grow'; *(spring) gush out'

reconstruction: *s

intervocalic (nasal-sibilant and nasal-stop clusters)

the correspondence sets in (3ff) show nasality in at least one language (< *nj, *ŋg, *ns, *nz, and the like)

relevant medial clusters with initial nasal:

<table>
<thead>
<tr>
<th>TT</th>
<th>[Jm Pr Gr]</th>
<th>[Be Wa Nn]</th>
<th>[Nj YD]</th>
<th>Mm</th>
<th>Tm</th>
<th>Tg</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;s</td>
<td>[Ø nj/ŋg (&quot;s)]</td>
<td>[nj Ø nj]</td>
<td>[nj nz]</td>
<td>nj</td>
<td>nj</td>
<td>–</td>
</tr>
</tbody>
</table>

note: Wa and Jm lack any productive nasal-initial cluster, so reconstructions based mainly on other lgs

3. nasality widespread:

nasal  √  [√ √ √ √]  [√ (√) √]  [√ √]  √  √  √  √  √  √

"s  [n n nj ("s)]  [nj z nj]  [nj nz]  –  nj  n

*a_u 'roselle', *ko_o 'millet beer', *ku_u 'rough', *o_o 'suck'

reconstruction: *ns or similar

*gi_u 'odor' (note Be-Wa-Nn and Mombo y'ŋ)

*gi_u 'odor' (note Be-Wa-Nn and Mombo y'ŋ)

"s  [n nj s]  [nj z nj]  –  d]  –  nj  –

*æ_e 'chicken' (YD d may be a mutation)

"s  [n nj s]  [nj – –]  [– –]  –  –  –

*nii_e 'gear'
4. Nasality in Jm(-Pr?) and Be, but not Tm (YD unclear)

\[ \text{nasal} \quad \text{?} \quad [\checkmark \quad ?] \quad [\checkmark \quad ] \quad [\quad ?] \quad ? \]
\[ \text{–} \quad [\checkmark \quad \text{n} \quad \text{s}] \quad [\checkmark \quad \text{n} \quad \text{j} \quad \text{s}] \quad [\quad \text{s}] \quad [\quad \text{z}] \quad \text{–} \quad \text{d} \quad \text{–} \]

\*\text{d}_\text{o}_\text{e} \ 'butt (with head)'

\[ \text{–} \quad [\checkmark \quad \text{n} \quad \text{s}] \quad [\checkmark \quad \text{n} \quad \text{j} \quad \text{s}] \quad [\quad \text{j} \quad \text{s}] \quad [\quad \text{z}] \quad \text{–} \quad \text{d} \quad \text{j} \]

\*\text{k}_\text{i}_\text{u} \ 'grain spike'

5. Nasality in (Jm-)Pr and Tm only (YD and Nj unclear)

\[ \text{nasal} \quad [? \quad \checkmark \quad ?] \quad [\checkmark \quad ?] \quad [? \quad ?] \quad [\checkmark \quad \checkmark] \quad [\quad ?] \quad ? \]
\[ \text{s} \quad [\quad \text{n} \quad \text{j} \quad \text{s}] \quad [\quad \text{n} \quad \text{j} \quad \text{z} \quad \text{s}] \quad [\quad \text{s}] \quad [\quad \text{z}] \quad \text{n} \quad \text{n} \quad \text{j} \quad \text{n} \quad \text{j} \quad \text{–} \]

\*\text{g}_\text{a}_\text{a}/*\text{g}_\text{a}_\text{i} \ 'dig'

6. Nasality in Jm and Tm only

\[ \text{nasal} \quad [\checkmark \quad ?] \quad [\quad ?] \quad [? \quad ?] \quad [\checkmark \quad \checkmark] \quad [\quad ?] \quad ? \]
\[ \text{–} \quad [\checkmark \quad \text{n} \quad \text{s} \quad \text{s}] \quad [\quad \text{n} \quad \text{s} \quad \text{s}] \quad [\quad \text{j} \quad \text{s} \quad \text{z}] \quad \text{n} \quad \text{j} \quad \text{n} \quad \text{j} \quad \text{–} \]

\*\text{m}_\text{u}_\text{u} \ 'thousand'

\[ \text{s} \quad [\checkmark \quad \text{n} \quad \text{s} \quad \text{s}] \quad [\quad \text{n} \quad \text{s} \quad \text{s}] \quad [\quad \text{s}] \quad [\quad \text{z}] \quad \text{n} \quad \text{n} \quad \text{j} \quad \text{n} \quad \text{n} \quad \text{j} \quad \text{–} \]

\*\text{m(b)}\text{o}_\text{u} \ 'bad'

Reconstruction: perhaps *s with secondary nasalization to *ns in Jm and Tm due to initial *m

7. Nasality in Jm-Pr only (not Tm)

\[ \text{nasal} \quad [\checkmark \quad \checkmark] \quad [\quad ?] \quad [? \quad?] \quad [\checkmark \quad?] \quad [\quad?] \quad ? \quad ? \]
\[ \text{s} \quad [\checkmark \quad \text{n} \quad \text{j} \quad \text{s}] \quad [\quad \text{n} \quad \text{s} \quad \text{s}] \quad [\quad \text{z}] \quad \text{–} \quad \text{d} \quad \text{–} \]

\*\text{o}_\text{o}/*\text{u}_\text{o} \ 'wind; air'

8. Nasality in TT and in Be-Wa-Nn group only

\[ \text{nasal} \quad [\checkmark \quad ?] \quad [\checkmark \quad ?] \quad [\checkmark \quad?] \quad [\quad?] \quad [\checkmark \quad?] \quad [\quad?] \quad ? \]
\[ \text{n}_\text{s} \quad [\checkmark \quad \text{s} \quad \text{s}] \quad [\quad \text{n} \quad \text{j} \quad \text{z} \quad \text{n} \quad \text{j}] \quad [\quad \text{s}] \quad [\quad \text{j} \quad \text{z}] \quad \text{j} \quad \text{d} \quad \text{–} \]

\*\text{o}_\text{u} \ 'younger same-sex sibling', *\text{s}_\text{i}_\text{e} \ 'draw (lines)'
9. nasality in TT only (perhaps a mutation)

<table>
<thead>
<tr>
<th>nasal</th>
<th>√</th>
<th>[   ]</th>
<th>[   ]</th>
<th>[   ]</th>
<th>?</th>
</tr>
</thead>
<tbody>
<tr>
<td>*ns</td>
<td>[j s –]</td>
<td>[s – s]</td>
<td>[j z] – d j</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*too_u 'testicles''

10. nasality in Tm only

<table>
<thead>
<tr>
<th>nasal</th>
<th>?</th>
<th>[   ]</th>
<th>[   ]</th>
<th>[? ?]</th>
<th>?</th>
<th>√</th>
<th>?</th>
</tr>
</thead>
<tbody>
<tr>
<td>–</td>
<td>[j s s]</td>
<td>[s s s]</td>
<td>[– –] – nj –</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*ba_a 'pull; draw (water)'

11. nasality in TT and Jm only (Tm d versus s)

<table>
<thead>
<tr>
<th>nasal</th>
<th>√</th>
<th>[√]</th>
<th>[   ]</th>
<th>[   ]</th>
<th>[   ]</th>
<th>?</th>
</tr>
</thead>
<tbody>
<tr>
<td>*ŋg</td>
<td>ŋ</td>
<td>s</td>
<td>j</td>
<td>[s s s]</td>
<td>[j –]</td>
<td>j d –</td>
</tr>
</tbody>
</table>

*su_uro/*su_e 'wipe'

| *ns | [ŋ – –] | [– – –] | [– –] – s – |

*u_u 'thin'

12. nonhomorganic nasal-obstruent cluster (*ms or similar)

| – | [ŋʃ | mj | ms] | [mj – –] | [– –] – – ŋ |

*ga_a 'wing'