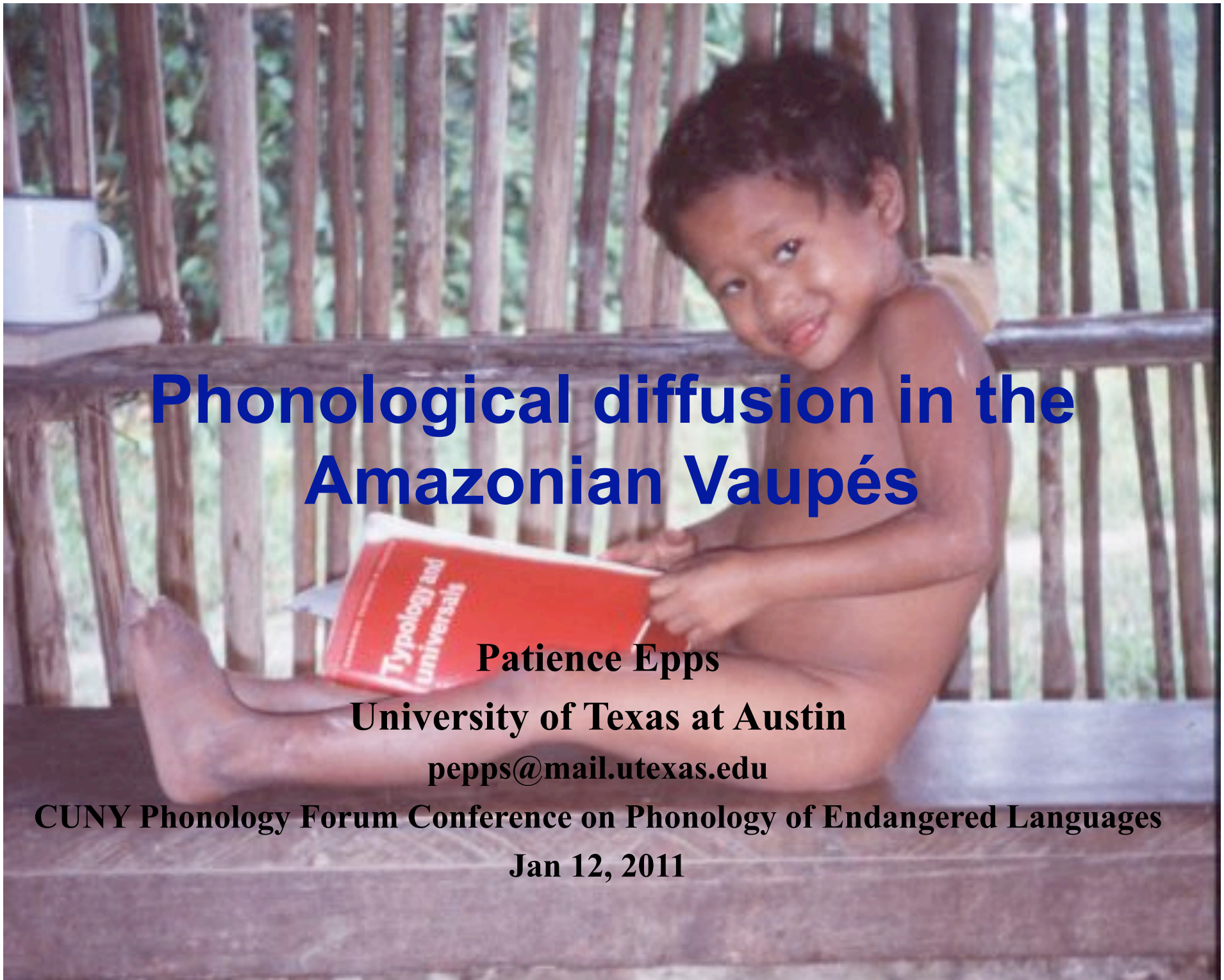

Phonological diffusion in the Amazonian Vaupés

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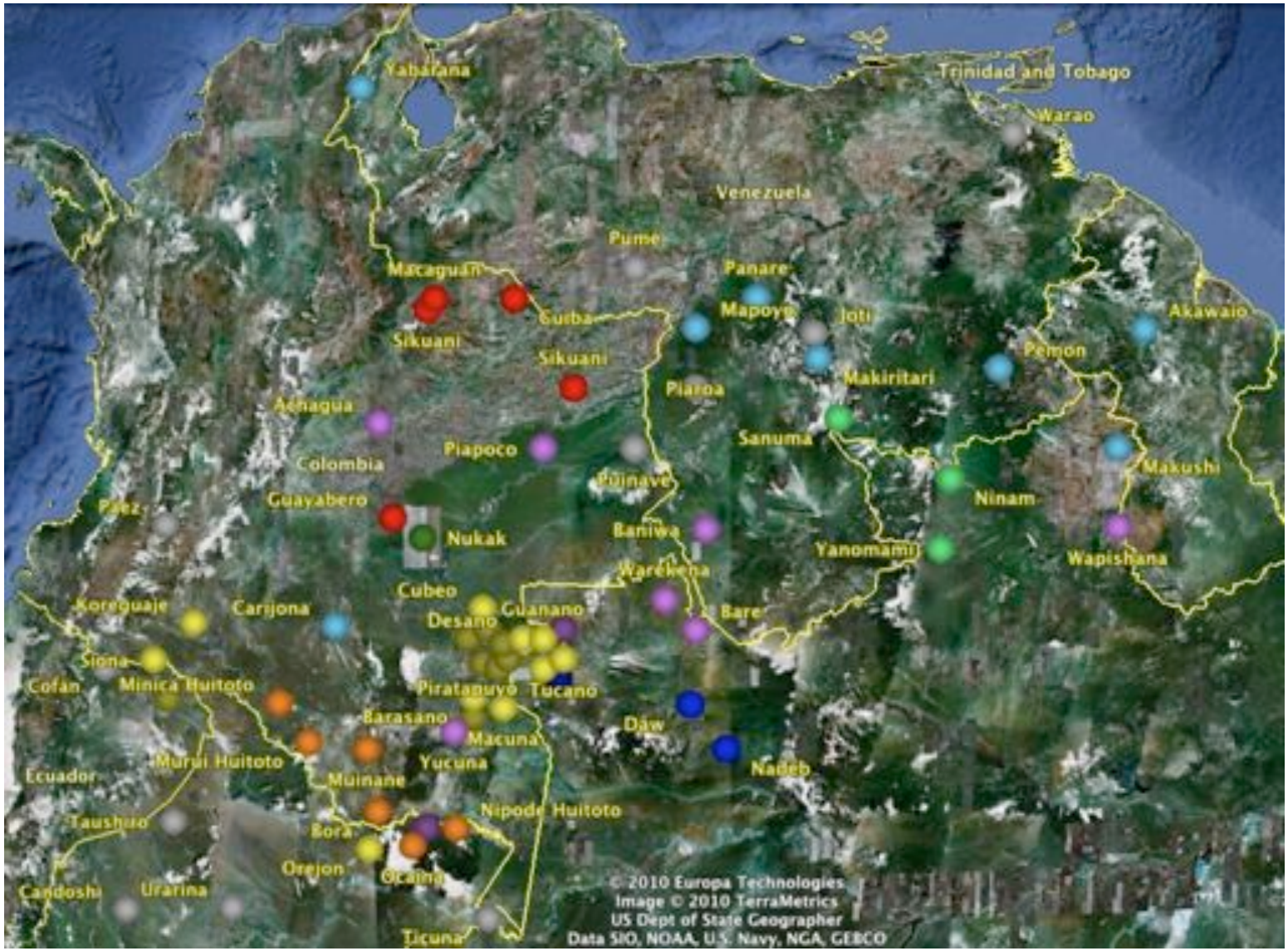
Introduction:
The languages of Amazonia

High diversity:

- 240-300 languages
- some 52 distinct groupings

Introduction

Northern Amazonian languages



The languages of Amazonia

Language endangerment:

- Some 600-1,500 languages spoken in South America at Contact
- Perhaps 65% of these are now extinct
- At least 77 out of some 300 remaining languages are now critically endangered (Moore 2007)

Urgent need for documentation:

- Good description: 19% of native languages of Brazil
- Some description: 64%
- No description: 13%
  (Franchetto 2000, in Moore 2007:30)

The languages of Amazonia

- Many typologically and theoretically noteworthy features, phonological and morphosyntactic
- Diversity + contact means that some of these features are widely distributed among languages
- Amazonian languages give us an opportunity to:
  - Investigate different permutations of particular phenomena across languages
  - Consider the variability and stability of these phenomena over time and space
  - Gain insights into Amazonian prehistory

The languages of Amazonia

Goals of this talk:

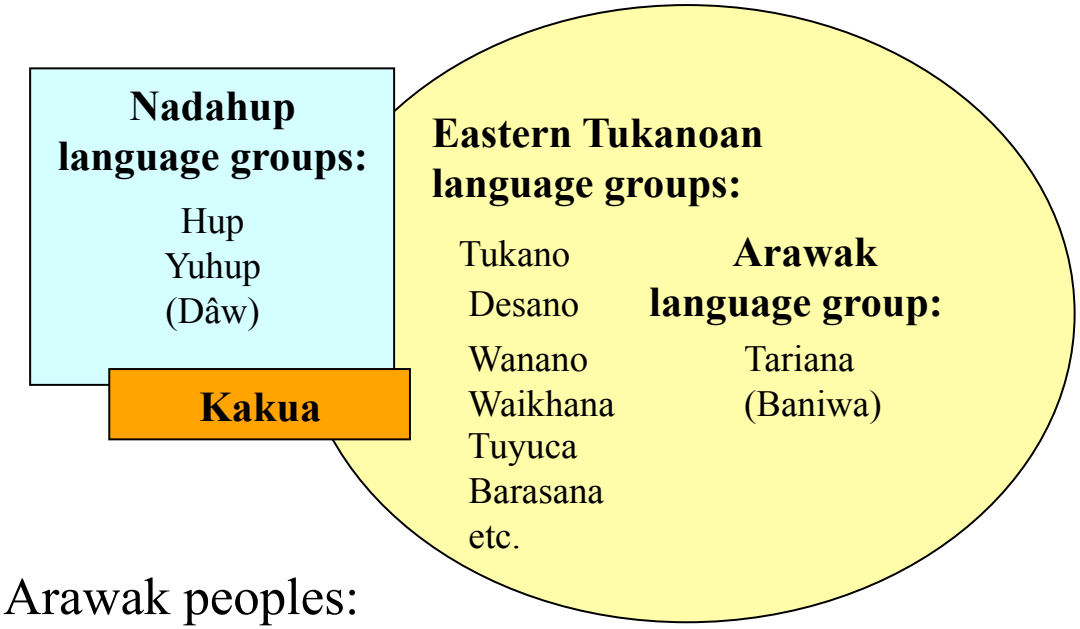
- Investigate the phonological systems in languages of the Vaupés region (northwest Amazonia)
- Examine noteworthy aspects of these systems, as instantiated across languages
- Consider the role of areal diffusion in the distribution of phonological features

Languages of the Vaupés region

East Tukanoan Arawak Nadahup Kakua-Nukak

Languages of the Vaupés region

Interaction and multilingualism



- Eastern Tukanoan and Arawak peoples:

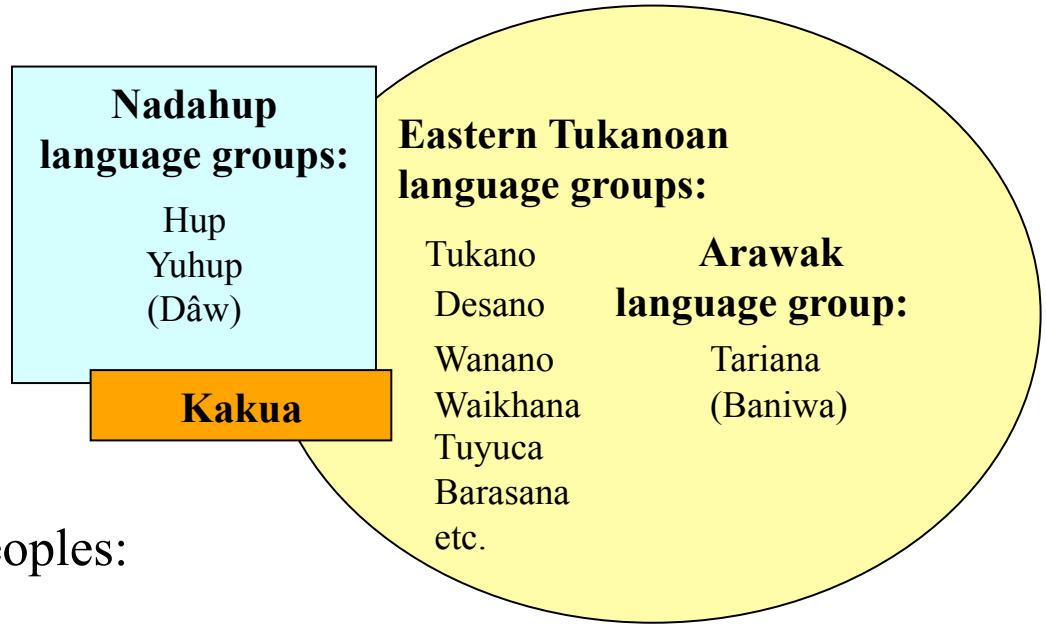
  - Interact through linguistic exogamy (marriage across language groups).
  - River dwellers; focus on fishing and agriculture.
  - Economic interaction with Nadahup/Kakua peoples: take socially superior role.

  Multilingual (people typically speak parents' languages, among others).

  Resistance to language-mixing motivated by linguistic exogamy (limited lexical borrowing but heavy grammatical diffusion)

Languages of the Vaupés region

Interaction and multilingualism



☐ Nadahup and Kakua peoples:

- Do not practice linguistic exogamy.
- Forest dwellers; focus on hunting, gathering.
- Economic interaction with Tukanoan (and Arawak) peoples: treated as socially inferior.

High rate of bilingualism in East Tukanoan languages

Resistance to language-mixing (in line with regional practices despite no linguistic exogamy; limited lexical borrowing but heavy grammatical diffusion)

Languages of the Vaupés region

Documented cases of language contact

- East Tukanoan > Tariana (Arawak) (Aikhenvald 2002)
- East Tukanoan > Hup/Yuhup/[Daw] (Nadahup) (Epps 2007, 2008)
- East Tukanoan > Kakua (Bolaños & Epps 2009, Bolaños 2010)
- Hup (Nadahup) > Kakua (Bolaños & Epps 2009)
- Baniwa (Arawak) > Cubeo (ET) (Gomez-Imbert 1996)
- Yucuna (Arawak) < > Tanimuca/Retuarã (ET) (Aikhenvald 2002)
- Other? Arawak > Kotiria, possibly Nadahup/Kakua > Cubeo (and other ET/Arawak?) (Goldman 1963)

Within broader northwest Amazon region:

- Bora (Boran) > Resigaro (Arawak) (Aikhenvald 2002)
- East Tukanoan > Nukak (Kakua-Nukak) (Bolaños & Epps 2009)

Languages of the Vaupés region

Phonological features

- Segmental inventories
- Phonological word and syllable structure
- Prosodic/suprasegmental features:
  nasalization tone glottalization

Some Hup words:

cáʔ ‘box’

căʔ ‘root clump’

ɟ’áʔ ‘turi (torch wood)’

căn’ ‘antler’

ɟ’áh ‘earth’

ɟ’ãˇh ‘*Dioscorea* tuber’

ɟ’á ‘black’

Languages of the Vaupés region

Hup

Vowels

Large inventories:

- Nadahup languages

i	ɨ	u
e	ə (ʌ)	o
æ	a	ɔ

Phonemic vowel length:
Nadëb only (< Arawak?)

Small inventories:

- Tukanoan languages (E & W)

i	ɨ	u
e		o
	a	

Tanimuca has lost ɨ, probably due to Yucuna (Arawak) influence (Aikhenvald 2002).

Vowels

Small inventories:

- North Arawak (typical pattern)

  i u

  e a

  Most North Arawak languages have phonemic vowel length.

  Tariana is developing ɨ and probably o (but without length) under Tukanoan influence.

  Yucuna gained o and lost length, probably under Tanimuca (Tukanoan) influence (Aikhenvald 2002).

- Kakua-Nukak

  i ɨ u

  e (ʌ) (o?)

  a

  Uncertain status of o in Kakua and Nukak (Bolaños 2010); may be emerging under ET influence.

Consonants

Voiceless stops: all languages

Voiced stops: (generally lacking in Carib, Yanomami, some W. Tukanoan)

- /b/ marginal in some N. Arawak lgs
- /g/ missing/marginal:
  - N. Arawak languages (but Resigaro developed under Bora influence)
  - E. Tukanoan: those in close contact with Arawak lack /g/ (Tanimuca/Cubeo, also some W. Tukanoan); those in eastern Vaupés lack /g/ in word-initial position. Chacon (2010): proto-Tukanoan glottalized voiceless stops > voiced stops, *except* in some cases word-initial /g/ - Arawak influence?
  - Nadahup: all languages lack [g] word-initially
- Oral-nasal contours for voiced stops: some E. Tuk, all Nadahup, Kakua-Nukak

Aspirated consonants:

- Common in N. Arawak languages only (also Yanomami)
- Aspirated voiceless stops developed in Kotiria [Wanano] (< Arawak)
- Some loss of aspiration in Tariana/Yucuna (Arawak) < Tukanoan

Consonants

Palatal stops: Nadahup (also Resigaro < Boran)

Fricatives:

- Labial: Kakua-Nukak (and Boran)
- Sibilant fricatives/affricates: 1 Tukanoan, 2+ Arawak, lacking Nadahup/Kakua-Nukak (except Dâw and Nadëb)
- Glottal/velar: most lgs have glottal; velar + glottal in Dâw and (probably) proto-Nadahup

Liquids: widespread,

but allophonic in Hup/Yuhup

Glides: widespread

Word and syllable structure

Preferred patterns:

- Tukanoan, Arawak:
  - CV syllable
  - 2-3 syllables per root morpheme (typical of other NW Amazonian languages)
- Nadahup and Kakua/Nukak:
  - CVC syllable
  - 1 syllable per root morpheme
  - Strong nasal contours on final voiced stops
  - Unique and highly salient pattern in the NW Amazonian context

Glottalization

- Glottal/laryngeal features (beyond presence of ʔ / h segments) are widespread in Vaupés languages
- Found in Tukanoan, Nadahup, Kakua-Nukak, and (marginally) Arawak
- Problematic for analyses; associated with consonants, vowels, or suprasegmental?

Glottalization:
Tukanoan

Glottalization in East Tukanoan languages of the eastern Vaupés:

Tukano, Piratapuyo, Desano, Siriano

- Only occurs in CVʔCV and CVʔV positions
- Only occurs in root morphemes (i.e. multisyllabic)
- Contrasts with (predictable) pre-aspiration on voiceless obstruents
- Sometimes conditions laryngealization on preceding vowel

Kotiria [Wanano] (Stenzel 2007:333)

du'ti [duʔtí] 'hide/escape'	*duti* [du^{h}tí] 'illness'
~da'bo [nãʔmṍ] 'rope'	*~dabo* [nãmṍ] 'wife'
su'a [suʔá] 'weave'	*sua* [suá] 'pick fruit'

Glottalization:
Tukanoan

Variable analyses:

- 'Laryngealized tone' (Ramirez 1997 for Tukano, where glottalization correlates with low tone on 1st syllable – but not true for other ET languages)
- Series of laryngealized vowels (Sorensen 1969:19-23)
- Glottal stop segment with restricted distribution (and as only licensed coda C; e.g. Miller 1999 for Desano)

Glottalization as a suprasegmental feature:

Stenzel 2007 for Kotiria and other languages; see also Silva 2010 for Desano

- Feature [constricted glottis] associates to the right edge of the first mora (in a subset of root morphemes)
- Unlike other prosodic features in ET languages (nasalization and tone), does not spread

Glottalization:
Tukanoan

Tukanoan glottalization in historical perspective:

Chacon (2010) reconstructs a series of voiceless glottalized stops in Proto-Tukanoan.

- C’ > C[voiced] in many East/West Tukanoan languages
- In Tukano, Kotiria, and others:
  - *C' > voiced stop / #_ (*except* g)
  - *C' > V'C / V_V

Glottalization:
Nadahup

Glottalization in Hup (Epps 2008)

- Property of consonants; series of glottalized stops: b’, d’, ɟ’, g’ and glottalized glides: j’, w’
- Glottalized stops do not contrast for voice
- As onsets: realized as laryngealization on following vowel [CV̰]
- As codas: realized as unreleased (voiceless) stop

  /**d’**oʔ/ [ⁿdo̰ʔ] ‘take’

  /tó**d’**/ [tót̚] ‘jar, bottle’

  /tó**d’**-ót/ [tót.ⁿdót̚] (jar + Oblique case) ‘with jar, bottle’

In Yuhup:

- Much like Hup, except that initial C’V is frequently realized as [VʔV]
- Ospina (2002) analyzes as a suprasegmental feature

Glottalization:

Nadahup

In Dâw (Martins 2004):

- Phonemic glottalized consonants: m', n', ɲ', l', w', j'
- [k’] and [c’] also exist, analyzed as allophones of [g] and [c] (but correspond to Hup /g’/ and /ɟ’/ in cognates)
- Possible that full range of glottalized Cs occurs, but d’ and b’ do not occur as onsets

In Nadëb (Barbosa 2005):

- [k’] and [tʃ’] exist, analyzed as allophones of [g] and [ɟ] (but correspond to Hup /g’/ and /ɟ’/ in cognates)
- Laryngealization also occurs on any vowel in a stressed syllable; analyzed as a suprasegmental feature

Glottalization:
Kakua-Nukak

Nukak:

- Glottalized voiced consonants may exist (p.c. Dany Mahecha to Katherine Bolaños)

Kakua (Bolaños 2010):

- Glottalized stops and glides exist, as in Hup, but:
  - /b'/ is only clearly attested glottalization contrast in onset position
  - /b'/, /d'/, /g'/, /j'/, /w'/ in coda position

Glottalization:

Vaupés languages

Glottalization generally lacking in other regional languages (Arawak, Carib, Yanomami, Bora)

Arawak (Aikhenvald 2002):

- Tariana : Some insertion of [h] before medial voiceless consonants; some sporadic insertion of word-final ʔ, attributed to Tukanoan influence
- Some glottalization present in Yucuna, possible influence from Tanimuca

SUMMARY:

- Variable status of glottalization in Vaupés languages as property of consonants or suprasegmental
- May reconstruct to Nadahup, Tukanoan, Kakua-Nukak – origin unclear
- Contact has likely influenced their distribution and realization

Nasalization

- Nasalization in Vaupés languages is a suprasegmental feature – property of syllable and/or morpheme, undergoes spreading

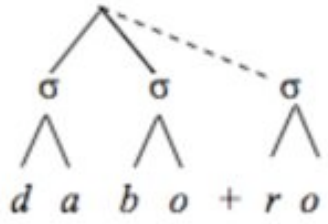
- Tukanoan nasal harmony much discussed
  (e.g. Kaye 1971, Noske 1995, Piggott & Van der Hulst 1997)

- Other area languages have similar phenomena – but with interesting variations

Nasalization:
Tukanoan

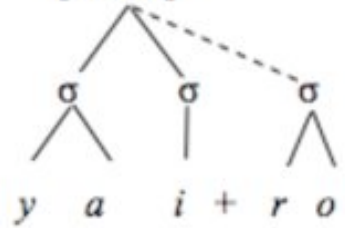
Nasal spreading in Kotiria [Wanano] (Stenzel 2004, 2007):

a. [+nasal]



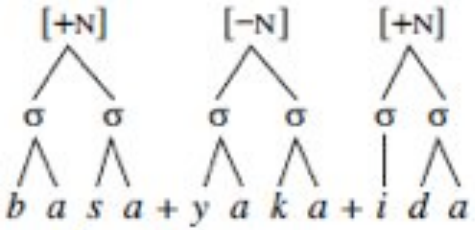
[nãmõ̃rõ̃] 'a wife'

b. [-nasal]



[yairo] 'a jaguar'

c.



people-steal-NOM:PL

[māsáj^{h}kaĩnā] 'kidnappers'

Suffixes in many ET languages are lexically marked as inherently nasal [+nasal], inherently oral [-nasal], or as unmarked (ø nasal) – a 3-way contrast!

Nasalization:
Tukanoan

Nasal harmony targets sonorants (includes voiced oral stops, see Rice 1993).

2 harmony types:

a) Non-targets (voiceless obstruents) are blocked by nasal spread

e.g. Secoya (WT): nasalization spreads progressively until it encounters a non-target; spreads regressively within the syllable:

mẽã 'variety of ant' *nãʔso* 'crayfish'

b) Non-targets (voiceless obstruents) are transparent to nasal spread

e.g. Tuyuca (ET):

nĩtɨ́ 'coal' *tɨ́ŋõ* 'Yapara rapids' (exs. Botma 2005:4)

Most systems of this type results in wholly nasal or oral morphemes, but in Southern Barasano nasalization is associated with a vowel and spreads progressively (and regressively within syllable).

Nasalization:
Arawak

- In most N. Arawak language, nasalization is a property primarily of consonants; no nasal harmony.

- Tariana (Aikhenvald 2002:24, 46, 2003):
  - Domain of nasalization is phonological word: spreads onto bound morphemes (progressive/regressive), skips over voiceless Cs
  - Result of Tukano influence.
  - Variation among speakers and dialects; those under more ET influence have more pervasive nasal harmony

- Yucuna: some nasal harmony, attributed to influence of Tanimuca (Tukanoan; Aikhenvald 2002:55)

Nasalization:

Nadahup

Hup (Epps 2008):

- Nasalization is morpheme-level property, as in E. Tukanoan – not contrastive for segments
- Spreading: only with vowel-copying suffixes, e.g. Oblique case *–Vt*:

núh-ű̃t [nű̃h-ű̃t] ‘on head’ *tə́g-ə́t* [tə́gᵑ.gə́t] ‘on tooth’

Yuhup (Ospina 2002, Brandão Lopes & Parker 1999, Botma 2005):

- Nasalization is morpheme-level, as in Hup
- But some vowel-initial suffixes following post-nasalized consonants undergo nasal spreading – typologically anomolous! (note pre-nasalization understood as phonologically irrelevant in Tukanoan languages)

[tə:dⁿ-ĩ̃h] ‘beating’ [ə:gᵑ-ĩ̃h] ‘drinking’

Nasalization:

Nadahup

Dâw:

- Martins (2004) includes both nasal consonants and vowels in phonemic inventory; contrastive:

  nɛĝ 'honey' *mab* 'sibling'

- BUT segmental contrasts within the morpheme are limited; most morphemes in her data are either all nasal or all oral (wrt potential targets), e.g. *mĩn* [mĩ:n] 'inga'.
- Nasal harmony limited to vowel-copying suffix -*V?* 'focus'

Nadëb:

- Barbosa (2005) includes both nasal consonants and vowels in phonemic inventory
- But, as in Dâw, actual examples of morphemes with both nasal and oral segments are very limited; e.g. *mog* 'tree sp.'

Nasalization:
Kakua-Nukak

Nukak (Cabrera et al. 1999: 363-404):

- Nasalization appears to be a morpheme-level property (though analyzed by Cabrera et al. as property of vowels)
- V-initial suffixes are nasalized by the post-nasalization of a root-final stop – like Yuhup!

  diw-at 'be born' *ub-at* [ubmãt] 'be afraid'

Kakua (Bolaños 2010 and p.c.):

- Nasalization is morpheme-level
- Spreading mostly limited to vowel-copying suffixes
- BUT for suffixes with a specified initial vowel, spreading *does* occur across a root-final /h/.
- Spreading sometimes occurs from a nasal CV root (no coda C), but speakers consider this a mistake

Nasalization:

Vaupés languages

SUMMARY:

Extensive nasal harmony (associated with morpheme and/or phonological word) is a feature of Vaupés languages:

East Tukanoan, Nadahup, Kakua-Nukak

Probably originated with E Tukanoan and spread to others in region (but Kakua-Nukak unclear)

Nasal harmony has a range of realizations across the region:

- (voiceless) obstruents transparent to nasalization
- (voiceless) obstruents block nasal spreading
- post-nasalization of root-final consonant may be inert or may spread
- other variations in spreading, e.g. transparent nature of /h/ in Kakua

Tone

- Widespread in Vaupés languages (and beyond, primarily to west)
- Like nasalization, prone to spreading
- Variation across area languages

Tone
Tukanoan

Varying analyses within Tukanoan as stress, tone, accent, 'pitch-accent' (see Hyman 2010, Chacon 2010)

All can be classified as tone languages, except Siona and Secoya (West Tukanoan); Chacon (2010) reconstructs tone for Proto-Tukanoan.

Some are [+ stress] [+ tone], where tone and stress correlate.

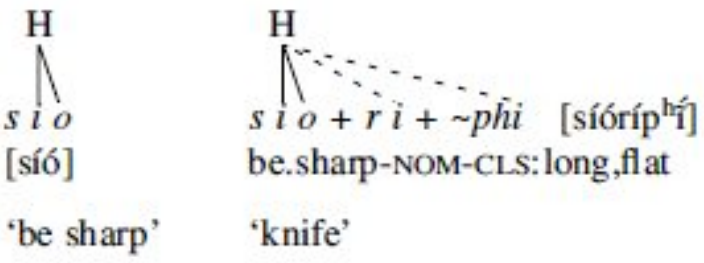
Others are [- stress] [+ tone] (cf. Hyman 2009)

Tone
Tukanoan

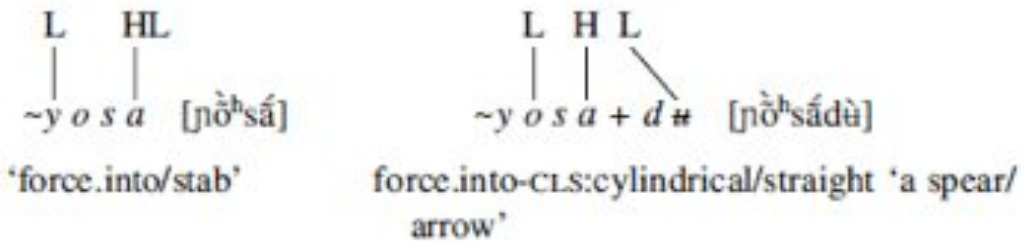
Kotiria ([- stress] [+ tone], Stenzel 2007:345-352; compare Barasano, Gomez-Imbert and Kenstowicz 2000):

- H and HL; both can occur with extrametrical (L) associating with left edge of word
- Associates with either 1st or 2nd mora of word; spreads progressively through phonological word

a)



b)

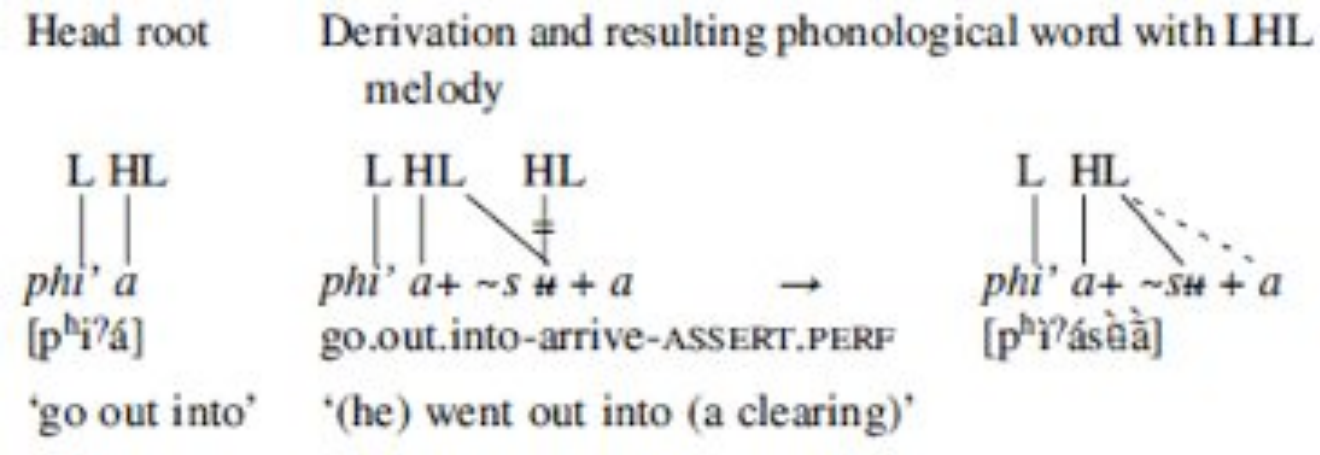


Tone
Tukanoan

Kotiria (Stenzel 2007:351):

- In compounds, the tone of the first root takes precedence, spreading throughout phonological word:

c)



Tone
Tukanoan

Variations in tone patterns:

- Gomez-Imbert (1999) discusses tonal differences between Barasano and Taiwano, two closely related languages

- Their speakers regularly intermarry; linguistic exogamy requires their languages to be distinct

- Gomez-Imbert argues that "tones are used as markers of difference" (15) while segmental/lexical distinctions are minimal

Tone
Nadahup

Hup (Epps 2008):

- Rising vs. high
- No tonal spreading
- Tone appears on stressed syllable only: [+ stress] [+ tone]
- Tone contrasts absent from verb roots

  núh (H) 'head' *nŭh* (R) 'tapioca'

Yuhup (Ospina 2002 and my fieldnotes)

- Like Hup, but tone values are *reversed*:

  nŭh (R) 'head' *núh* (H) 'tapioca'

Tone

Nadahup

Dâw (Martins 2004):

- Rising, falling, and Ø tone
- Rising and falling correlate with vowel length

  mãj (Ø) 'payment' *mãj* (R) 'hole' *mãj* (F) 'much'

Nadëb (Martins 2005, Barbosa 2005):

- No tone

Tone

Nadahup

Nadahup correspondences:

- short V Nadeb:: ø tone Daw:: high tone Hup:: rising Yuhup
- long V Nadeb:: rising tone Daw (voiceless coda):: falling tone Daw (voiced coda):: rising tone Hup:: high tone Yuhup

Nadahup tonogenesis?

- Hup-Yuhup-Dâw (subgroup) probably innovated tone under Tukanoan influence
- Yuhup almost certainly underwent a tone reversal
- But it is also possible that Nadëb lost tone and developed contrastive vowel length under Arawak influence

Tone
Kakua-Nukak and Arawak

Kakua (Bolaños 2010):

- Rising vs. falling vs. low (all roots, including verbs)
- [- stress] [+ tone]
- Tone spreads to affixes

Nukak (Cabrera et al. 1999: 374):

- Tone – phonetic high, mid, low, rising, falling; no further info

Arawak (Aikhenvald 2002, Ramirez 2001):

- Languages vary in presence/absence of tone; Tariana and Baniwa (in/near Vaupés) have tone

Tone:
Vaupés languages

SUMMARY

- Tone occurs throughout the Vaupés, but varies across languages according to correlation with stress, number of contrasts, etc.
- Areality suggests speakers adopt tone in order to sound *similar*
- But tone also seems particularly prone to change – may be manipulated to emphasize linguistic *difference* (e.g. Barasano ~ Taiwano; Hup ~ Yuhup)

Phonological diffusion

- What do we know about phonology in language contact generally? What is the relative stability of different types of features?

- Phoneme transfer: may piggy-back into a language on loan vocabulary; be transferred from speech community's L1 in process of language shift

- Situations of pervasive multilingualism may involve significant transfer without shift – "phonological metatypy" (Ross 1996, Foley 2010)

- Are some phonological features particularly prone to diffusion, and others more stable?

  e.g. prosodic features as prone to transfer – like copying an 'accent' (Urban & Sherzer 1988, Matisoff 2001)

Phonological diffusion

Relative stability/diffusibility of phonological features in the NW Amazon:

- Highly diffusible: tone, nasalization, glottalization (?)
- Somewhat diffusible: vowel contrasts; aspiration and voicing contrasts
- Relatively stable: word/syllable structure

- Coded for 39 phonological features (segmental, phonotactic, prosodic) across 29 languages (E/W Tukanoan, Arawak, Nadahup, Kakua-Nukak)
- Evaluation of relative similarity (due to inheritance or contact) using NeighborNet (Huson & Bryant 2006)

Phonological diffusion:

Segmental features / syllable structure

Consonants:

/b/	liquid(s)	at least 1 sibilant fricative
/d/	glottal stop	2+ sibilant fricatives
/g/ (robust)	labial fricative	
[g] word initial	affricate(s)	
aspirated stops	velar fricative	
palatal stops	glottal fricative	

Vowels:

/i/	/e/	/ɔ/	Diphthongs
/ɨ/ or /ʉ/	/ɛ/ or /æ/	/o/	
/u/ or /ɯ/	/ə/ or /ʌ/	/a/	

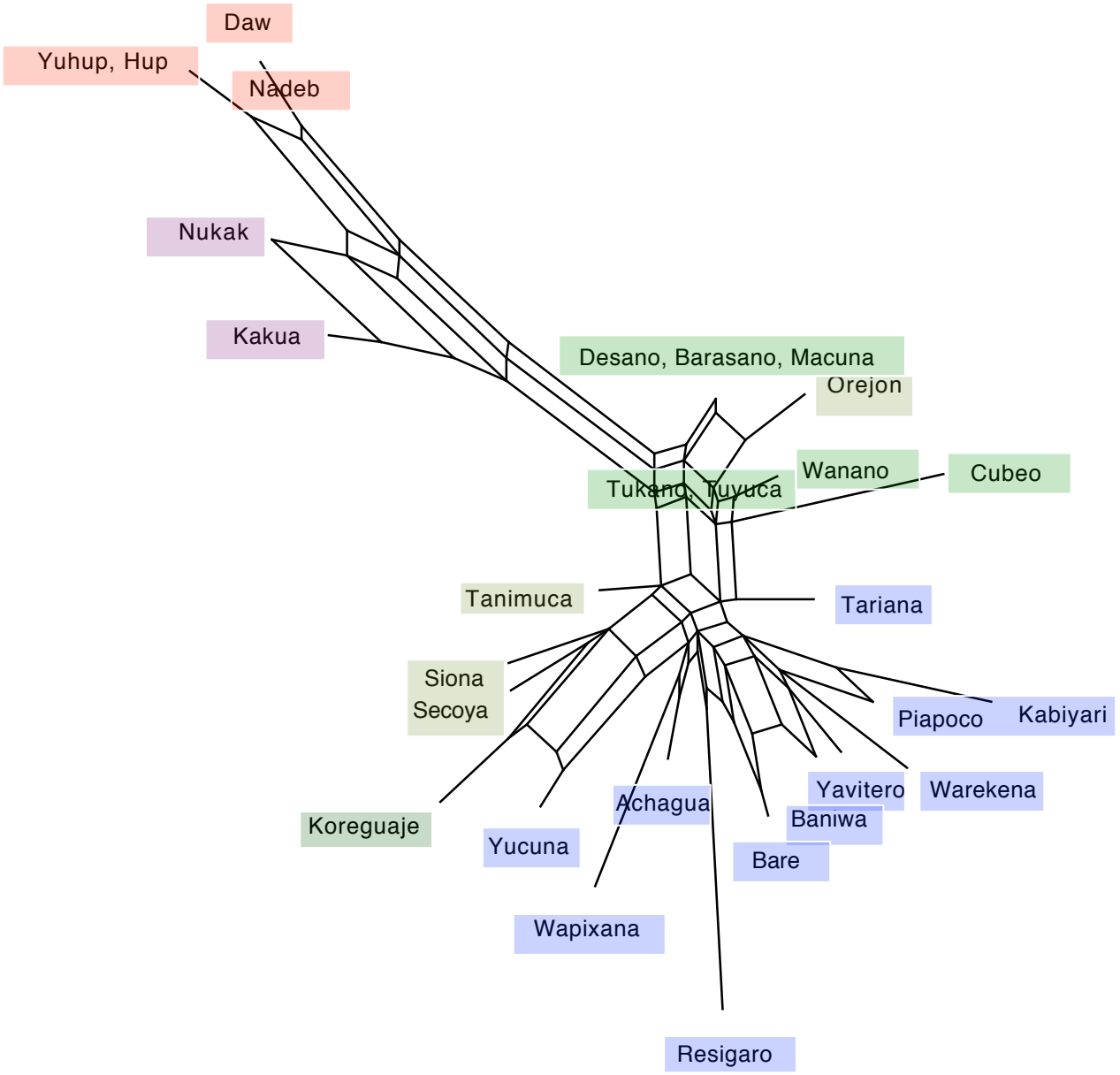
Syllable/word structure:

Morphemes usually 1 syllable

No/restricted codas

Phonological diffusion:

Segmental features / syllable structure



Phonological diffusion:
Prosodic and related features

Nasalization:

- property of (most) morphemes/phonological words
- property of syllables (only)
- property of Cs
- property of Vs (robust)
- nasal spreading across some morpheme boundaries
- voiced Cs with oral/nasal contours (e.g. [bm])

Tone:

- contrastive tone or stress/pitch-accent

Glottalization:

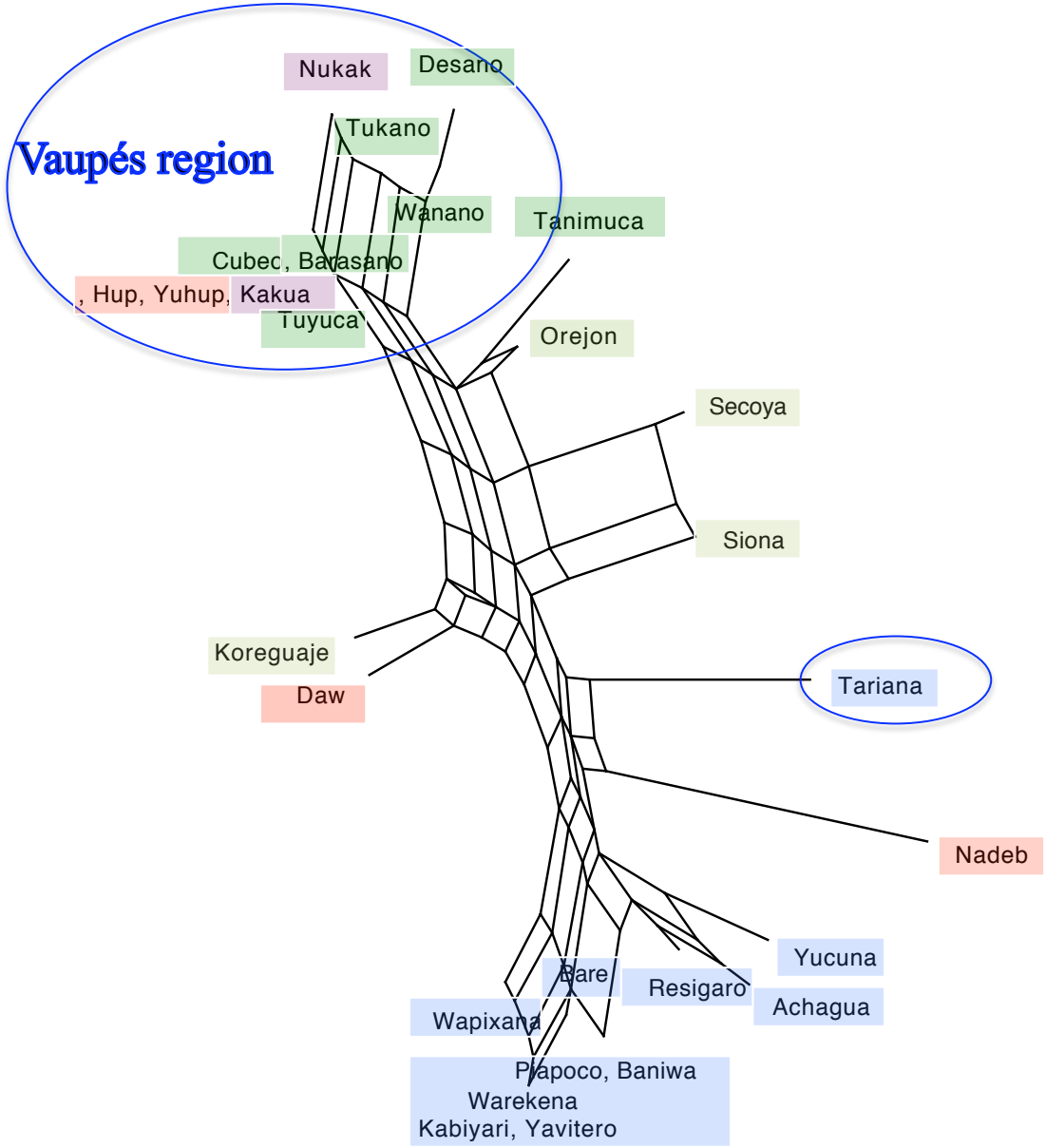
- glottalization (not associated with glottal stop segment) exists
- glottalization of Cs
- glottalization/laryngealization of Vs (not associated with Cs)
- glottalization is suprasegmental

Other:

- Vowel harmony
- Vowel length

Phonological diffusion:

Prosodic and related features



Contact and NW Amazonian prehistory

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Some speculations:

- Tukanoan family may have originated in area between current E/W branches (see Chacon 2010); early contact with Boran/Witotoan languages; move of ET languages into Vaupés

- Early Kakua-Nukak and Nadahup relationship (contact or genetic?) in Vaupés/Rio Negro region, before/independent of Tukanoans

- Prolonged contact between Tukanoan and Kakua-Nukak; Nukak later move out to northwest

- Prolonged contact Tukanoan and Hup-Yuhup, some Dâw

- Localized Tukanoan-Arawak contact within Vaupés

- Contact Nadëb and Arawak (and/or Carib?)

Conclusions

- Amazonian languages are widely endangered and little documented – but many intriguing phonological (and other!) features
- Diversity + contact provides insights into the variability and relative stability of phonological features
- Distribution of phonological features gives glimpses into prehistory – e.g. an ancient association between Nadahup and Kakua/Nukak?
- A puzzle still in need of much work – and languages in need of much documentation!

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