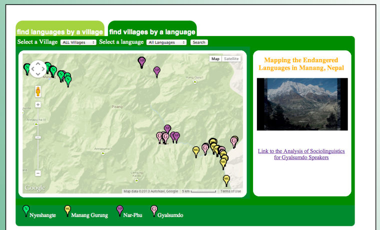
Mapping the Languages of Manang, Nepal



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Introduction

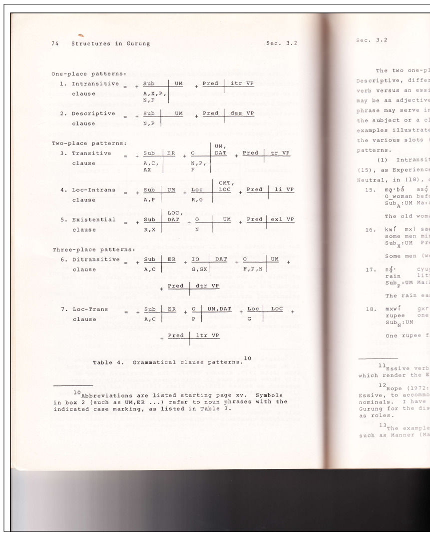
- This talk aims to:
- Provide some historical perspective on documentation activities and outputs, with a focus on Nepal
- Matisoff (1991: 498): "It is high time to "mainstream" S(ino-)T(ibetan) linguistics"
- It's also time to mainstream documentation methods & outputs within the context of 21st century digital & informatics scholarship
- A case study of how this is being done with four language communities of Manang District, Nepal

Documentation

- Language Documentation in Nepal in a traditional perspective
- B.H. Hodgson and G. Grierson in late 19th/early 20th centuries
- Linguistic surveys of Nepal intensified ca. 1980's: Werner Winter, now LinSuN at Tribhuvan University (Regmi 2010)
- Ongoing documentation initiatives by Summer Institute of Linguistics
- Energies skewed particularly to eastern Nepal, but this is beginning to change
- In Manang and surrounds ('Tamangic'): Georg, Glover, Hildebrandt, Honda, Mazaudon, Noonan

Documentation

- Documentation outputs in Nepal:
- Growing number of grammars published in mainstream venues: Brill, Mouton, sketches through Routledge edited volumes, Lincom Europa
- Even greater amount of information as unpublished mimeos, handouts or else as limited-release publications
- Many outputs were concerned largely with issues of genealogical affiliation and shared lexico-grammatical correspondences
- So, content more focused on paradigmatic patterns, comparative glossary-building and contrastive (-emic) analysis


74 Structures in Gurung Sec. 3.2

One-place patterns:
1. Intransitive clause = + Sub (A,X,P,N,F) | UM + Pred | itr VP
2. Descriptive clause = + Sub (N,P) | UM + Pred | des VP

Two-place patterns:
3. Transitive clause = + Sub (A,C,AX) | ER + O (N,P,F) | UM, DAT + Pred | tr VP
4. Loc-Intrans clause = + Sub (A,P) | UM + Loc (R,G) | CMT, LOC + Pred | li VP
5. Existential clause = + Sub (R,X) | LOC, DAT + O (N) | UM + Pred | exl VP

Three-place patterns:
6. Ditransitive clause = + Sub (A,C) | ER + IO (G,GX) | DAT + O (F,P,N) | UM + Pred | dtr VP
7. Loc-Trans clause = + Sub (A,C) | ER + O (P) | UM,DAT + Loc (G) | LOC + Pred | ltr VP

Table 4. Grammatical clause patterns.[10]

[10] Abbreviations are listed starting page xv. Symbols in box 2 (such as UM,ER ...) refer to noun phrases with the indicated case marking, as listed in Table 3.

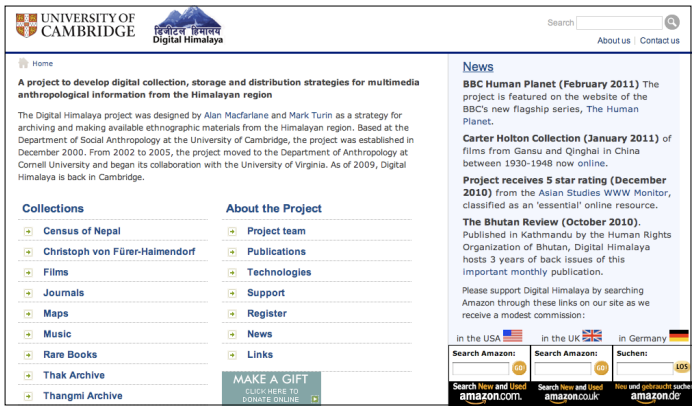
Glover (1974: 74)

Ghacok Gurung

Outputs

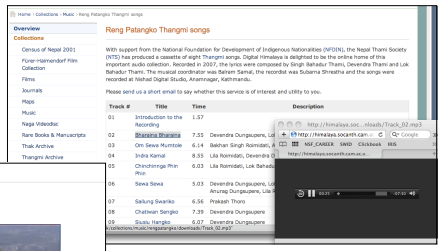
- Newer initiatives have brought methods and outputs within this particular field into the 21st century:
- Archives: Digital Himalaya (University of Virginia, University of Cambridge), Tibetan Himalayan Library (U of Virginia), LACITO
- Documentation blogs and web pages: CPDP, Nar-Phu, etc.
- A-V companions to grammars: van Driem and Tshering's 1998 Dzhongkha practical grammar
- The online journal *Himalayan Linguistics* now has a "field reports" component
- But there is still room for more work and development

Digital Himalaya



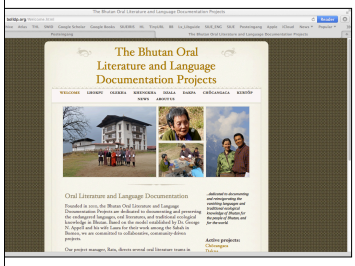
The DH Thangmi Archive

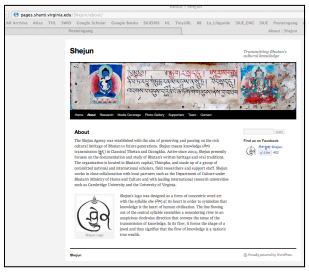
Thangmi songs (mp3 format) & films (mp4 format)



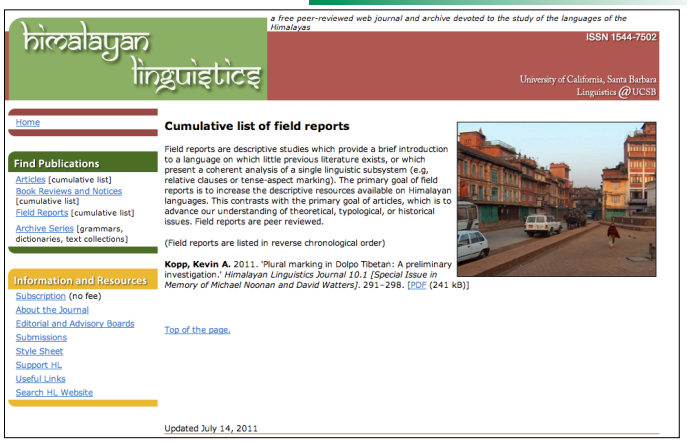
Also: LACITO
http://lacito.vjf.cnrs.fr/archivage/

Collaborative Efforts in Bhutan

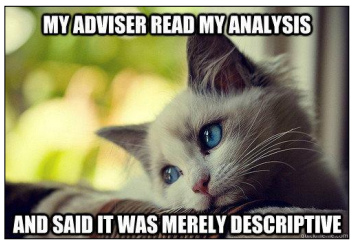




Field Reports



Field Reports



Field reports can legitimize certain types of (descriptive) studies or specific phenomena, allowing for replication or incorporation into theoretical platforms as necessary

Ongoing Need

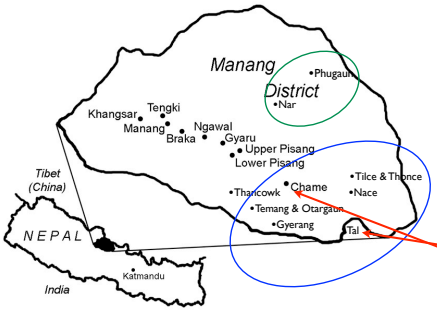
- The linguistic diversity across the geographically changeable and compact/bounded inhabitable regions of Nepal, combined with within-family and across-family contact, along with varying degrees of threat/ maintenance to these languages should all shape the methods of documentation too
- Historically, this would be a tall order for any purely paper-bound output
- But existing grammars already hint at the possibilities of what a multi-variable approach to documentation on any given language/in any area might reveal (handout, appendix)

Ongoing Need

- This kind of information is essential; not only does it contribute to/ challenge theories of natural human language...
  - E.g. phonemic vs. sub-phonemic, conditioned vs. free variation, structure-preserving vs. structure altering; lexical vs. post-lexical; lexically general vs. specified (Kiparsky 1982; Mohanan 1986; Blevins 2004 ; Nespor and Vogel 2007)
- An added bonus is that the variation frequently appears to have spatial and sociolinguistic motivations
- These observations open up possibilities for revisiting and expanding methods and outputs of language documentation & description, enriching analysis by factoring in other variables

Manang Languages

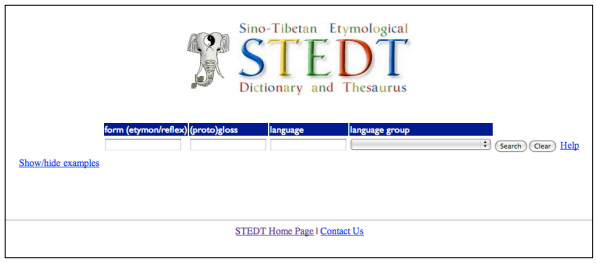
My own main documentation focus since 1998



- Nar & Phu spoken to north-east
- Nyeshangte/Manange spoken in northern & central VDC's
- Manang-Gurung in southern & central VDC's
- Gyalsumdo around Tal & Chame

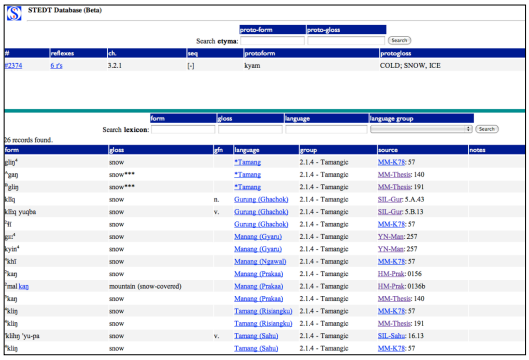
Manang Languages

- Case 1: Lexical Comparison
- My first field trip to Nepal in 1998 involved gathering lexeme information following the model of STEDT



Manang Languages

- STEDT
- Another good example of digital innovation in comparative method outputs



- Case 1: Lexical Comparison

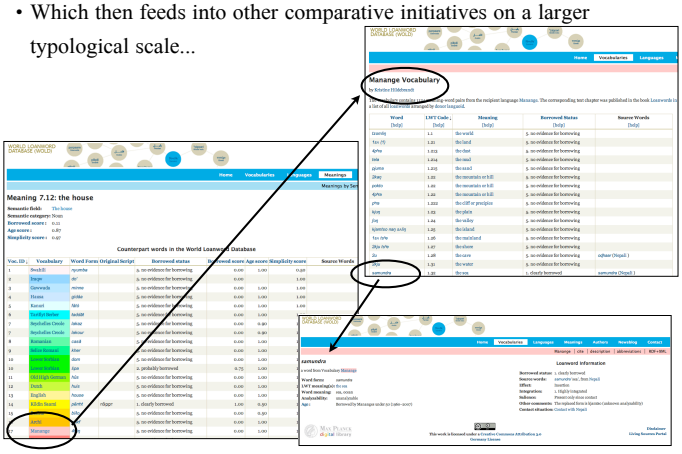
20-30 yrs. old | 14 yrs. old < 10 yrs | 40 yrs. old! < 10 yrs.

Etymons	Gloss	Ngawal Nye.	Ghyaru Nye.	Prakaa Nye.	Manang Nye.	Nar-Phu Noonan	Nar-Phu KAH	Gurung W.W.G.	Gurung KAH	Gyalsumdo
khyim, kim, kyum	house									
(s-)diŋ, s-niŋ, nyiŋ	heart									
rey, s-rwi(y)	rope									
lap, la, pak, rwak	leaf									
sjəkw, b-raŋ, m-nak	morning									
dbuɣ, gjaɣw	head									
lam	road									
r+wag, s-mak, haŋ	black									
thad, tay	big									
mwəy, ziy, tsiy, ŋay	small									

- Case 1: Lexical Comparison: facilitates~problematizes etyma reconstruction; reveals conservative/innovative variants; provides leads to contact effects & dialect variation

Etymons	Gloss	Ngawal Nye.	Ghyaru Nye.	Prakaa Nye.	Manang Nye.	Nar-Phu Noonan	Nar-Phu KAH	Gurung W.W.G.	Gurung KAH	Gyalsumdo
khyim, kim, kyum	house	4t^{h}ĩ	3tin	4t^{h}ĩ	4t^{h}iŋ, 4t^{h}ĩ	tĥĩm	3tĥĩm	ʤĩ, dĩ	ti	x
(s-)diŋ, s-niŋ, nyiŋ	heart	1tĩ	2din	1tĩ	1tĩ	nĩŋ, tĩŋ	tĩŋ, kĩm, mĩku	1tĩ	tĩ, ku, k^{h}iŋ	ɲiŋ
rey, s-rwi(y)	rope	x	2tso	1tɕo	1ts^{h}o	ʧ^{h}ô	ʧ^{h}ô	ʧ^{h}u	ʧ^{h}o, sjopa	x
lap, la, pak, rwak	leaf	3pa	2ba	2pa	3pa	pɛti, pĥa	pa, lɛptɛ	3po	po	làpʧi, tĥũmpu
sjəkw, b-raŋ, m-nak	morning	x	2nanan	2nəntaŋ	3nanaŋ	nĥamtoŋ	namtoŋ, nɛmtoŋ	ŋagã	x	nàmtsẽ
dbuɣ, gjaɣw	head	2krɣ	2bagari	1pakli	1p^{h}akli	kræ	krʌ, mikrɛ	kra	kra	kĥõ
lam	road	4k^{h}jẽ	3kjẼn	4k^{h}jẽ	4k^{h}jẽ	kĥlâm, lam	kjʌlam	4gã	x	làm
r+wag, s-mak, haŋ	black	x	2mlaŋgja	1mlɔ̃kja	1mleŋkja	mĥlaŋ	mlaŋ	mlõgja	mlõkja	nàkpu
thad, tay	big	x	2toba	1tjepʌ	1tjʌpʌ	t^{h}epe	t^{h}jepe	t^{h}eba	t^{h}epa	ʧ^{h}úmpu
mwəy, ziy, tsiy, ŋay	small	x	x	2pretsa (error?)	1ʧampʌ	ʧãŋpe	ʧaŋpe, ʃipe	ʧ^{h}joba	ʧoŋpa	ʧ^{h}éma

- Case 1: Lexical Comparison
- Which then feeds into other comparative initiatives on a larger typological scale...



- Currently the only systematic comparative analysis I have is based on (Indic) loanwords in the context of relative endangerment (Hildebrandt 2004, 2009; Wilbur 2005)

Lg.	Loans or Loan Free Variation w/Indic	PTB or PST etyma
Ghacok Gurung (n = 509)	149 (29%)	360 (71%)
Manang Gurung (n = 250)	30 (12%)	220 (88%)
Manange (n = 412)	35 (9%)	377 (91%)
Nar-Phu (n = 360)	15 (4%)	345 (96%)

Manang Languages

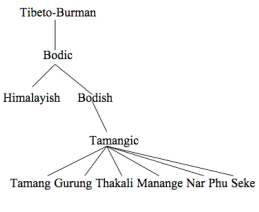
- Case 2: Sino-Tibetan tonogenesis:
- Relatively "recent" diachronic phenomenon, and many S-T languages still incipiently tonal in terms of phonetic correlates, domains of contrast and perceptual functional load:

No tone	The languages are a-tonal	Dolakha Newar, Garo[a)], Kinnauri, Limbu, Qiang
Amalgam	For at least half of the tones, the phonetic correlates include F_0 *and* phonation differences. The number of contrastive tones is often four or fewer	Burmese[b)], Dege Tibetan, Kham, Kyirong Tibetan, Manange
Pure	Tone is (almost) entirely a function of F_0 distinctions. If there is an additional parameter, it applies to only one tone. The number of tones is often greater than four	Cantonese, Dulong, Kayah-Li, Lahu, Mandarin, Meithei, Wu

Tone Systems in 19 S-T languages

Tamangic Tonogenesis

PROTO	*p	*p^h	*b	*m	MODERN
*HI	p	p^h	--	m	/1/ modal
*p, *p^h, *b, *m	p	p^h	--	m	/2/ modal
*LOW	--	--	p	m	/3/ non-modal
*p, *p^h, *b, *m	--	--	p$^{(h)}$	m	/4/ non-modal



Resulting Systems

- In languages with adequate data

		Tamang	Gurung	Thakali	Manange
*HI	/1/	54 ±asp	33 ±asp	54	22 ±asp
	/2/	55 ±asp	54 ±asp	44	44 ±asp
*LOW	/3/	33/22 fi, +asp	11 fi, -asp	11 fi, -asp	52 –asp (only obs)
	/4/	211 fi, +asp, [b]?	12 fi, -asp, [b]?	121 fi, -asp, [b]	42 +asp (only obs)

(fi = 'breathy/murmur phonation; [b] = possible phonetic voicing effect of onset; Chao numbering system where 5 = high, 1 = low)

- However, Mazaudon & Michaud (2006, 2008), Hildebrandt (2007), Mazaudon (2005): high degrees of idiolectal & dialectal variation, phonetic correlates differently weighted across languages, varied role of F0 (pitch) in defining the systems

Issues of Representation

- The different diachronic paths and currently varied systems of these languages have some significant consequences for representation of tone
  - Featural approach: 2 tones + initial C [VOICE] feature (Kjellin 1975); but: in some lgs., voicing differences part of the consonant, part of the vowel, or else both (in particular, Tamang)
  - Separate tone & phonation: /1, 2/ tone, /3, 4/ phonation/register (Maddieson 1984); but: across lgs., /3, 4/ different trajectories
  - HI & LOW Register systems: in LOW (Yip 1995, Duanmu 1992) phonetic voicing of onsets based on tone category; but: voicing in Tamang tones phonetically unstable & now Manange /1/ & /4/ for some speakers → "low merger" (despite etymology)

Issues of Representation

- Mazaudon & Michaud (2008) suggest a 'panchronic' approach:
  - It's possible that Gurung, Tamang, Thakali → Manange-type system
  - If so, we are observing tonogenesis still in-action, with gradual de-linking (& possibly re-linking) of non-F0 correlates
  - In particular, re-linking may occur via contact with Indic languages (non-tonal, true register-based systems, dominant, lingua-franca presence in Nepal)
  - And we are likely to witness a great deal of inter-speaker & regional variation

The Problem of Acoustic Correlates

- My past research on phonetic correlates has revealed more questions than answers

	F0	Initial C VOT	Medial C VOT	Stem Amplitude	Spectral Tilt (modal v. non-modal)	V Duration
Manange (9 spkrs, 4 communities)	4 tones (rural) 2-3 (urban)	/4/ +asp /3/ -asp	allowable for all tones	n.s.	n.s.	n.s.
Nar(-Phu) (2 spkrs, one community)	2 tones "high" & "low"	male: /2/ vs. others	n.s.	n.s.	/3/ v. /4/ (female: vowel jitter)	female: /1, 3/ vs. /2, 4/
Manang-Gurung (7 spkrs, 2 communities)	some spkrs 3-way, others 2-way	for some spkrs: /1, 2/ v. /3, 4/	n.s. (most words monosyll.)	n.s.	n.s.	n.s.
Gyalsumdo (1 speaker)	3-way (2 high, 1 low)	n.s.	insufficient data	n.s.	n.s. but vowel jitter significant	n.s.

Issues in Morpho-Syntax

- Case 3: "Optional" Case-Marking
- "Case" is traditionally thought of as a structural/grammatical correlate to verb-argument relations, or else lexically specified by a case governor, or else semantically constrained (e.g. with spatial cases)

Ergative case marking in Nepali

(1) **məi-le/*mə** pauroṭi kaṭ-ē
1SG-ERG/*1SG bread cut-PST.1SG
'I cut the bread.'

(2) **məi-le/mə** pauroṭi kaṭ-dəi-tsʰu
1SG-ERG/1SG bread cut-IPFV-PRES.1SG
'I am cutting the bread.'

(3) **dʰuŋga-huru-le/*dʰuŋga-huru** dzʰjal pʰuṭa-e
stone-PL-ERG/*stone-PL window break-PST.3PL
'The stones broke the window.'

(4) **dʰuŋga-huru-le/*dʰuŋga-huru** dzʰjal pʰuṭa-dəi-tsʰən
stone-PL-ERG/*stone-PL window break-IPFV-PRES.3PL
'The stones broke the window.' (Li 2007: 1465-1467)

- ERG is obligatory on **animate subjects** in the Perfective but not in the Imperfective.
- It is obligatory on **inanimate subjects.**

Issues in Morpho-Syntax

- Optional Ergative Case Marking (OEM)
- Well documented within T-B (Chelliah & Hyslop eds. 2011)
- Examples from Manang-Gurung

Elicitations (recorded in 2013)
1. tela **ŋa-i** kjo-ni tshe pi-i
yesterday 1SG-ERG 2SG-DAT book give-PERF
'Yesterday I gave you the book.'
2. **ŋa-i** ke lə-i
1SG-ERG work do-PERF
'I did the work/I worked.'

Text Data (gathered in 2012)
1.**ŋjo** tsətsə pi-i
1.PL salt give PERF
'We gave them salt.' (Dhar GM1)
2. tsu **mənthe -jo** binti lə-i
this Manange -PL petition do -PRF
These Manange people did (offered) a petition. (Dhar GM1)

Issues in Morpho-Syntax

- A kind of differential subject marking
- The behavior is linked to semantic & information-structural factors
- The task is to catalogue the relevant conditions that correlate with OEM (& other optional case expressions) in these languages
- Sociolinguistic factors, including the growing role and influence of Nepali, are probably at play in the observed variation across the different linguistic levels
- Add to this the recent, significant development & settlement-impacting activities going on in Manang (and Lamjung, where other Gurung varieties are spoken)

these workers are from Eastern Nepal

Road-Building:
Dynamite embedded in chiseled holes in rock walls, upper Manang, 2010

Road-Building:
Blasting a road out of cliff walls, near Tal village, lower Manang (summer 2010)

What results from this does not always resemble an actual road! (Lamjung, 2009)

Manang Languages

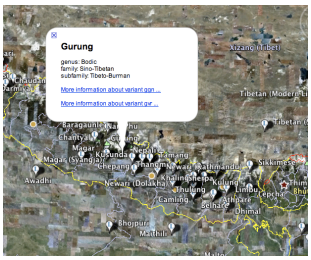
- Am I seeking to do the impossible?
  - I want to obtain a comprehensive, representative data-set of lexico-grammatical, phono-semantic & discourse strategies found in these four (+) languages (along with data on dialect variation)
  - I want to better understand how development initiatives interrupt or preserve lg. attitudes, usage & transmission
- Actually, this type of study is attractive to a cross-linguistic, geo-spatial perspective
- GIS (Geographic Information Systems) representation of Manang

GIS

- GIS is a system for storing and displaying geo-spatial information on the web or in other digital formats
- It integrates software, hardware & programming to answer questions involving geographically referenced data

GIS and Documentation

- GIS-documentation link-ups are increasingly employed, with some interesting and compelling exemplars
- DELAMAN network (spatial representation of metadata from endangered language archives)



GIS & Documentation

- Berkeley Linguistics Mapping Project (BeLMaP): Studies the role of space in the spread of linguistic features via diffusion/borrowing in areas of intense contact (Michael 2010)

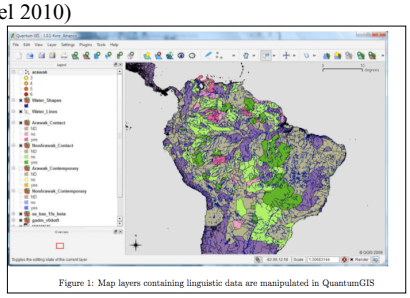
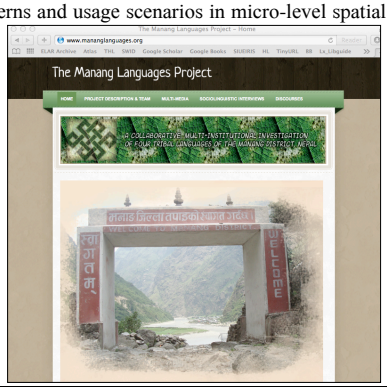


Figure 1: Map layers containing linguistic data are manipulated in QuantumGIS

- Anju Saxena and collaborators: "Digital Areal Linguistics: A Lexical View of the Himalayan Micro-Area" (Swedish Research Council)

A GIS Perspective of Manang Languages

- NSF CAREER: "Documenting the Languages of Manang, Nepal for Local and International Impact"
- Visualize patterns and usage scenarios in micro-level spatial perspectives

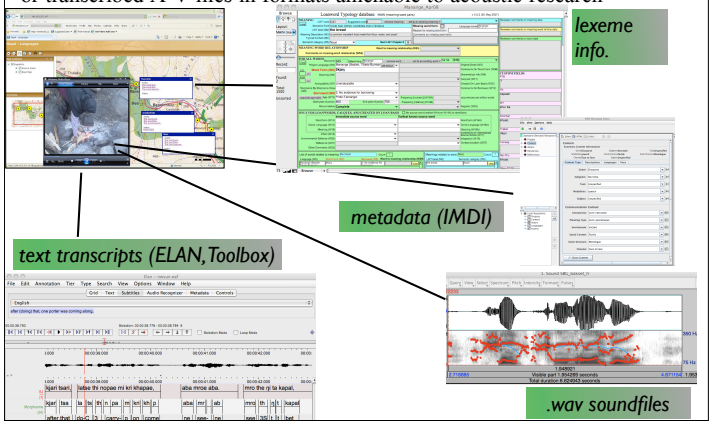


Mapping Languages of Manang

- Map designed by Shunfu Hu (SIUE), with G.A. assistance from Prita Malla & Kanchan Karki
- http://www.siue.edu/~shu/nepal7.html

Mapping Languages of Manang

- The geo-points may themselves become "hotlinks" to downloadable data, or transcribed A-V files in formats amenable to acoustic research



Acoustic Findings

- 80-90 words elicited from speakers in each village throughout Manang
- Organized by a range of phonetic, phonological & lexical factors
- If village is represented by more than one language, we attempt representation from each lg.
- So far: data from 10 M-G; 6 Gyalsumdo; 1 Manange; 2 Nar (more Manange & Nar data to be gathered in 2014)

Acoustic Findings

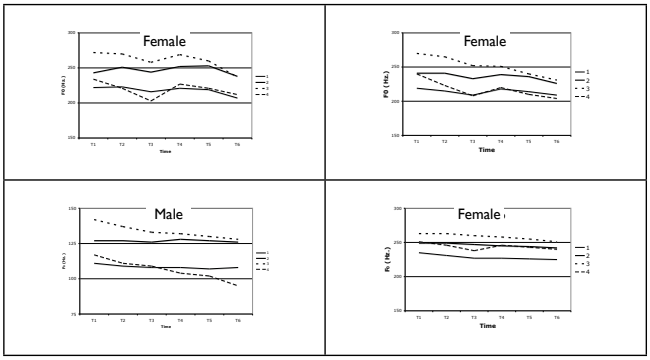
- Words were recorded in isolation (three repetitions) & frame-medial or final context (three repetitions)
- Gurung *kwe* 'bee' & *la-pʌ* 'drive.away-NOM'
  - For nouns: toso ŋʌ-e kwe mro-e-po [now 1SG-ERG bee see-ASP-NOM] 'Now I see a bee.'
  - For verbs: toso ŋʌ-e la-pʌ tsʌ-ti-po [now 1SG-ERG drive.away-DEONT want-ASP-NOM] 'Now I want to drive away.'
  - Gyalsumdo *ʈo* 'stone' & *ʈo* 'walk/go'
    - For nouns: ŋʌ ʈo t^hoŋ-sõ [1SG stone see-TAM/EVID] 'I saw the stone.'
    - For verbs: ŋʌ tʌntʌ ʈo-ke (re) [1SG now walk/go-TAM/EVID (EVID)] 'I am walking now/I walk now.'

Acoustic Findings

- What can we look to as modern reflexes, or as features to the tonogenetic developments in these languages?
- Just what kind of variation is possible amongst any generalizations?
  - Pitch-melody (within/across the registers)
  - Behavior of initial obstruents (VOT)
  - Voicing of vowels (and consonants) with respect to Electroglottographic measurements

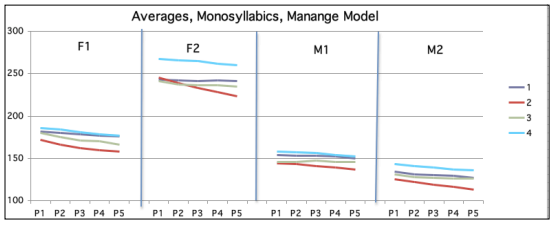
Acoustic Findings

- One place to begin: Pitch-melody within "high" vs. "low" register groupings (Four Manange speakers, 6 measurement points)



Acoustic Findings

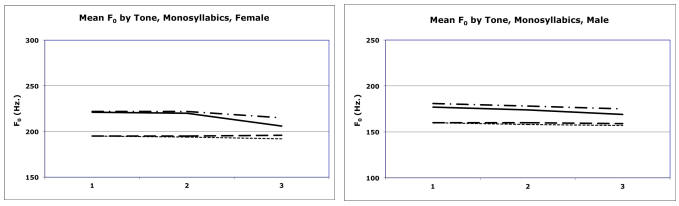
- Pitch-melody: Four Manang-Gurung speakers (5 measurement points)



- Manange (prior slide): four-way separation for most speakers (not male)
- M-G: a high-low separation only emerges when plotted against Manange model for 3 of 4 speakers so far, which seems to be an interesting development for communities in this region

Observations & Analysis

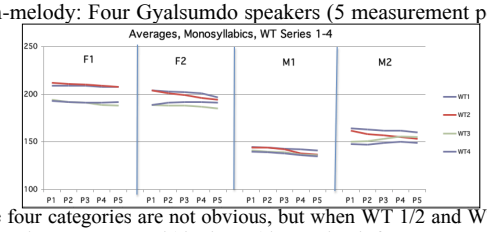
- Pitch-melody: Two Nar-Phu speakers (3 measurement points)



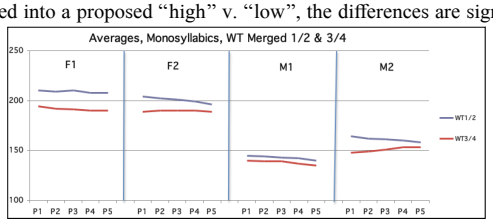
- No clear evidence (yet) for additional melody distinctions within a high-low register

Observations & Analysis

- Pitch-melody: Four Gyalsumdo speakers (5 measurement points)

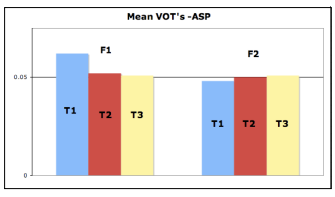


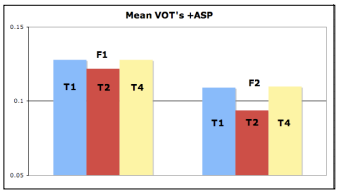
- The four categories are not obvious, but when WT 1/2 and WT 3/4 are merged into a proposed "high" v. "low", the differences are significant



Observations & Analysis

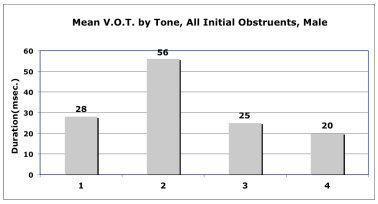
- Another possible cue: Voice Onset Time (VOT) differences on initials in different registers (or tone groupings within the H-L division) may emerge as a reflex of older (obstruent) voicing contrasts (Manange, 2 speakers)

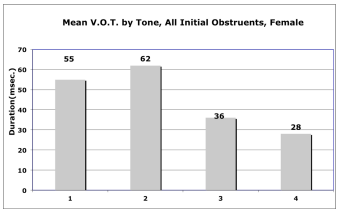




Observations & Analysis

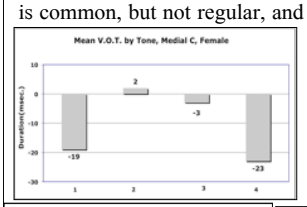
- VOT differences on initials, Nar (2 speakers)

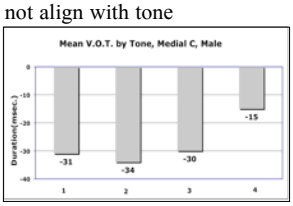


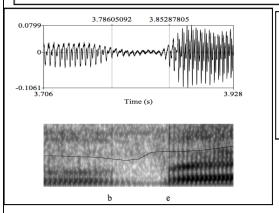


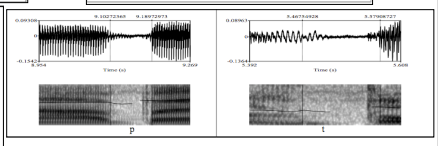
Observations & Analysis

- In word-medial position, passive plosive voicing assimilation (V_V) is common, but not regular, and does not align with tone







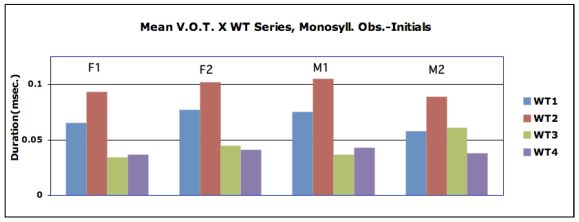


/na-p̪e/ 'sick-NOM' & /pʰâl̪to/ 'part of foot'

/tʰû-p̪e/ 'sew-NOM'

Observations & Analysis

- VOT differences on initials, Gyalsumdo (4 speakers)



- The male speakers show a strong tendency towards pre-voicing or else breathy onsets with words in WT 3 & WT 4 (those cases are not reflected in these bar-graphs)

Observations & Analysis

- Electroglottographic cues: Mazaudon and Michaud (2008) observed for Tamang that the open-quotient (Oq) values were significantly higher, with a dipping then rising pattern through time for the LOW tones vs. HI.
  - i.e. for the LOW tones, they observed an overall rise in airflow rate in the nucleus

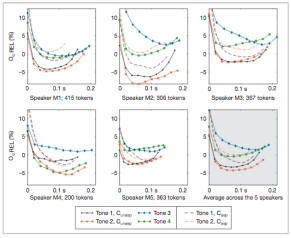


Fig. 4. Averaged curves of O_q (relative to the mean O_q value of each speaker), plotted against average duration.

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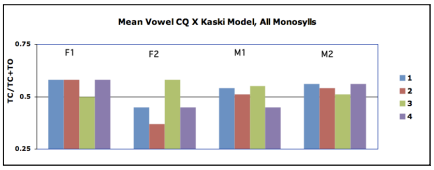
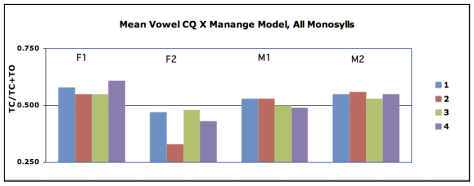
- My study: all words recorded through a EG2-PCX2 two-channel EGG assembly (see slide #1)
- I measured Closed Quotient (CQ): difference between time of v.f. closure in relation to total time of voicing cycle; Non-modal predicted to carry lower CQ values than modal, as v.f. closure is shorter in time & opening portion lags for longer
- I took only one measurement point

Observations & Analysis

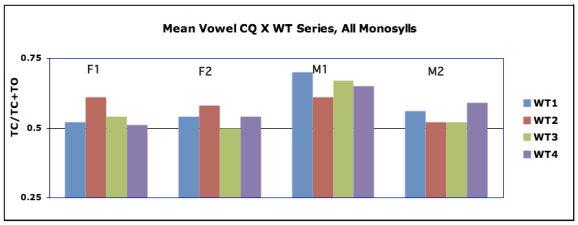
- EGG CQ for Manang-Gurung:
- When either the Kaski or the Manange tone models are considered, a weak correlation between /4/ vowels & lower CQ, but it is not consistent across speakers





Observations & Analysis

- EGG CQ for Gyalsumdo:
- Three of four speakers: initial vowels of WT 3 and/or 4 show lowered CQ values, but this is not always significant



Summary

Tamangic Languages of Manang

Characteristics	Manange	Manang Gurung	Nar(-Phu)
Pitch-melody	High-low & level-falling/contour	High-Low emerges only when compared to Manange model	High-Low
Onset voicing	No voicing; aspiration split in tones /3/ & /4/	No voicing; phonetic aspiration rare	Lower VOT in low register
Other cues			Possibly jitter

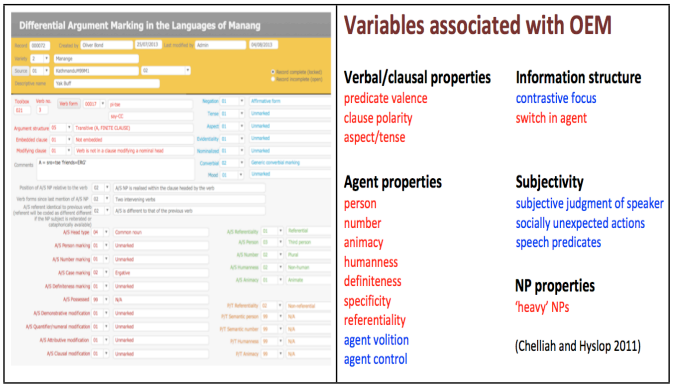
Summary

Gyalsumdo

Two Registers	Characterized by
"High" (WT 1/2)	Higher F0 (no evidence for contour diffs. yet), ±asp obs.
"Low" (WT 3/4)	Lower F0, tendency towards obstruent voicing, particularly by males, weak evidence for shorter vocal fold closure for vowels, obstruent aspiration rare

OEM Findings

- Oliver Bond (Surrey University) & Dubi Nanda Dhakal (Tribhuvan University) collaborators



OEM Findings

- Note that non-marking of overt A arguments is much more common than marking, and that arguments themselves are also frequently optional

	Manange		Gurung		Nar		Gyalsumdo	
Verb forms	129	100%	71	100%	37	100%	27	100%
Verbs with overt A/S NPs	37	28.68%	11	15.49	13	35.14%	2	7.41%
With ERG S	3	2.33%	0	0%	3	8.11%	0	0%
Intransitive	**91**	**70.54%**	**19**	**26.76%**	**20**	**54.05%**	**0**	**0%**
With overt S	26	20.16%	11	15.49%	5	13.51%	0	0%
With ERG S	0	0%	0	0%	0	0%	0	0%
Transitive	**35**	**27.17%**	**7**	**9.86%**	**15**	**40.54%**	**23**	**85.19%**
With overt A	11	8.53%	0	0%	7	18.92%	2	7.41%
With ERG A	3	2.33%	0	0%	2	5.41%	0	0%
Ditransitive	**0**	**0%**	**0**	**0%**	**1**	**2.70%**	**4**	**14.81%**
With overt A	0	0%	0	0%	1	2.70%	0	0%
With ERG A	0	0%	0	0%	1	2.70%	0	0%
Unclear	3	2.33%	45	63.38	1	2.70%	0	0%

OEM Findings

Unmarked A arguments frequently occur in these contexts:

- They are used for maintenance of reference of a given referent rather than a switch
- Such arguments are definite & specific
- They are typically kin terms or pronouns used as topics
- O arguments are explicitly realized
- The verb of the relevant clause is itself a converb or nominalized verb in the larger sentence

Future Plans

- These are languages with low referential density (cf. Bickel 2003)
- And ergative-marking appears to be as much information-structural related as strictly determined by grammatical function of the argument
- These are still early days, and we plan to align our tonal & morpho-syntactic observations with sociolinguistic usage & attitude surveys gathered alongside the phonetic & discourse data

Final Considerations

- A spatial perspective is not a substitute for intensive, comprehensive documentation of systems as they are used in everyday settings, across genres; the methods of investigation must remain rigorous
- There is also the non-trivial matter of community permission, input and collaboration in an endeavor resulting in linguistic mapping at a micro-level (cf. Penfield et al 2008, Rice 2011)
- Such initiatives also rely on intense cross-disciplinary (and cross-institutional) collaboration with experts on hardware, software and programming, on larger budgets, and on longer timelines (e.g. NSF CAREER, ELDP Large Grants, U.S./U.K./EU cross-council collaborations, etc.)

Final Considerations

- Following guidelines advocated by ELAR, by DoBeS and by Bird and Simons (2003), all of this collaboration and expertise must all ultimately be open-source (to the extent possible), transportable, cross-platform (non-proprietary), available to/learnable by a wide range of users, must find a long-term home for storage/access/archive, and must use mark-up languages available for long-term access

Final Considerations

- However, spatial representations of structure and usage in such multi-lingual, heavy-contact, endangerment-prone areas provide an additional, more intuitive visual perspective of 'what's going on'
- Such representations are particularly illuminating in areas where multiple features are considered simultaneously, or where structural variables are paired with socio-cultural/attitude/usage-scenario ones
- They also open up linguistic documentation and analysis to wider audience numbers and types (van Uytvanck et al's 'curiosity factor')