INTONATION IN A LINGUISTIC AREA BUILDING AN INTONATIONAL TYPOLOGY OF SOUTH ASIA

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Goals for this talk

- Introduce you to the work I do
- Describe a method for approaching intonation in an unfamiliar lg
- Share findings from applying this approach to a diverse range of South Asian Igs (SALs)
- Argue that the intonation of SALs is more complex than previously thought...
- …even just at the word-level

What I do

- "I work on all speech sounds other than Cs and Vs"
- Voice quality/phonation
 - Breathiness in Gujarati
 - Creak in American English
- Intonational phonology
 - Deep view: Bangladeshi Bengali
 - Broad view: South Asian Igs in general



Sameer (they/he)

- South Asia includes:
 - Bangladesh
 - Bhutan
 - India
 - Maldives
 - Nepal
 - Pakistan
 - Sri Lanka
- Also sometimes:
 - Tibet
 - Burma
 - Afghanistan



- South Asia has four large lg families:
 - Indo-European
 - ► Indo-Aryan (IA)
 - Nuristani
 - Iranian
 - **Dravidian** (Dr)
 - Austroasiatic (AA)
 - ► Munda
 - Khasic
 - Nicobarese
 - Tibeto-Burman (TB)



South Asian language families (map produced by Suresh Kolichala, 2015)

- But it's also identified as a region of convergence: a "linguistic area" (Emeneau 1956)
- Even across language families, South Asian Igs (SALs) typically have:
 - Retroflexion (ț ḍ ņ !... [t d η l...])
 - Echo reduplication ("doctor-voctor" = "doctors etc.")
 - SOV order ("they rice eat")
 - Non-NOM experiencers ("to me hunger strikes")
 - Vector verbs ("they written-took the address")

- But it's also identified as a region of convergence: a "linguistic area" (Emeneau 1956)
- Even across language families, South Asian Igs (SALs) typically have:
 - Retroflexion (except Assamese and most TB lgs!)
 - Echo reduplication (but what pattern? b-, v-, s-, gi-, -u-...)
 - SOV order (except Kashmiri and Khasic)
 - Non-NOM experiencers (but which case? see next slide)
 - Vector verbs

- Experiencers:
- '<u>l'm hungry/angry'</u> USES: (Subbārāo 2012)
 - DAT "<u>to me</u>" in Munda Igs, Dr Igs, most IA Igs
 - ▲ NOM "<u>I'm/have</u>" in Khasic, most TB lgs
 - GEN "<u>of me</u>" in East IA lgs; some TB lgs



Questions

- So if there's a typical SAL in all these other areas + exceptions & smaller patterns...
- …is there also a typical SAL intonation?
 - If so, what are the common characteristics?
 - What are the exceptions and smaller patterns?
- What does having no tone or stress contrasts (in most lgs) do to the intonation system?
- What new phenomena do SALs contribute to our knowledge of intonational systems?

- With no stress or tone contrasts, what does SAL intonation look like?
- Some claim they are strikingly uniform (Féry 2010, Hock 2016, Féry & Fanselow 2020)
 - Identical patterns across lgs
 - LH pattern: 2 boundary tones per word-ish-sized unit
- "Phrase-language" model of four SALs: Bengali, Hindi, Malayalam, Tamil (Féry 2010)

$[\sigma\sigma\sigma\sigma]$

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Preview of results Clip of Urdu demonstrating the "typical" SAL pattern described in literature: LH's forever... 325 Hz 235 Hz 100 Hz landmarks Η Η H Η Η (159)ltones HâL* Ha Ha Ha L* Ha L* L% Ha L* L* L* (151) words 'orhe 'udhar šaul 'hue 'niklā 'garam ā se mu (132)English wear-3SG be-3SG come emerge-3MSG shawl tra DST-way from warm (132)

'...emerged from there, wearing a warm shawl.'
<NWS-Urdu-R01b>

- Here I hope to demonstrate that there is a typical SAL intonation, but it is more complex and variable than this
- My focus: "word"-level intonation: LH and more

Easier to relate to existing literature

- Preview: while the LH rise is indeed pervasive...
 - ...we need to interpret exactly what it is
 - ...and we add its many alternatives to our models

But how might this simple-seeming rise be analyzed (by linguists and speakers)?

L on initial, H on final

- L on stress, H on final
- L on stress, H follows
- ► H on final, L on penult
- LH anchored to stress
- What happens when we look at longer words, or words with different stress patterns?

 $[\sigma\sigma]$

- In fact, we will see evidence of all these interpretations of the rise, across different SALs;
 - L on initial, H on final
 - L on stress, H on final
 - L on stress, H follows
 - H on final, L on penult
 - LH anchored to stress

['σσσ] [σ΄σσ] ['σσσ] [σ΄σσ] ['σσσ] [σ΄σσ] ['σσσ] [σ΄σσ]

- The main patterns I plan to cover are:
 - > The alignment of **L** to the stress σ
 - The variable alignment of H
 - The presence of more complex contours than LH
 - The effect of lexical pitch accent ("lexical tone")

Approaching a new language

How does one analyze the intonation of a language they have no intuitions in?

Speech type

- Avoid fully naturalistic speech (too much variability & reduction, hard to parse)
- Avoid formal reading (too slow, speakers aren't really "feeling" what they're saying)
- Best compromise: reading a brief story

Approaching a new language

How does one analyze the intonation of a language they have no intuitions in?

Scope of study

- IP boundaries often rely on native judgment about turn-taking, speaker confidence
- Question-answer pairs often rely on native judgment of given and focused items
- Best compromise: non-phrase-final word-level prosody in storytelling

Approaching a new language

How does one analyze the intonation of a language they have no intuitions in?

Data collection

- Rely less on diasporic speakers whose intonation may reflect multiple lgs at once
- Avoid recording people in a lab while surrounded by speakers of other lgs
- Pay (use Wise, WesternUnion) bilingual native speakers in situ to translate stories for you
- Have them find (effective-)monolinguals to self-record without fancy gadgets (use WhatsApp)

Data come from corpus in progress (Khan 2023, in prep):

North Wind and Sun fable

- JIPA IA: Assamese, Bengali, Hindi, Kalasha, Khowar, Kholosi, Nepali, Punjabi, Saraiki, Sindhi Dr: Malayalam, Telugu, Tamil TB: Sumi
- UCLA Archive IA: Hindi, Sindhi, Urdu Dr: Kannada, Telugu, Tamil

North Wind and Sun + Frog, Where Are You? (Mayer 1969)

Reed College LoL
IA: Hindi, Nepali, Urdu
Dr: Kannada, Malaya

Socially-distant self-recording Sufficiency ages (IA, Ir, Dr, TB) Most recordings both hade and sent using WhatsApp

- Lgs in the corpus:
 - IA: 41 lgs
 - Ir: 3 lgs
 - Dr: 5 lgs
 - ▲TB: 2 lgs
 - isol.: 1 lg (Burushaski)
 - 55 lgs total



- Lgs studied here:
 - IA: 19 lgs
 - Ir: 1 lg (Pashto)
 - Dr: 5 lgs
 - 25 lgs of 3+ spkrs in the corpus



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- For crosslinguistic consistency, examples are transcribed using InTraSAL
 - Intonational Transcription of South Asian Igs
 - A substantial elaboration of B-ToBI (Khan 2008/2014)
- Uses Intonation in Romance (Frota & Prieto 2015) as a model for how to build an abstract analysis combining different languages

What does InTraSAL look like?

White .

- Here's a spectrogram and pitch track of Sindhi
- First the transcriber just listens to the pitch movements and their timing

'...with that much more force...' <NWS-Sindhi-J>



300 Hz

Label the Landmarks Tier: label for each target

Just label; don't think too hard about "why"

Mitigates unconscious shoehorning of a new lg into tunes we find familiar



- Then the Words and English tiers
 - Words tier: consonant+vowel transcription
 - English tier: technical translation



Last, the Tones tier

- This is when you're ready to interpret the Landmarks based on your (evolving) model
- Use InTraSAL labels, from AM Theory



Patterns to cover

► The main patterns I plan to cover are:

- The alignment of L to the stressed σ
- The variable alignment of H
- ► The presence of **more complex contours** than LH
- The effect of lexical pitch accent ("lexical tone")

σσσ]

- Let's first describe the initial L of the rise
- Some call it a boundary tone, aiming for the left edge of a phrase (aL) (Féry 2010)
- Others call it a pitch accent (L*), aiming for a stressed σ (Hayes & Lahiri 1991, Genzel 2007, Patil et al. 2008, Khan 2014, Féry & Fanselow 2020...)

- Stress assignment (Hock 2016:398-400):
 - initial
 - initial+weight
 - penult+weight
 - ▲ contrastive



Stress assignment (Hock 2016:398-400):

penult+weight

▲ contrastive



L tone alignment $[\sigma \sigma \sigma] [\sigma \sigma \sigma]$

L* in Urdu: on heavy σ, not strictly 1st σ/left edge



- L in northern SALs aligns with stressed σ, even when not on the left edge: L*
- This stress pattern is determined by weight and/or lexical marking

 $[\sigma\sigma\sigma\sigma]$ σσσ 'mut ta fiq ši 'mā lī
L tone alignment

Stress assignment (Hock 2016:398-400):

initial

initial+weight



South Asian language families (map produced by Suresh Kolichala, 2015) Base map taken from Hock (2016, p.7)

L* in Assamese: ignores weight, always initial



'The North Wind...' <NWS-Assamese-J>



L* in Odia: ignores weight, always initial



'Having gotten irritated, the traveler...'
<NWS-Odia-D01b>



- In Dr and most IA lgs, it seems the L is strictly on the 1st σ
- lgnores σ weight, no word-specific behavior
- ► Two interpretations: aL or L*?

$\begin{bmatrix} \mathbf{H} & \mathbf{L} & \mathbf{H} \\ \mathbf{\sigma \sigma \sigma} \end{bmatrix} \begin{bmatrix} \mathbf{\sigma \sigma \sigma} \end{bmatrix}$ bhū mi yil sa nyā si

- aL interpretation: L on word's left edge
- Would mean that L is attracted to left edges, and ignores stress
- This would mean that stress has no role in the intonation of such lgs

ίσ'σσ

sa

а

ʹϭϭϭ

'bhū mi yil

L tone alignment [' $\sigma \sigma \sigma$]

L* interpretation: L on stress

 $[\sigma \sigma \sigma]$

'bhū mi yil

- Would mean that in these lgs, stress is weight-insensitive and always initial
- Indeed, evidence from Bengali & Tamil data show the initial σ is phonologically "special"

[σσ

'sa n

L tone alignment [' $\sigma \sigma \sigma$]

- Considering all this, we can adopt the L* interpretation, with reservations (Keane 2014)
 - Allows for cross-SAL transparency

['σσσ]

'bhū mi yil

Takes into account phonological status

['σσσ

'sa n

L tone alignment

- Stress assignment (Hock 2016:398-400):
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L tone alignment

- L* location:
 - initial
 - penult+weight
 - ▲ contrastive



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Patterns to cover

- ► The main patterns | plan to cover are:
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H tone alignment

- Most accounts of SALs describe strict rightalignment of the rise's H tone: Ha (Genzel 2007)
- ► Ha location is useful for describing:
 - Domains of consonant- & vowel-based processes (Hayes & Lahiri 1991, Twaha & Mahanta 2016)
 - Disambiguation of sentence structure (Lahiri & Fitzpatrick-Cole 1999, Féry & Fanselow 2020)



'...was obliged to accept...' <NWS-Assamese-J>



H tone alignment

- But occasionally, researchers mention a mysteriously early appearance of this H:
- H immediately after the σ with L*, regardless of distance to word edge, in:
 - Bengali (Khan 2014)
 - ► Tamil (Keane 2014)
- Complex pitch accent L*H?

H tone alignment

This suggests that "the" rise in a conflation of at least two different structures

[σσσ]

['σσσ]

L*...Ha: rise peaks at AP edge

L*H: rise peaks just after L*

- Most SAL research looks mostly/only at words of two syllables (which are highly frequent)
- This means L*...Ha and L*H could not be adequately distinguished
- We need to look at longer stems





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More complex contours

- So far, we've assumed that even with some variation, SALs use LH contours on all words
- But exploring this corpus reveals more complex rises, involving medial tones:
 - ► LLH (late rise): $L^*...LHa$ [$\sigma \sigma \sigma$] ► LHH (early rise): $L^*H...Ha$ [$\sigma \sigma \sigma$]

HL*...Ha $[\sigma \sigma \sigma$

L*H...LHa $\sigma \sigma \sigma$

- We also see contours that involve falls:
 - ► LHL (rise-fall): L*H...La $[\sigma \sigma \sigma]$
 - ► HLH (fall-rise):
 - LHLH (double rise):

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ΗL*...Ηα σσ

- LHH (early rise): $L^*H...Ha$ [$\sigma \sigma \sigma$]
- We also see contours that involve falls:
 - ► LHL (rise-fall): L*H...La [σσσ]
 - ► HLH (fall-rise):
 - ► LHLH (double rise): L*H...LHa ['σ e

Two examples of L*...LHa in Nepali*



'That one will be accepted as the stronger.' <NWS-Nepali-J>

stress marks reflect the weight-sensitive stress pattern in Riccardi (2003), but this does not reliably reflect L alignment in the current study



Three examples of L*...LHa in Assamese*



'That much more tightly did (he hold) his shirt.' <NWS-Assamese-J>

stress marks reflect the weight-sensitive stress pattern from Mahanta (2012), but this does not reliably reflect L alignment in the current study



Two examples of L*...LHa in Malayalam



'...wrapped in a cloak on (him)...'
<NWS-Malayalam-J>

- This late rise (L*...LHa) might just be a variant of the direct rise (L*...Ha)
- Variation within speaker, within a sentence
- "Free" variation, w/ lg-specific preferences?
- Fortunately, for those using the H as a sign of phrasing: H is still at the end of the unit

Early rises: L*H...Ha [$\sigma \sigma \sigma$]

Two examples of early rise L*H...Ha in Odia



- 'The Wind (told) the Sun...' <NWS-Odia-D01b>
- Notice the slight fall after L*H peak

Early rises: L*H...Ha [$\sigma \sigma \sigma$]

Example of early rise L*H...Ha in Tamil



'...the Wind and the Sun...' <NWS-Tamil-J>

)

Early rises: L*H...Ha [' $\sigma \sigma \sigma$]

- This early rise (L*H...Ha) might also be a variant of the direct rise (L*...Ha)
- Variation within speaker, within a sentence
- "Free" variation, w/ lg-specific preferences?
- However, for those using the H as a sign of phrasing: peak is generally not on the edge
- Overlooking this could affect analysis

Early and late rises [$\sigma \sigma \sigma$] [$\sigma \sigma \sigma$]

- Most frequent rise, aside from L*...Ha:
 - Early rise (L*H...Ha)
 - Late rise (L*...LHa)
 - neither found
- E & S lgs make substantial use of alternative rises
- Other Igs have no alternative rise
 - We'll return to Punjabi, Khowar



South Asian language families (map produced by Suresh Kolichala, 2015) Base map taken from Hock (2016, p.7)

More complex contours

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- But exploring this corpus reveals more complex rises, involving medial tones:
 - ► LLH (late rise): L*...LHa ['σσσ]
 ► LHH (early rise): L*H...Ha ['σσσ]

HL*...Ηa σσσ

L*H...LHa $\int \sigma \sigma \sigma$

- ► We also see contours that involve falls:
 - ► LHL (rise-fall): $L^*H...La$ [$\sigma \sigma \sigma$]
 - ► HLH (fall-rise):
 - LHLH (double rise):

Rise-falls: L*H...La [$\sigma \sigma \sigma$]

Example of L*H...La in Tamil



'...can make (the traveler) take off the shawl...



Alt. rise-falls: LH*...La $[\sigma \sigma \sigma]$

Sindhi has another rise-fall, with H on stress:



)

'That whoever...the traveler's coat...' <NWS-Sindhi-J>

Fall-rises: HL*...Ha [$\sigma'\sigma\sigma$]

As fall-rises involve a pitch accent preceded by H, they only occur in SALs with non-initial stress

Two examples of HL*...Ha in Urdu



Double-rises: L*H...LHa[$\sigma \sigma \sigma$]

Double rises are characteristic in Dravidian lgs e.g. Tamil:



))

Double-rises: L*H...LHa[$\sigma \sigma \sigma$]



)

'In the end the Wind admittedly (?) lost...'
<NWS-Kannada-R01d>

Complex pitch accents

- We've now seen an expanded inventory of pitch accents across SALs
- We can distinguish them based on the position of the H vis-à-vis the stressed σ



Complex pitch accents

- Stress-attracted H tone typically:
 - Trails stress (L*H)
 - Is on stress (LH*)
 - Leads stress (HL*)
 - ▲ Poorly attested
- N & far N lgs prefer H on or before the stress
- S & E lgs prefer H after the stress



South Asian language families (map produced by Suresh Kolichala, 2015) Base map taken from Hock (2016, p.7)
Complex pitch accents

- As we move north and west, the SALs...
 - …are weight-sensitive
 - …have right-leaning stress placement
 - …have earlier H in complex pitch accents
 - …resemble Arabic, English, Swedish
- As we move south and east, the SALs...
 - …have a fixed, left-leaning stress pattern
 - …have a later H in complex pitch accents
 - ...rely less on "default" Ha
 - ...resemble Korean, Mongolian, French

Patterns to cover

► The main patterns I plan to cover are:

The alignment of L to the stressed σ

- The variable alignment of H
- ► The presence of **more complex contours** than LH

The effect of lexical pitch accent ("lexical tone")

Lexical pitch accent $[\sigma \sigma \sigma]$

Stressed σ's with historical breathy onsets in Punjabi bear falling lexical accent Hx*L, not L*



Lexical pitch accent $[\sigma \sigma \sigma]$

Stressed σ's followed by historical breathy C's in Punjabi bear rising lexical accent L*Hx

Can be hard to distinguish from L*...Ha rise



In Shekhawati, stressed σ's with historical breathy onsets bear a rising lexical accent Lx*H

▶ NB: Punjabi has falling HxL* in this position

Can be hard to distinguish from L*...Ha



<NWS-Rajasthani-Shekhawati-D03b>

In Shekhawati, and (to a lesser extent) Dhundhari, Merwari, and Bagdi (Gusain 1999), stressed σ's followed by historical breathy C's bear high lexical accent Hx*

100 Hz andmark Ĥ (24)tones Hx* Ha Ū* Hā (23)words iiX baat pAr XA (25) English PRX.S matter on argu (25)





- The more robust (e.g. Shekhawati) pattern is:
 - ► Historically breathy onset → rising lexical accent:
 - ► $^{1}dz^{h}$ əgər → ^{1}dz ăgər 'argument'
 - Iminara → Iminara (na)
 - ► bə' t_{i}^{h} atri → bə' t_{i}^{h} tri 'increasing (FSG)'
 - ► Historically breathy offset → high lexical accent:
 - ▶ $Ih \rightarrow Ii$ 'this (OBL)' (cf. Hindi IS)
 - ▶ 'pɛĥli → 'pɛ́li 'first'
 - Isamdz^hjo → Isámdzjo 'understood (MSG)'

Similar to the pattern described for Bagdi (Gusain 1999)

 Lexical input in pitch accent?
Yes ("tonal"): 7

▲ No: 18



South Asian language families (map produced by Suresh Kolichala, 2015) Base map taken from Hock (2016, p.7)

- Is there a typical SAL intonation?
- What does having no contrastive tone or stress do to the intonation system?
- What new phenomena do SALs contribute to our knowledge of intonational systems?

Is there a typical SAL intonation?

In some very basic ways, yes:

- Stress placement is generally not contrastive
- Tone is generally not contrastive
- Words generally bear rising contours
- We already knew these things though

- Beyond that, we see substantial differences within/across lgs
 - L of rise might mark L-edge and/or stressed σ
 - H of rise can mark R-edge and/or stressed σ
 - Lots of alternative patterns: medial tones, falls

- Our inventory is much larger than any previous model of SALs
 - Pitch accents: L*
 - Boundary tones: Ha

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 - Pitch accents: L*, L*H, LH*, H*, HL*
 - Boundary tones: Ha, La, LHa, HLa

- Our inventory is much larger than any previous model of SALs
 - Pitch accents: L*, L*H, LH*, H*, HL*
 - Boundary tones: Ha, **La, LHa, HLa**
 - ip/IP boundary tones: those at the ends of larger units e.g. sentences

What does having no contrastive tone or stress do to the intonation system?

- Wide variability within and across SALs in tonal inventory and frequency
- The conflation of stressedness and initialness also allows for **ambiguity in analysis**
- Even in Igs where the two are not conflated, speakers vary as to whether stressedness or initialness attracts the L tone of the rise

What does having no contrastive tone or stress do to the intonation system?

These observations suggest that an intonation system without contrastive tone or stress will concentrate its tones at phrase edges

cf. Féry's (2010) "phrase languages"

Initial stress arguably can be an "edge"

Only in a subset of IA lgs (in N/FN) is the stress "strong" enough to draw a pitch accent away from a phrase edge

What new phenomena do SALs contribute to our knowledge of intonational systems?

- AM Theory may need to incorporate tones with variable association
 - The L of a rise can behave like a pitch accent (L*) or a boundary tone (aL)
 - The H of a rise a boundary tone (Ha) or part of the pitch accent (L*H)
 - If L*H, is the H a sort of boundary tone for a foot?

Remaining questions

- Other language families: TB, AA?
- Language-internal variability?
- Effects of multilingualism?



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- Everyone in the audience here at the University of Zurich
- ► The authors who shared their recordings with me
- > The consultants who provided translations and morphological analysis
- The speakers who produced new recordings

L*H % ôšońkho dhonnobad অসংখ্য ধন্যবাদ!

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