Intonation in Australian languages

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Overview

- Intonational characteristics of a group of Australian indigenous languages (mainly Northern Australian languages)

Nita, Nancy, and Ruth,
Goulburn Island, NT

Why study intonation in Australian languages?

- Many phonetic and phonological models of intonation are based on handful of well-studied languages – English, German, Japanese etc.
- Need more work on less-well described languages to refine existing prosodic typologies
- Until relatively recently, poorly understood and under-researched area of phonetics and phonology in the Australian context compared to “segmental” phonetics and phonology, word stress

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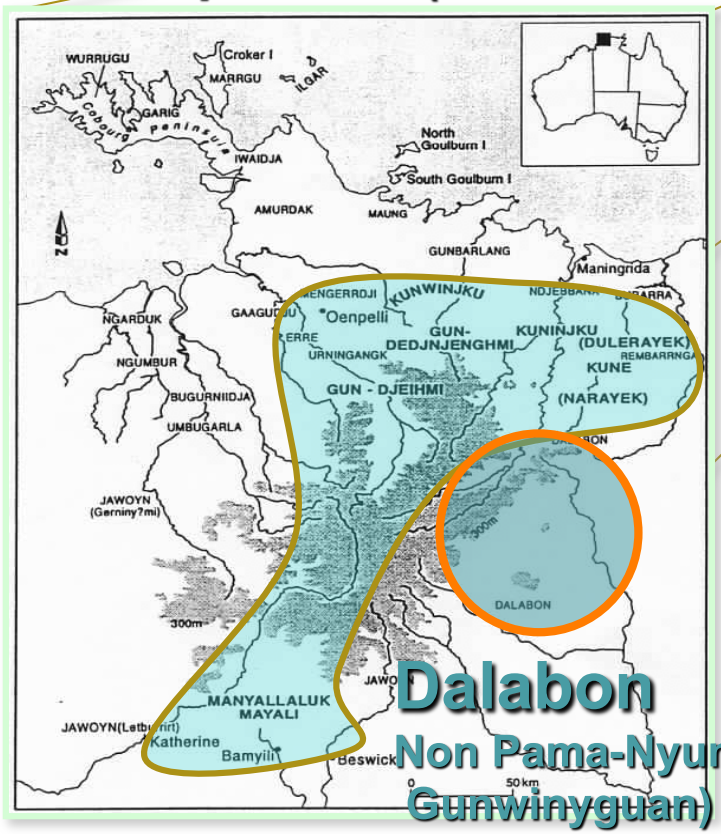
And because of intonational phenomena like this…

- Dalabon, Eastern Arnhem Land
- Bininj Gun-wok (Kundedjnjenghmi variety), Eastern Arnhem Land
- Mawng, Goulburn Island

Bininj Gun-Wok (Non Pama-Nyungan, Gunwinyguan)

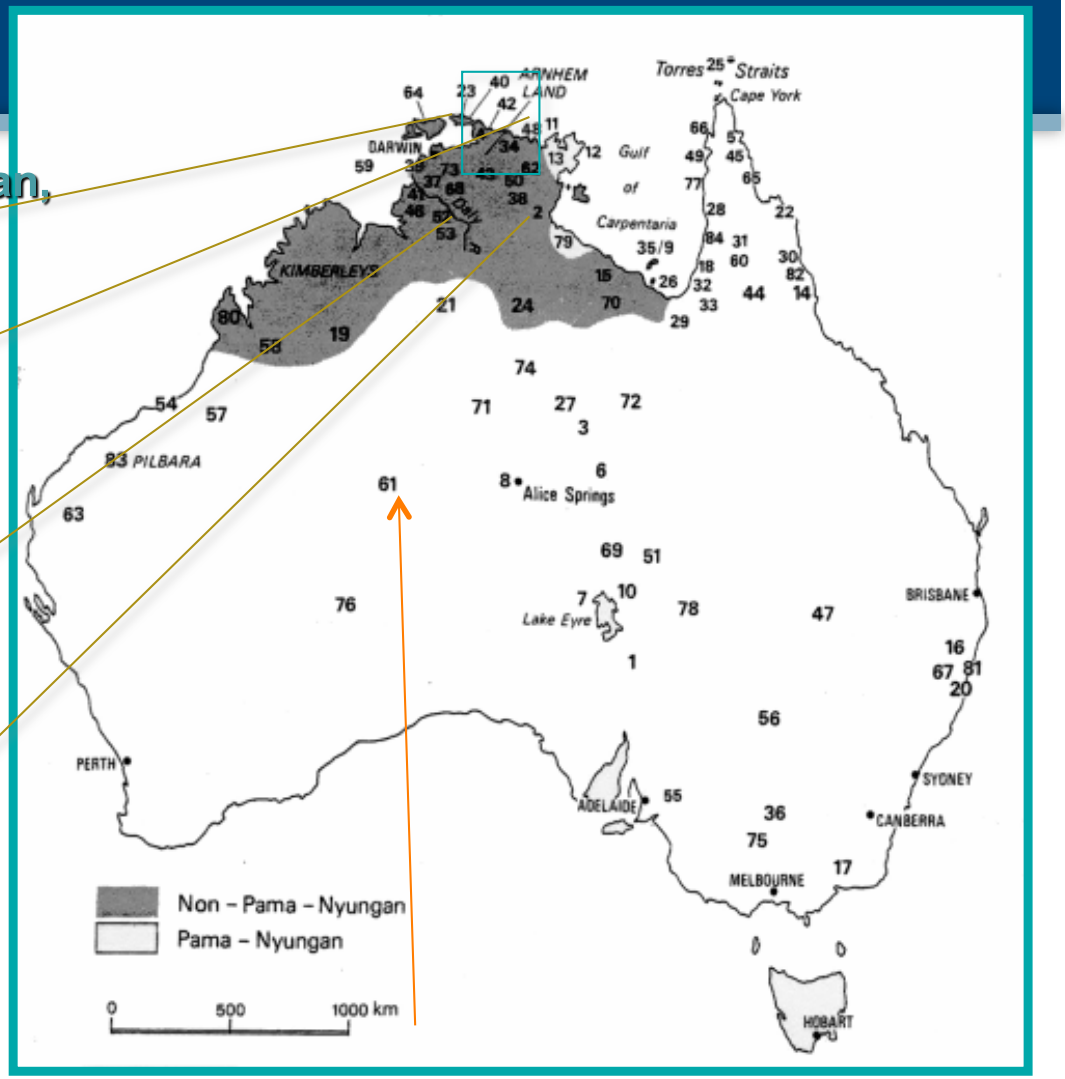
> 2000 speakers (dialect chain)



Dalabon

Non Pama-Nyungan Gunwinyguan)

Severely endangered < 10 speakers



Pitjantjatjara (Pama-nyungan fam.)

Western Desert language

Around 3000 speakers

Adapted from: Stoakes et al. (2007); Evans, N. (1995)

Mawng

Location:

Goulburn Island,

Northern Territory
Australia

300 speakers

Iwaidjan family

non-Pama-Nyungan,

Typological profile:

Mildly polysynthetic

vs BGW & Dalabon which are highly polysynthetic -

All languages have relatively free word order compared to English, for example.

A major goal of intonational research

- It is a major goal of intonational research on any language to sort out what tunes occur in a language and "to be able to make explicit predictions of how a given tune will be realized when it is applied to different texts". (Ladd 2008; 201)

A classic view: What does intonation contribute to spoken communication?

- Sentence Modality
- Phrasing, discourse segmentation
- Grammar of Focus marking; pragmatics
- Speaker attitude, emotion, etc. (paralinguistic functions)

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What do we know about intonation in Australian Languages?

- Most traditional descriptive grammars of languages include statements about the segmental phonology of the language, phonotactic variation, word stress
- Increased interest in the relevance of intonation:
  - Information and discourse structure: topic, focus
  - Grammatical organization, clause relations – languages are mostly non-configurational (i.e. word order gives no clues to syntax)
  - Morphological complexity, stress; grammatical word – prosodic word mismatch
  - Multilingualism

Why is Intonation hard?

- F0 is hard to interpret or even analyse (particularly if you are dealing with an elderly group of speakers, and languages that none of us have as L1); speaker-specific variation
- Other phonetic parameters; voice quality, duration, intensity..
- Gradient rather than discrete
- Difficult to sort out what is paralinguistic from linguistic - slippery form/function relationship "a slippery beast" (Gussenhoven 2004)
- Symbolic representation not like IPA transcription of phonemes/ lexical tones

Universalist vs Linguistic Typological approaches (after Fitzpatrick 2000)

- Completion, finality, declaratives: **low/falling pitch**
- Incompleteness, non-finality, questions: **high/rising pitch**
- New/salient information: **local pitch peaks** on some kind of constituent, often a word
- **Pitch declination** across intonational phrases & **pitch range or register reset** at the beginning of intonational phrases; topic shift

- Separate phonological component from **phonetic implementation**

- Autosegmental-Metrical approach (Bruce 1977, Pierrehumbert 1980, Gussenhoven 2004; Beckman et al. 2005; Ladd 2008)

- **F0 contour** is analysed as series of **High** and **Low** Tone targets that align with the **text** in particular ways

Questions we can ask using this approach (After Beckman 2006)

- **Tone inventory**: What are the tones that make up the "tune" of an utterance, and where do they come from?

Do they come from the lexicon?
Intonational morphemes that are post-lexical, i.e. Syntax, Pragmatics, Discourse

Tone alignment: How is the "tone" anchored to the "text"?

word or phrase edge, i.e demarcative? e.g French, Korean

rhythmic prominence or "stress" i.e. prominence lending (e.g. German)?

Rhythmically-undifferentiated syllable i.e. Japanese?

Boundary tones, Phrase tones?

Pitch accents

Phonetic realization of the tones

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What do we know so far about Australian languages?

- Australian languages have definable and recognizable “falling” and “rising” tunes that delimit chunks of speech i.e. **intonational phrases**
- **Prominence-lending post-lexical pitch-accents** that also combine with **boundary tones** to delimit the edges of these chunks.
- No lexical tone; almost all have been analysed as having lexical stress, but phonetic analyses of “stress” realization – equivocal results – variable stress placement

King 1998; Fletcher & Evans 2000, Fletcher,Evans & Round 2002; Birch 2002, Bishop 2003; Bishop and Fletcher 2005, Round 2010; Ross 2011, Fletcher in press; also Simard 2010 for Jaminjung

4 important parameters

- Accentual prominence
- Tune - source of F0 variation
- Phrasing – “chunking”
- Pitch range – “graph paper” on which tones are realized

What are we trying to find out?

- Challenge 1: What are the characteristic tones and "tunes" of Australian languages?
- Challenge 2: How does the tune align to the "text"?
  - e.g. do tones line up with "rhythmically" prominent syllables in the word as well as demarcating the edges of phrases?
- Challenge 3: What are these tunes used for?
- Challenge 4: How do we model variation among languages?

- Typical and (atypical) tunes‘

- Each intonational phrase provides an opportunity for a new choice of tune... (Pierrehumbert and Hirschberg1990: 272).

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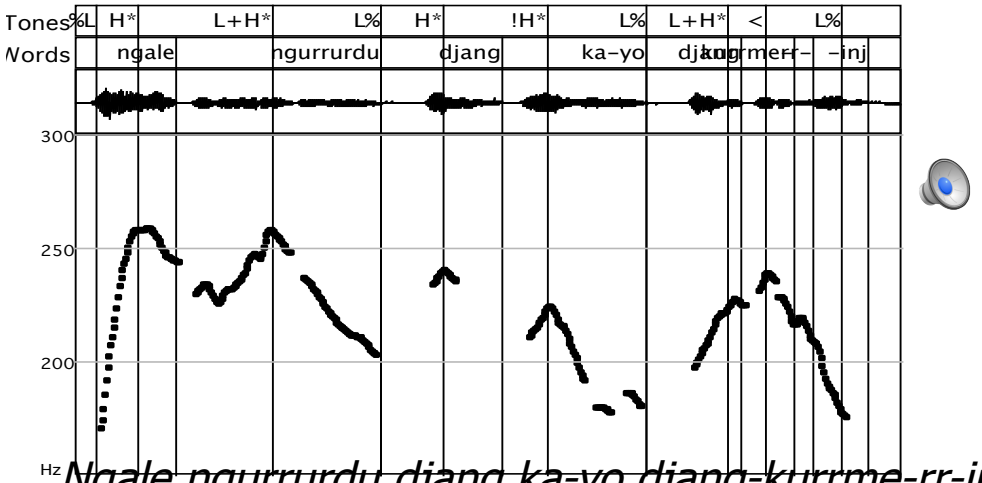
Falling tunes

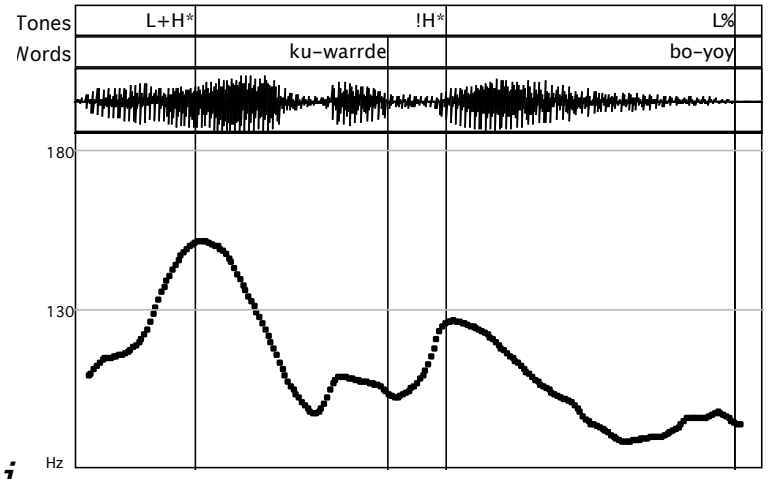
Kundjedjedmi (BGW)



Ngale ngurrurdu djang ka-yo djang-kurrme-rr-inj

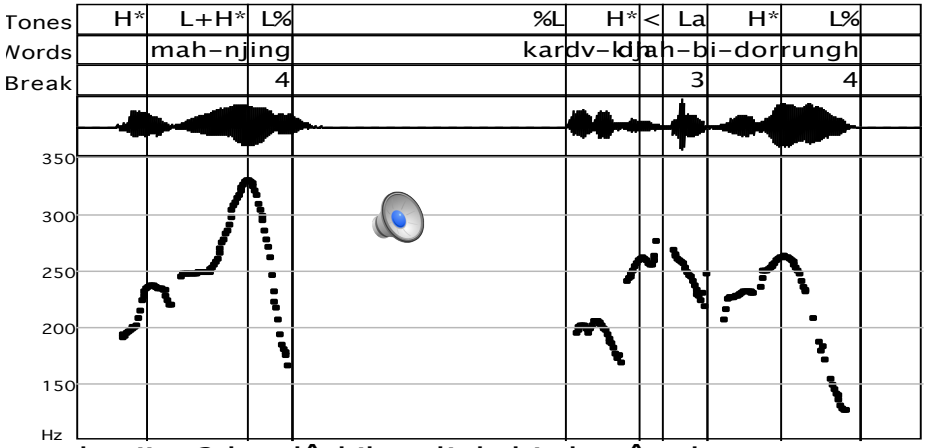
"That emu of ours is a dreaming, she put herself in the landscape as a dreaming"

Kunwinjku (BGW)



Ku-warrde bo-yoy 'Water lay in the cave"

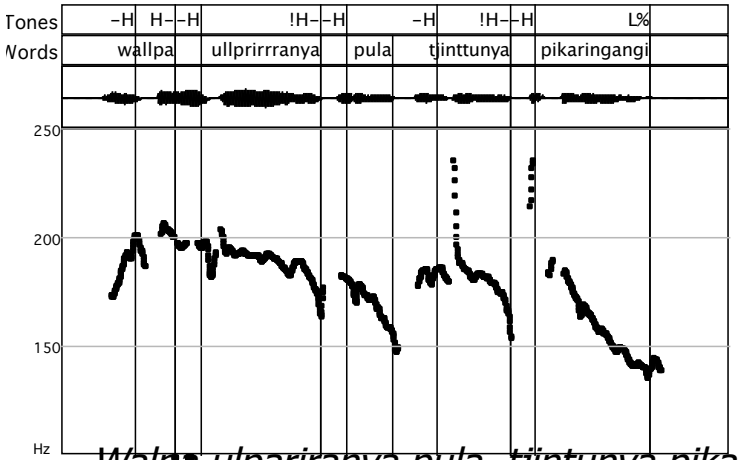
Dalabon



mah njing? kardû-kih djah-bi-dorrûngh

"What about you? Maybe you have got someone with you?"

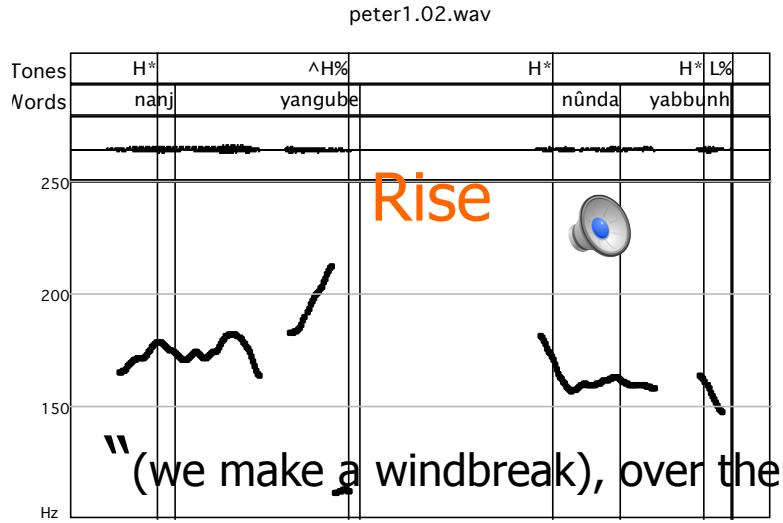
Pitjantjatjara (read speech)



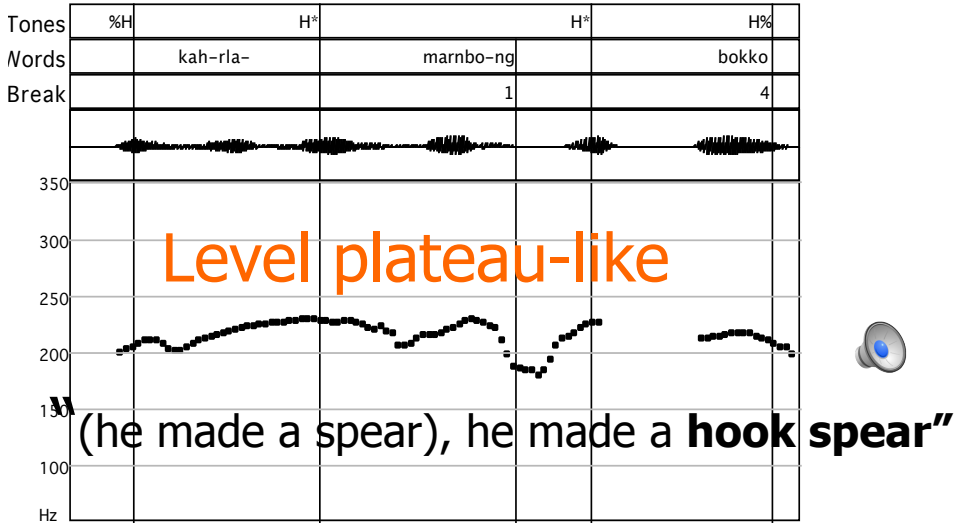
Walpa ulpariranya pula tjintunya pikaringangi.

Wind south they two sun got angry.

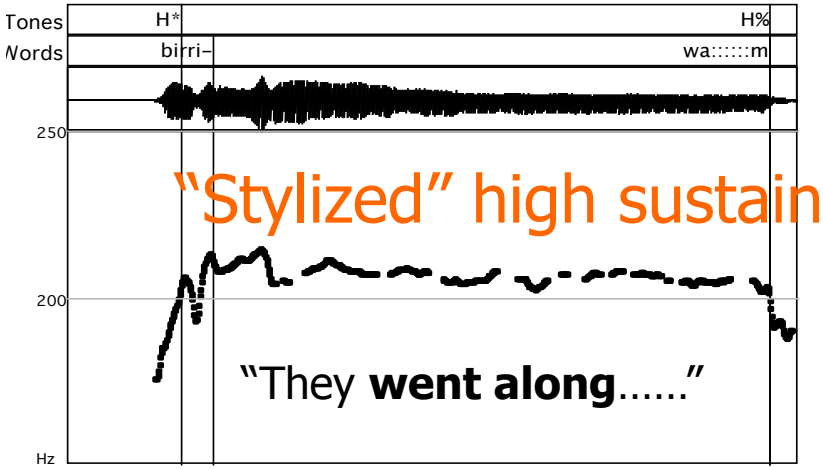
Rising & high level (non-falling) tunes



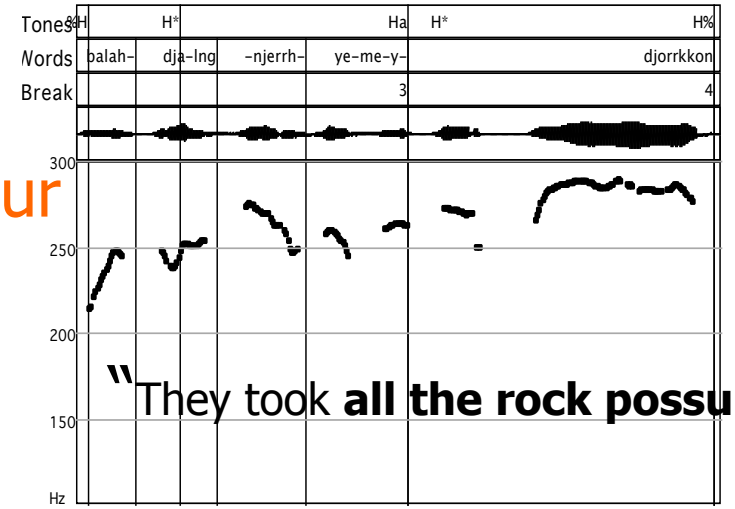
Dalabon



Dalabon



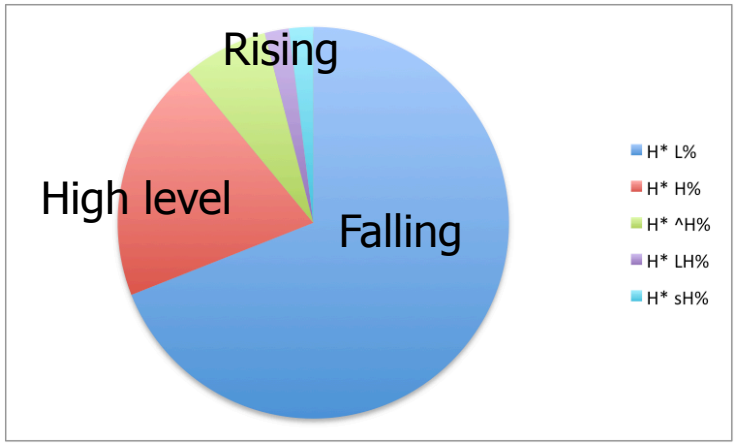
Kuninjku



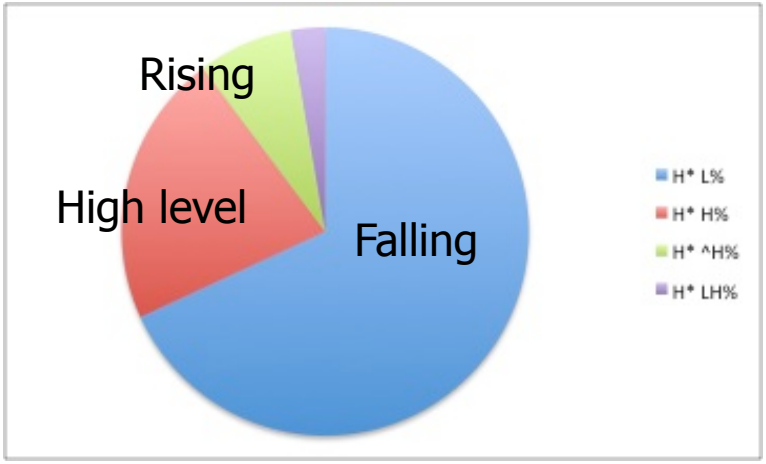
Also, Kayardild (Round 2010), Iwaidja (Birch 2002)...

Tune distribution

Dalabon Narratives (Fletcher 2007, in press)

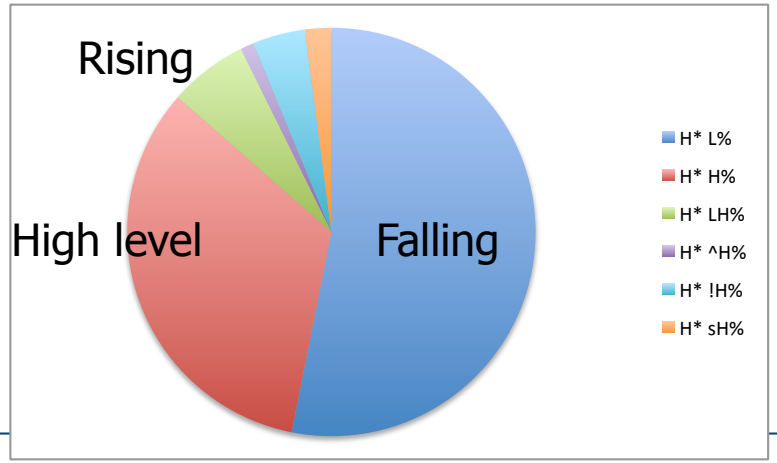


Dalabon Narratives (Ross 2011)



Bininj Gun-wok Narratives

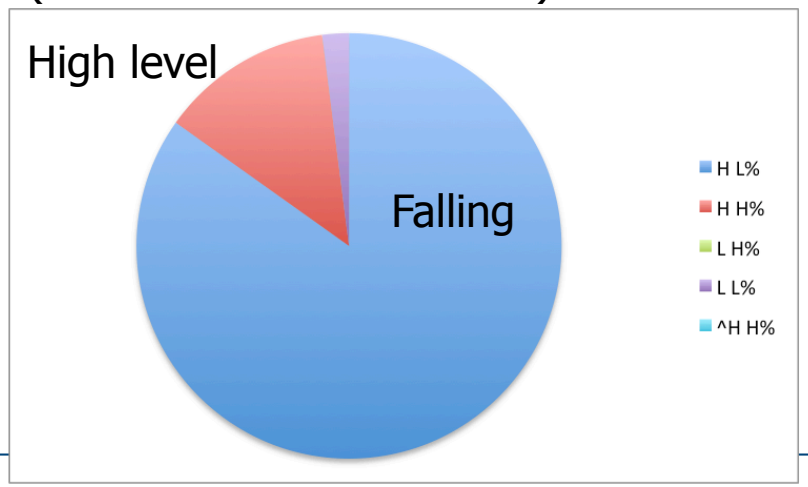
(Fletcher & Evans 2002)



See also Bishop (2003)

Pitjantjatjara (read speech)

(Tabain and Fletcher 2012)



Tone Inventory - Dalabon

Intonational phrase

Pitch accents	Left-edge boundary tones	Right-edge boundary tones	Right edge minor phrase tones	Pitch Range
H*	(%L)	L%	(Lp)	**HiF0**
!H* **^H***	(%H)	H%	(Hp)	**Final_Lo**
L+H*		LH%		
		^H%		
		H:: (Stylized rise)		

90%

Local pitch range variation

e.g. English Pitch accents H* L* L+H* L*+H H+!H* H*+L,H+L*…
Dutch Pitch accents H*L L*H H* L* …

Prosodic Hierarchy (after Selkirk 1979; Nespor and Vogel 1984)

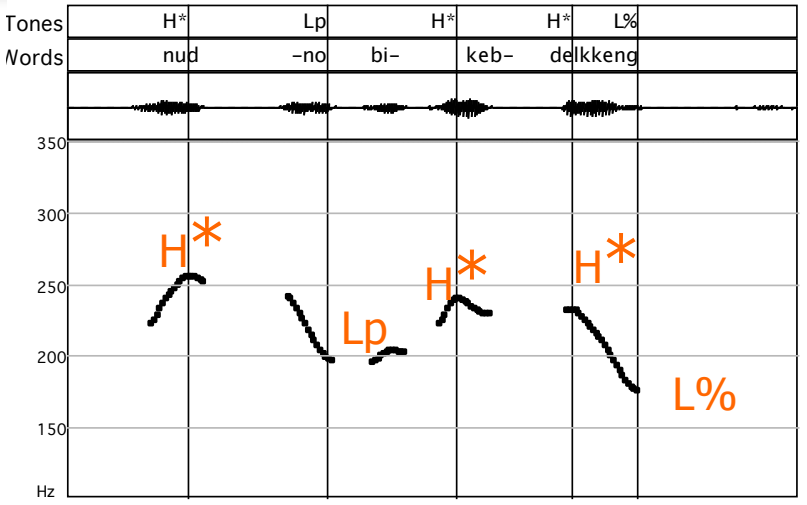
Intonational Phrase (IP)
|
Phonological Phrase / Accentual Phrase
|
Prosodic Word (PW)
|
Foot
|
Syllable

Boundary Tones (preboundary lengthening, pause glottalization)

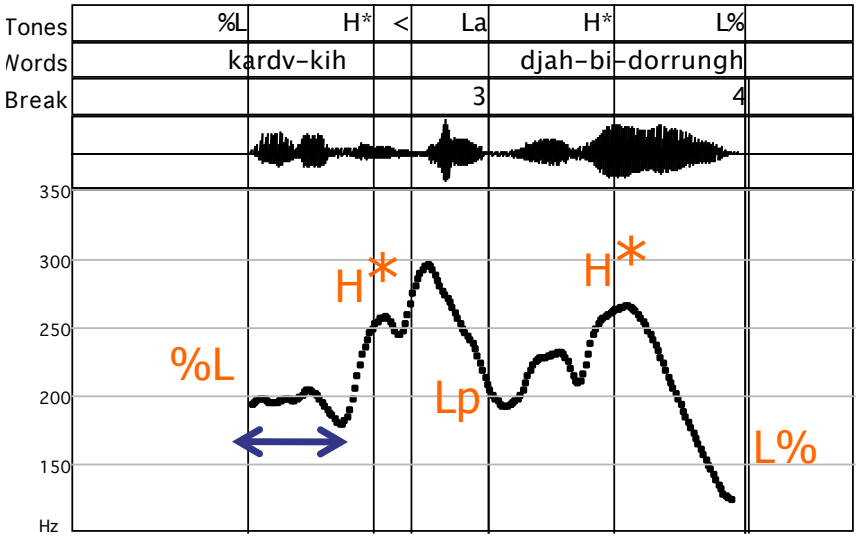
Pitch accents

What do the Pitch Accents align to?

- **Pitch accents** - first or second syllable of the word, often on the stem morpheme, also some prefixes, “stressed” syllable…
- Antepenultimate, penultimate or final syllable of a phrase-final word
- Variation in the Northern Languages, variable accent placement (often due to syllable deletion), delayed peaks, but usually first or last foot of word



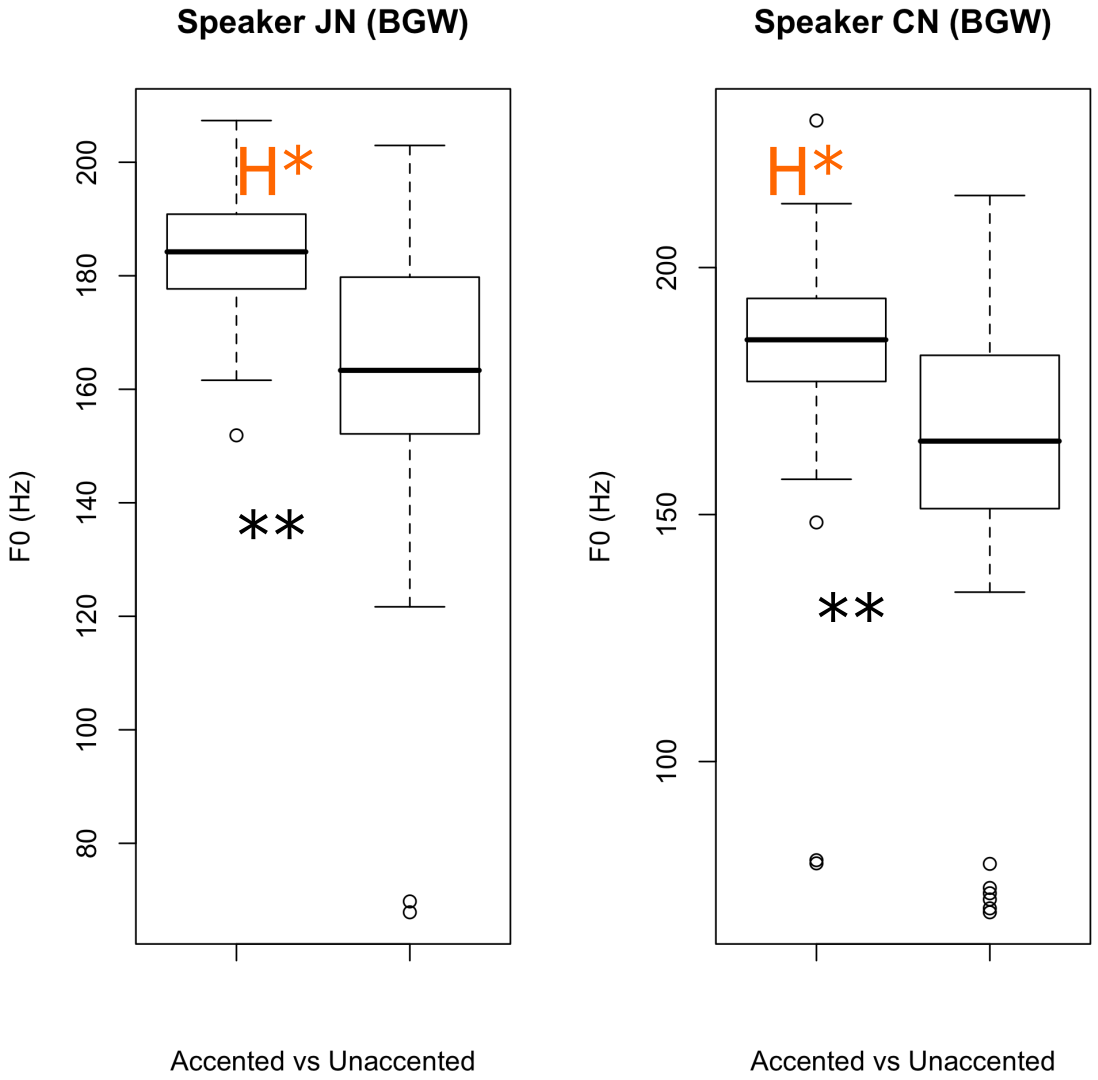
BGW - Kundedjnjenghmi



Dalabon – no accent on prefix

Fletcher & Evans 2002, Bishop 2003, Fletcher in press

Accentual prominence in Kunwinjku



6 speakers

Minimal accentual lengthening in vowels

Accented vowels less variable in quality

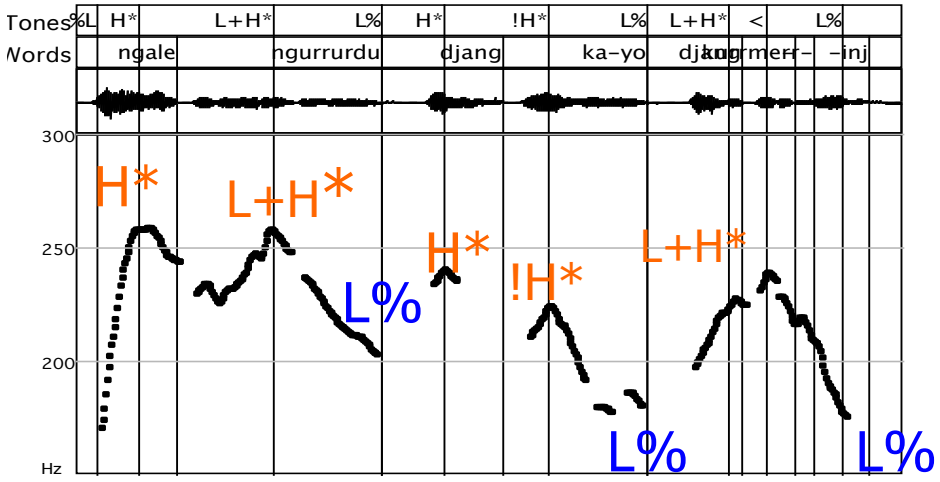
Longer sonorants – post-tonic vowel

Fletcher et al. 2007, 2010

Boundary Tones and pitch range modification

- Boundary tones mark the right edge - additional cue of final lengthening, not as pronounced as in European languages – with the exception of the stylized rises (King 1998, Fletcher and Evans 2002, Bishop 2003, Pentland 2004, Round 2010, Simard 2010)

Kundjedjedmi (BGW)



"That emu of ours is a dreaming, she put herself in the landscape as a dreaming"

Downstep

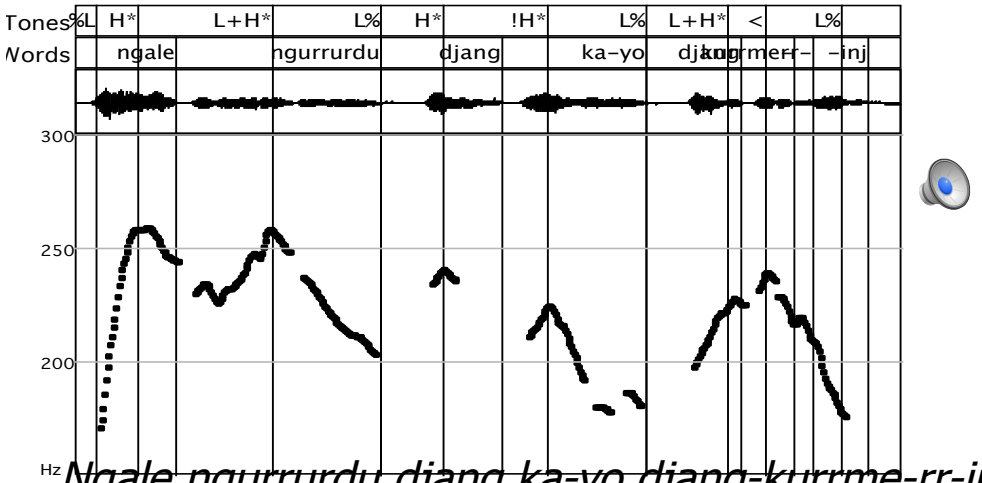
Final Lowering

Pitch range reset

- Tune and sentence modality

Falling tunes

Kundjedjedmi (BGW)



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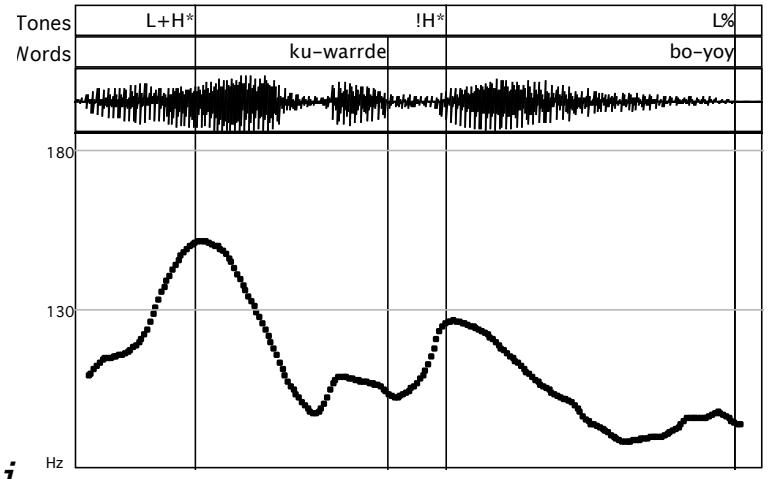

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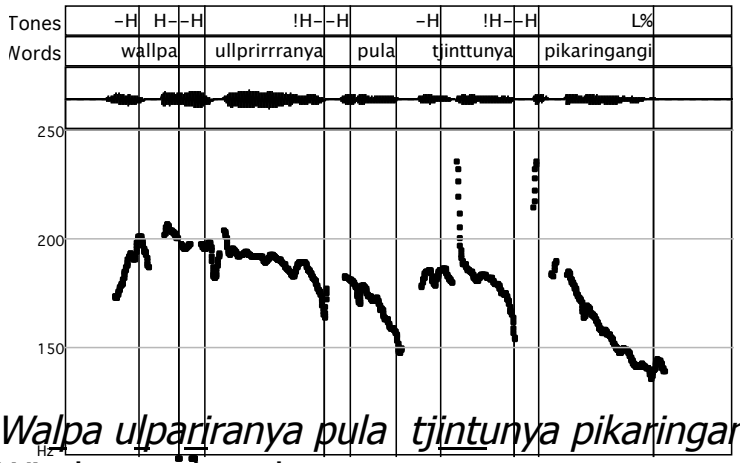
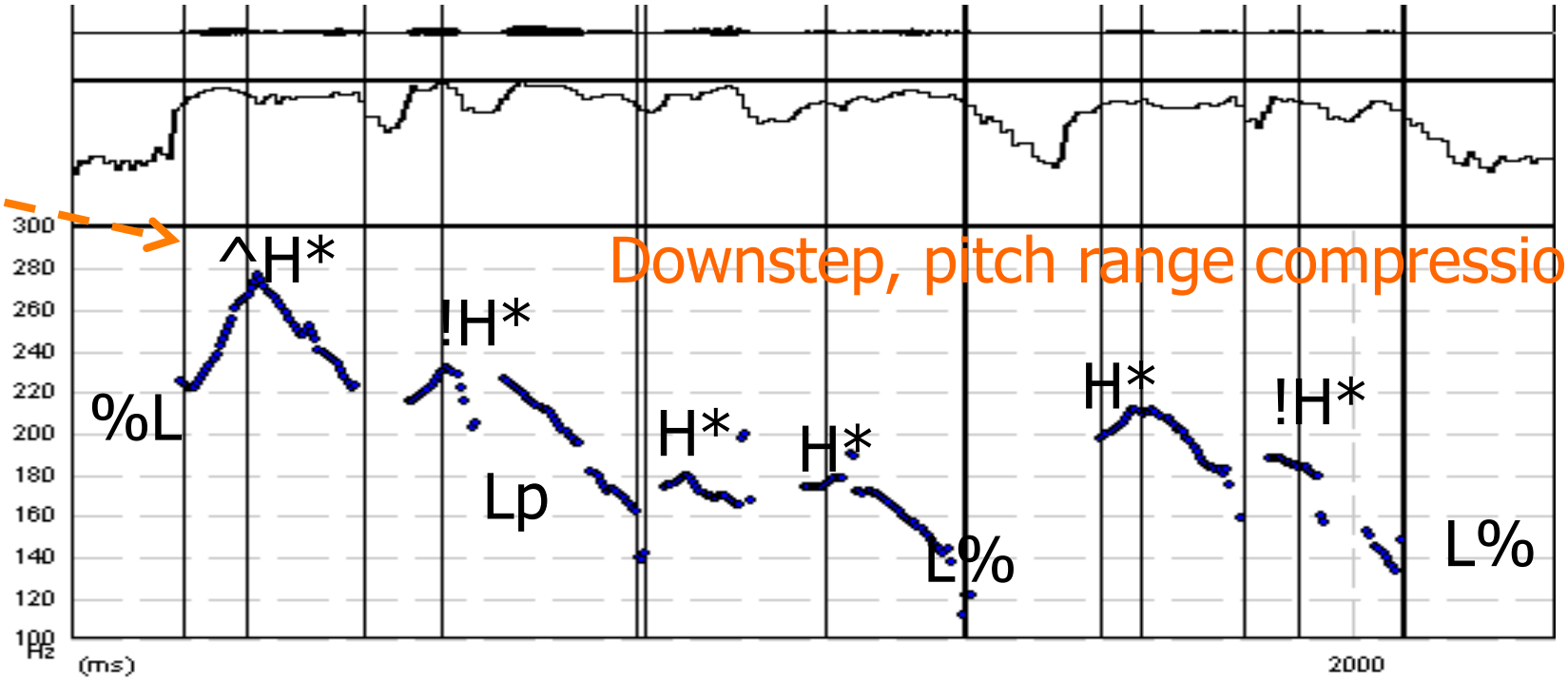


Walpa ulpariranya pula tjintunya pikaringangi.
Wind south they two sun got angry.

Dalabon – interrogative intonation (WH-question)

Accent scaled higher



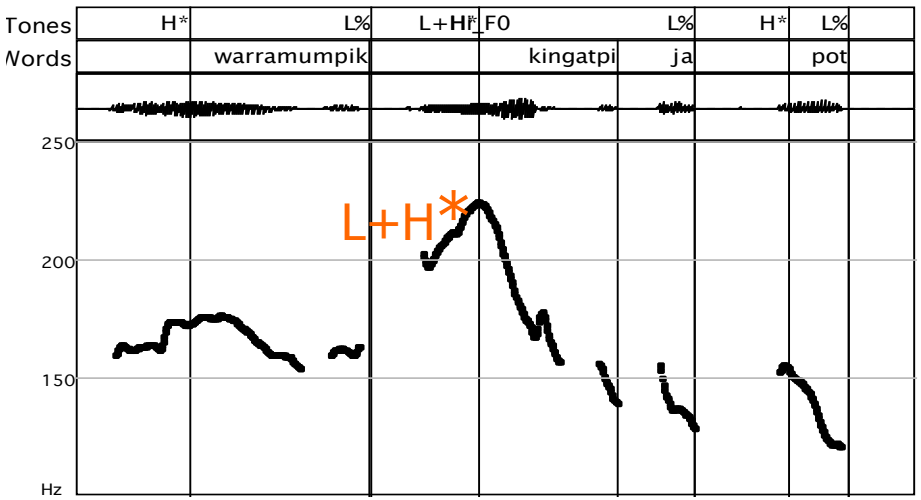
"**Where** are you going" [repeated – afterhthought]

Interrogative intonation in Mawng

- Analysis of the QUIS - *Question and information structure* corpus - Mawng
- Question word is **often** but **not always** first in the utterance and often is the location of the **strongest /highest pitch peak**, pitch downdrift or **downstep** through rest of the phrase
- Similar pattern is realised **without** question word

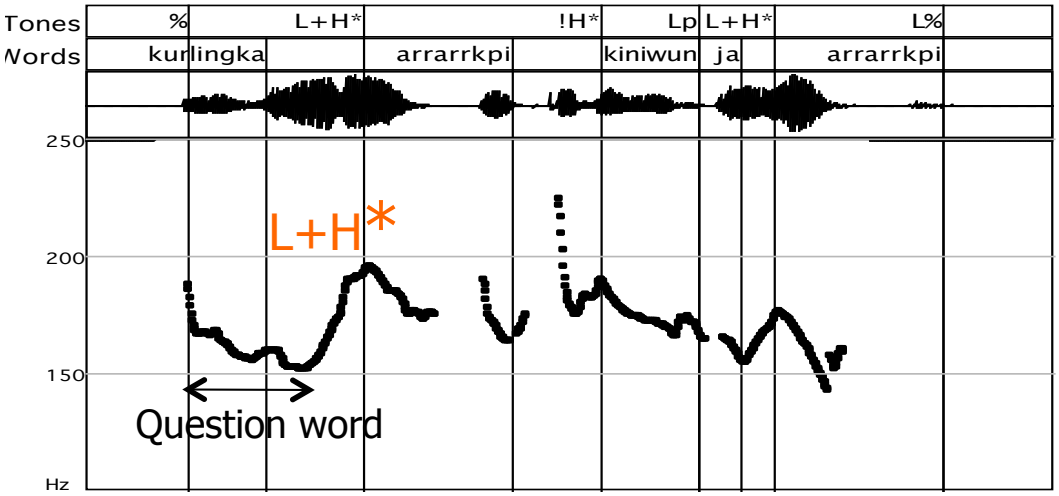
Polar questions & Interrogative markers - Mawng

No Question word



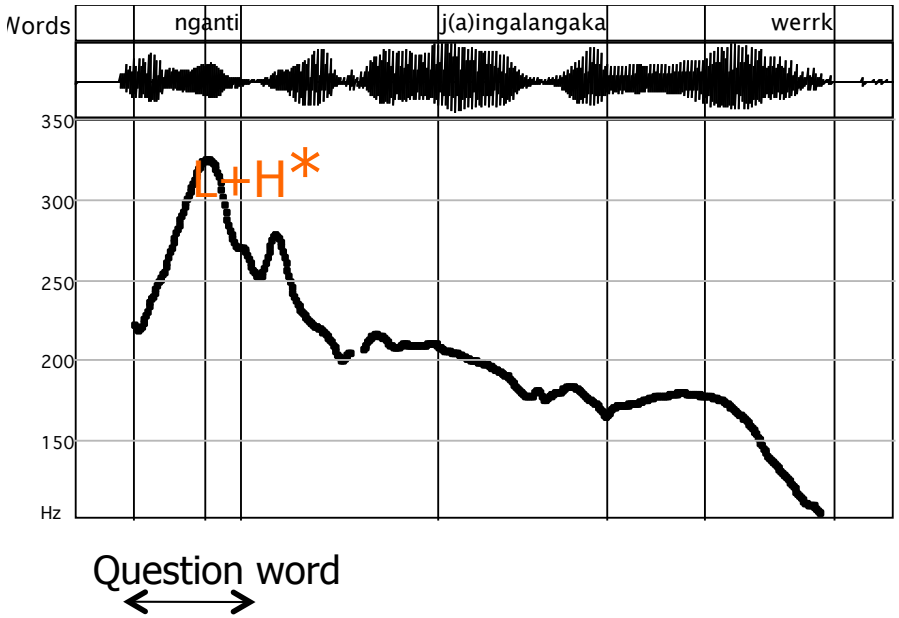
"Is a woman **carrying** the pot?"

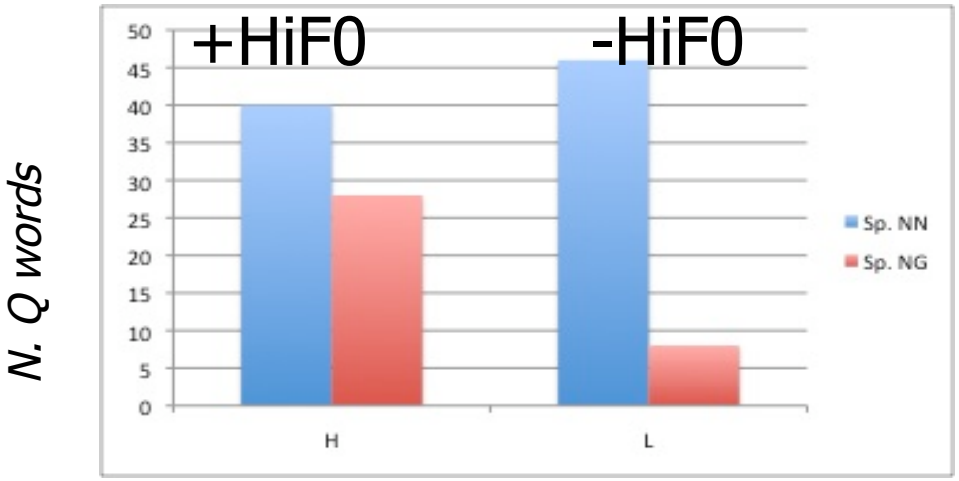
With a Question word



"Is a **man** hitting a man?"

"Wh" -Question words - Mawng





Questions – expanded pitch range

"**Who** is the one that she sent first?"

Similar pattern noted for imperatives…

"Tune" & Sentence modality

- Falling tunes – declaratives, but also questions, imperatives….
- Non-falling tunes, continuitive, listing, non-finality…
- No **high rising question tunes** in our narrative corpora but not a lot of questions are asked!!
- Is possible to turn a declarative into a question with a final rise? **Yes** (e.g. Ngalagkan, Mawng, Warlpiri), just not that common!
- Upwards re-setting of pitch range topline, register, but not necessarily a H% final rising boundary tone

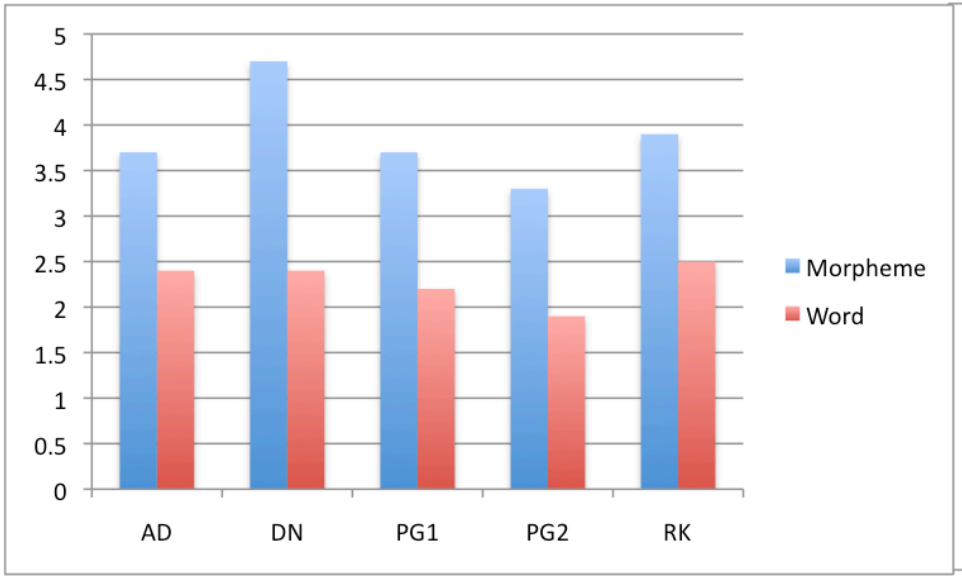
Phrasing

- Phrasing and Discourse segmentation

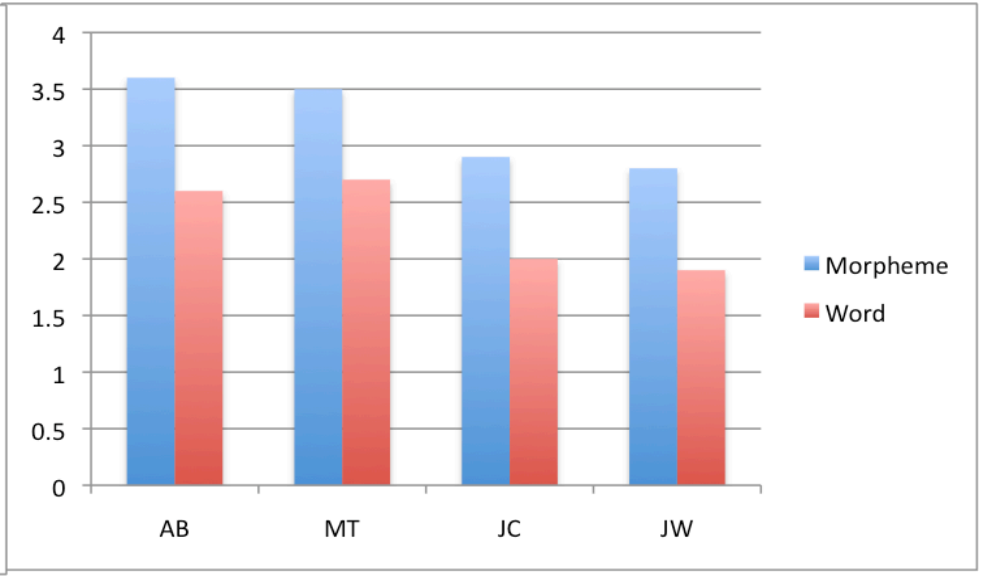
General patterns

- Intonational Phrases often align with grammatical words (mildly – highly polysynthetic languages)
- Bininj Gun-wok **1.9 grammatical words/IP** (Bishop 2003; Bishop and Fletcher 2005)

Kayardild 2.3 words/IP

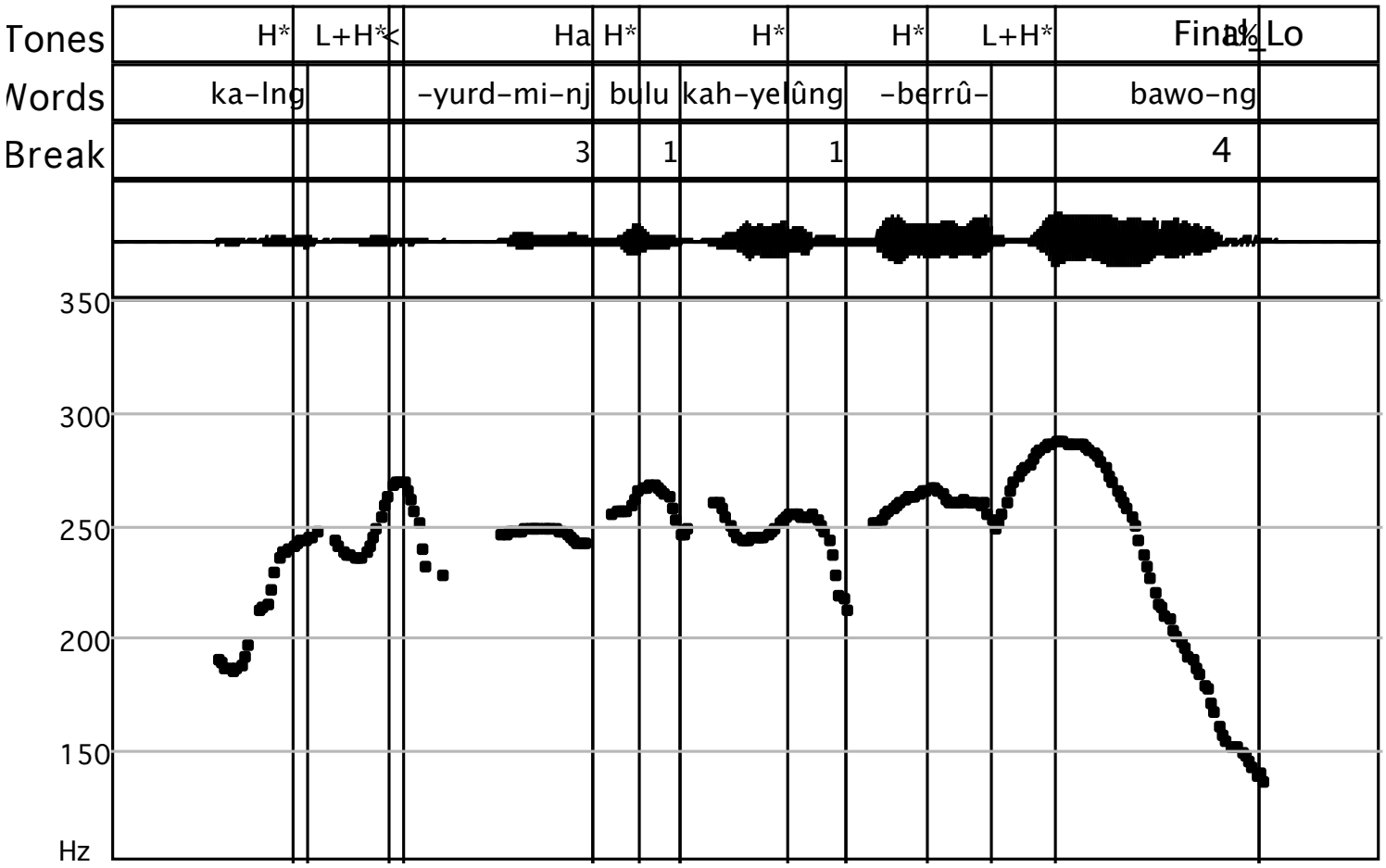


Dalabon 2.4 words /IP



Ross 2011

Dalabon – multi-verb Intonational Phrase



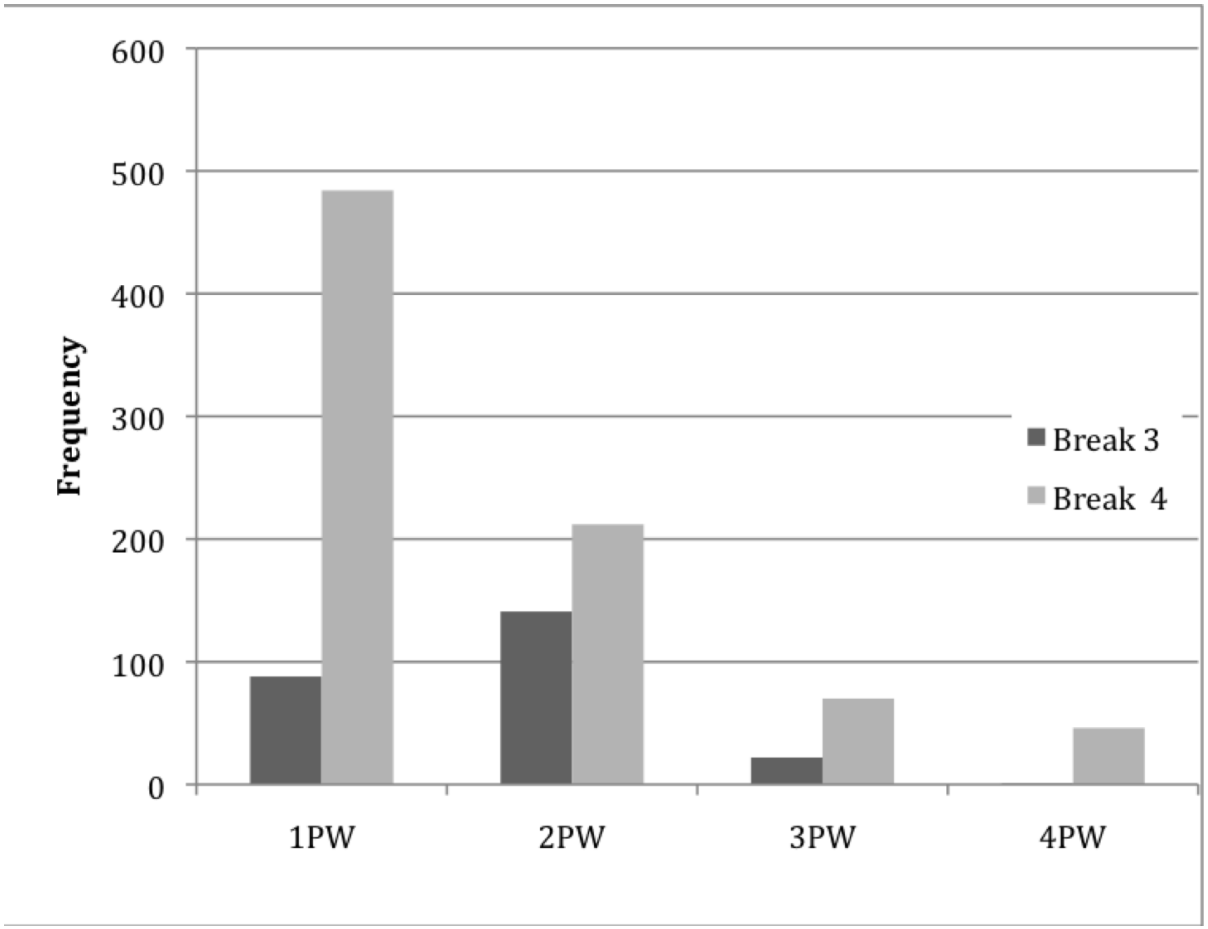
12% of IPs

"Semantic cohesion" of events

ka-lng-yurdmi-nj *bulu* *ka-h-yelûng-berrû-bawo-ng ...*
3SG-SEQ-run-PP them 3SG-R-SEQ-many-leave-PP
'He ran away then and left them all.'

(Fletcher in press, Ross 2011)

Intonational Phrasing - Dalabon



Accentual Phrase

Intonational Phrase

Marority of intonational phrases consist of one or two prosodic words (carrier of a pitch peak but no boundary tone)

(Fletcher in press)

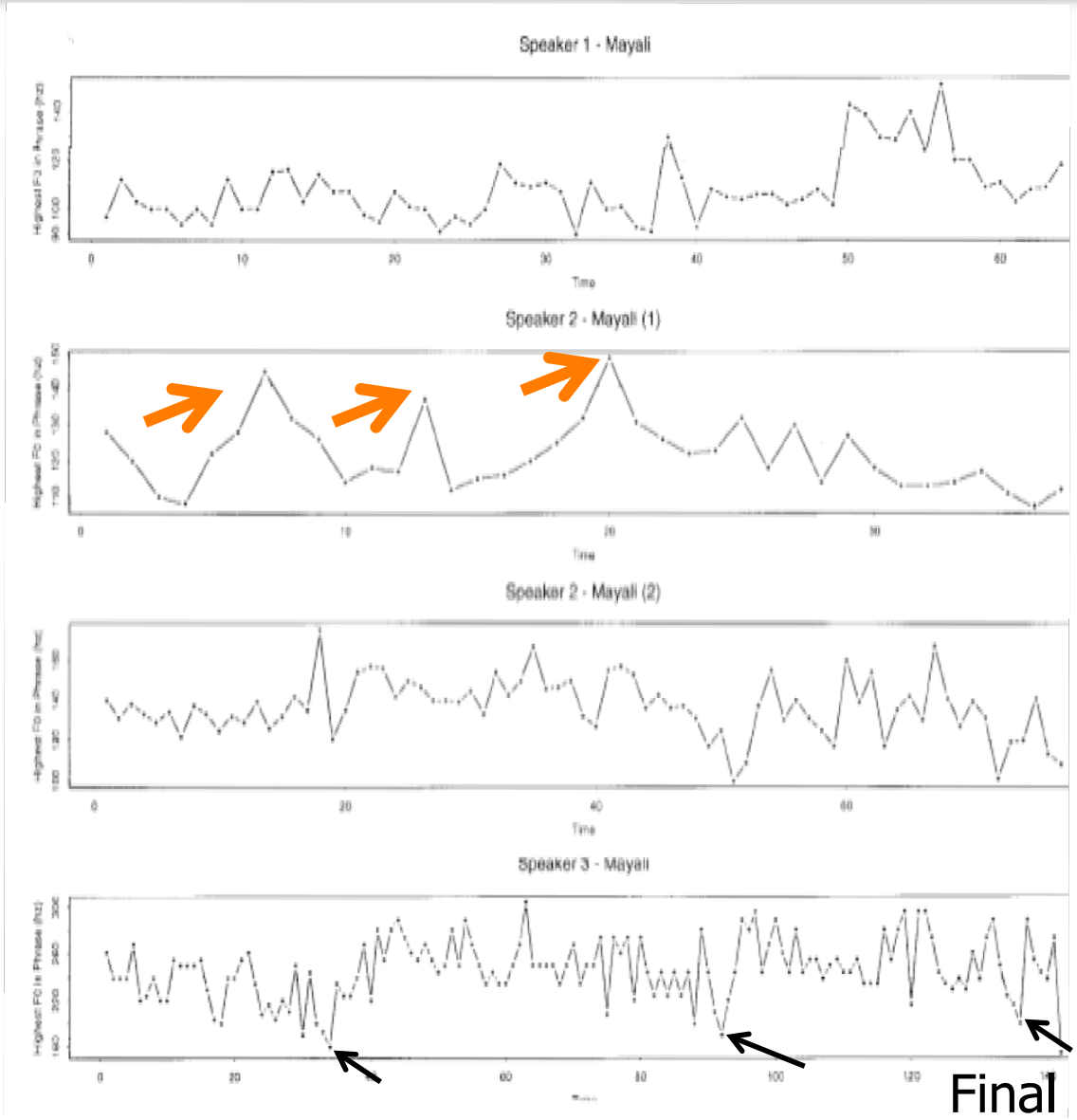
"Paragraph" intonation – Global pitch range manipulation

Global pitch range reset

Tracking Pitch Topline (HiF0) across successive IPs in 4 BGW narratives

Topic shift

(Fletcher & Evans 2000)



Final lowering

Similar patterns across a range of other languages Kayardild, Iwaidja, Dalabon

Focus-marking

Typical intonational devices cross-linguistically

- **Prominence-lending pitch movement** on **focal constituent** or absence thereof (de-accentuation)
- **Flexibility of nuclear accent placement** (e.g. English, German)
- **Phrasing or de-phrasing**, i.e. putting a word into its own separate intonational unit
- **Special pitch accent shape**, e.g. L*+H in Bengali
- Manipulation of local and global pitch range

Word order, Focus, and Intonation

- Australian - ‘free word order’, “non-configurational” (Hale 1983)
- Word order contributes to information structure categories such as **given-new status, topic and focus.**
- Initial position - **focus** (or discourse prominence) in a large number of Australian languages (Baker and Mushin 2008)

Focus in Australian Languages

- Intonation also plays an important role in marking **focus** in languages with more flexible word order, such as Hungarian (Zimmerman and Onea 2011) and Georgian (Skopoteas *et al.* 2009).
- **pitch range expansion** on the focused word (e.g. Fletcher and Evans 2000, Bishop 2003, Simard 2010)
- **rising pitch accent shape** L+H* anchored to the focused word may also be used (e.g. Bininj Gun-wok; Bishop 2003, Bishop and Fletcher 2005)
- **Intonational phrasing** – focused element is also often realized as its own IP separated by a pause from following material in the same "clause" (e.g. Bishop 2003, Simard 2010, Fletcher in press, Ross 2011).

Focus in Mawng

- Experiment was conducted to elicit contrastive or “corrective” focus through a scripted interaction
- Interaction between word order: local and phrasal pitch range, pitch accent location & realization, and intonational phrasing.

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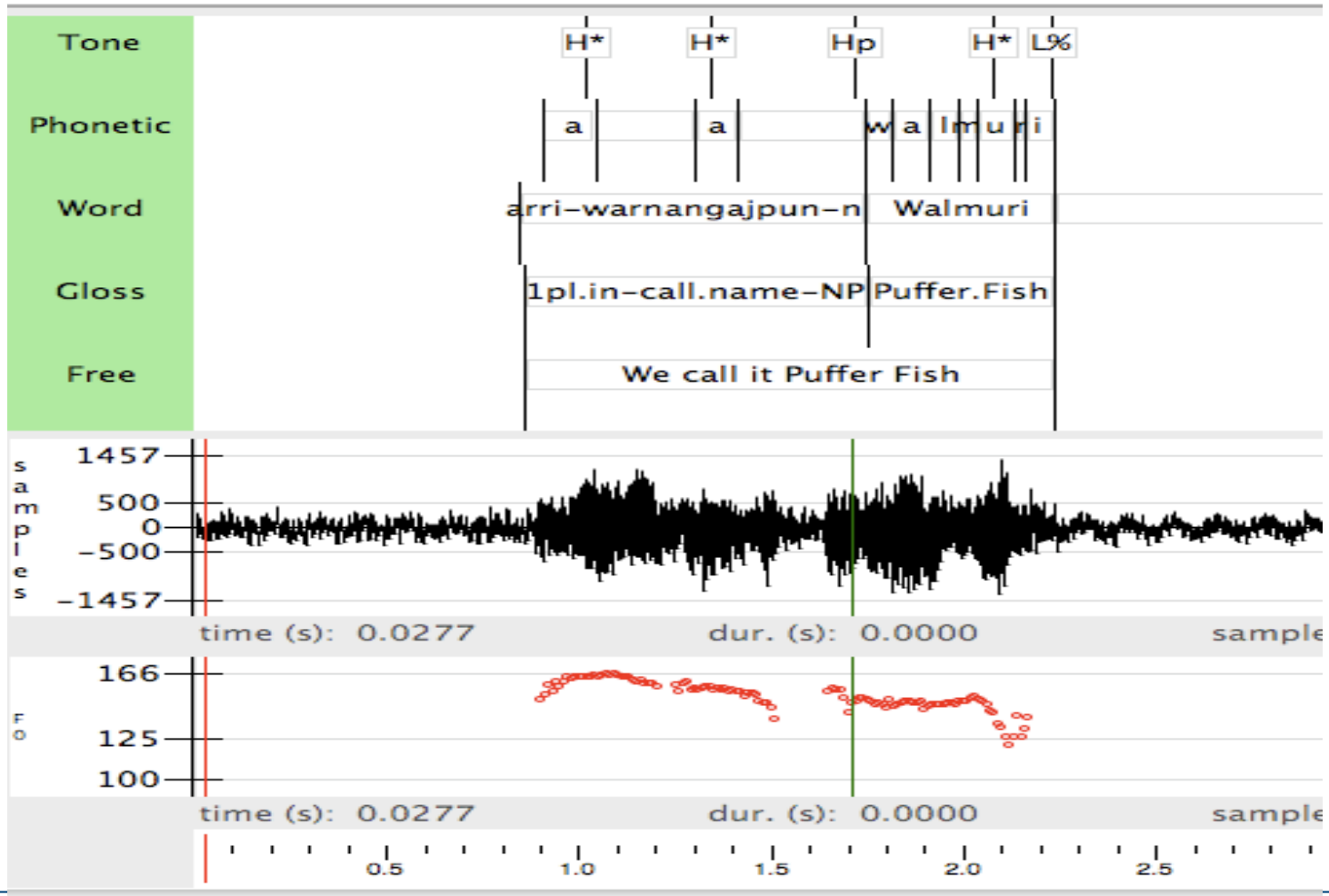
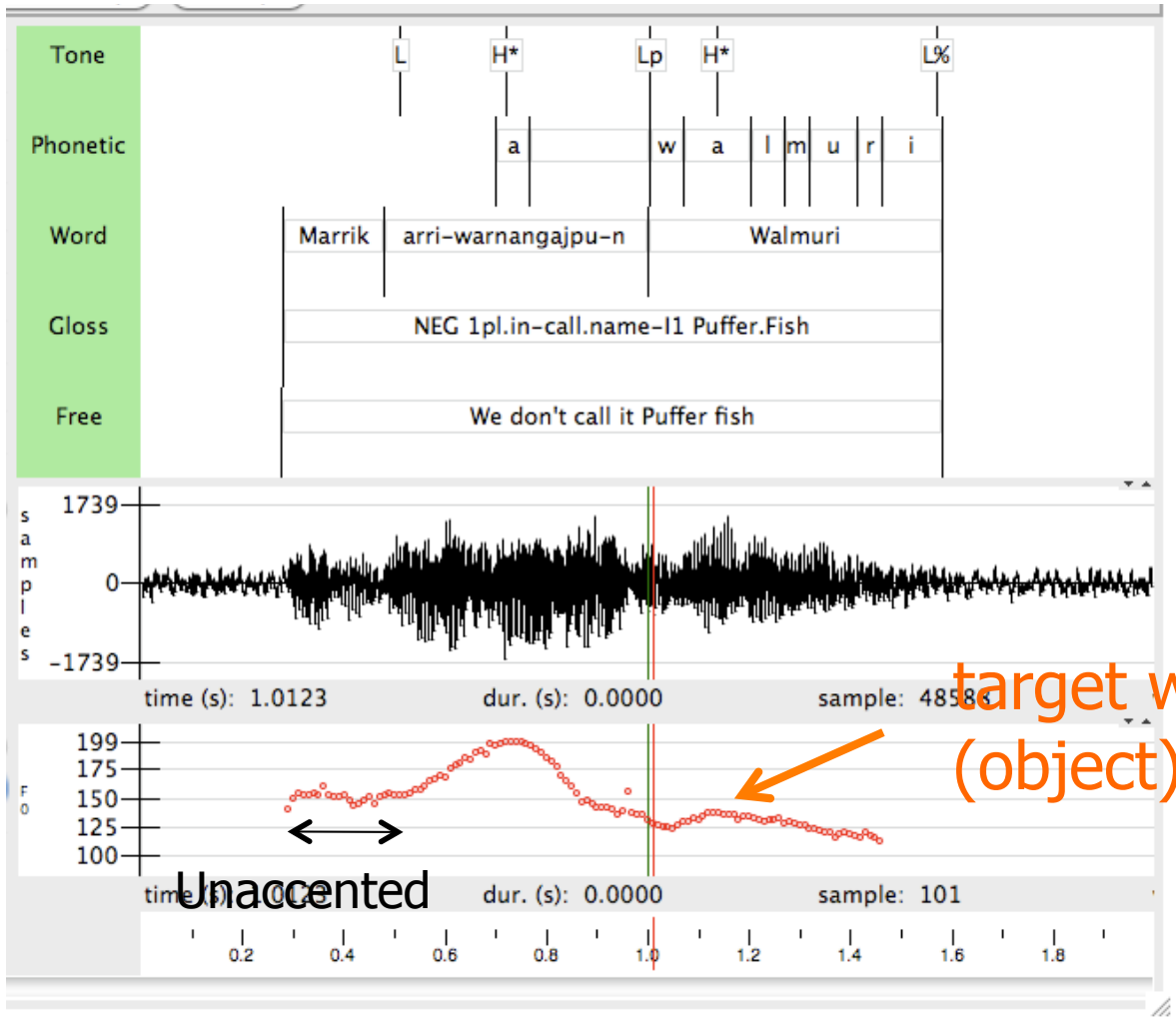
"Broad" focus

- "Statement style" intonaton, limited affect, narrow pitch range "We call it puffer fish."



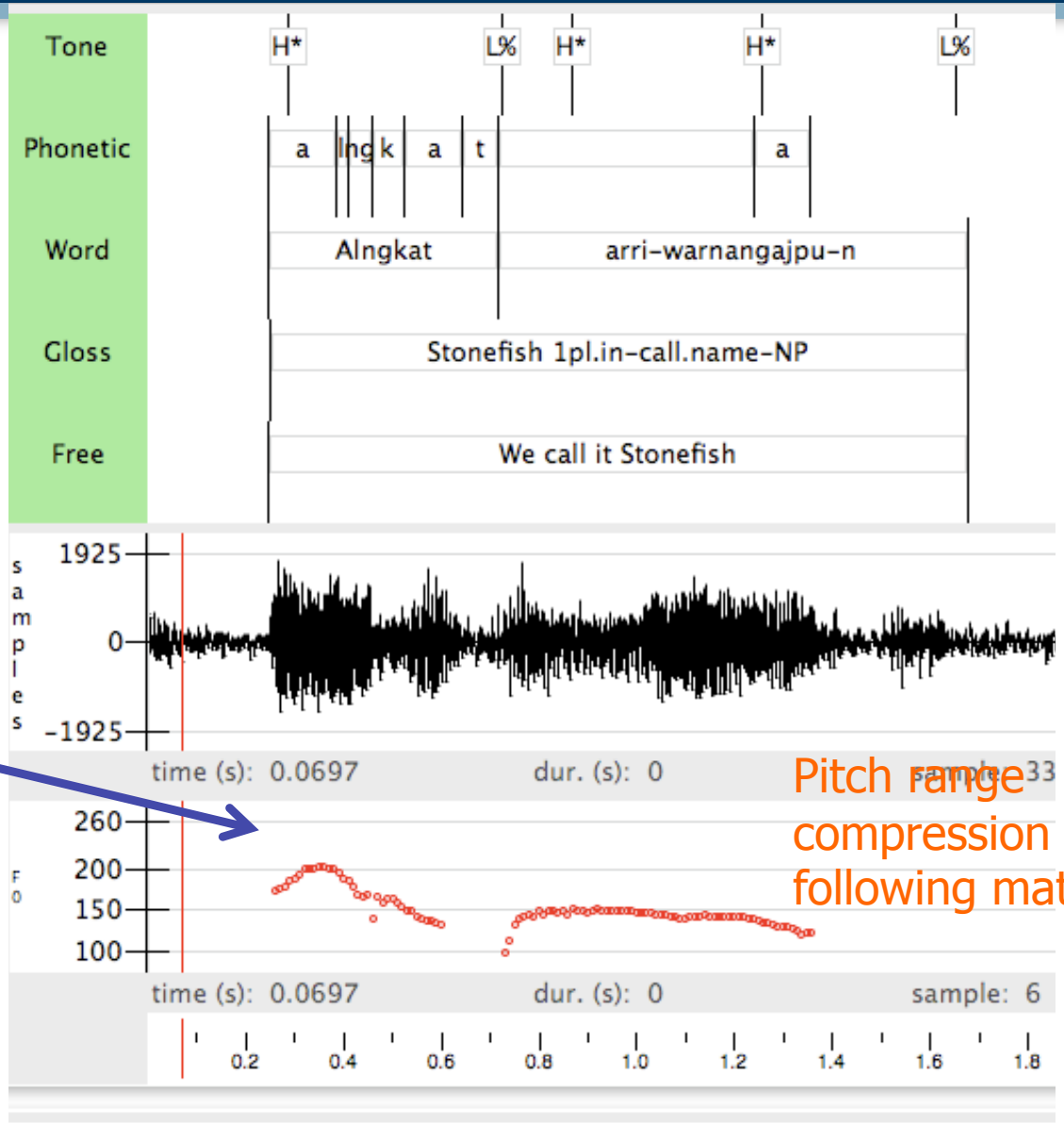
First part of response

- “Correction” context a. Major pitch movement on “call” - target word (object) is realized in reduced range



Typical Pattern - Corrective focus

- "Correction" context b. Focus word **fronted**, also receives highest pitch peak, and/ or realized as a separate IP



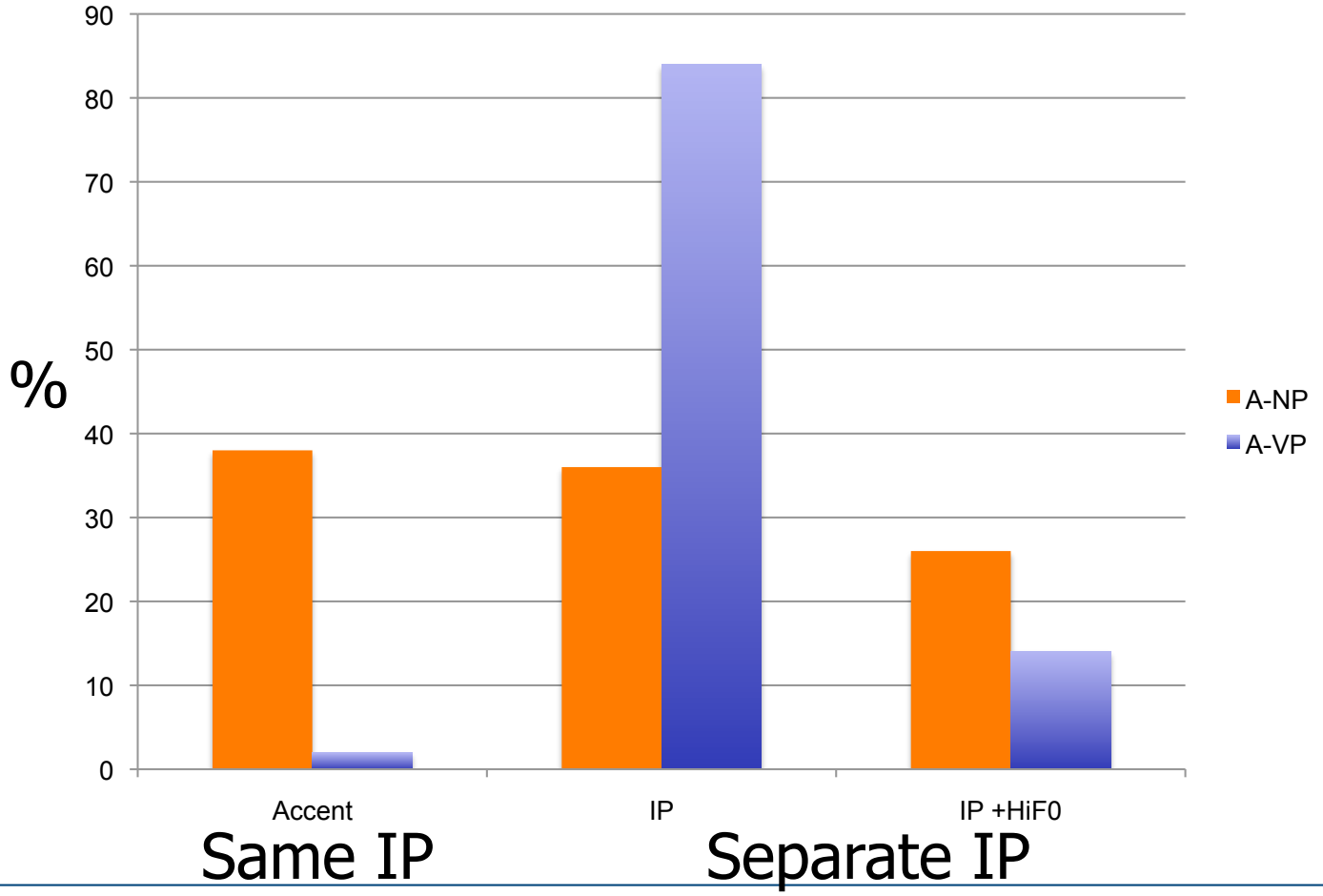
Fronted (object) target word

Pitch range compression of following material

Good example of Word-initial accentual prominence

Neutral context - “broad focus”

Typical phrasal, declarative intonation



Nouns & VP “tokens” utterance final – attract a **penultimate** pitch accent.

Often realized as separate minor intonational phrase.

Clear differences between VP and Nouns

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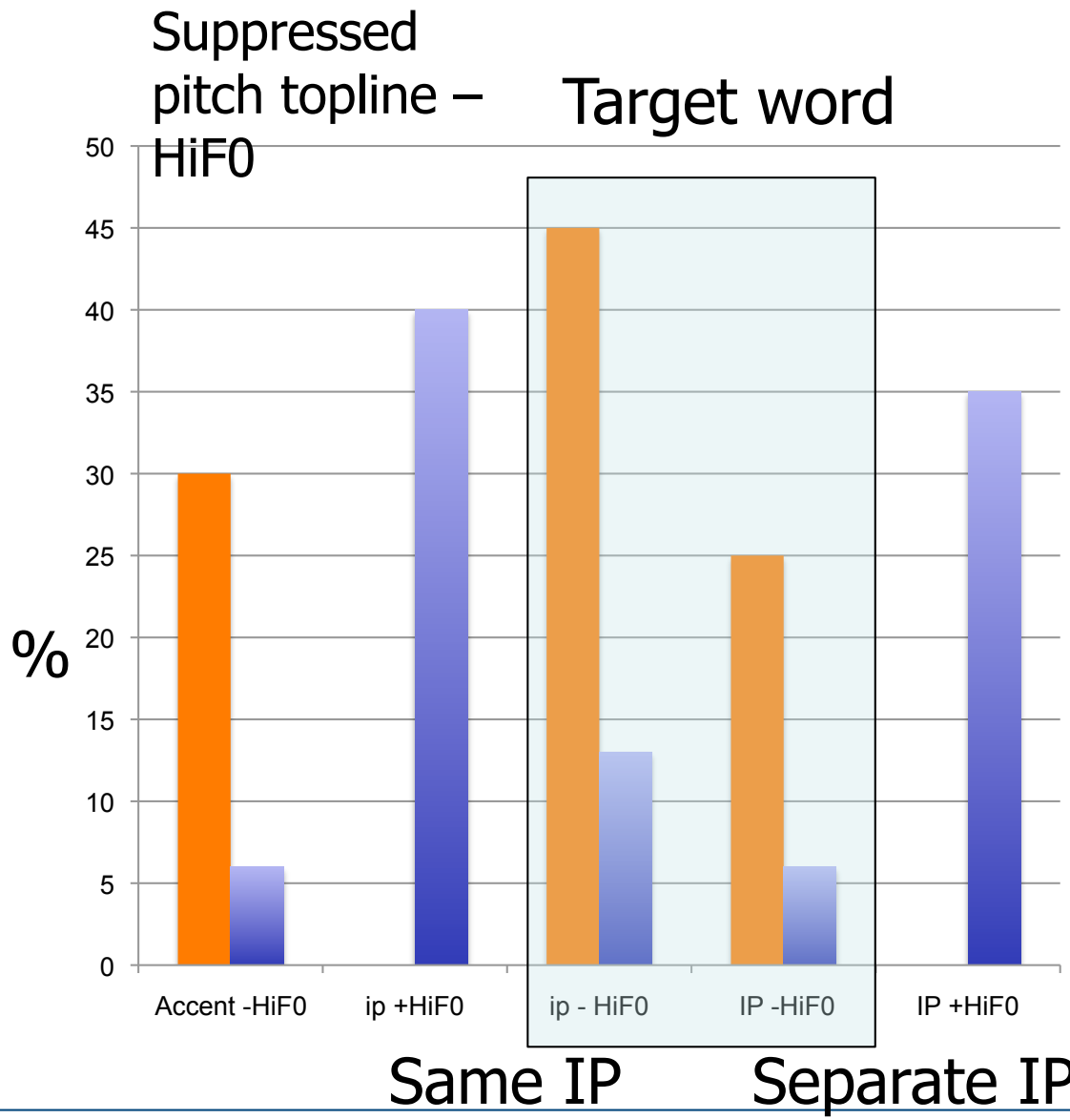
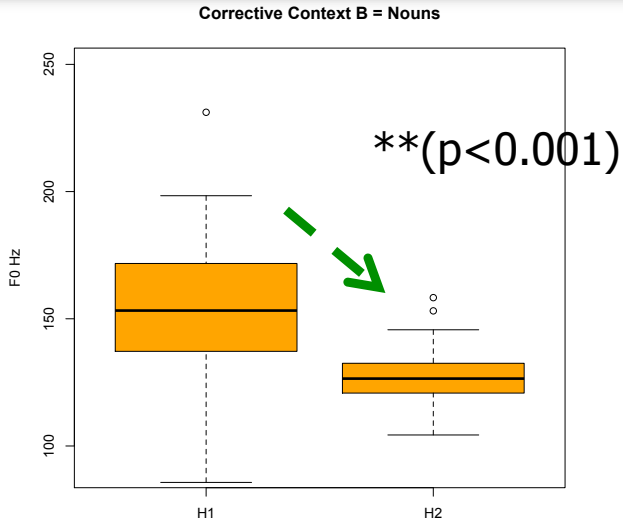
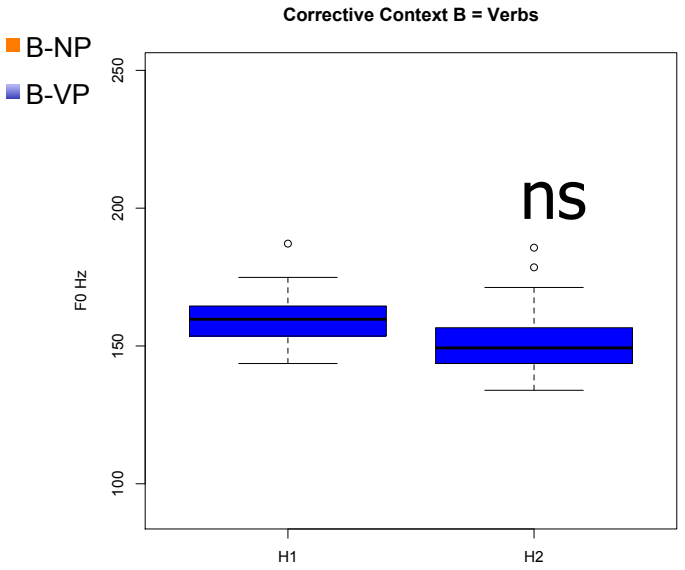
"We don't CALL it stonefish."



F0





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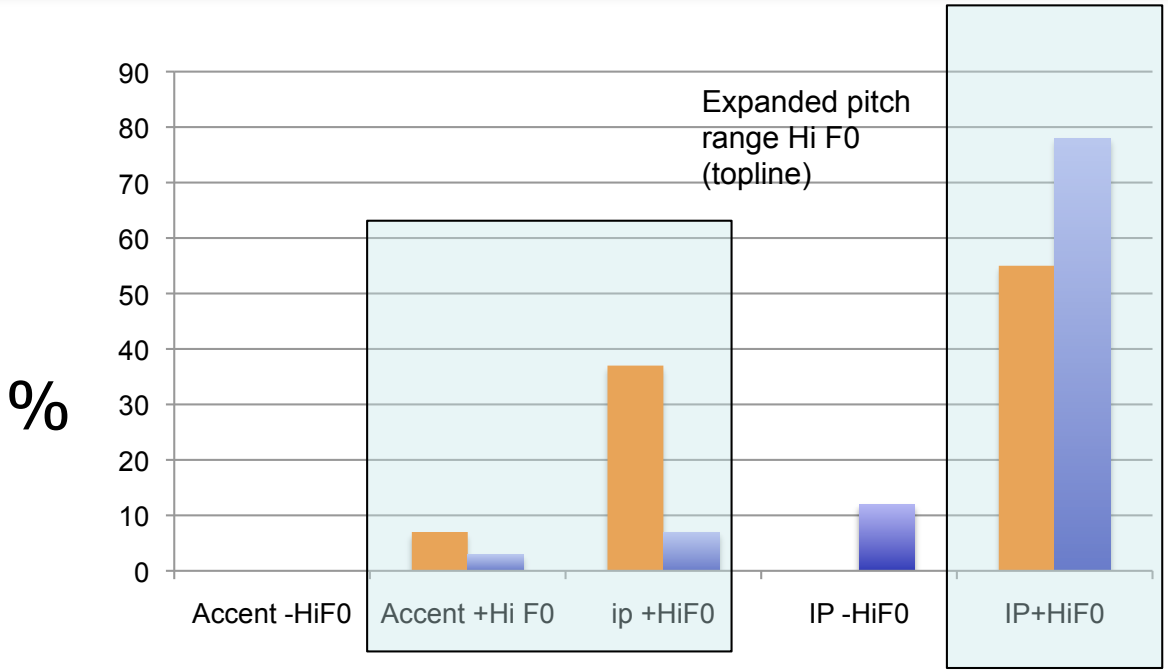
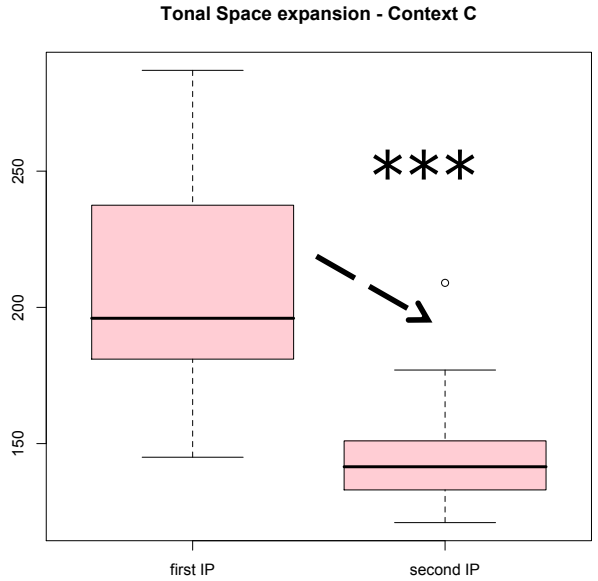
"We call it PUFFER FISH."



Same IP Separate IP

Focal Noun

F0



Fronted verbs and nouns in their own IP, realised in expanded pitch range "prosodic dislocation"

Pitch range suppression of following IP, also in verbs

Implications

- Similar strategies to those employed in other “free” word order languages
- Syntactic fronting - intonational phrasing, possible variable pitch accent realization (LH* vs H*)
- **Consistent** pitch range / register manipulation, not unlike the register manipulations that are observed in radically different languages e.g. tone languages
- Similar to polar/”Wh” – questions, imperatives etc minus prosodic dislocation
- Nouns are special – often missing in conversational discourse

The story so far….

- Fewer “tones” i.e. fewer intonational pitch accent shapes compared to Germanic languages, e.g. German, Dutch, English but there is intonational variation!
- Distinctive plateau and “stylized” high tunes in narrative discourse (also Round 2010, Kayardild, Simard 2010, Jaminjung)
- Importance of phrasing, and **pitch range manipulation**
- Traditional intonational functions: modality, phrasing and discourse segmentation, and focus marking

Speaker attitude – paralinguistic effects

- Pitch register shifts, story telling, reported speech
- Use of other features besides F0, particularly in story telling, narrative discourse
- Voice quality modification
- …but that's another story

The challenges..

- On-going challenge of teasing apart word-level and phrase-level stress
- Variability - some Australian languages are probably more “phrasal”, some more “accentual”
- Varying evidence that there are consistent cues to accentual prominence beyond pitch – implications for lexical prosody
- AM framework can accommodate variation (e.g. Hualde 2006, Ladd 2008, Beckman and Venditti 2010)
- Look beyond F0

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The challenges..

- Importance of analysing different genres, including interactive discourse as well as narratives, controlled elicited materials etc.
- What about perception and processing?
- To be continued…

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