Suprasegmentals

Instrumental phonetics

February 24

Inna Sieber

innasieber@gmail.com

Suprasegmentals

Prosodic units / features = suprasegmentals:

- Hierarchy

- Structure: nucleus, periphery, boundaries

- System: not inventories but schemes

Units: mora, syllable, word, prosodic phrase, utterance…

Features: stress, lexical tones, intonation, rhythm, tempo…

Parameters: pitch, intensity, duration + phonation, quality…

Today:

1. Word stress
2. Lexical tones
3. Intonation

Types and descriptions

How to measure

Word stress

Stress (accent)

- makes one syllable of the word prominent (**word stress**)
- makes one word in a phrase prominent (**prosodic stress**)

phrase accent

Domain (word stress):

- a vowel?
- a syllable?
- a word?

NB: lexical stress ≠ word stress
lexical stress is word stress that can distinguish between words and word forms in a language
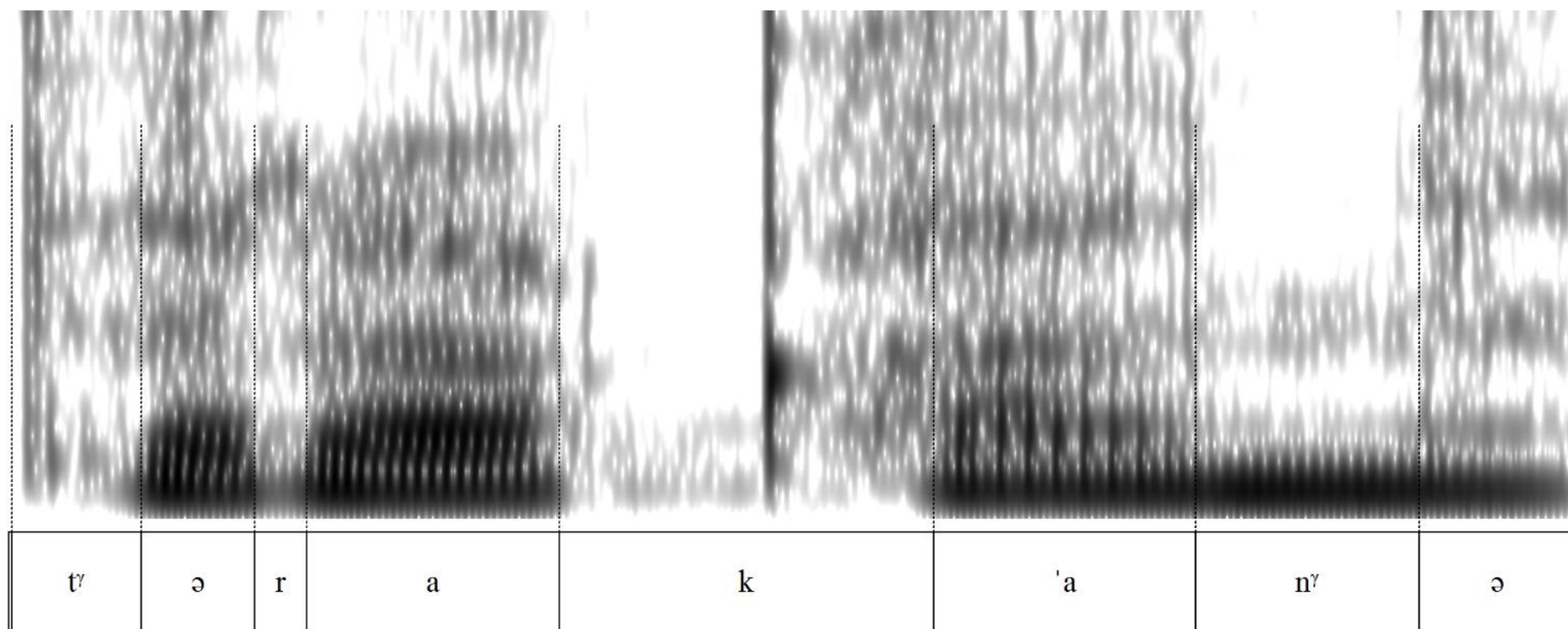
Word stress: perceptive/acoustic parameters

- Loudness (intensity)

- Duration

- Pitch (fundamental frequency)
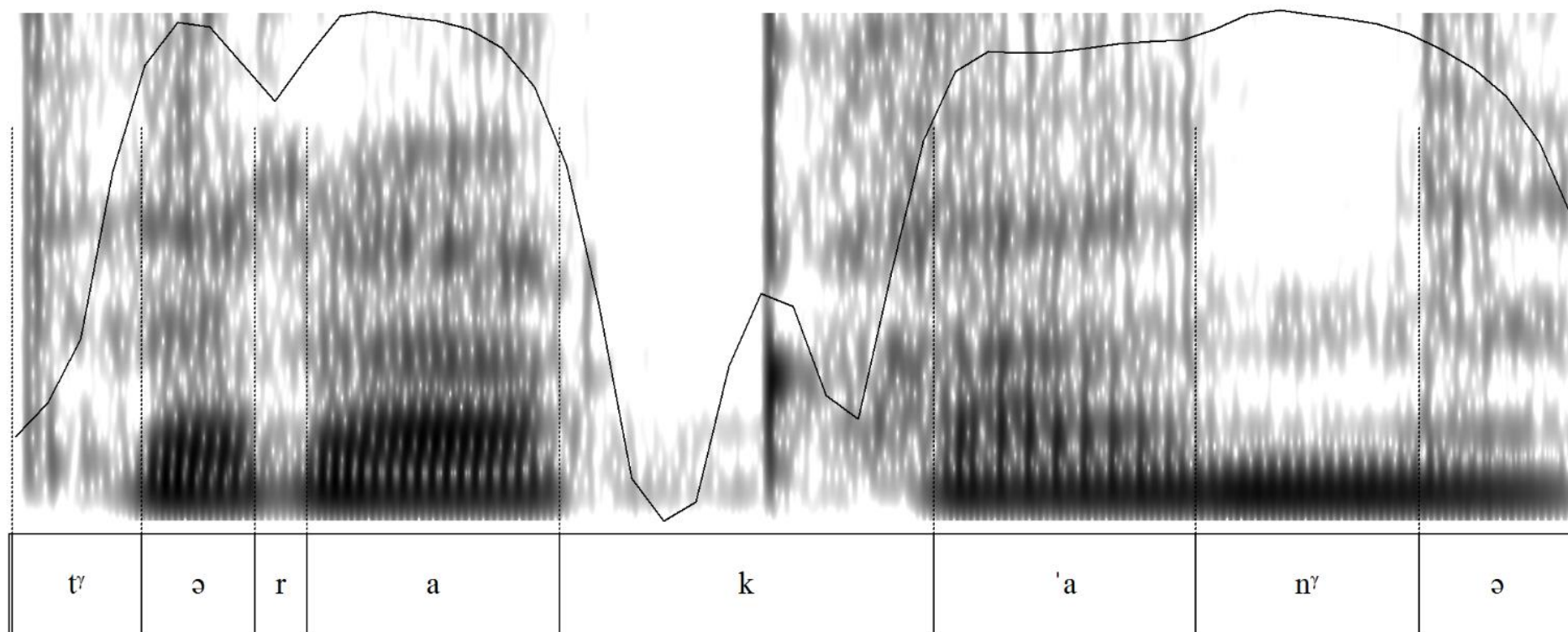
- Vowel quality (reduction)

What parameters are responsible for stress?
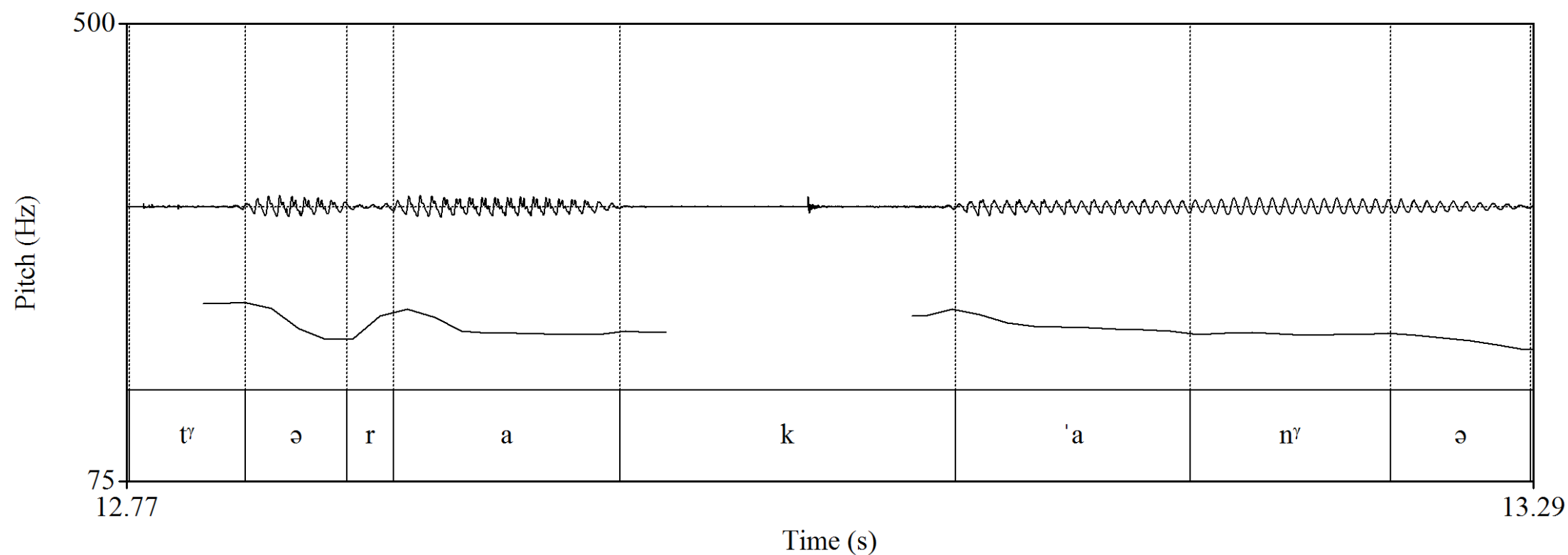
What is the most important?

Russian, allegro: /taraˈkani̵/ or /taraˈkana/ ('cockroach')

tʸ	ə	r	a	k	ˈa	nʸ	ə

Russian, allegro: /taraˈkanɨ/ or /taraˈkana/ ('cockroach')

| tˠ | ə | r | a | k | ˈa | nˠ | ə |

Russian, allegro: /taraˈkanɨ/ or /taraˈkana/ ('cockroach')

Russian: what is prominent?

- Duration: pre-stressed and stressed are longer

- Quality: pre-stressed and stressed preserve quality and distinction

- Intensity: the last unstressed syllable is the least intensive (keep vowel height in mind)

- Pitch: initial segments have higher pitch

In Russian the "prosodic nucleus" differs in duration and quality

Lexical tones

Pitch and tone

- Fundamental frequency (F0) – acoustic term
- Pitch – perceptual concept or the same as F0
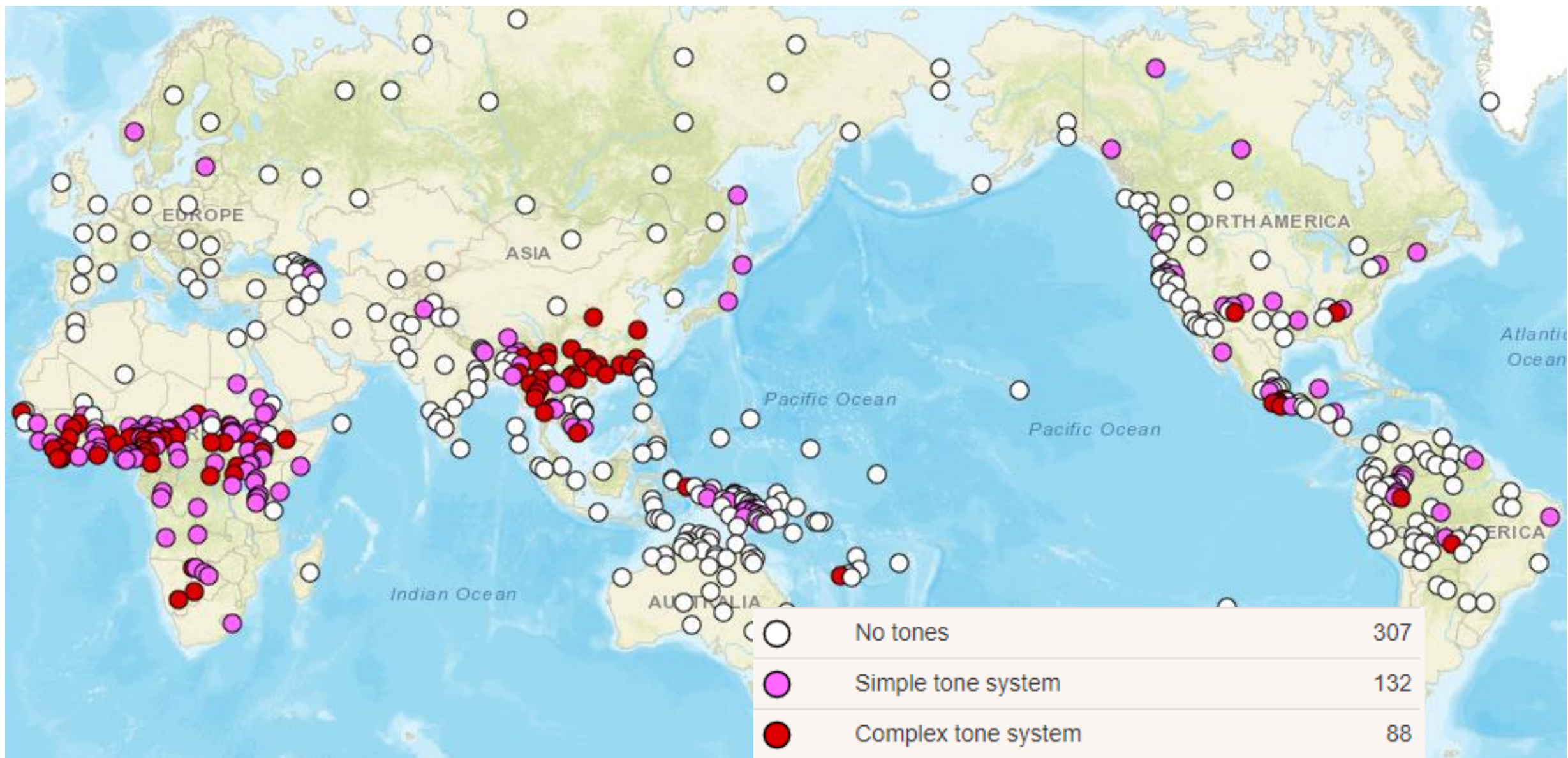- Tone – phonology, a linguistic term

What suprasegmentals use pitch?

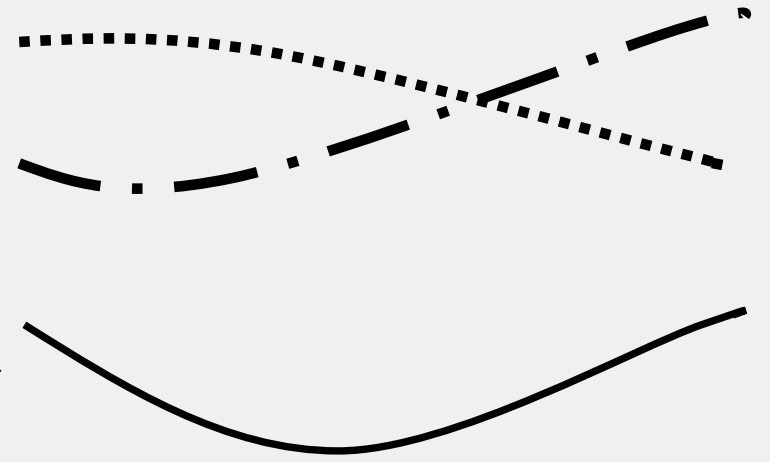|	INTONATION	TONE
Domain	Prosodic phrase, utterance	Syllable
Is pitch independent?	There are other parameters (pause, phonation, duration)	Independent (more or less)
What is distinguished?	Information structure, purpose of speaking	Words, word forms

Tones (lexical tones)

- can distinguish between morphemes, words, word forms

- are independent from phonetic position

- characterize each syllable of the word

- can combine pitch with phonation, intensity and duration

In **lexical tone languages** tone is distinctive and it is an essential feature of morphemes, words and word forms

○	No tones	307
●	Simple tone system	132
●	Complex tone system	88

Tones: typology

LEVEL TONES	CONTOUR TONES
differ in pitch	differ in direction of movement

Level tones:
- extra high, EH
- high, H
- mid, M
- low, L
- extra low, EL

Contour tones:

Simple tones:
- rising, R
- falling, F

Complex tones:
- rising-falling, RF
- falling-rising, FR

+ low rising, high falling etc…
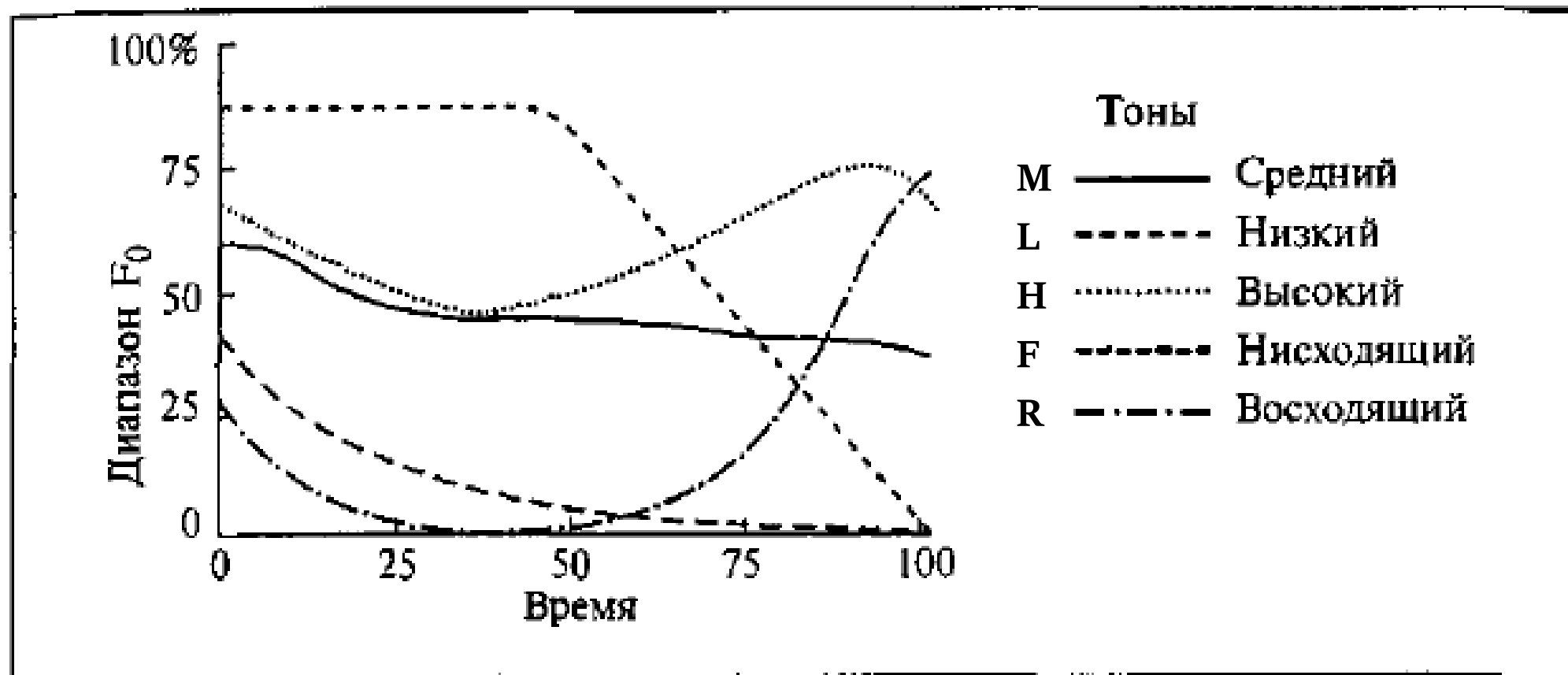
Thai level (M, L, H) and contour (F, R) tones

Рис. *3.41.* Изменение основной частоты в тонах тайского языка

Tone systems: typology

- Register tone languages – level tones only
- Contour tone languages – level tones AND contour tones

Register tone languages

Word is a sequence of level tones

Yoruba:

- oba/MH   '(he) met'
- oba/MM   '(he) hided'
- oba/ML   '(a bird) sat'

Predictable contour tones are possible due to phonological rules

Efik:

- ke urua/HLLL > kurua/FLL 'at the market'

Listen to Yoruba tones (--> 2:00)

Guinea Kpelle

(1)   **ŋaa**   **ɓɛlaa** **lɛ**   **ma**
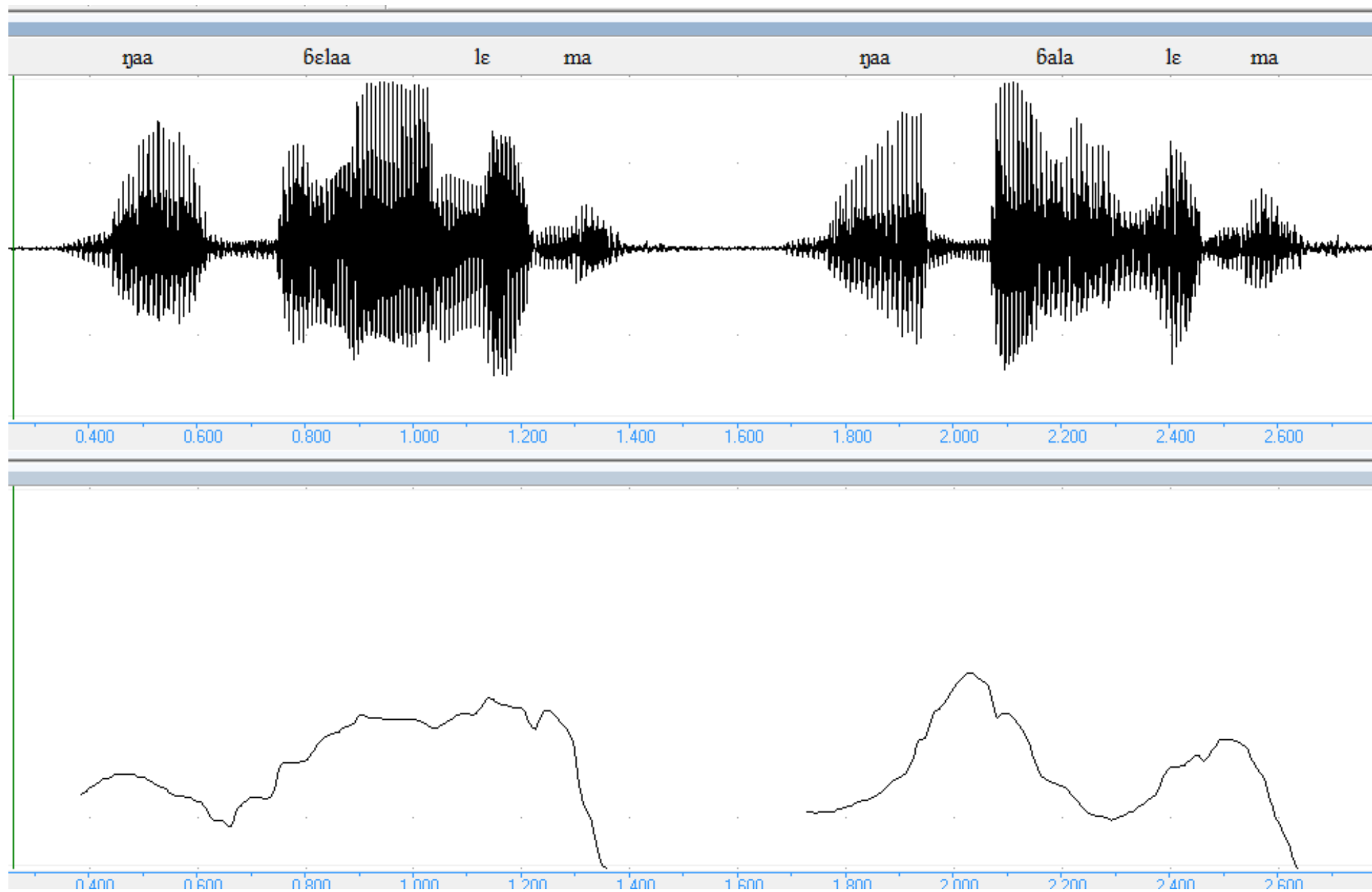
        I   sheep show   him

        'I showed him a sheep'

(2)   **ŋaa**   **ɓala**   **lɛ**   **ma**

        I   drum show   him

        'I showed him a drum'

Guinea Kpelle

ŋaa   ɓɛlaa   lɛ   ma   ŋaa   ɓala   lɛ   ma

(thanks to Maria Konoshenko, 2018)

Level tone systems

- Usually L&H or L&H+M; one of them is basic

- Affixes can be neutral or can bear tones

- Root to affixes or affixes to root

- One tone can spread over the word

- Tones depend on the context (just like segments!)
  - Downstep in tone terracing: merge and reset

- Constraints on tone sequences: tones change when affix creates the prohibited tone sequence

Contour tone languages

- At least one level tone

- Contour tones are not derived from level tone(s)

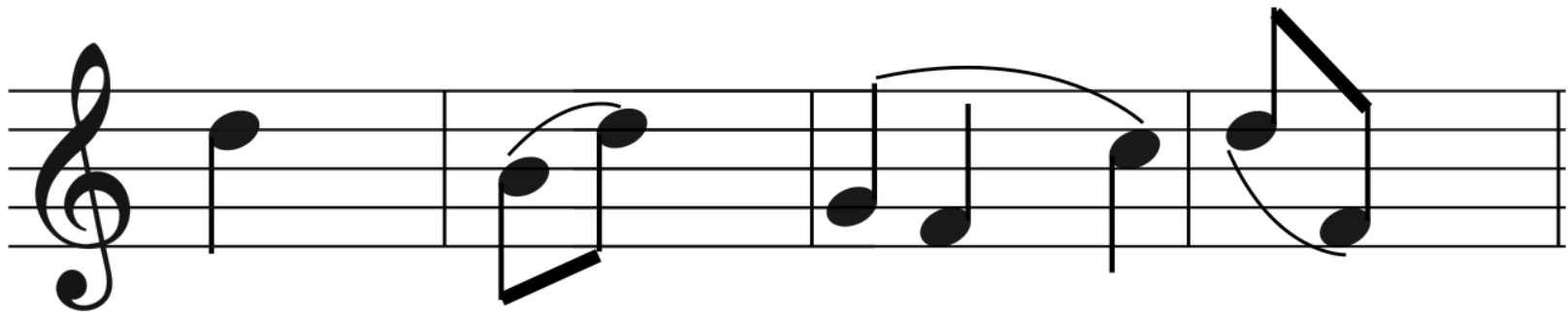- Shape is more important than register

- Phonation

Thai:
- nha:/HR   'aunt'
- nha:/LR   'thick'
- nha:/LF   'name'
- nha:/HF   'field'

Beijing Chinese

1. Mā / H   'mum'

2. Má / R   'cannabis'

3. Mǎ / LFR   'horse'

4. Mà / F   'to scold'

Beijing Chinese
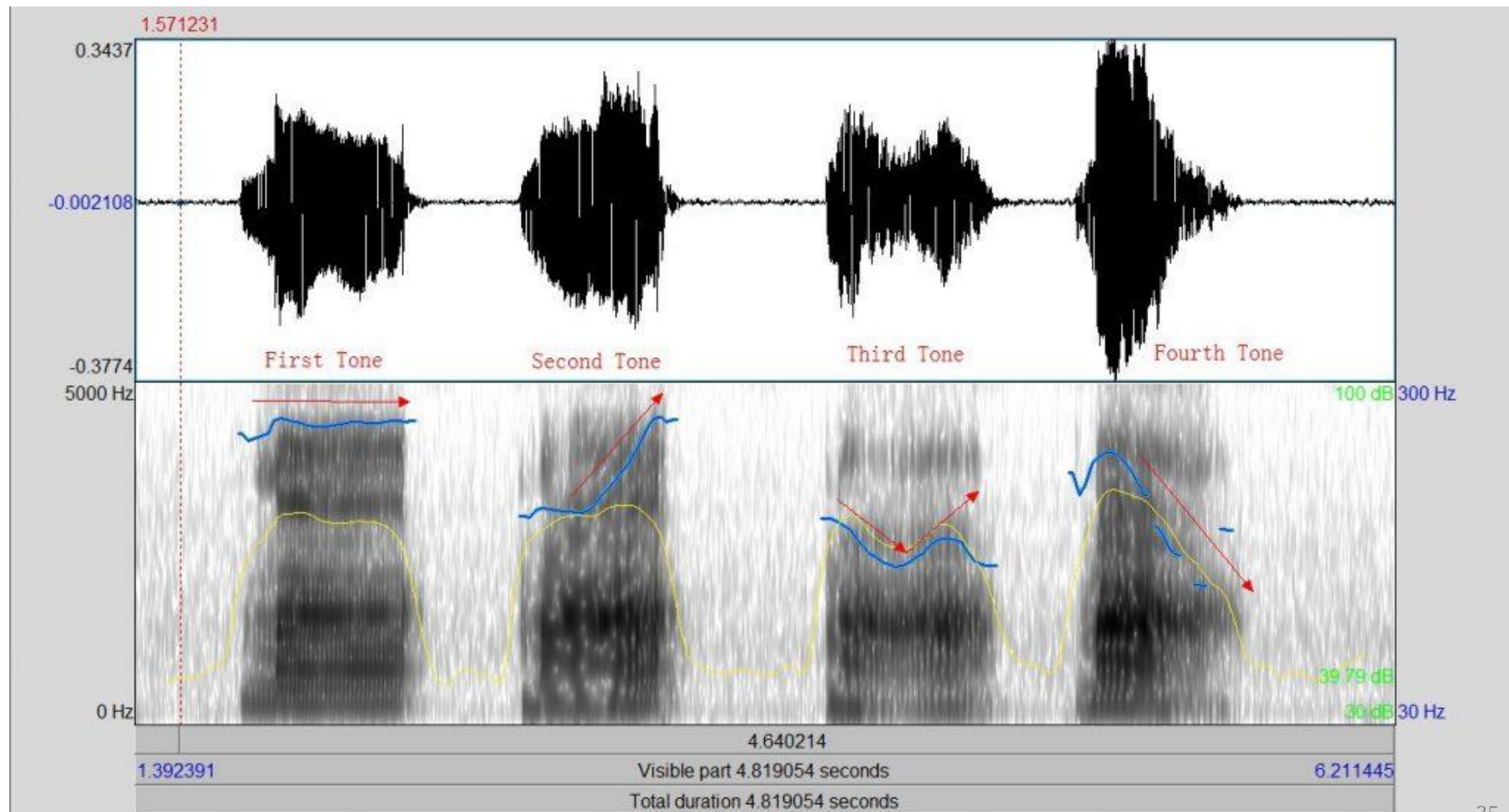
Vietnamese tones

Glottalized / breathy /
modal voice

Long / short

(Nguyễn & Edmondson 1998)
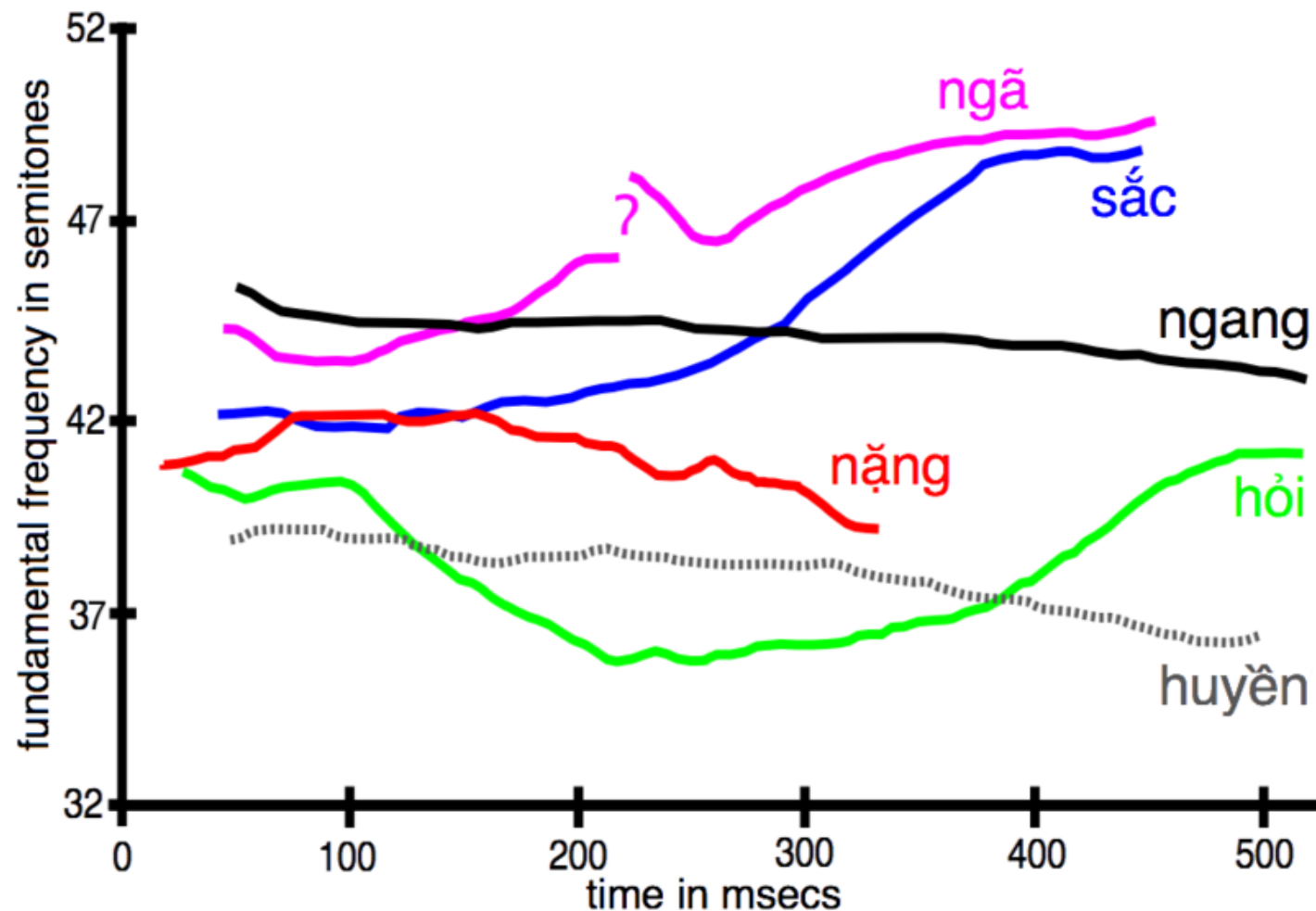
Listen to Vietnamese tones (--> 9:25)

Level vs. contour tone systems

Level tone systems	Contour tone systems
Africa (Hausa, Yoruba…)	Southeast Asia (Chinese, Vietnamese…)
Few tones Tones are set for each syllable of the sequence in allowed combinations	Lots of tones Tone is a vocabulary feature of words/morphemes, while sandhi sometimes take place
Tone is grammatical: person, tense, singular/plural	Tone is associated with a word or a morpheme and usually accompanies it

Transcribing tones

5 = extra high

4 = high

3 = mid

2 = low

1 = extra low

[ba^{42}], [ba^{35}]

[su^{214}], [su^{424}]

TONES AND WORD ACCENTS

LEVEL			CONTOUR		
é̋ or ˥		Extra high	ě or ᴧ		Rising
é ˦		High	ê ᴠ		Falling
ē ˧		Mid	é̌ ↑		High rising
è ˨		Low	è̌ ↗		Low rising
è̏ ˩		Extra low	ê̌ ↑		Rising-falling
↓ Downstep			↗ Global rise		
↑ Upstep			↘ Global fall		

28

Stress in lexical tone languages

- <u>Register tone languages </u>usually have no stress:

    syllables are all equally prominent

- <u>Contour tone languages </u>can have stress:

    there can be more tonal distinctions under stress

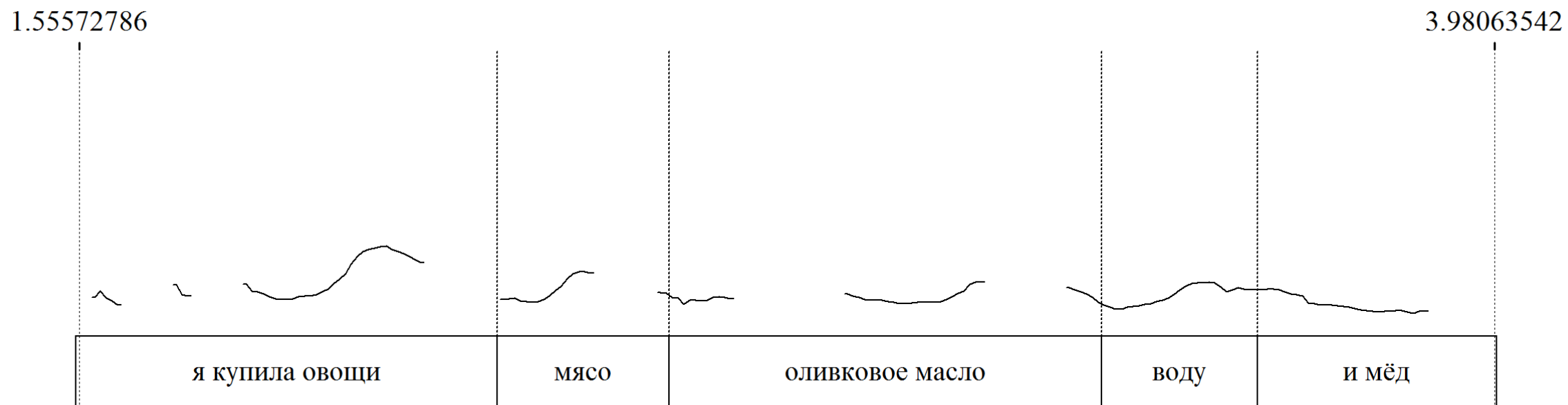   (compare with vowel reduction!)

Intonation

Intonation

- Pitch

- Pauses

- Division into parts

- Prosodic stress

- ToBI transcribing system

- Janet Pierrehumbert

George's shopping

Alright there! I got veg, meat, olive oil, water and honey. Can you hear me? What else do we need?
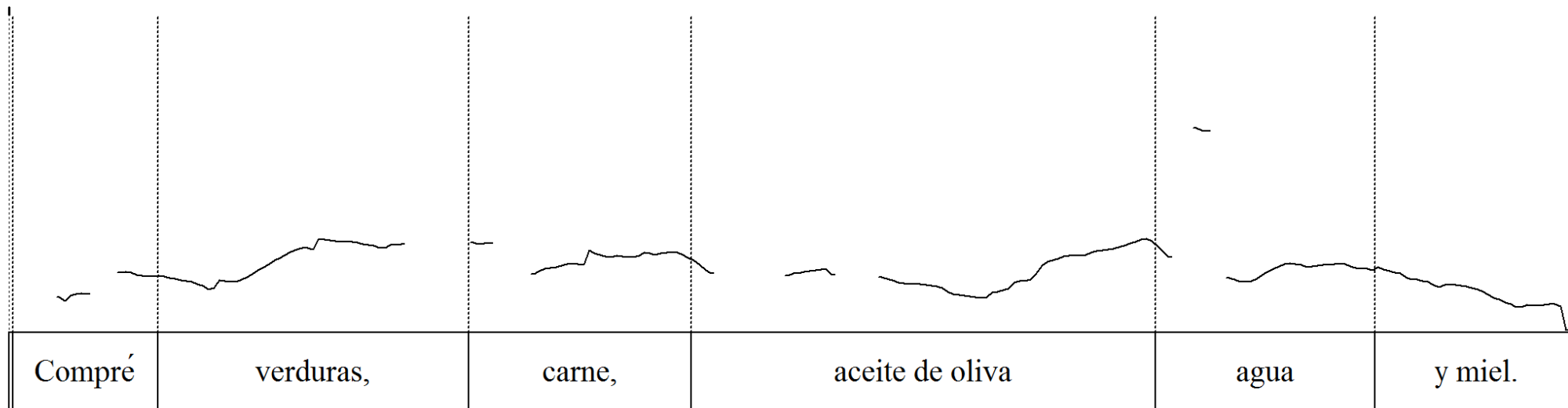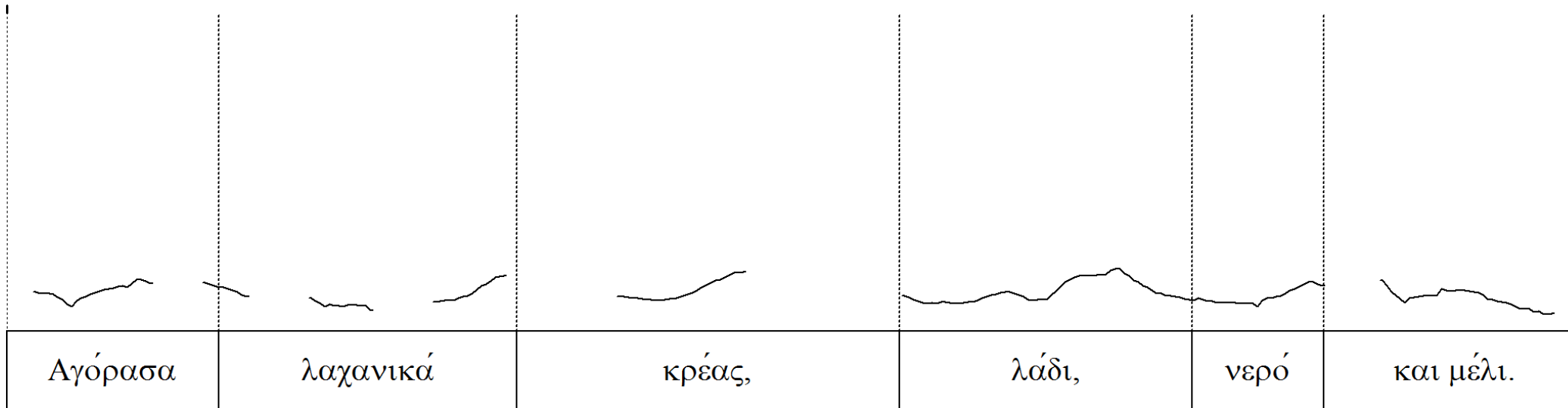
Russian

1.55572786   3.98063542

я купила овощи	мясо	оливковое масло	воду	и мёд

Spanish

5.69728693   8.54786567

| Compré | verduras, | carne, | aceite de oliva | agua | y miel. |

Greek

2.91900641   6.3526763

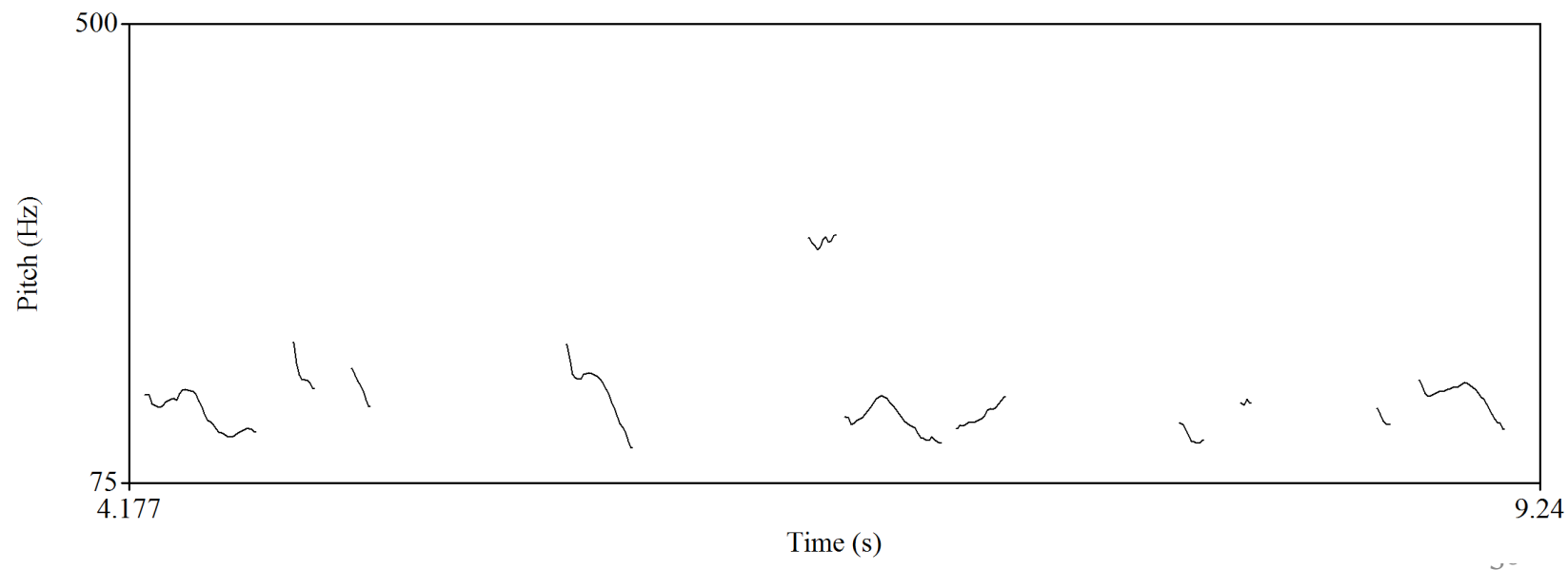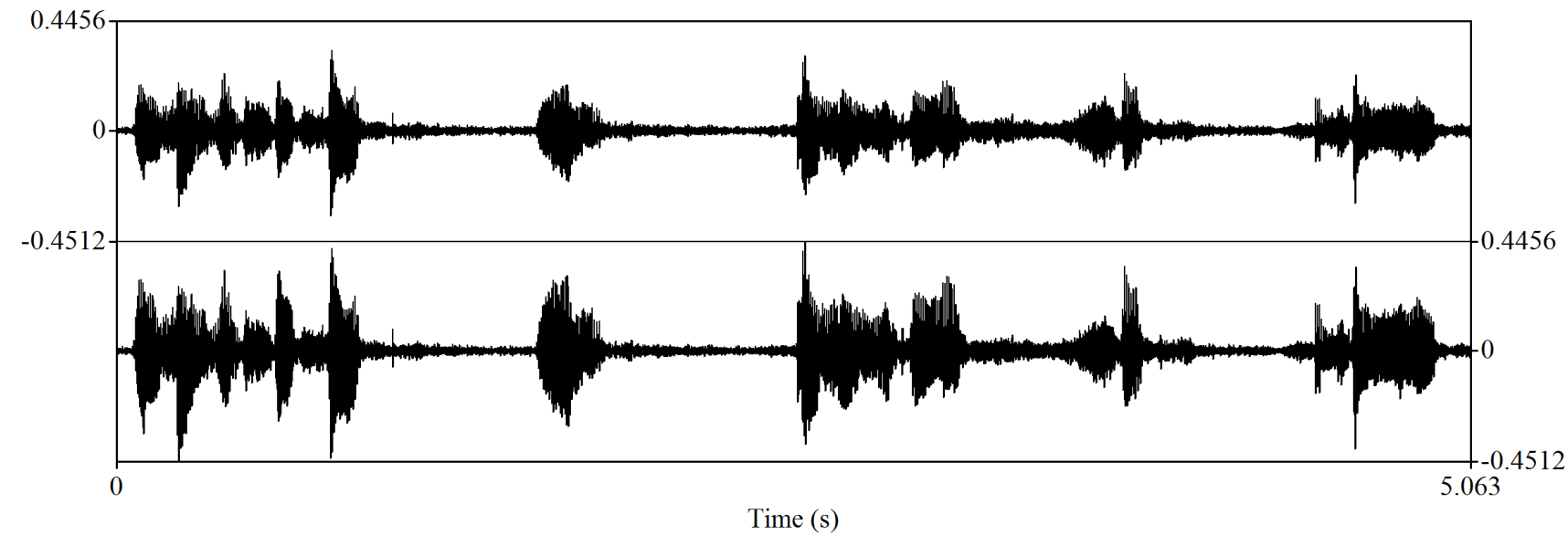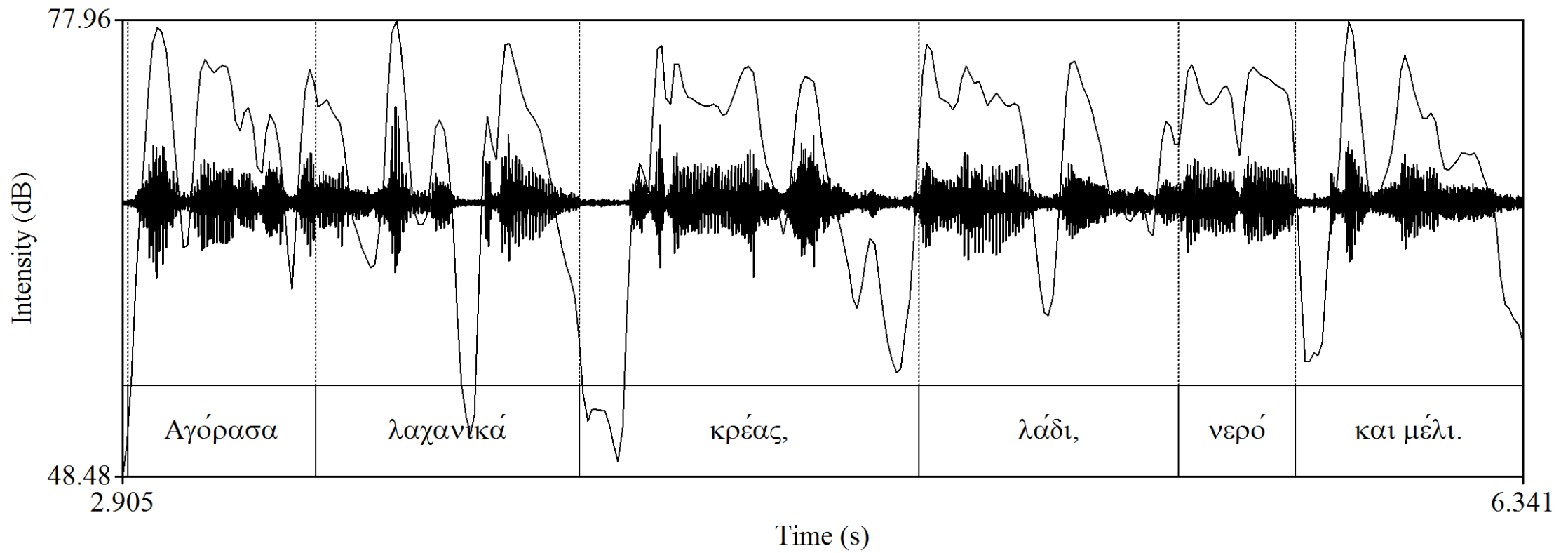| Αγόρασα | λαχανικά | κρέας, | λάδι, | νερό | και μέλι. |

Chinese

Stress in Greek

Today:

1. Word stress
2. Lexical tones
3. Intonation

What else?

- Rhythm!
  - stress-timed, syllable-timed, mora-timed languages
  - measuring duration
- Speech tempo
  - measuring the number of units
- Describing prosody of a language
- Second language acquisition
- etc…

References

- Maddieson I. 2013. Tone. In: Dryer, Matthew S. & Haspelmath, Martin (eds.) The World Atlas of Language Structures Online. Leipzig: Max Planck Institute for Evolutionary Anthropology. (http://wals.info/chapter/13)

- Кодзасов С.В., Кривнова О.Ф. 2001. Общая фонетика. М.: РГГУ.

- Maddieson I. 2010. Typology of phonological systems. In: Song Jae Jung (ed.) The Oxford Handbook of Linguistic Typology. Oxford University Press.

- Ashby M., Maidment J. 2005. Introducing Phonetic Science. Cambridge University Press.

- Yip M. 2002. Tone. Cambridge University Press.

- Nguyễn, Văn Lợi; Edmondson, Jerold A (1998), "Tones and voice quality in modern northern Vietnamese: Instrumental case studies", Mon-Khmer Studies, 28: 1–18

More on tones:

Gandour, Jackson. 1978. The perception of tone. In Fromkin 1978: 41–76.

Hyman, Larry. 1975. Phonology: theory and analysis. New York: Holt, Rinehart & Winston.

Hyman, Larry. 2007. Universals of tone rules: 30 years later. In Tomas Riad, Carlos Gussenhoven (eds.). Tones and tunes. Berlin: Mouton de Gruyter.

Hyman, Larry. 2011. Tone: is it different? In John Goldsmith, Jason Riggle, and Alan C. L. Yu (eds.). The Handbook of Phonological Theory, Second Edition. Blackwell.

Hyman, Larry & Russel Schuh. 1974. Universals of tone rules: Evidence from West Africa. Linguistic Inquiry 5: 81-115.

Maddieson, Ian. 1978. Universals of tone. In Universals of Human Language; Volume 2 Phonology (ed. J.H. Greenberg et al.). Stanford University Press, Stanford: 335-363.

Maddieson, Ian. 2005, 2011. Tone. Chapter 13 in World Atlas of Language Structures, and World Atlas of Language Structures Online.

Pike, Kenneth L. Tone languages: A technique for determining the number and type of pitch contrasts in a language. University of Michigan Publications in Linguistics 4. Ann Arbor, MI. 1948.

Wedekind, Klaus. 1985. Thoughts when drawing a map of tone languages. Afrikanistische Arbeitspapiere 1: 105-124.

Welmers, William. E. 1959. Tonemics, morphotonemics, and tonal morphemes. General Linguistics. 4.1-9.

Yip , Moira. 2002. Tone. Cambridge: Cambridge University Press.

Zhang, Jie. 2001. The Effects of Duration and Sonority on Contour Tone Distribution – Typological Survey and Formal Analysis. PhD Dissertation, UCLA.

Maria Konoshenko