Prosody: Theory and Practice

Session 1
Overview of Course
Prosodic Semantics and Pragmatics

Dafydd Gibbon

Guangzhou Prosody Lectures, November 2017

Schedule

Week 1, 31st Oct 2017:
01 10:00-11:40 Overview; F*unctions of Prosody*
02 14:30-16:10 Digital phonetics: Basics; Praat phonetic workbench

Week 2, 7th Nov 2017
03 10:00-11:40 *Practical Prosody: recording with Praat*
04 14:30-16:10 *Practical Prosody: prosodic analysis with Praat*

Week 3, 21st Nov 2017
05 10:00-11:40 *Transcription models for prosody*
06 14:30-16:10 *Practical annotation session: speech rhythm*

Week 4, 21st Nov 2017
05 10:00-11:40 *Prosodic Phonology: models of intonation*
06 14:30-16:10 *Prosody and Technology: applications*

What is Prosody and why study it?

What is Prosody and why study it?

- Prosody covers the rhythms and melodies of speech and their meanings
  - The meanings of rhythms and melodies are the main topic for this session
  - The rhythms and melodies of speech are described in terms of their structure and their phonetic form
    - What is rhythm? Is it important, and, if so, why?
    - What is melody? Is it important, and, if so, why?
- Most of this course is concerned with how rhythms and melodies are studied:
  - Observation, analytic listening, transcription, judgment of form, structure and function
  - Digital recording and measurement, quantitative (statistical analysis)

What is Prosody and why study it?

- So why go to all this effort and study prosody?
- The simple answer: because it's there!
- The professional answer: because it reveals fascinating insights into the human mind and the evolution of speech
- The communicatively useful answer: because it makes essential contributions to the meaning of speech, for example:
  - Rhythms may indicate structure, or the attitude of the speaker as in formal vs. informal speech, excitement
  - Melodies may also indicate structure, or dialogue acts (types of question, answer, confirmation, request, instruction, …)

The Place of Prosody in the Architecture of Language

The Rank Interpretation Architecture

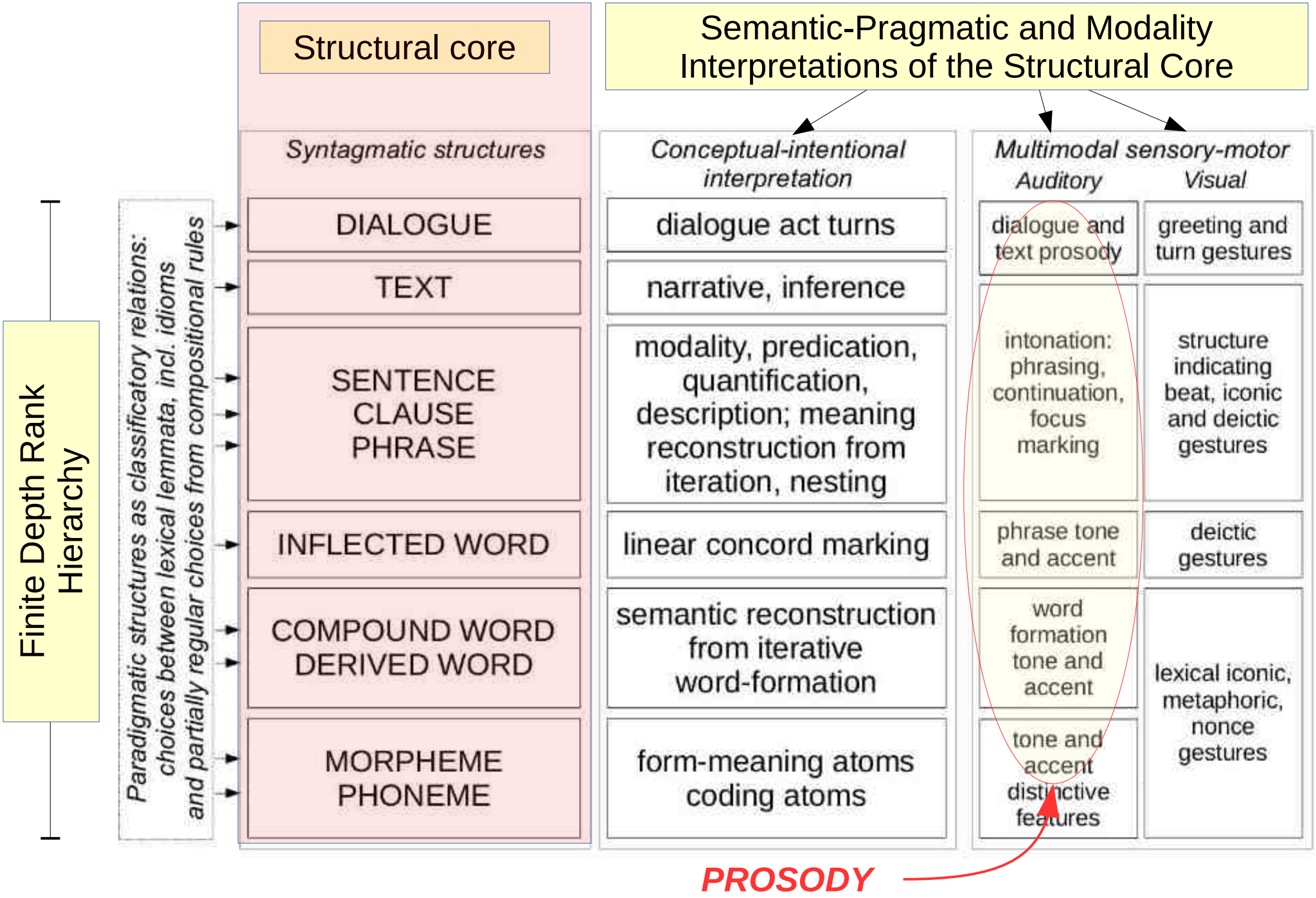
The Architecture of Language

Finite Depth Rank Hierarchy

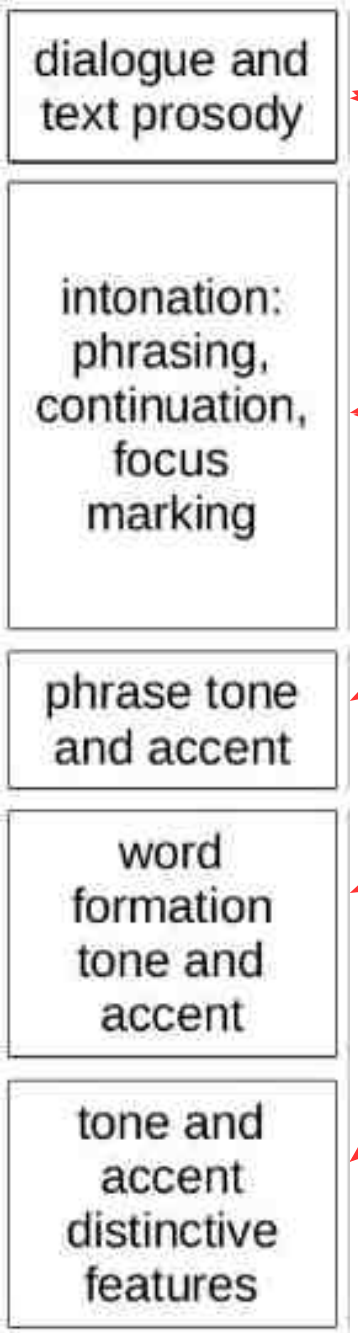
with three components at each rank:

Structural Core
Semantic-Pragmatic Interpretation
Modality Interpretations

The semiotic Rank Interpretation Architecture



*The Rank Interpretation Architecture - Prosody**



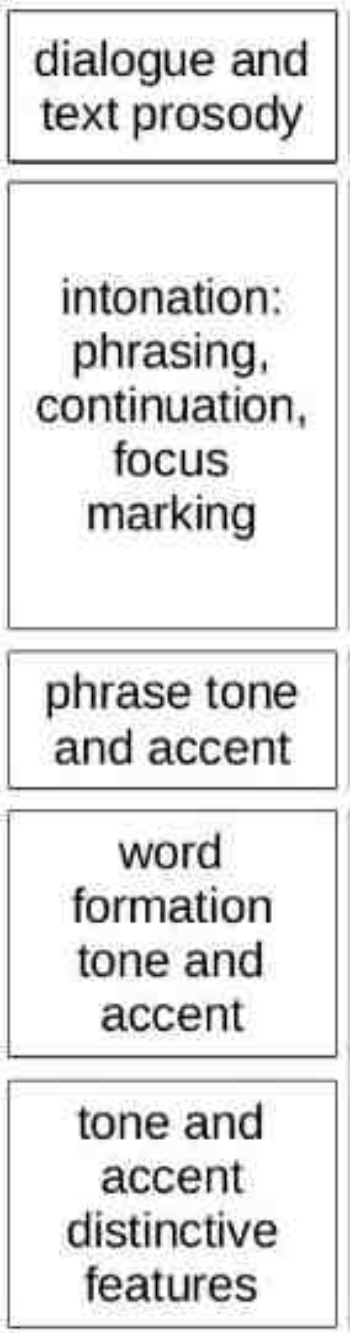
- Discourse structure
- Speaker characterisation
- Information structure
- Grammatical cohesion
- Lexical constituency:
  - morphemic content
  - phonemic contrast

**My heuristic model. DG*

Functional aspects of prosody

- **Discourse functions**
  - discourse framing
  - turn-taking continuity
  - speech act marking
- **Speaker characterisation**
  - identity, personality
  - sentiment, excitement
- **Information structure**
  - given-new
  - focus, contrast, emphasis
- **Grammatical cohesion**
  - phrasing
    - boundary marking
    - rhythm grouping
    - contour coherence
    - disambiguation
  - morphosyntactic tone
- **Lexical functions**
  - phonemic & morphemic
    - stress
    - pitch accent
    - tone

Functions



- Classic:
  - symbol (morphemic?)
  - icon (teeny weeny mouse with low pitch)
  - index (relation to time, place, person, cause)
- Linguistic:
  - lexical meaning (distinctive / contrastive)
  - structural meaning (configurative: delimitative, culminative
  - discourse meaning
    - turn-taking
    - speech act:
      - illocution
      - perlocution
    - Gricean: [check Hirshberg and my gesture paper]

Discourse functions

Discourse functions

- Discourse functions
  - discourse framing
    - "call contours"
    - strategic use of hesitation phenomena, vocalisations
  - turn-taking continuity
    - start with high pitch
    - end
      - low pitch: completed
      - high pitch: attention-getting, incomplete
    - dialogue act marking
      - adjacency pair marking, e.g. question-answer patterns
  - intonation unit boundaries
    - initial, final

Background Research on Discourse Functions

Grice
Searle
Hirschberg and Pierrehumbert
Sidner
Gibbon
Ohala, Gussenhoven

Hirschberg & Pierrehumbert

dialogue and text prosody

intonation: phrasing, continuation, focus marking

phrase tone and accent

word formation tone and accent

tone and accent distinctive features

- Hirschberg & Pierrehumbert
  - Overview of well-known functions of intonation (understood as pitch patterning)
  - Presented as an extension of Grice's theory of discourse, "The Cooperative Principle"

"The central thesis of this work is that there are many ways in which intonation helps to structure discourse."

Beckman, M. and J. Pierrehumbert (1986) Intonational Structure in Japanese and English. *Phonology Yearbook* III, 15-70.

Hirschberg, J. and J. Pierrehumbert (1986) Intonational Structuring of Discourse. *Proceedings of the 24th Meeting of the Association for Computational Linguistics*, 136-144.

Pierrehumbert, J. and J. Hirschberg (1990) The Meaning of Intonational contours in the Interpretation of Discourse. In P. Cohen, J. Morgan, and M. Pollack (eds). *Intentions in Communication*. MIT Press, Cambridge MA. 271-311.

Intentional structure: prosody and speech acts

- Grice:
  - The Cooperative Principle
    - Make your contribution such as it is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged.
  - Gricean Maxims (Conversational Maxims)
    - Maxim of Quality
    - Maxim of Quantity
    - Maxim of Relevance
    - Maxim of Manner

Grice, Paul (1975). Logic and conversation. In Cole, P. Morgan, J. (eds.) *Syntax and semantics. 3: Speech acts*. New York: Academic Press. pp. 41–58.

Intentional structure: prosody and speech acts

- Maxim of Quality
  - Supermaxim
    - Try to make your contribution one that is true
  - Submaxims
    - Do not say what you believe to be false.
    - Do not say that for which you lack adequate evidence.
- Relevance to prosody
  - prosodic features
    - unmarked association with grammar
      - 'normal' tones, accents, intonation
    - marked association with semantics
      - scope of operators (*and*, *not*, ...)
      - 'contrastive', 'emphatic'

Intentional structure: prosody and speech acts

- Maxim of Quantity
  - Make your contribution as informative as is required (for the current purposes of the exchange)
  - Do not make your contribution more informative than is required
- Relevance to prosody
  - Appropriate pitch range of prosodic units
    - paratone, intonation, pitch accent, tone
  - Appropriate rhythmic features:
    - duration of prosodic units
      - syllables, feet, phrases, ...
    - rate of speaking
    - acceleration and deceleration

Intentional structure: prosody and speech acts

- Maxim of Relevance
  - Be Relevant
    - what different kinds and focuses of relevance there may be
    - how these shift in the course of a talk exchange
    - how to allow for the fact that subjects of conversations are legitimately changed
- Relevance to prosody
  - Phonetics:
    - situationally relevant pronunciation of correct sounds, tones, pitch accents, intonation
  - Grammar:
    - match of prosody and grammar
  - Semantics:
    - match of prosody and dialogue acts, speech acts, turn-taking

Intentional structure: prosody and speech acts

- Maxim of Manner
  - Supermaxim:
    - Be perspicacious
  - Submaxims:
    - Avoid obscurity of expression.
    - Avoid ambiguity.
    - Be brief (avoid unnecessary prolixity).
    - Be orderly.
- Relevance to prosody:
  - Listener orientation:
    - Phonetics: clarity of tone and rhythm
    - Grammar: mark structure
    - Semantics: disambiguate meanings

Back to Hirschberg & Pierrehumbert

- "semantico-pragmatic effects":
  - structure:
    - discourse segmentation, topic structure
    - parallelism between mentioned items
    - subordination relationships between propositions salient in the discourse
    - topic shift, digression, interruption
    - turn-taking
  - semantic functions:
    - disambiguation of ambiguous utterances [DG: scope]
    - appropriate choice of referent (reference resolution)
    - distinction between 'given' and 'new' information (information status: given/new, topic/comment, focus/presupposition)
    - conceptual contrast
    - indirect speech acts [DG: other speech acts, too]

Prosody and speech acts

- Austin 1962 & Searle 1969:
  - **locutionary acts**:
    - meaning: modality, mood, possibility, predicate & arguments
      - lexical morphemic tone; phrasal intonational meaning
    - metalocutionary acts
      - marking of properties of locutions (boundary tones, accents, ...)
  - **illocutionary acts**:
    - interactive creation of new bond between interlocutors
      - question, promise, command; marriage, official appointment, ...
  - **perlocutionary acts**:
    - creation of an effect by the speaker on the hearer
      - impress, disappoint, interest, excite, bore; praise, insult, ...

Prosody and speech acts

- Searle (1975) classifies illocutionary speech acts:
  - assertives:
    - speech acts that commit a speaker to the truth of the expressed proposition
  - directives:
    - speech acts that are to cause the hearer to take a particular action, e.g. requests, commands and advice
  - commissives:
    - speech acts that commit a speaker to some future action, e.g. promises and oaths
  - expressives:
    - speech acts that express on the speaker's attitudes and emotions towards the proposition, e.g. congratulations, excuses and thanks
  - declarations:
    - speech acts that change the reality in accord with the proposition of the declaration, e.g. baptisms, pronouncing someone guilty or pronouncing someone husband and wife

Speech Acts: Searle's rule types (1969)

- Conventions or rule types:
  - Constitutive Rules:
    - create an act whose existence is logically dependent on the rules
      - chess rules, rules of football (touchdown rule as constitutive vs. no taunting rule as regulative).
      - illocutionary rules series of systems of constitutive rules and that illocutionary acts are performed in accordance with these rules." These are the rules he is out to identify as the goal of this essay.
  - Regulative Rules:
    - regulate pre-existing activity whose existence is independent of the rules
    - if the rules are flouted (disobeyed), there are sanctions, punishments

Speech Acts: Conditions on Promising (renumbered)

dialogue and text prosody

intonation: phrasing, continuation, focus marking

phrase tone and accent

word formation tone and accent

tone and accent distinctive features

1. [Uptake Condition]: Normal input and output conditions obtain.
2. Propositional Content Conditions:
    1. S expresses the proposition that p in the utterance of T.
    2. In expression that p, S predicates a future act A of S.
3. Preparatory conditions:
    1. Relevance condition: It is not obvious to both S and H that S will do A in the normal course of events.
    2. H would prefer S's doing A to his not doing A, and S believes H would prefer his doing A to his not doing A.
4. Sincerity condition: S intends to do A.
5. Essential condition: S intends that the utterance of T will place him under an obligation to do A.
6. Gricean Meaning Condition: S intends (i-1) to produce in H the knowledge (K) that the utterance of T is to count as placing S under an obligation to do A. S intends to produce K by means of the recognition of i-1k, and he intends i-1 to be recognized in virtue of (by means of) H's knowledge of the meaning of T.
7. [Linguistic Condition]: The semantical rules of the dialect spoken by S and H are such that T is correctly and sincerely uttered if and only if conditions 1-6 obtain.

Speech Acts: Conditions on Promising (renumbered)

dialogue and text prosody

intonation: phrasing, continuation, focus marking

phrase tone and accent

word formation tone and accent

tone and accent distinctive features

1. Input-Output Condition: Normal input and output conditions obtain.
2. Propositional Content Conditions:
   1. S expresses the proposition that p in the utterance of T.
   2. In expression that p, S predicates a future act A of S.
3. Preparatory conditions:
   1. Relevance condition: It is not obvious to both S and H that S will do A in the normal course of events.
   2. H would prefer S's doing A to his not doing A, and S believes H would prefer his doing A to his not doing A.
4. Sincerity condition: S intends to do A.
5. Essential condition: S intends that the utterance of T will place him under an obligation to do A.
6. Gricean Meaning Conditi
knowledge (K) that the utter ler an
obligation to do A. S intends nition of
i-1k, and he intends i-1 to b) H's
knowledge of the meaning of T.
7. [Linguistic Condition]: The semantical rules of the dialect spoken by S and H are such that T is correctly and sincerely uttered if and only if conditions 1-6 obtain.

Most relevant for prosody

Prosody and Speech Acts: IFIDs

- Searle (1975)
  - Illocutionary Force Indicating Devices:
    - **Phonetic**
      - **stress**
      - **intonation contour**
    - Orthographic:
      - punctuation
      - comma, period, exclamation mark, question mark
    - Grammatical:
      - word order
      - the mood of the verb
      - declarative, interrogative, imperative
    - Lexical:
      - the so-called performative verbs

Grosz & Sidner 1986

- Discourse structure marking
  - **linguistic** structure (phrasing, framing)
    - pitch register, pitch range
  - **intentional** structure (purposes, speech acts)
    - pitch accent contour type
    - boundary tone type
  - **attitudinal** state (objects, properties, relations, and discourse intentions that are most salient at any given point)
    - accent placement, focus, contrast, emphasis
    - given/new, theme/rheme

Grosz, B. J. and C. L. Sidner. 1986. Attention, intentions and the structure of discourse. BBN report.

Gibbon 1981b, 1983: metalocutionary discourse framing

- Paralinguistic metalocutionary channel
  - two aspects:
    - gradient constraints on pitch/intensity/tempo variation
    - affect, sentiment, attitude
  - not necessarily automatic: can be imitated
- Linguistic metalocutionary channel
  - information marking – a rough correspondence:

Prague school	**Halliday**	**ToBI**
delimitative	- tonality	- boundary assignment
culminative	- tonicity	- tone assignment
distinctive	- tone	- tone

Gibbon 1981b, 1983: metalocutionary discourse framing

- Metadeictic functions:
  - pointers to
    - *heads* of constructions
      - grammatical
      - semantic, e.g. focus / contrast / emphasis
    - grammatical and discourse boundaries
      - start and end of paratone, intonation group
      - end of intonation group
- Semantic-pragmatic modification
  - modifiers of meaning
  - discourse processes (e.g. breakdown)

Gibbon, Dafydd. 1981b. Metalocutions, structural types and functional variation in English and German *Papers and studies in contrastive linguistics*, 13, p. 17-39.

Gibbon, Dafydd. 1983. Intonation in context. An essay on metalocutionary deixis. In: Gisa Rauh, ed. *Essays on Deixis*. Tübingen: Narr, pp. 195-218.

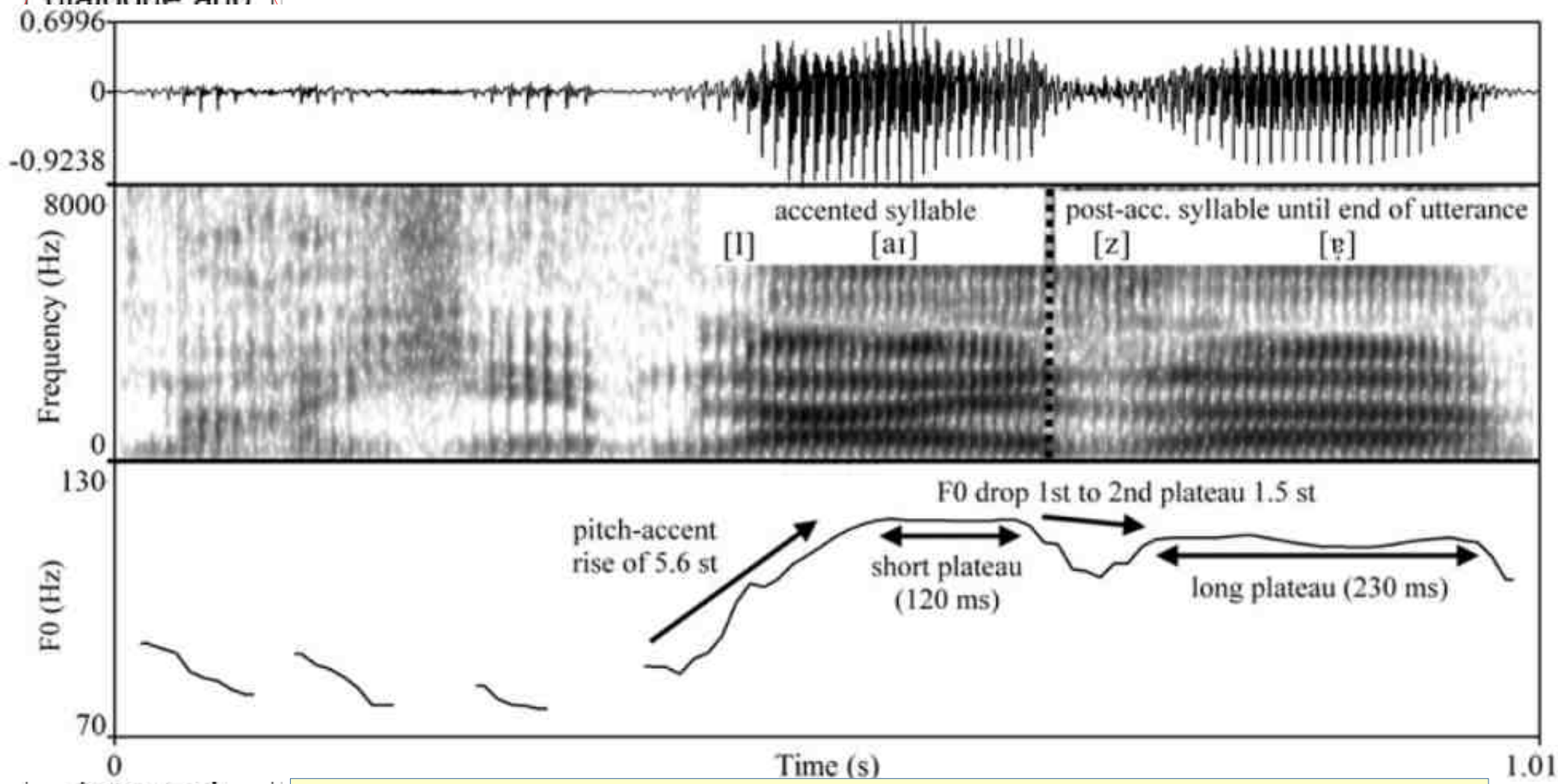
Gibbon 1981b, 1983: metalocutionary discourse framing

- 3 basic conditions on speech acts:
  - Uptake condition / Channel condition
    - Normal input and output conditions obtain
  - Essential condition
    - commitment
  - Sincerity condition
    - truth – probability – certainty
- Example – “call contours”
  - Only discourse framing:
    - Start: “Jooohn-neee!”
    - End: “Byyy-eee!”
    - NOT * Yesterday I saw Jooohn-neee in town.

Gibbon 1981b, 1983: metalocutionary discourse framing

"Call contours", discourse chants

dialogue and



tone and accent distinctive features

German: "Dann mach ich eben leiser!"

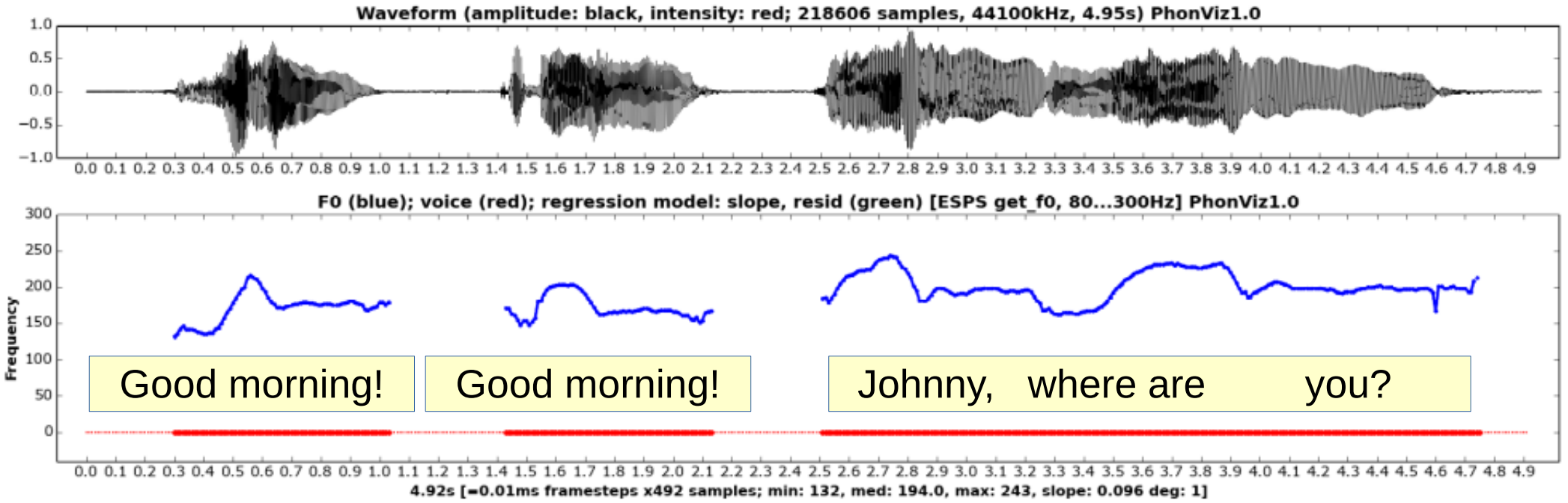
Niebuhr, Oliver. 2013. *Resistance is futile – the difference between continuation rise and falling contour in German*. Proc. 14th Interspeech Conf.

Gibbon 1981b, 1983: metalocutionary discourse framing

"Call contours", discourse chants

dialogue and text prosody

intonation:



tone and accent distinctive features

Metalocutionary discourse framing: "call contours"

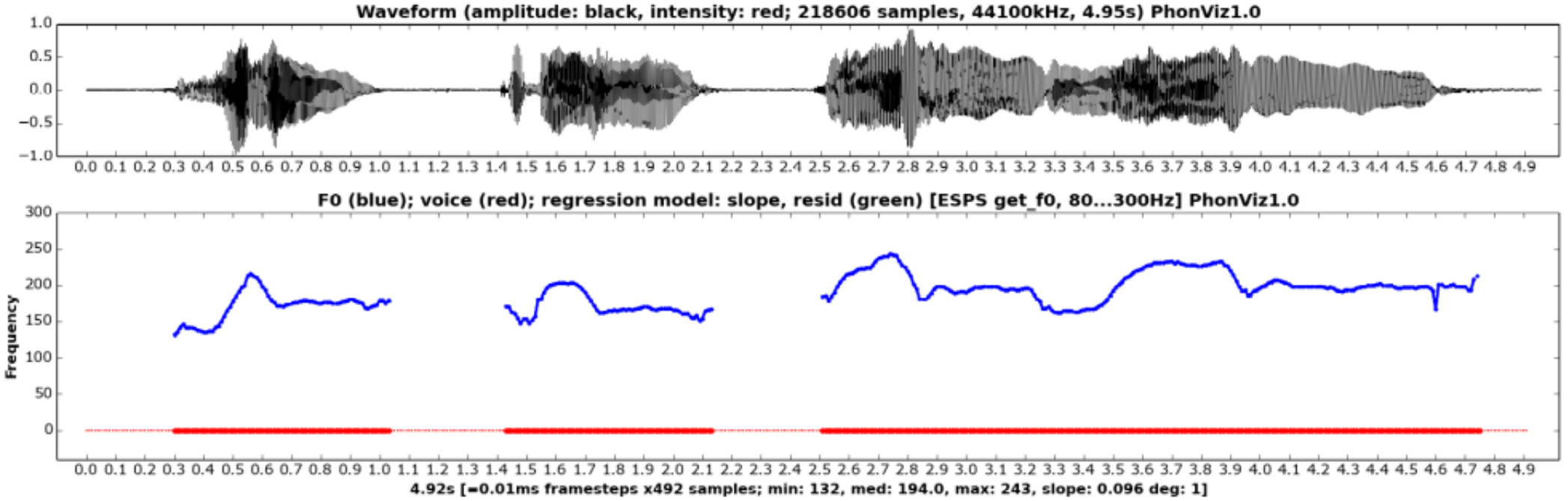


Table 1: Chant contour frequencies averaged over the accent-bearing syllable; chant contour ratios compared with just and tempered minor 3rd.

associated locution	1st F0 level	2nd F0 level	F0 ratio	minor 3rd ratio	
				just	Tempered
hello	212	177	1.198	1.2	1.189
goodbye	201	168	1.196		
Johnny	240	196	1.224		
where are you	230	197	1.168		

Metalocutionary discourse framing: "call contours"

- Discourse functions of: "call contour":
  - Uptake condition / Channel condition
  - Searle's conditions for successful promising:

    1. Normal input and output conditions obtain.

    I use the terms "input" and "output" to cover the large and indefinite range of conditions under which any kind of serious and literal linguistic communication is possible. "Output" covers the conditions for intelligible speaking* and "input" covers the conditions of understanding. Together they include such things as that the speaker and hearer both know how to speak the language; both are conscious of what they are doing; they have no physical impediments to communication,* such as deafness, aphasia, or laryngitis; and they are not acting in a play or telling jokes, etc. It should be noted that this condition excludes *both* impediments to communication such as deafness and also parasitic forms of communication such as telling jokes or acting in a play.

    Searle, J. 1969. *Speech acts*. Cambridge University Press, p. 57.

    *Under the "conditions for intelligible speaking" and "no physical impediments to communication" I include *communication at a distance*, which I term *teleglossia*.

  - Call contours are *teleglossic devices* which function in *discourse framing*.

Metalocutionary discourse framing: "call contours"

- Discourse functions of: "call contour":
  - discourse framers (discourse structure markers)
  - teleglossic (communication at a distance):
    - normal input and output conditions do NOT obtain
  - types of function creating normal input and output preparatory conditions for speech acts:
    - missing channel (e.g. English, German)

      ˉJOHN-NY, where ˉARE-YOU?
    - opening and closing channel (e.g. English, German)

      Good ˉmor-ning! ... ˉBye-ye!

      ˉMor-gen! .... ˉWieder-sehen!
    - interrupted channel (German)

      ˉLAU-TER hab ich gesagt! (*LOUDER I said!*)
      - *A language specific function: in English this would be considered unusual, possibly rather rude* ☺

Metalocutionary discourse framing: "call contours"

- Discourse discourse framing function of chants:

ENGLISH: ¯JOHN-NY - ¯BY-E

GERMAN: Manu¯E-LA - - - - ¯LAU-TER - - - - - ¯WIEDER-SEHEN

discourse-initial | discourse-medial | discourse-final

→ DISCOURSE FRAME TIMELINE →

Intonation idioms: lexicalised prosody

- Greeting:
  - Good morning /
  - Good morning \
- Ambiguity:
  - Excuse ¯ me /
  - Excuse \ me /
- Reproach:
  - And so ¯ you should \
  - And so / you should \
- Appraisive exclamation:
  - Oh / wow /\ (cf. the “wolf whistle”)
- And of course ‘call contours’

Indexical Meaning: Speaker Characterisation

- Speaker characterisation
  - indexicality: identity, personality
  - emotionality: attitude, sentiment
  - paralinguistic codes:
    - Ohala: Frequency code
    - Gussenhoven: Effort Code

Paralinguistic meaning and sound symbolism

- Universal codes of paralinguistic intonation meaning with a biological basis:
  - **Frequency Code** (Ohala; Gussenhoven: “Size code”)
    - size of vocal cords / vocal tract ~ frequency: power relations
      - scale: friendly/submissive – aggressive/dominant
      - certainty – uncertainty
      - MW: also excitement
  - **Effort Code** (Gussenhoven)
    - range, energy, emphasis
    - precision, negativity
  - **Production Code** (Gussenhoven)
    - chunking

      cf. C. Gussenhoven. Intonation and interpretation: Phonetics and phonology. In Proceedings of Speech Prosody 2002, Aix-en-Provence, 2002.

Universal paralinguistic functions

- **Frequency Code** (Ohala)

  Gussenhoven: also “Size code”

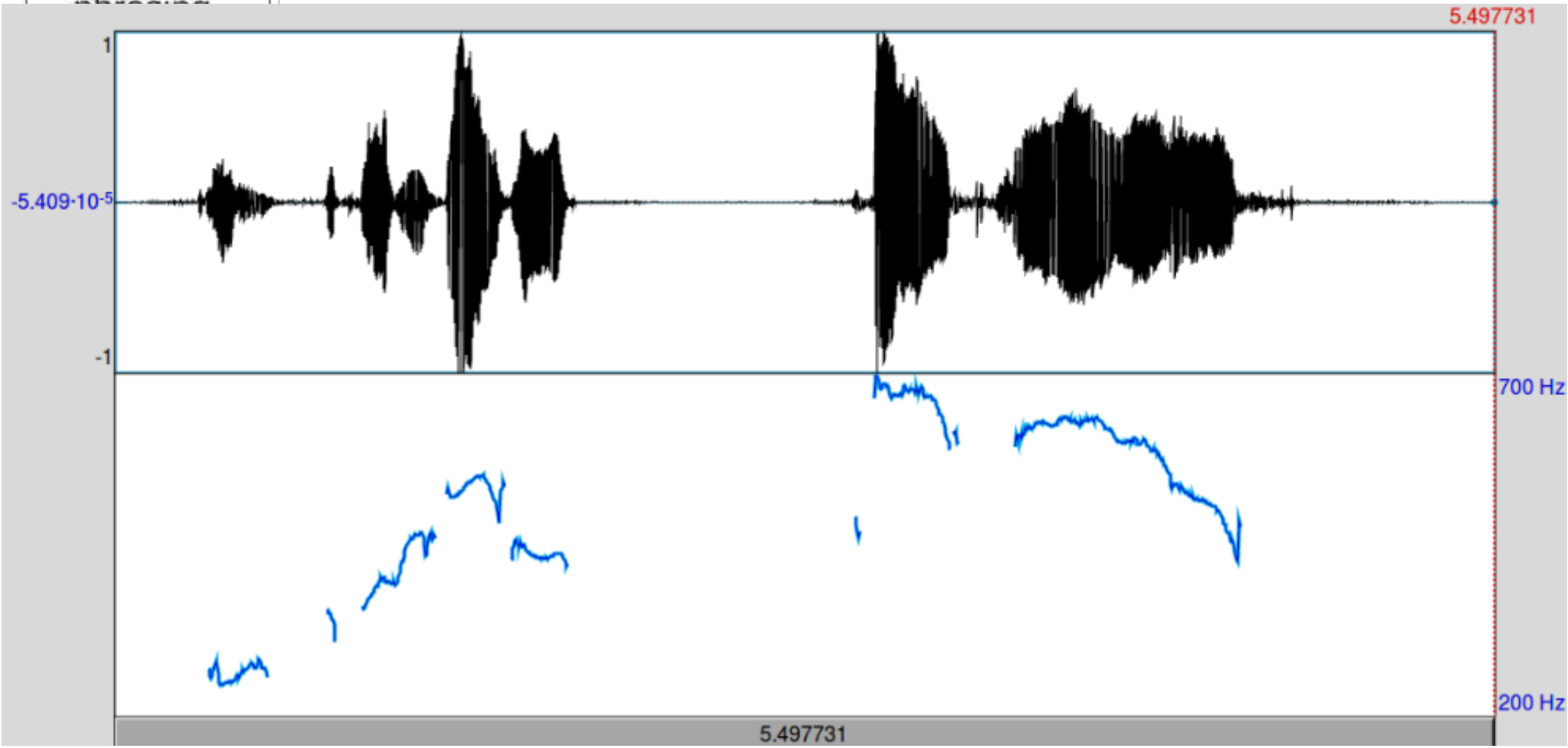
  - size of vocal cords ~ frequency: power relations
    - MW: also excitement
    - Gussenhoven: Smaller larynxes contain lighter andsmaller vocal cords, with which faster vibration rates are achieved for a given amount of energy. The correlation between larynx size and rate of vocal cord vibration is exploited for the expression of power relations. The many ramifications of this latter connection were dealt with by Ohala [9],[10][11]. The term for this form-function relation is his, and my labels for the next two relations are by analogy with his term. An alternative term would be ‘Size Code’.
  - iconic function:
    - ‘teeny weeny mouse and a great big bear’
  - frequency range: male adult – female adult – child

Universal paralinguistic functions

dialogue and text prosody

intonation:

- **Frequency Code** (Ohala)
  - Gussenhoven: also “Size code”
    - size of vocal cords ~ frequency: cf. child voice



Universal paralinguistic functions

- **Effort Code** (Gussenhoven)
  - Energy ~ precision? :)
  - The amount of energy expended on speech production can be varied: putting in more effort will not just lead to more precise articulatory movements, but also to more canonical and more numerous pitch movements. Lavishing more care on the production process means less slurring together of these movements, causing them to be carried out with less undershooting of targets
  - Energy ~ precision?
    - DG: 2 dimensions, at least; cf. functional OT (Boersma) and the hyper-hypo-articulation span
    - emphasis, surprise – negativity
  - Grammaticalisation: accent and focus

Universal paralinguistic functions

- **Production Code** (Gussenhoven)
  - The generation of energy is tied to the exhalation phase of the breathing process, and hence becomes available in phases, Lieberman's breath groups [13].This code associates high pitch with the beginnings of utterances and low pitch with the ends.
  - Also: Production Phase Code
  - Speakers place more effort on beginnings than on ends of utterances
    - High pitch at utterance start
    - But cf. nuclear stress/accent
    - Also: global pitch slope (e.g. declination) is more than just a marker of beginnings and ends:
      - Rather, it is variation at the edges that is interpreted in terms of initiation and finality.

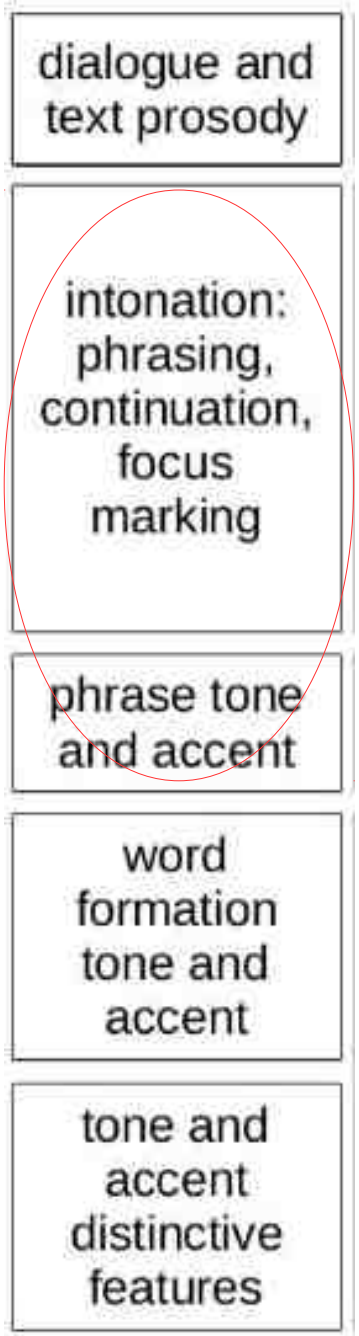
Universal paralinguistic functions

- Pitch as a universal, as in Gussenhoven's Biocodes:
  - pitch height – biological size
  - intensity, range – energy and precision
  - boundary tones, declination – structure marking
- The Modulation Code cross-classifies the others (Gibbon)
  - two properties as a sequence or time function:
    - global range / intensity / tempo variation
    - local prominence by pitch variation, intensity variation, tempo variation
  - two functional properties
    - paralinguistic:
      - global: excitement (range)
      - local: insistence (prominence), e.g. No-wo-w
    - linguistic:
      - intonation hierarchy (paratone)
      - accent sequence constraints

Animals also share the paralinguistic functions. (G-calls)

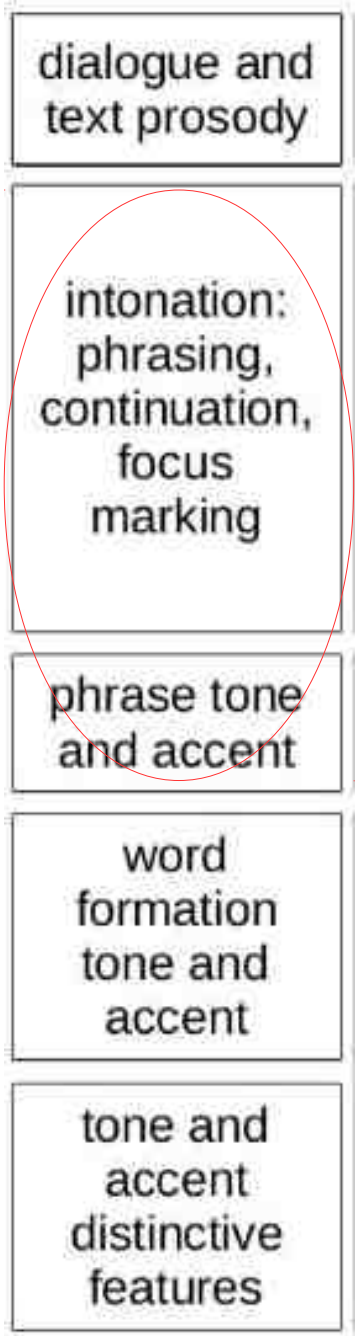
Grammatical functions of prosody

Prosody and grammar



- Grammatical function:
  - configuration relations (global pattern):
    - boundary marking
      - boundary tones: ‘startup tone’, ‘quitting tone’
      - final lengthening
    - rhythmic grouping
      - quasi-isochrony of pitch accent / stress spacing
    - contour coherence
      - global fall (declination)
      - global rise (inclination)d
  - culmination relations (local accents):
    - theme-rheme, given-new, contrast, focus

Prosody and grammar



- Single clause:
  - transitivity
  - ‘sentence stress’:
    - phrasal
    - contrastive
    - focus
    - emphatic
  - mood
  - (logical) scope
- Multiple clause:
  - coordinating
  - subordinating

Lexical functions of prosody

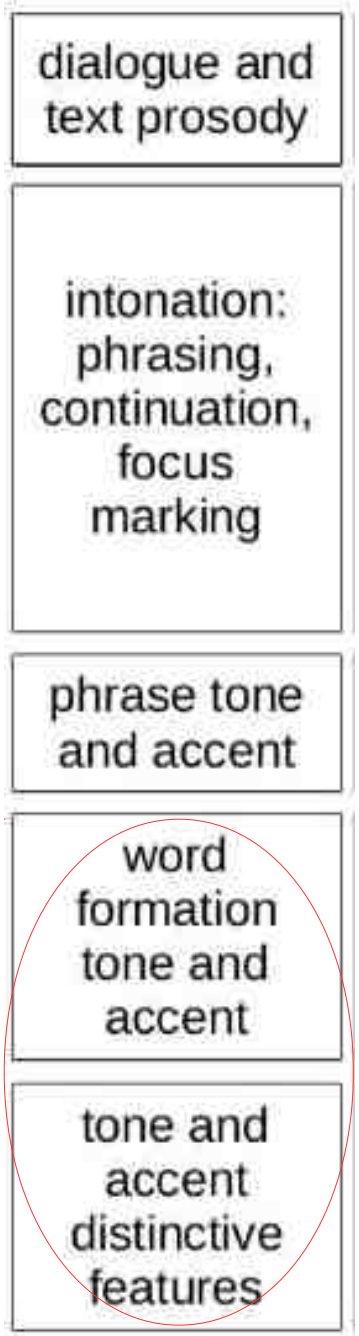
in

Morphology

and

Phonology

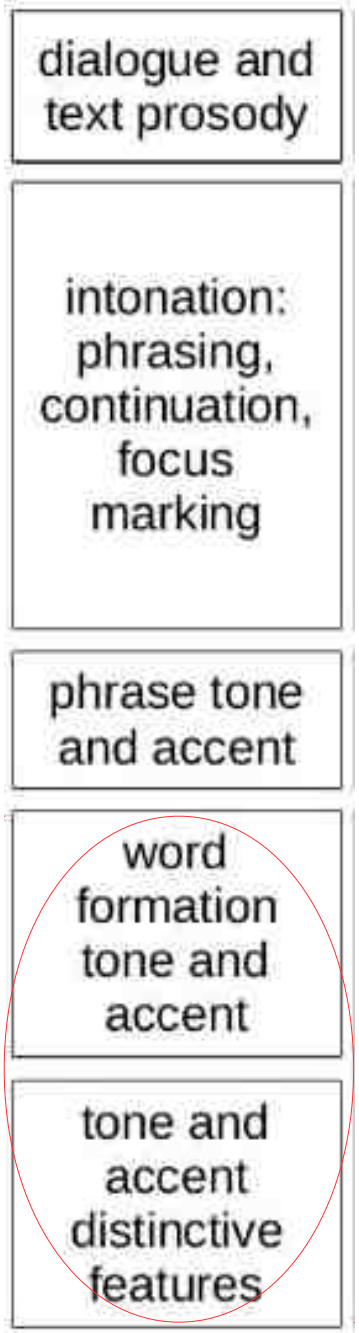
Prosody and the lexicon



- Lexical function
  - compositional (structural):
    - linking tone
    - compound stress
  - morphemic (meaningful) function
    - inflectional tone
  - phonemic (contrastive) function
    - duration
    - stress
    - pitch accent
    - tone

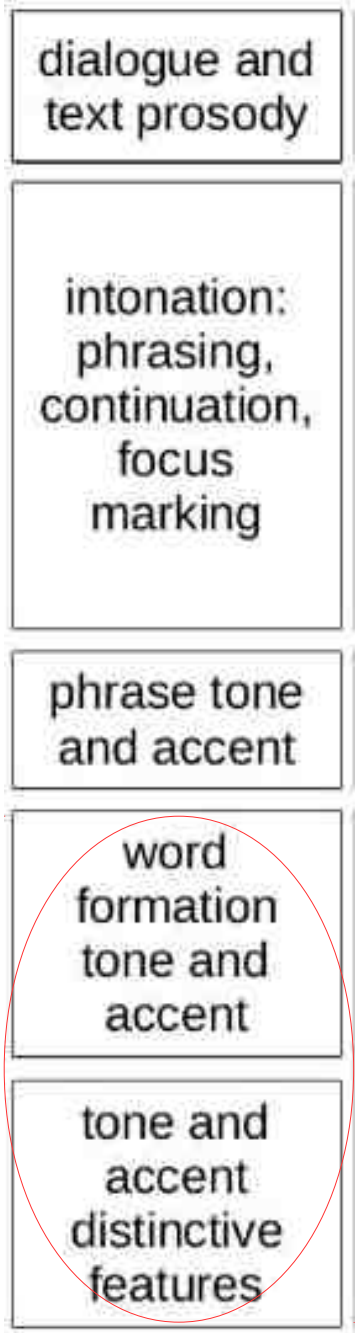
Note that *intensity* falls out of this one.

Morphemic functions of prosody: inflection



- Classical loan words in German:
  - Dóktor – Doktóren
  - Transistor – Transistóren
  - Télefon – telefónisch – Telefoníe
- Classical loan words in English:
  - póssible - possibílity
  - télephone – teléphony – telephónic
  - catástrophy - catastróphic

Morphemic functions of prosody: derivation



- affix-dependent stress shift:
  - English latinate derivation:
    - télephone – teléphony – telephónic
      (cf. SPE stress rules)
  - German latinate derivation:
    - Télefon – Telefoníe – telefónisch

Morphemic functions of prosody: compounding

dialogue and text prosody

intonation: phrasing, continuation, focus marking

phrase tone and accent

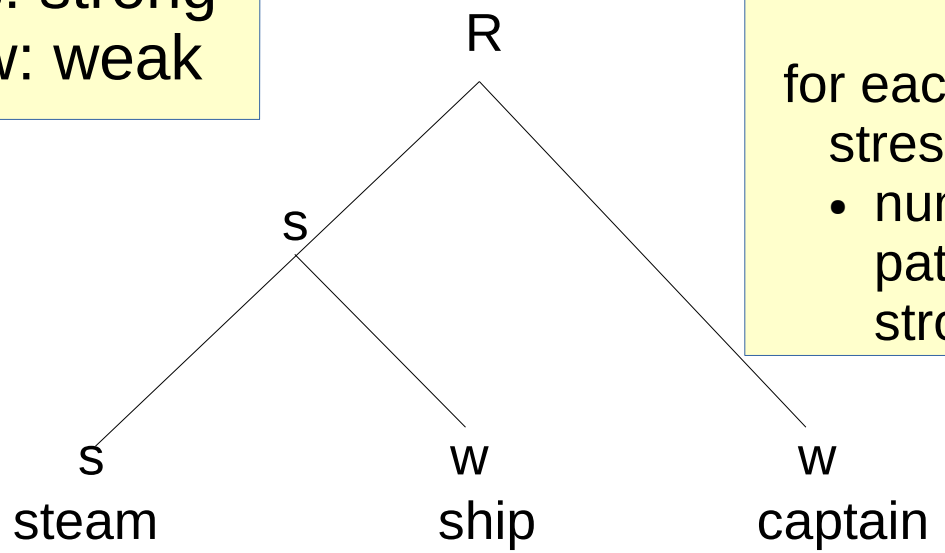
word formation tone and accent

tone and accent distinctive features

- English:
  - ^{1}steam^{2}ship, ^{1}steam^{3}ship ^{2}captain

    SPE Compound Stress Rule

R: root
s: strong
w: weak



Liberman's bottom-up algorithm for the Nuclear and Compound Stress Rules:

for each leaf in the tree:
stress level =
- number of nodes in the path from the first non-strong node to the root

Morphemic functions of prosody: inflection

dialogue and text prosody

intonation: phrasing, continuation, focus marking

phrase tone

tone and accent distinctive features

- Morphosyntactic tone – inflection:

Ibibio (ISO 639-3 ibb, Lower Cross, Nigeria):

jàá (distal future)vs. jáà (proximal future)

`mm`e	`afj'a	'edọn̄	'e+j^a+'e+b'ed	`Im'e
Plur	white	sheep	SubjAgr+Fut-Prox+SubjAgr+wait-for	Ime

Prosody and the lexicon: phonemic tones

dialogue and text prosody

intonation: phrasing, continuation, focus marking

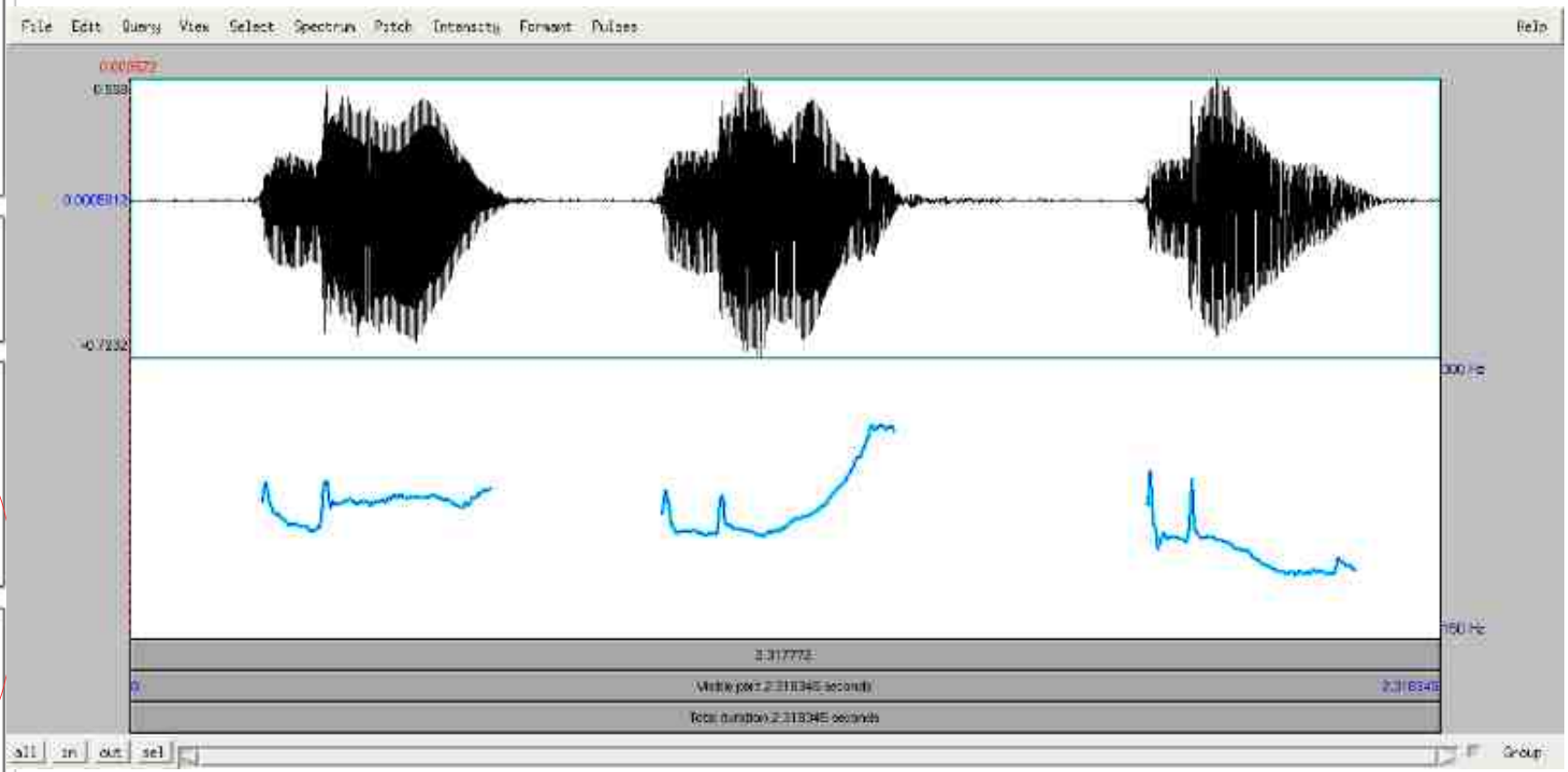
phrase tone and accent

word formation tone and accent

tone and accent distinctive features

- Kuki-Thadou (ISO-639-3)
  - Phonemic tones:

Thadou minimal pairs: /low/



lów (H) ‘field’, lŏw (LH) ‘medicine’, lòw (L) ‘neg marker’.

Prosody and the lexicon: microprosody

dialogue and text prosody

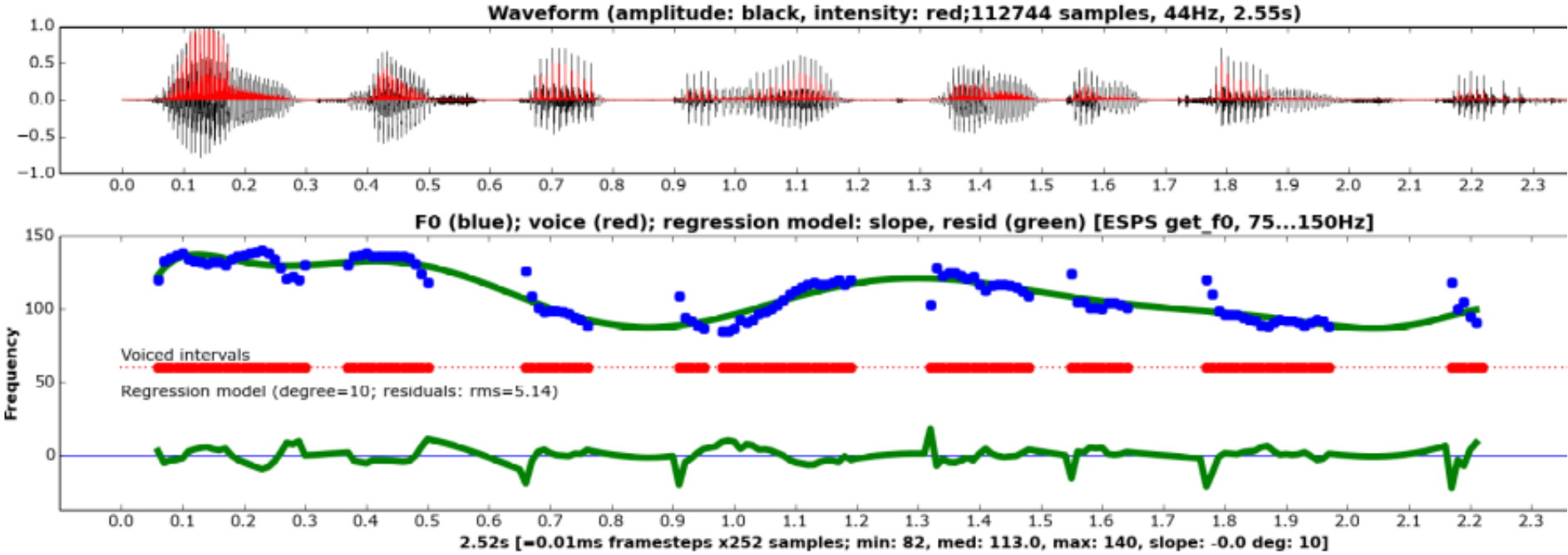
intonation: phrasing, continuation, focus marking

phrase and ac

wor forma tone acce

tone acce distin featu

- microprosody = subphonemic prosody
  - consonantal pitch perturbation
  - vowel intrinsic pitch
  - phonotactic parsing:
    - <u>syllable boundary marking</u>



Endlich gab der Nordwind den Kampf auf.

Prosody and the lexicon: microprosody

dialogue and text prosody

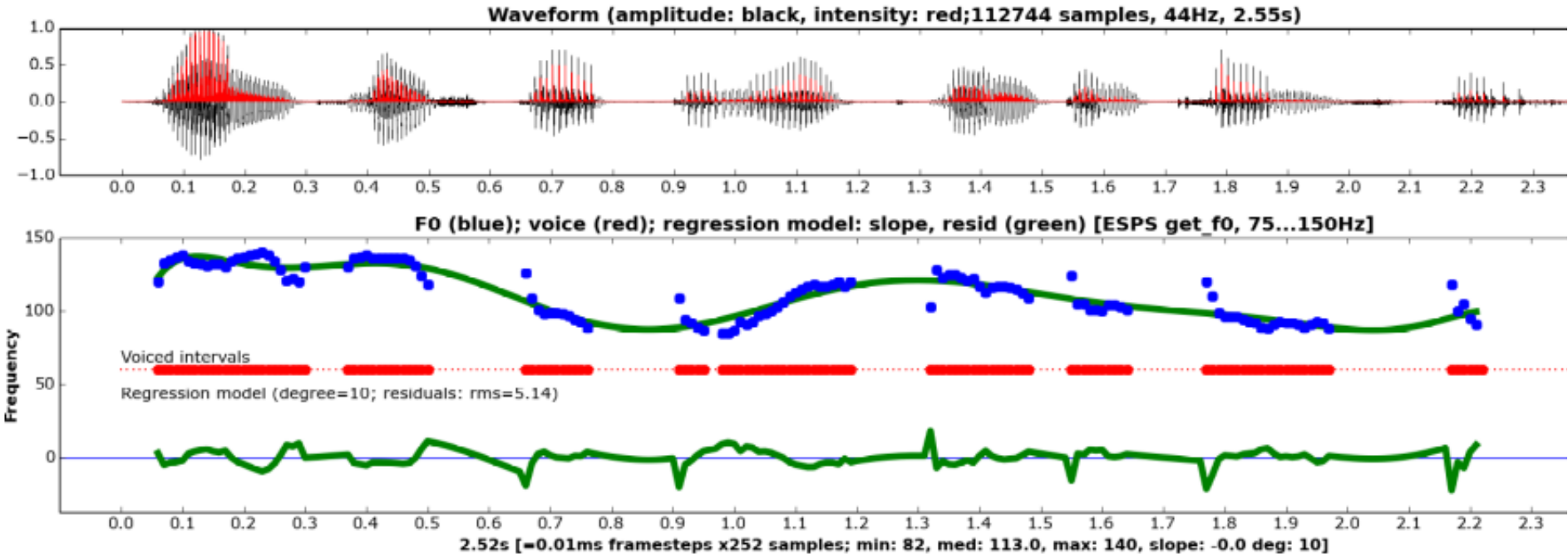
intonation: phrasing, continuation, focus marking

phrase and ac

wor forma tone acce

tone acce distin featu

- microprosody = subphonemic prosody
  - waveform: amplitude (black), intensity (red)
  - measured pitch (blue)
  - pitch model, 10th degree polynomial regression (green)
  - voicing (red)
  - microprosody (green)



Prosody and the lexicon: microprosody

dialogue and text prosody

intonation: phrasing, continuation, focus marking

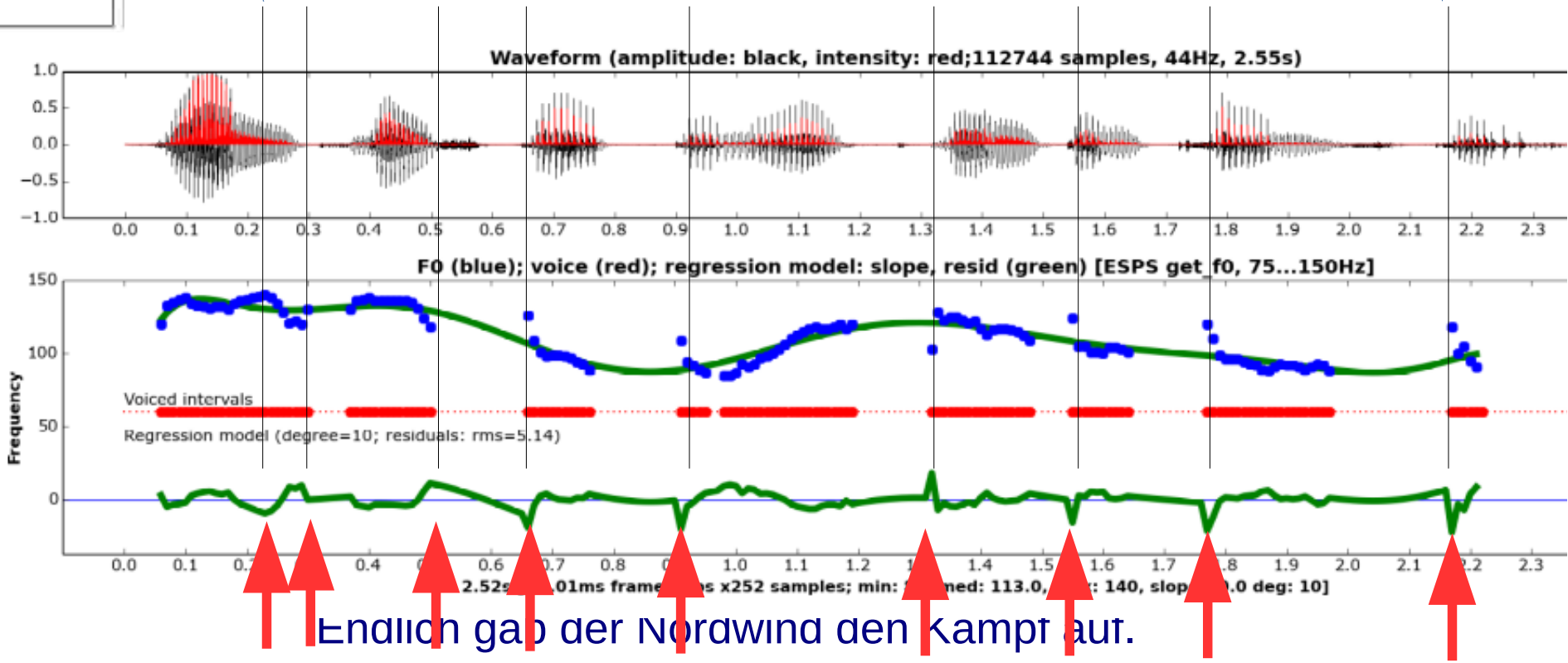
phrase and ac

wor forma tone acce

tone acce distinc featu

- microprosody = subphonemic prosody
  - phoneme articulation affects air pressure
    - → vocal folds change phonation rate

Pitch perturbations marking syllable margins



Endlich gab der Nordwind den Kampf auf.

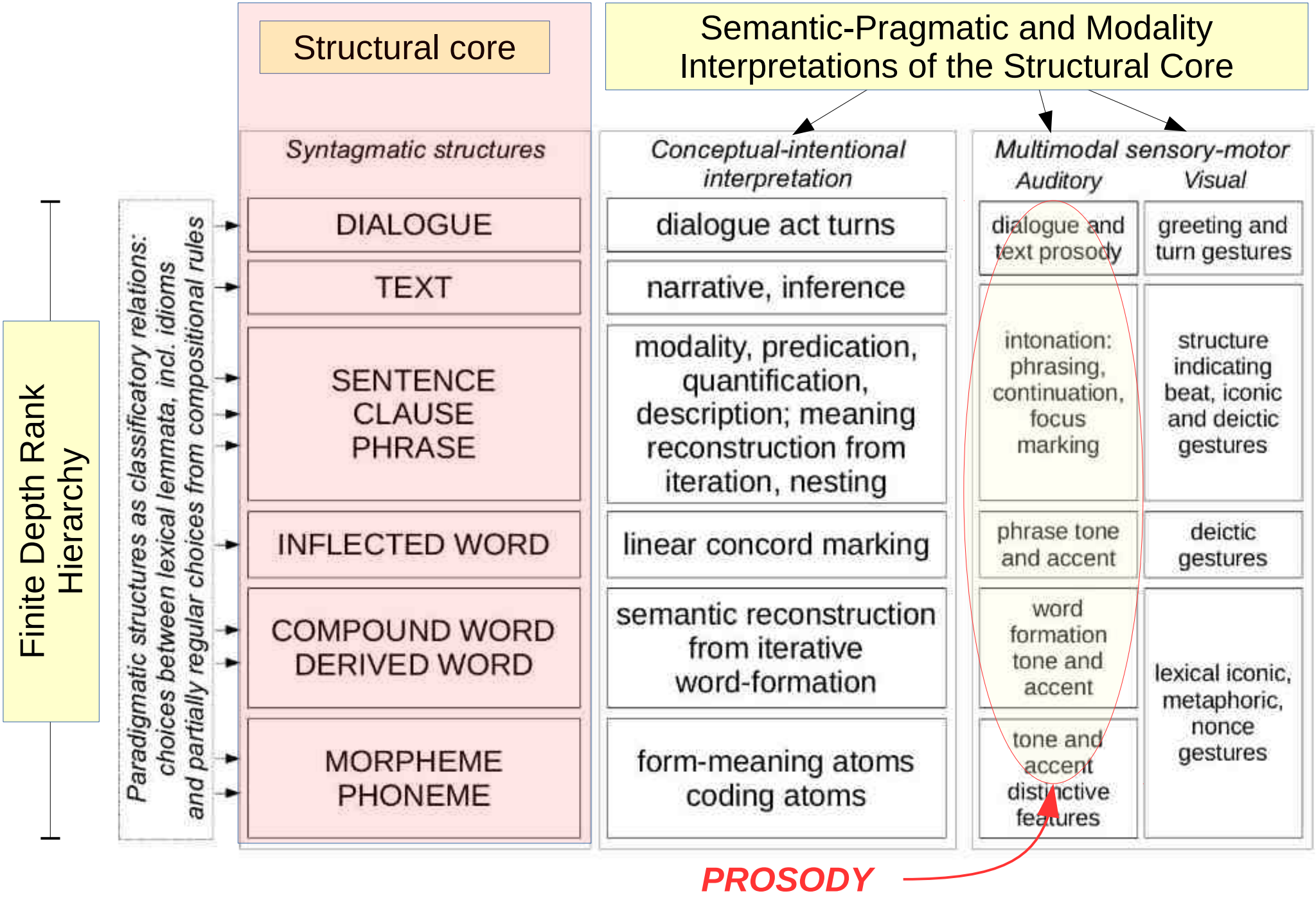
The Architecture of Language

Finite Depth Rank Hierarchy

with three components at each rank:

Structural Core
Semantic-Pragmatic Interpretation
Modality Interpretations

The semiotic Rank Interpretation Architecture



Summary

- What you should know:
  - Prosody has very many functions at many ranks
    - Discourse
      - there are many discourse functions, and many models of functions
      - semantic
      - pragmatic
    - Grammar
      - configuration
        - cohesion
        - boundaries
      - culmination
        - nuclear stress, focus, contrast, emphasis
    - Lexicon:
      - Morphemic
      - Phonemic
      - Sub-phonemic

Background reading

Background to the Rank Interpretation Architecture:

Gibbon, Dafydd and Sascha Griffiths (2017). Multilinear Grammar: Ranks and Interpretations. Open Linguistics 3(1): 265-307

https://www.degruyter.com/downloadpdf/j/opli.2017.3.issue-1/opli-2017-0014/opli-2017-0014.pdf

Background to Prosody:

Gibbon, Dafydd (2017). Prosody: Rhythms and Melodies of Speech. https://arxiv.org/pdf/1704.02565v2.pdf