Prosodic Phrases and Contrast Units in Intonation

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Aim of the paper

- The paper presents prosodic phrases as contrast units (CU) or hierarchies of CUs which structure prosodic phrases (IPs, ips) at the Information Structure (IS) level.

- In other approach the units that structures the content of prosodic phrases are treated as embedded phrases (p-phrase) related to pitch accents giving them phonological basis (Féry C.).

- In our approach CUs are defined on an IS basis because they pair utterance elements (words, group of words) and apply them functions at the IS level.

About Romanian Intonation - our research

- Phonological description of Romanian intonational contours
  - Jitcă D., Apopei V., Păduraru O., Maruşcă S., Intonation in Romance: "Transcription of Romanian Intonation", edited by Sonia Frota & Pilar Prieto, Oxford University Press, 2015

- Presentation of Romanian utterance partitioning into functional elements at the Information Structure level:
  - Jitcă D., Prosodic variation (with)in languages: Intonation, phrasing and segments: "From ToBI phonological events to functional melodic forms at the communicative level", Equinox Publishing House, (to apear in 2017)

Two Level Information Structure Models

- Steedman's approach uses two level IS model in utterance partitioning but the two IS levels are applied at different two levels of utterance tree: e.g. within a SVO utterance, one IS level is realized as Focus-Background structure at the local S-V level and a second IS level as theme-rheme structure at the global level .

  - $(S_{focus}-V_{background})_{theme} - O_{rheme}$

- In our two level IS model, both structures are realized within the same CU level, becoming two real independent IS levels. This is possible because the functions are encoded by two different acoustical marker categories.

  - $S_{(theme+background)} -(V_{theme+background} – O_{rheme+focus})_{rheme+focus}$

Our Information Structure Model

- In our view CU at any level of the utterance tree has two functional complementary constituents. Each of constituents has functions at the two IS levels:

  - "Topic" – "Focus" (T and F labels) because each CU is one realization of two events we named "topic" and "focus" because they correspond in a concrete discourse context to the semantic categories of givenness and newnness.

  - "Theme"-"Rheme" we called CU_Predicate-CU-Argument (P and A labels) because the intonation marks one constituent as "1st reference" and the other as what it says about the "1st reference"

Our Information Structure Model in a pragmatic interpretation

- "Topic" -"focus" and "CU_predicate"-"CU_argument" functions result from the cortical organization of speech processing and then they are they are also related to semantic functions at the linguistic levels.

- "Topic" vs. "focus" elements are two constituents with different temporal features of their pitch contours: e.g. pitch contour with slow Pitch Movement (PM) for "topic" element and pitch contour with a sharp PM for "focus" element.

- "CU_Prediacte" element (1st reference) has lower target tone than its paired "CU_Argument" element.

Prosodic Phrases-Phonological View

- Prosodic phrases are tonal groups separated in certain cases by edge tones and breaks or other pitch features.

- One of pitch accents within phrase is considered the most "prominent" and applies to the corresponding word the quality of nucleus.

- Other pre-nuclear or post nuclear accents may produce embedded p-phrases

Prosodic Phrases- IS view

• Prosodic phrases are Information packages which may correspond to a single CU and has a single IS partition or they may have one global CU and lower level CUs as constituents. In the later case a hierarchy of nested IS partitions results.

• Constituents are functional elements at the IS level.

• One of constituents bears the global nucleus and lower level CUs have their local tonal prominences which project the IS functions of the corresponding constituents to the whole respective CUs at the higher IS partition level.

Nucleus Position Rules

- There are two types of intonational contours : emphasized and non-emphasized

- We formulate two nucleus position rules: NENSR (non-emphasized nuclear stress rule) and ENSR (emphasized nuclear stress rule).

- NENSR: nuclear accent (stress) is related to the minimum tonal target tone. Nucleus function corresponds to the CU_predicate element of the respective CU.

- ENSR: nuclear accent is related to the emphasis. In descending contours, nucleus corresponds to the CU_argument element of the respective CU
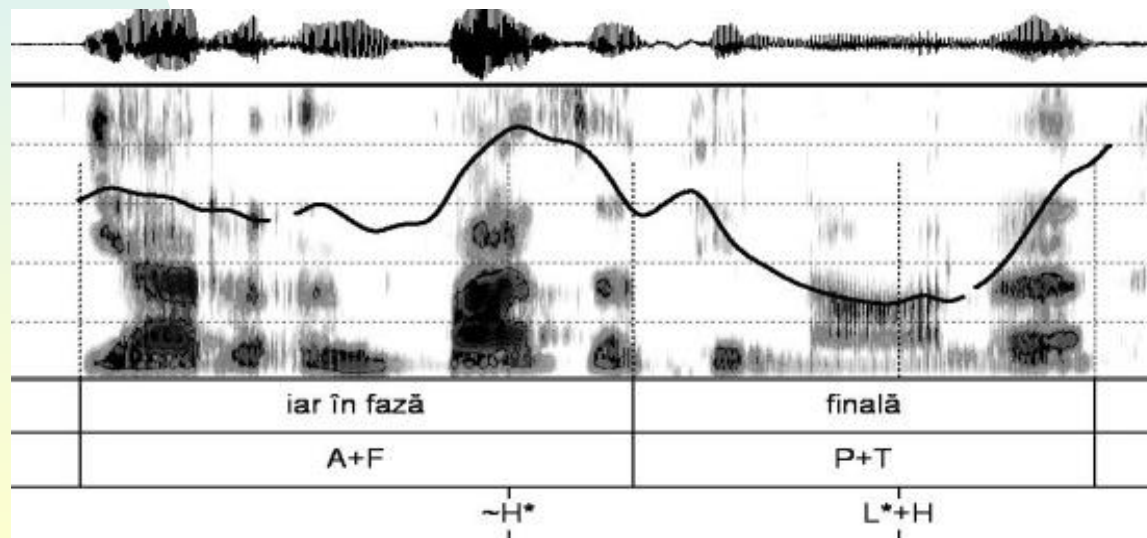
Intonational Phrase with one CU

Iar în fază finală...'and in the last step'

Phonological features:

- non-emphasized F0 contour

- The nucleus on the last word

iar în fază	finală	
A+F	P+T	
~H*	L*+H	

- $\{(A+F)_{\sim H*}/(P+T)_{L*+!H}\}$ (1)
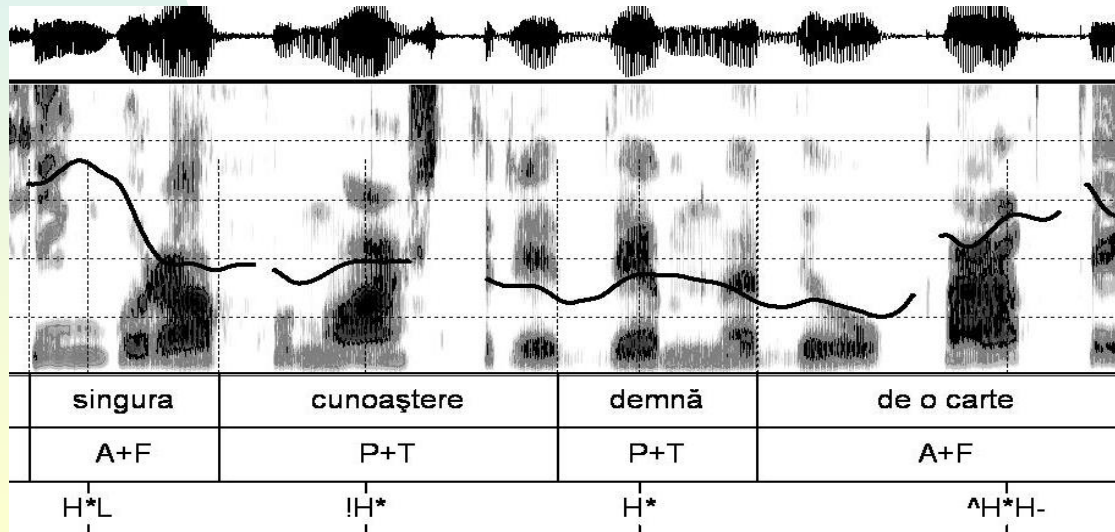
Two Intermediate Phrases with one CU

Singura cunoaştere, demnă de o carte... 'the only knowledge significant for a book... '

I. Phonological features:

- emphasized F0 contour

- nucleus on the first word

II. Phonological features:

- Non-emphasized F0 contour

- nucleus on the first word

singura	cunoaştere	demnă	de o carte
A+F	P+T	P+T	A+F
H*L	!H*	H*	^H*H-

- $\{\{(A+F)\ H*/(P+T)!H*L\ \}_{A+F}\ /\{(P+T)\ H*/\ (A+F)\ ^H*H-\}_{P+T}\ \}$

Two Intermediate Phrases with one CU
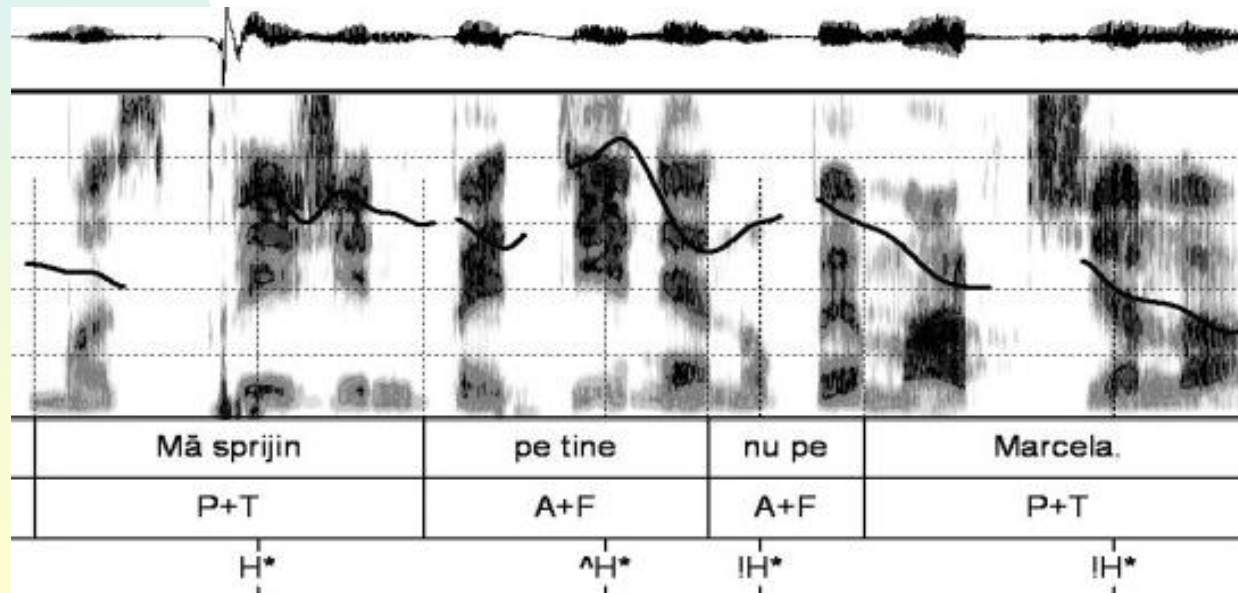
Mă sprijin pe tine, nu pe Marcela. 'I count on you, not on Marcela… '

I. Phonological features:

•emphasized F0 contour

• nucleus on the final word

II. Phonological features:
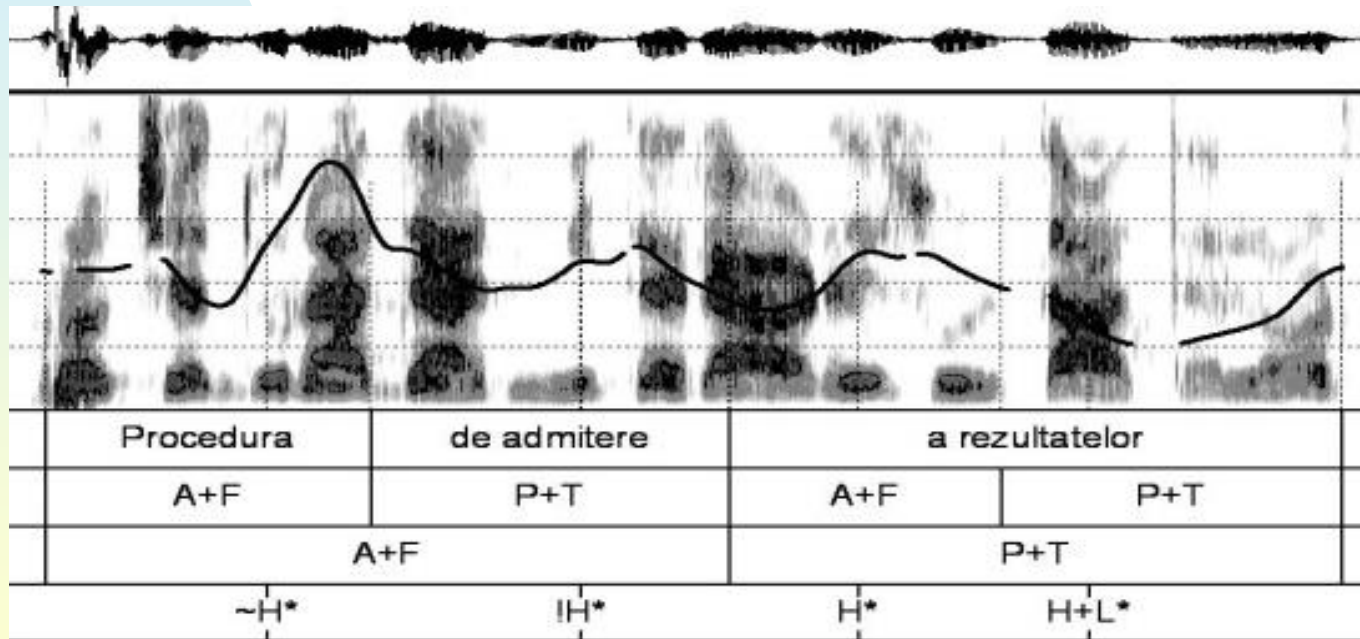
•Non-emphasized F0 contour

•nucleus on the final word

	Mă sprijin	pe tine	nu pe	Marcela.
	P+T	A+F	A+F	P+T
	H*	^H*	!H*	!H*

$$\{\{(P+T)_{H*}/(A+F)_{^{\wedge}H*L}\}_{A+F} /\{(A+F)_{\sim!H*}/ (P+T)_{H*}\}_{P+T}\}$$

Intonational Phrase with nested CUs and left branching

Procedura de admitere a rezultatelor.. .' 'The result acceptance procedure… '

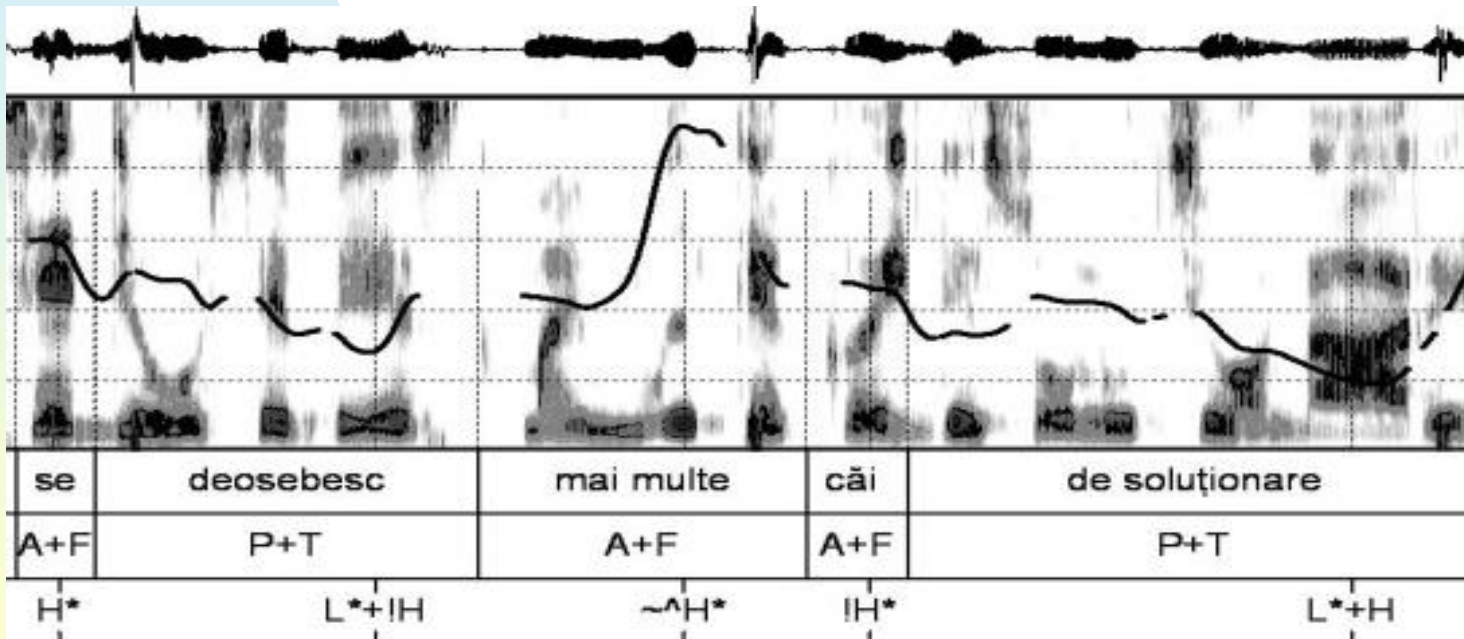- non-emphasized F0 contour; nucleus on the last word

$$\{ [(A+F)\text{~}_{H*}/(P+T)_{!H*}L]_{A+F} / [(A+F)_{H*}/ (P+T)_{L*+!H}]_{P+T} \}$$

Intermediate Phrase with nested CUs and right branching

...Mai multe căi de soluţionare... 'There are several ways of solving…'

- emphasized F0 contour; nucleus on the first word

| se	deosebesc	mai multe	căi	de soluţionare
A+F	P+T	A+F	A+F	P+T
H*	L*+!H	~^H*	!H*	L*+H

{ (A+F)~H*L/[(A+F)~!H*/(P+T)L*+H]P+T}

Intermediate Phrases with nested CUs and phrase-initial CU_predicate element

…Se deosebesc mai multe căi de soluţionare a situaţiilor…

'There are several ways of solving…'
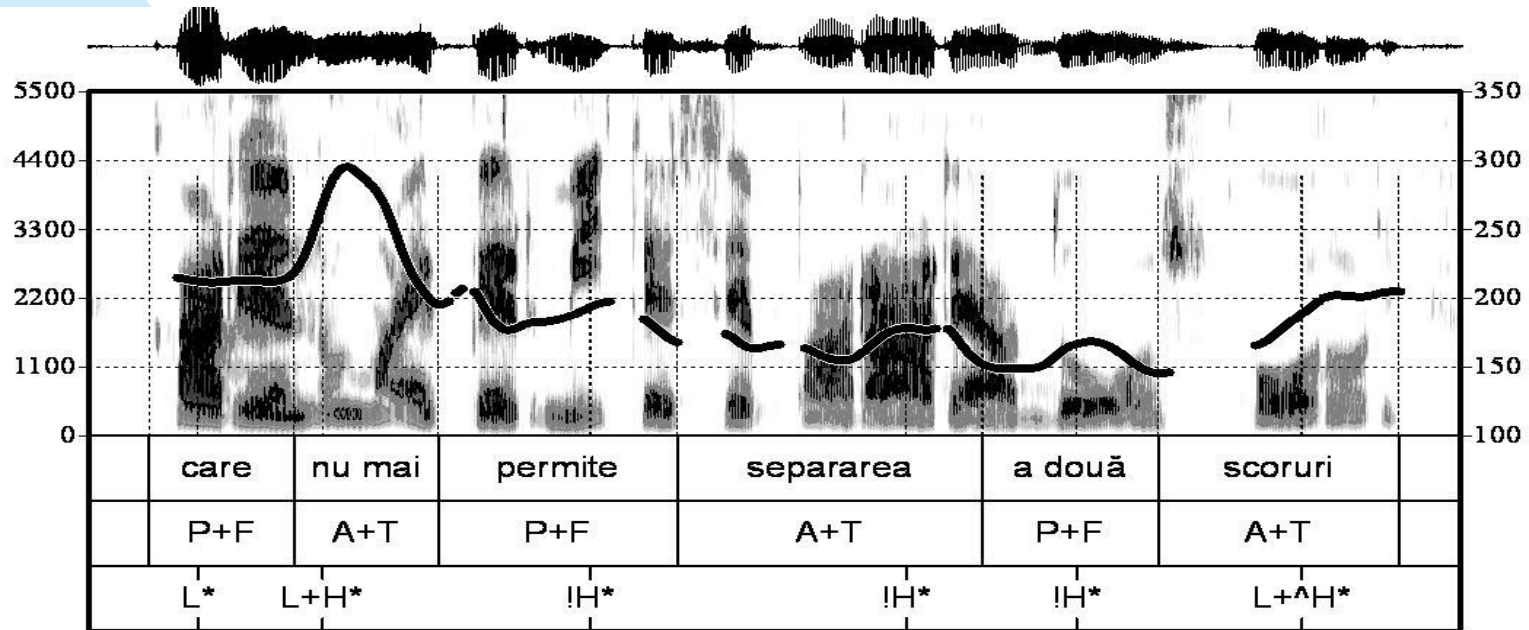
- emphasized F0 contour; nucleus on the second word

se deosebesc	mai multe	căi	de soluţionare	a situaţiilor	de dezacord
P+T	A+F	P+T	A+F	A+F	P+T
H*	^H*L	!H*	H*	~H*	L*
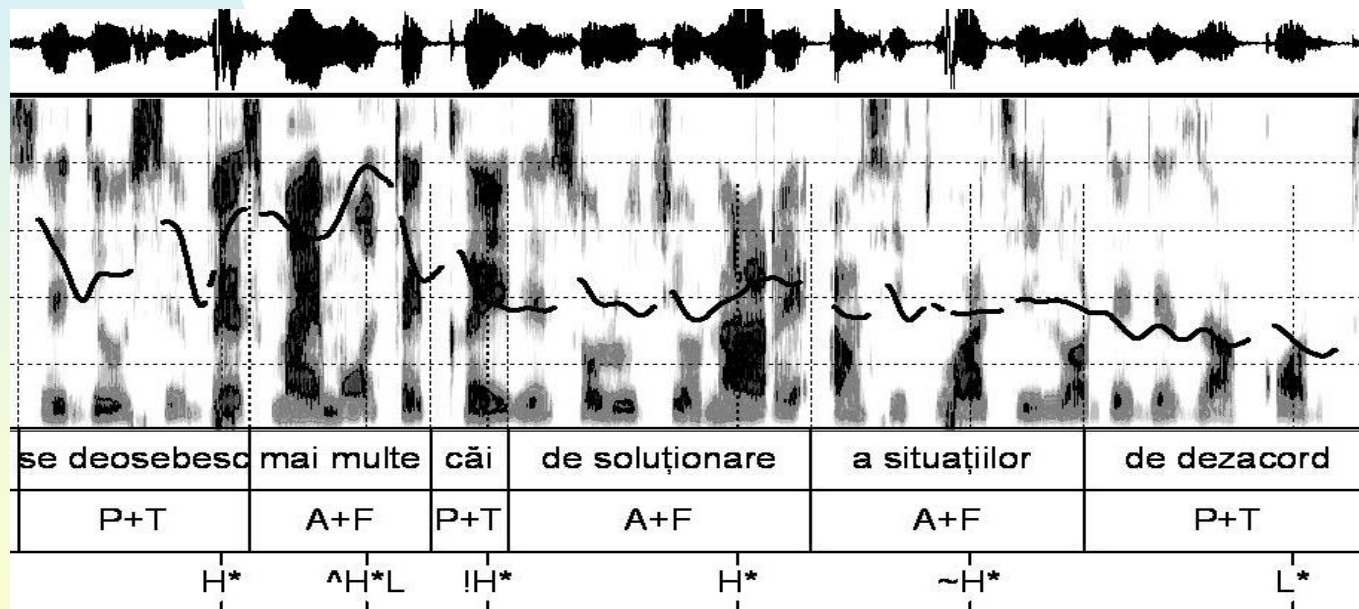
$\{ (P+T)H* /[(A+F)^{H*}L(P+T)!H+H*]A+T \}$

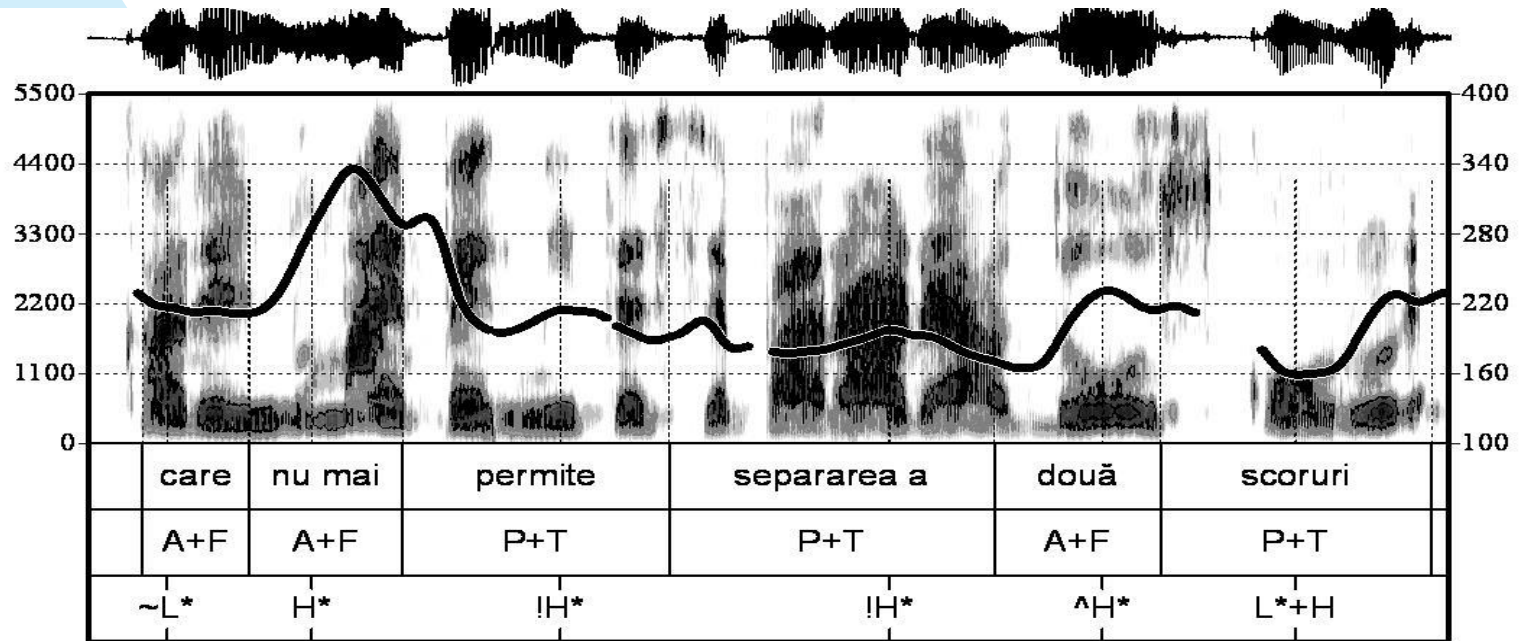$\{ (A+F)H* /[(A+F)~H*/(P+T)L*]P+T \}$

Two intermediate phrases without F0 reset separation (I variant)

...care nu mai permite separarea a două scoruri... 'which does not allow the two score identification… '

$$\{ \ (P+F)\!\sim_{L^*}/[(A+T)_{L+H^*} \ /(P+F)\!\sim_{!H^*}]_{A+T}\}_{A+T}$$

$$\{(A+T)_{!H^*} \ /[(P+F)_{H^*} \ /(A+T)_{L^*+H} \ ]_{P+F} \ \}_{P+F}$$

Two intermediate phrases without F0 reset separation (II variant)

...care nu mai permite separarea a două scoruri...

$$\{\{(A+F)_{\sim L*}/[(A+F)_{H*L} /(P+T)_{!H*}]_{P+T}\}_{P+T}$$
$$\{ (P+T)_{!H*} / [(A+F)_{\wedge H*} /(P+T)_{L*+H}]_{A+F} \}_{A+F}$$

Conclusions

- The IS model introduces two levels of contrast: topic - focus and CU_predicate-CU_argument. These IS functions firstly result from the cortical organization of the human speech processing.
- The paper presents different CU architecture for intonation phrases involving number of constituents, types of branching within CU hierarchy, the position of functional constituents within CUs and nucleus types and position.
- The paper aims to demonstrate that CUs links utterance elements into a logical hierarchy where prosodic phrases are CUs having as constituents lower level CUs or simple prosodic words.