

THE PROSODIC REALIZATION OF INFORMATION PACKAGING: EVIDENCE FROM BRITISH ENGLISH

MATTHIAS MITTENDORFER

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Part I

Background

Basic assumptions:

- intonation = string of sequentially ordered local pitch events (H and L) (i.a. Beckman & Pierrehumbert, 1986; Ladd, 2008; Pierrehumbert, 1980)
- three types of pitch events
 - pitch accents (T*)
 - phrase accents (T-)
 - boundary tones (T%)
 } e.g. H* L-L%; L+H* L-L%; etc.
- prosodic constituency hierarchy (i.a. Beckman & Pierrehumbert, 1986; Nespor & Vogel, 2007)
 - Intonational Phrase (IP) – e.g. H* L-L%
 - Phonological Phrase (PP) – e.g. H* L-

A- / B-Accent distinction: (Bolinger, 1965; Jackendoff, 1972)

- A-accent
 - Focus accent
 - high pitch accent with low phrase accent/boundary tone ($H^* L-L\%$)
- B-accent
 - Topic accent
 - high pitch accent with low phrase accent/high boundary tone ($((L+)H^* L-H\%$)

(1) A: Well, what about FRED? What did HE eat?

B: $[[\text{FRED}]_{\text{Top}} \text{ ate the } [\text{BEANS}]_{\text{Foc}}] \sim$.

(Jackendoff, 1972, p. 261)

→ see also Büring (2003), Pierrehumbert and Hirschberg (1990), and Steedman (2000)¹

¹B-Accent defined in terms of contrast

Hedberg and Sosa (2007): study on spontaneous English dialogue

- testing correlation between A-/B-accent and Topic and Focus
 - systematic correlation between intonation and information packaging confirmed
 - empirical situation more complex than A-/B-accent distinction
- no clear Topic or Focus accent in the data → results generally inconclusive

Hedberg (2006): review of results (2007 study)

→ miscoding, optionality of contrastive coding, target undershoot

"[I]nformation structure categories [. . .] may be indeterminate" (Hedberg, 2006, p. 377)

Definitions: (from Gundel, 1988)Topic:

An entity, E, is the topic of a sentence, S, iff, in using S the speaker intends to increase the addressee's knowledge about, request information about, or otherwise get the addressee to act with respect to E.

Comment:

A predication, P, is the comment of a sentence, S, iff, in using S the speaker intends P to be assessed relative to the topic of S.

Focus:

That part of the linguistic expression that realizes the comment.

→ more constrained theoretical framework needed

Questions under discussion (QUD):

- pragmatic method for information-structural analysis
- each assertion comes with an implicit QUD
- QUD determines which part of assertion is focused / backgrounded / not-at-issue

Criteria for QUD formulation:

- Q-A-CONGRUENCE
Assertion of target utterance must be a possible answer to QUD
- MAXIMIZE Q-ANAPHORICITY
Questions must consist of as much given (or highly salient) material as possible
- Q-GIVENNESS
Questions can only consist of given (or salient) material²

²i.e. familiarity in a broad sense

- (2) We didn't meet at Cambridge and we didn't in Ipswich either although we were both born there. [...] *But we certainly met in Stratford.*

Q₁: {Where did you meet?}

> A₁: [[We]_{Top} certainly met [in Stratford]_{Foc}]_~.

(S1B-023 #022)

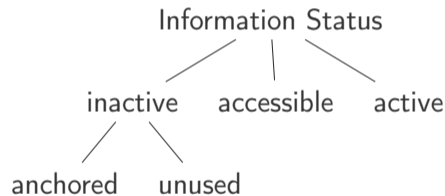
'~' = F-Domain (Background + Focus)

- RQ1: Can a refined analysis of natural data using QUDs contribute to our understanding of the relationship between information packaging and prosody?
- RQ2: What is the prosodic realisation of Topic, Focus, and Contrast?
- RQ3: How can the interface between information packaging and prosody best be modelled in Functional Discourse Grammar?

Information Packaging:

- Topic
- Frame-setting Topic
- Focus
- TopicFocus (TopFoc)
- Contrastive Topic
- Contrastive Focus
- Contrastive frame-setting Topic

For Topic expressions:



(cf. Lambrecht, 1994; Prince, 1981)

ICE-GB: (Nelson et al., 2002)

- covers a wide variety of genres (private conversations, interviews, etc.)
- includes audio files

Data collection:

- 23 different texts examined
 - a total of 356 utterances (containing one or more clauses) more or less randomly extracted
 - 379 A-Topic expressions
 - 606 Focus expression
 - + separate data sets on dislocation, preposing, and parallel structures
- QUD and ToBI analysis (e.g. Brunetti et al., 2021; Riester et al., 2018; Silverman et al., 1992)

Part II

Empirical analysis

Topic expressions and accenting:

	o	H*	!H*	L*	L+H*	L+!H*	L*+H	H+!H*	H*+L	#
active	234	59	2	0	10	1	0	1	0	307
accessible	7	23	1	3	6	1	0	0	0	41
unused	0	9	0	0	5	0	1	0	0	15
anchored	0	8	4	0	2	1	0	0	1	16
Total	241	99	7	3	23	3	1	1	1	379

Table 1: Accent distribution across Topic expressions and information states

- clear correlation with activation status found
 - active entities tend to be unaccented → preferred Topic expressions (cf. Lambrecht, 1994)
 - accessible, unused, anchored entities → (!)H* as an activation accent
- B-Accent (L+H*) as 'Topic accent' unlikely³

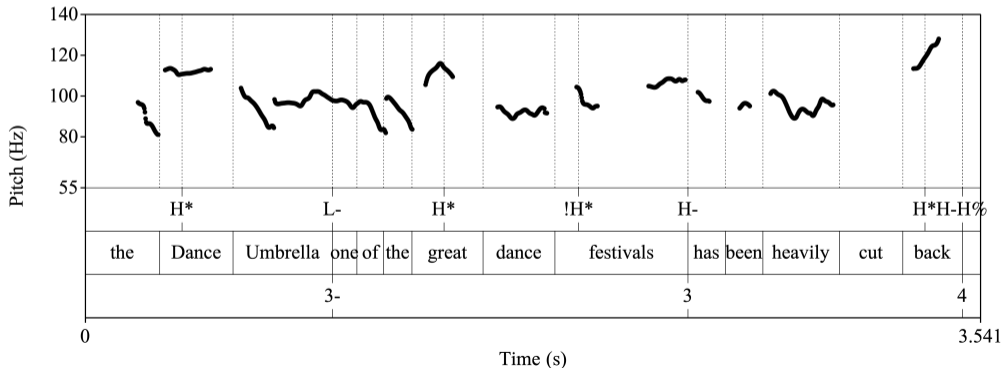
³including L-H% sequence not shown here

Activation accents:

- (3) The turmoil [...] has meant that a lot of local boroughs have been pulling out and even renegeing on their promises. Theatres like the Almeida, which has a wonderful record, have been cut by twenty per cent. [*The Dance Umbrella*]_{TOP}, *one of the great dance festivals, has been heavily cut back.*

(S1B-022 #026)

- (4) [The Dance Umbrella]_{TOP}, one of the great dance festivals, has been heavily cut back. [Play](#)



Accented active elements:

- (5) a. But I do believe we made it clear all the way through that we are insisting that the United Nations resolutions are complied with and [*THAT*]_{Top} *means an unconditional withdrawal from Kuwait.*

(S1B-027 #013)

- b. In times of stress pastoralists are very mobile. *If there's a drought, [*THEY*]_{Top} can get up and move.*

(S2A-047 #078)

- Lambrecht (1994) → sentence accents establish pragmatic relations
 - accents on non-active referents establish new Topic relation
 - accents on active referents mark discontinuity (e.g. Topic shift, unexpectedness)
- but little evidence for relevance of Topic in English (e.g. Mackenzie & Keizer, 1991; Prince, 1997)

Topics in English: (see also Prince, 1997, 1998, on dislocation/preposing)

[...] Topic assignment is necessarily a rather arbitrary affair. After all, P1 [i.e. clause-initial] position can be filled only once, and thus Topic assignment can only take place in those cases where P1 is not already filled by some other element [...]. Obviously, this is not a desirable situation.

(Mackenzie & Keizer, 1991, p. 193)

- Lambrecht's claim empirically problematic
- correlation of accenting and activation systematic → no need for topichood

Topic not a grammatically relevant notion in English

	o	H*	!H*	L*	L+H*	L+!H*	L*+H	H+!H*	H*+L	#
Focus	1	425	104	24	32	8	2	3	7	606

Table 2: Distribution of pitch accents on Focus expressions

Focus:

- all Focus expressions (but one) accented
 - 529 assertions carry H* or !H* → Focus accent (\neq A-accent/H* L-L%)
 - L+H family → likely emphasis (but Contrast possible)
 - L* accent
 - at the end of utterances (declination)
 - narrow speaker pitch range/span
 - coding uncertainty as result of narrow pitch range/span (or target undershoot)

Broad Focus:

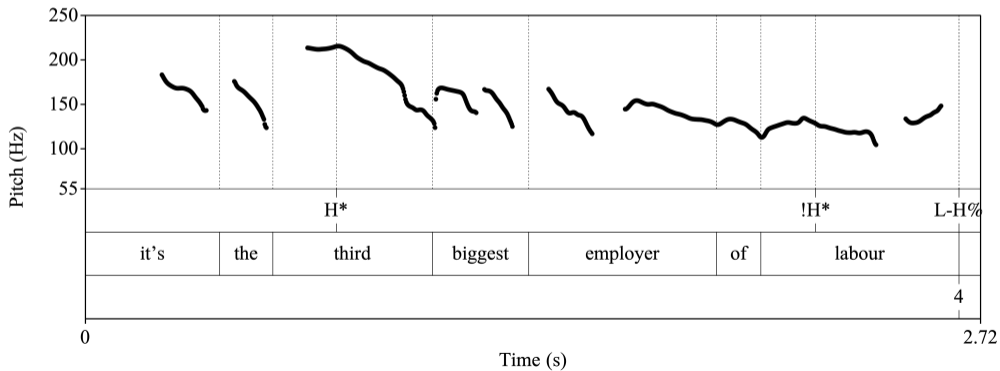
- (6) And if there's going to be any Conservative criticism of support for the arts on purely monetarist Thatcherite principles, the arts is the best investment we can possibly have. *It's the third biggest employer of labour.*

Q₁: {What shows that the arts is the best investment we can possibly have?}

> A₁: [It [is the third biggest employer of labour]_{Foc}]_~.

(S1B-022 #042)

(17) It [is the third biggest employer of labour]_{Foc}]~. [Play](#)



Narrow Focus:

- (18) Politics does come into this and one has to say straight away I won't say it again during this programme but all three who've just spoken are active supporters of the Labour Party. [...] *So they all are committed to the Labour Party*

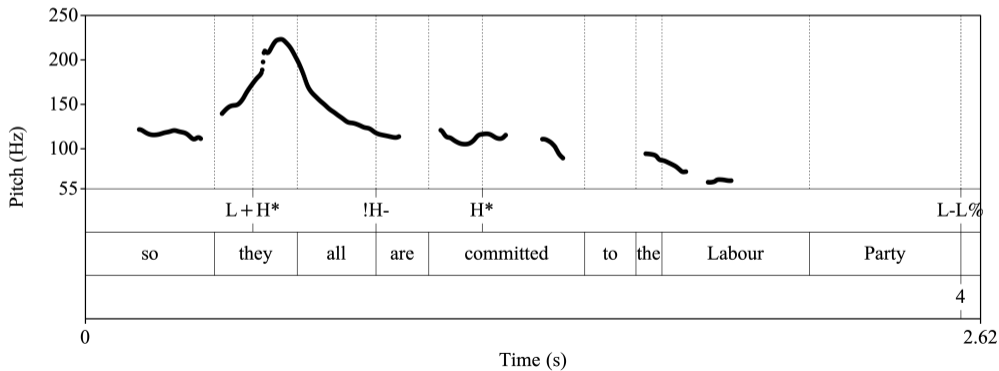
Q₁: {They are what to the Labour Party?}

> A₁: [They all are [committed]_{Foc} to the Labour Party]~.

(S1B-022 #074)

- narrow Focus on *committed*
- post-focal deaccentuation of following material expected

(18) [THEY all are [COMMITTED]_{Foc} to the Labour Party]~. [Play](#)



- embedding present if interpersonal modifier can be inserted
- RL embedding \neq embedding at IL

- (19) a. There are certain things Libertas is (*reportedly*) useful at.
 b. There are [certain things [Libertas [is useful at]_{Foc}] \sim]_{TopFoc}.

(S1B-007 #020)

- (20) a. They are attractive and (*reportedly*) feminine.
 b. [They are [[attractive]_{Foc} and [feminine]_{Foc}]_{Foc}] \sim .

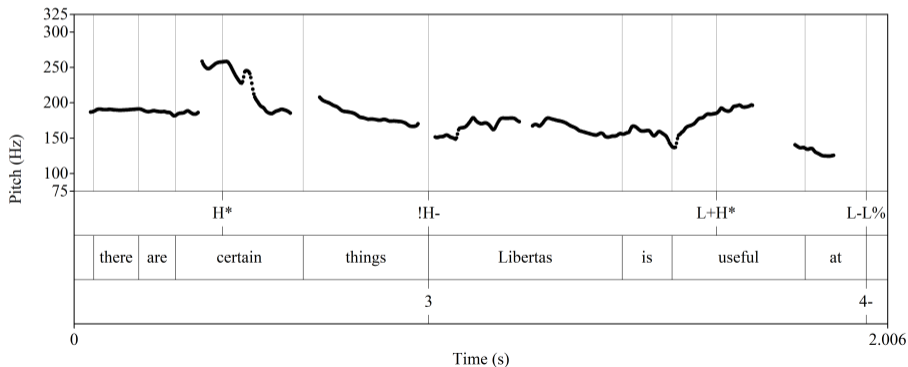
(S1B-048 #175)

- (21) a. I suspect that they will (**supposedly*) be controversial.
 b. [I [suspect that they will be controversial]_{Foc}] \sim .

(S1B-047 #009)

(19) There are [certain things [Libertas [is useful at]_{Foc}]~]_{TopFoc}.

Play



Jackendoff's (1972) B-Accent:

- (L+)H* (L-H%) originally discussed as a Topic accent⁴
- later related to Contrast (cf. Büring, 2003; Pierrehumbert & Hirschberg, 1990)

S [= Speaker] employs the L+H accent to convey that the accented item – and **not some alternative related item** – should be mutually believed. The evocation of a salient scale plus predication can convey the effect of speaker commitment to the instantiation of the open expression with the accented item.*

(emphasis added; Pierrehumbert & Hirschberg, 1990, p. 296)

→ only Contrastive Topics receive B-accent (Büring, 2003)

⁴NB: problematic for many of Jackendoff's own examples

L+H* on (A-)Topic/Focus expressions:

(20) a. Politics does come into this and one has to say straight away I won't say it again during this programme but all three who've just spoken are active supporters of the Labour Party. [...] *So [THEY]_{TOP} all are committed to the Labour Party.*

(S1B-022 #074)

b. When I go home at the weekends it's not just going home to the farm which is a business it's going home to something which is much deeper than that. *It revives me [every WEEK]_{Foc}.*

(S1B-037 #028)

Büning's claim that "all and only contrastive topics are marked by a B-accent"
(2003, p. 525) problematic

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H*~L+H* distinction: (Arvaniti et al., 2022; Ladd, 2008)

- H* and L+H* different realisations of the same accent category
- H*~L+H* → emphasis continuum
- dual function of L+H*
 - Emphasis-marking in some
 - Contrast-marking in other cases

Are there any truly contrastive L+H* accents in the data set?

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Are there any truly contrastive L+H* accents in the data set?

Complex parallel structures:

- two (or more) assertions contrasted at two positions
- prime examples of contrastiveness; usually CT-F structure assumed (Büring, 2003)

(22) [John]_{CT} bought [chicken]_F and [Peter]_{CT} (bought) [veal]_F.

(Repp, 2010, p. 1339)

Discourse relations: (cf. Brunetti, 2024; Repp, 2016)

- distinction between SIMILAR, OPPOSE, and CORRECTION⁵
- no consistent CT-marking found → not all parallel structures involve CT

⁵broad notions; e.g. OPPOSE subsumes concession (and other weaker forms of Contrast); CORRECTION subsumes dialogic rejection and monologic antithesis

OPPOSE:

(24)

L+H*

Well certainly [some hedgerows] are very old indeed, but [an awful LOT of hedgerows] were created in the late eighteenth and nineteenth centuries.

(S1B-037 #048)

- pragmatically clearly contrastive
 - discourse segments make opposing contributions to discourse
 - but no systematic L+H* marking
- (weaker) Contrast not marked in the prosody of English; L+H* related to Emphasis
- L+H* strengthens perceived contrastiveness

?CORRECTION:

(25) L+H*

So [a GROUP of Jews] say the only way we can protect Judaism is to withdraw.

L+H*

[ANOTHER group of Jews] say the only way we can sustain Jewish identity is to redefine its terms.

(S1B-047 #095-098)

- pragmatically contrastive
 - some evidence of systematic L+H* marking (but limited data)
 - L+H* can be seen as a Contrast-marker

Contrast-marking seems to be sensitive to discourse relations, not alternatives

What about Contrastive Focus?

Complex parallel structures:

- little evidence for contrastive L+H* marking
- L+H* most likely Emphasis-marker

Some potential CF-marking in the larger data set though:

- (26) Look at Chapter Three Verse Three how God will purify the children of Levi like silver and gold like gold and silver and they will be offering sacrifices to the Lord
L+H*
 in righteousness. *Not the children of Aaron. The children of LEVI.*

Topic:

- little evidence for
 - Topic in English
 - Jackendoff's (1972) B-accent
- accenting better explained in terms of activation, Emphasis, Contrast-marking
 - (!)H* as an activation/emphatic accent
 - L+(!)H* related to Emphasis/Contrast

Focus:

- (!)H* clear Focus accent (less evidence for H* L-L%/A-accent)
- L+(!)H* related to Emphasis/Contrast

Contrast:

- sensitive to discourse relations, not alternatives
- only strongly contrastive relations seem to be marked by L+(!)H*

Part III

An FDG analysis

Kojadinović (2022) and Mittendorfer (to appear):

- individual PA represented at PL
 - T% on IP (f or r)
 - T- on PP (f or r)
 - T* on PP (h or l) } account for all combinations of PAs
- inflates set of phonological π at PL
- implies distinct pragmatic meaning for each pitch accent type

Problem: $H^* \sim L+H^*$ distinction

- Pierrehumbert (1980) → different contributions to common ground (categorical)
- Arvaniti et al. (2022) and Ladd (2008) → gradient; non-categorical (paralinguistic)

Should this distinction be represented in the FDG formalism?

Proposal at IC-FGD2024 (São Carlos, Brazil):

- abstraction away from individual PA
- 2 macro-operators
 - High group $\mathbf{H} \rightarrow H^*, !H^*, H+!H^*, L+H^*, L+!H^*$
 - H^F (Focus accent)
 - H^C (Contrastive accent)
 - H^{emph} (Emphatic accent)
 - Low group $\mathbf{L} \rightarrow L^*, L^*+H, L^*+!H$
- H^F at PP layer triggers insertion of *nuclear* accent
- H^C/H^{emph} at PW layer trigger insertion of *pre-nuclear* accent

Proposal at IC-FGD2024 (São Carlos, Brazil):

- (27) H^* $!H^* L-H\%$
 [It [is the THIRD biggest employer of LABOUR]_{Foc}]_~.
- a. $(C_I: [(R_I) (CM_I: [(emph R_J: [(T_I) (T_J) (R_J)] (R_I))]_{Foc} (CM_I))]) (C_I)$
- b. $(rIP_i: [(H^F fPP_i: [(PW_i: it's) (H^{emph} PW_j: the\ third) (PW_k: biggest) (PW_l: employer) (PW_m: of\ labour)] (PP_i))] (IP_i))$

■ Emph

- inserts H^{emph} on PW_j
- pre-nuclear H^* (Emphasis reflex)

■ Foc

- inserts H^F on PP_i
- nuclear Focus accents $!H^*$

Problems with H^F , H^C , H^{emph} :

- PL representations of Contrastive Focus, Emphatic Focus

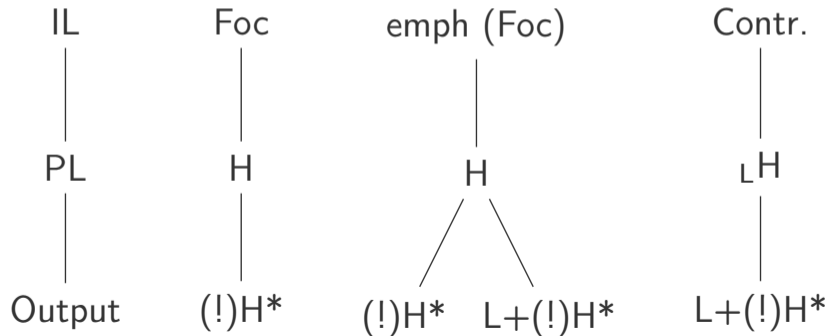
$$(28) \quad (C_1: [(R_1) (CM_1: [(T_1) (R_2)_{CF}] (CM_1))] (C_1)) \\ (IP_1: [(PP_1) (?? H^F H^C_{PP_2})] (IP_1))$$

- corrective $L+H^*$ cannot be accounted for⁶
- reduplicates IL information at the PL
 - establishes 1-to-1 relationship between accent types and pragmatic meaning
 - many-to-1 relations present (e.g. meaning of $L+H^*$)

⁶emphatic $L+H^*$ on Foc expression likewise problematic

New proposal:

- endpoints of $H^* \sim L+H^*$ continuum captured by **H** and **LH**
 - H used for Focus and Emphasis
 - LH used for the systematic expression of Contrast (i.e. either corrective Foc or CTs)



Accent placement:

- PL layer at which $(L)H$ is inserted determines (pre-)nuclear status
 - $(L)H$ at PP \rightarrow nuclear (Focus accent)
 - $(L)H$ at PW \rightarrow pre-nuclear (for expressions of Contrast/Emphasis)

Advantages:

- $(!)H^* \sim L + (!)H^*$ remains
 - a continuum w.r.t. Emphasis (i.e. paralinguistic; shape determined in the Output)⁷
 - a categorical (i.e. grammatical) distinction w.r.t. Focus and Contrast
- does not reduplicate interpersonal information on the PL
 - remains flexible w.r.t. tonal meanings
 - does not presuppose 1-to-1 relationship between pragmatic meaning and accent type

⁷via link between Conceptual and Output Component

- (29) H* !H* L-H%
- [It [is the THIRD biggest employer of LABOUR]_{Foc}].~.
- a. (C_I: [(R_I) (CM_I: [(emph R_J: [(T_I) (T_J) (R_J)] (R_I))] _{Foc} (CM_I))] (C_I))
- b. (rIP_i: [(fHPP_i: [(PW_i: it's) (HPW_j: the third) (PW_k: biggest) (PW_l: employer) (PW_m: of labour)] (PP_i))] (IP_i))

- **emph**

- inserts **H** on PW_j
 - realised as pre-nuclear H* on *third*⁸

- **Foc**

- inserts **H** on PP_i
 - realised as nuclear !H* on *labour*

⁸Accent type determined by conceptual factors in Output

(32) L+H* L-
 [[Another group of Jews]_{CT} say the only way we can sustain Jewish identity is
 H* L-L%
 [to redefine its terms]_{Foc}]~.

- a. (C_I: [(R_I)_{Contr} (CM_I: (R_J) (CM_J: [(T_I) (R_K)]_{Foc} (CM_J)) (CM_I))] (C_I))
 b. (fIP_i: [(fPP_i: [(_LHPPW_i: another group of Jews)] (PP_i)) (PP_j: [. . .] (PP_j))
 (fHPP_k: – redefine its terms – (PP_k))] (IP_i))

■ **Contr** Φ

- inserts _LH on PW_i
- choice of L+H* grammatical, hence represented in the Grammar

■ **Foc** Φ

- inserts H on PP_k
- realised as H* (no Emphasis, no Contrast)

General conclusions:

- Topic expression
 - typically unaccented (& pronominal)
 - if accented → activation, emphasis
 - little evidence for B-accent in English
- Focus expressions
 - always accented in some way
 - (!)H* as a Focus accent (≠ A-accent)
- QUDs predict
 - accent location
 - post-focal deaccentuation

In FDG:

- Interpersonal Level
 - Comment layer at the IL
 - embedded Communicated Contents
- Phonological Level
 - H and LH as π
 - PP layer → nuclear accent
 - PW layer → pre-nuclear accent
- $\text{H}^* \sim \text{L} + \text{H}^*$ continuum
 - edges represented by π s (for Foc and Contr.)
 - Emphatic accent type determined in Output, i.e. paralinguistic

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