

Melody in Language: Intonation

Hedberg/Sosa research
c.f. Patel ch. 4.1, 4.3

Intonation

- Autosegmental-Metrical Approach to Intonation
 - A phonological approach.
 - Views intonation as a sequence of distinctive high and low tones, with intervening pitch interpolated.
 - Developed in the 1970s, under the influence of phonological studies of tone systems in Africa.
 - Pierrehumbert 1980.
 - ToBI (Tone and Break Indices)
 - A system for annotating American English Intonation.
 - Beckman & Ayers-Elam 1997
 - There are also ToBI systems for other languages now.
 - Jun 2005

ToBI Annotation System

- Tones
 - Pitch accents
 - H^* , L^* , $L+H^*$, L^*+H , $!H$, $H^*+!H$
 - Edge tones:
 - Phrase accents: $L-$, $H-$: delimit intermediate phrases.
 - Boundary tones: $L\%$, $H\%$: delimit intonational phrases.
- Break Indices
 - Indicate the degree of juncture between successive words.
 - 0, 1, 2, 3, 4

Yes-No Questions

- American English: Downstepped head + low rise.
British English: High head + low rise.
- Can you **swim**?
L*H-H%
- Is **Matt** through **school**?
H* L*H-H%
- Have** you **seen** a **doctor** yet?
H* !H* L*H-H%
- And **do** you have **time** to go **out** and **see** them?
H* !H* !H* L*H-H%

Configurational Account of Meaning

- O'Connor & Arnold 1973 (British English)
 - (Prehead) + (Head) + Nucleus + (Tail)
 - Low Bounce
 - Low rise preceded by a high head and an optional low prehead, or a low rise preceded solely by a high prehead.
 - "This is by far the most common way of asking yes-no questions; it should be regarded as the normal way, with the speaker displaying *genuine interest* in obtaining the information requested."
 - Take Off
 - Low rise preceded by optional low head and optional low prehead.
 - "Such questions almost invariably express disapproval or skepticism."

Compositional Account of Meaning

- Pierrehumbert & Hirschberg 1990
 - Meaning of pitch accents
 - H*
 - The items made salient by the H* are to be treated as “new” in the discourse. An open proposition instantiated by the item is to be added to H’s mutual belief space.
 - L*
 - The item is to be made salient but not part of what S is predicating in the utterance.
 - L+H*, L*+H
 - Are employed to convey the salience of some *scale* (partially ordered set) linking the accented item to other items salient in H’s mutual beliefs.
 - » L*+H: Lack of predication, and evoking a scale: lack of speaker commitment.
 - » L+H*: Predication, and evoking a scale: contrast
 - Meaning of edge tones
 - H-, H%
 - The phrase is to be interpreted in conjunction with an upcoming phrase or utterance.
 - L-, L%
 - The current phrase is to be interpreted as separate from the upcoming phrase or utterance; perhaps relating to a preceding phrase or utterance.

Contradiction Contour

Liberman & Sag 1974

A: My fate is sealed. I have been diagnosed with elephantiasis.

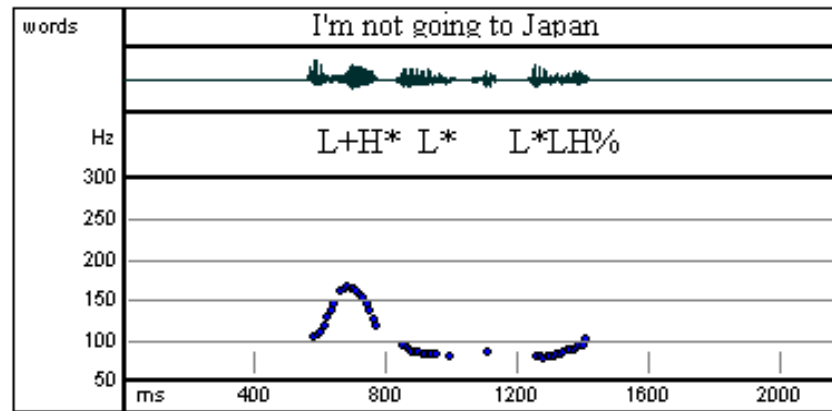
B: **Elephantiasis isn't incurable!**

L*+H L* L* L*L-H%



(1) Elephantiasis isn't incurable!

Contradiction Contour



A: Where? What are you talking about

B: In Japan.

A. **I'm** not **going** to **Japan**.

L+H* L* L*L-H%

Contradiction Contour

MZ: Yeah, I'll tell you, forget the movie. I mean, as Tony and you were saying before, we are faced with an unbelievably serious problem, which the military has been telling us privately for years. **This isn't something that**

H* !H* !H*

they just **found** out **about** on **nine/eleven**. They have

L* L* L* L*L-H%

been terrified about this for years.



Contradiction Contour

A: That's right. Barry doesn't drink.

B: **I** **drink**. Just not when I drive.

$L^{*}+H$ $L^{*}L-H\%$

Contrastive Contradiction Contour

- I'm not **going** to **Japan**.

L+H* L* L*L-H%

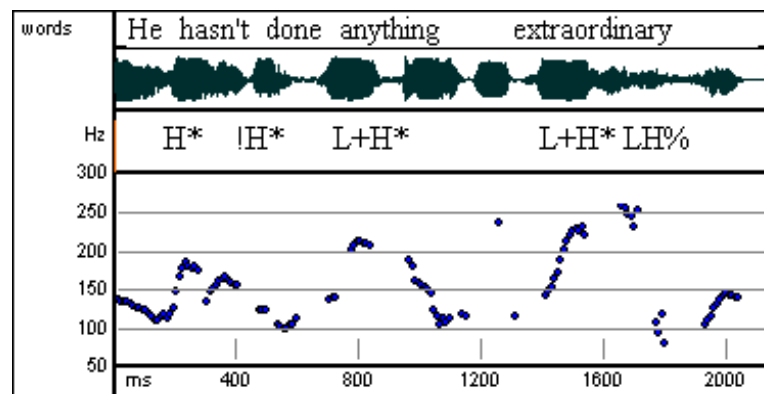
- I'm not **going** to **Japan**?

H* !H* L*H-H%

- I'm not **going** to **Japan**. I'm **going** to **China**.

L+H* L* L+H*L-H% H* L+H*L-L%

Contrastive Contradiction Contour



JM: Well, he's been a successful politician, and he's been a successful statesman, has he not?

LO: He's done – the only thing – he was in a box with China. He did the only thing you could do.

He **hasn't** done **anything** extraordinary.

H* L+H* L+H* L-H%

Contrastive Contradiction Contour

- EC: Well, I think definitions of beauty or handsomeness change over the years, and I, frankly, think this guy is pretty attractive. **I don't find him unattractive.**

H* L*+H L+H* L-H%



Rise-Fall-Rise Contour

Ladd 1976



(3) I fed the cat

Rise-Fall-Rise Contour

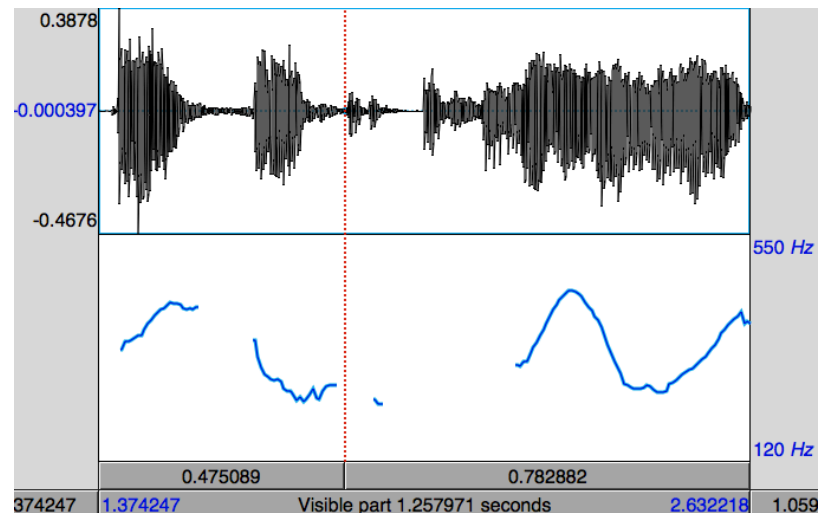
Ward & Hirschberg 1985

“Implicating Uncertainty”

A: Did you feed the animals?

B: **I fed the cat.**

H* L* L*+H L-H%



Rise-Fall-Rise Contour

Ward & Hirschberg 1985

- An analysis of naturally occurring data reveals that the FALL-RISE intonational contour makes a context-independent contribution to utterance interpretation: the conveyance of speaker UNCERTAINTY.
- Two necessary conditions are proposed for the felicitous use of fall-rise: (a) some item referenced in an utterance must be perceived as linked by a scalar relationship with its context; and (b) speaker uncertainty with respect to the scale or scalar value evoked must be plausible.

Rise-Fall-Rise Contour

Ward & Hirschberg 1985

- (56) A: Is she taking any medication?
B: \Vi/tamins.
- (61) A: Did she get a hundred on the midterm?
a. B: She got a ninety-\eight/.
b. B: #She got a \six/ty.
- (72) A: Uh, your bibliography showed more than one place where Strawson and Donnellan are reprinted.
B: \Straw/son was in \six/, I \think/.

Yes-No Questions

Nuclear Contour	ToBI Category	Number
Low rise	L*H-H%	325
	L*L-H%	2
High rise	H*H-H%	39
	!H*H-H%	5
Fall rise	H*L-H%	1
	L+H*L-H%	1
High fall	H*L-L%	9
	!H*L-L%	1
	L+H*L-L%	7
Low fall	L*L-L%	6
Level	H*H-L%	9
	!H*H-L%	3
	L*+HH-L%	2
TOTAL		410

Table 1. Nuclear Contours of Yes-No Questions

Falling Yes-No Questions

- Yes-no questions that fall tend to be non-genuine questions.
- Felicity conditions for questions (Searle 1969)
 - The speaker S must not already know, or believe she knows, the answer to the question she is asking the hearer H.
 - S must desire a response from H.
 - S must believe that H can provide a response.
- Questions used as announcements, statements, requests for action, etc., rather than requests for information.

Falling yes-no questions

- Can we **talk** about the **job** things now?

H*

L*L-L%



- Did I **tell** you that I have a new **job**?

L+H* !H*

!H*

L*L-L%



- Do you have a **cold**?

H*L-L%



Wh-Questions

Nuclear Contour	ToBI Category	Number
High Fall	H*L-L%	64
	!H*L-L%	34
Rise Fall	L+H*L-L%	44
	L+!H*L-L%	6
Low Fall	L*L-L%	14
Low Rise	L*H-H%	26
	L*L-H%	1
High Rise	H*H-H%	3
	!H*H-H%	1
Fall Rise	H*L-H%	2
Rise-Fall-Rise	L+H*L-H%	2
	L+!H*L-H%	1
Level	H*H-L%	1
	H*!H-L%	1
TOTAL		200

Table 2. Nuclear Contours of Wh-Questions

Rising Wh-Questions

- Wh-questions that rise tend to restrict the space of possible answers.
- Hamblin 1973:
 - The meaning of a question is the set of its possible answers.
- Echo questions, reminder questions, supplementary information questions

Rising Wh-Questions

- (1) [A is citing an email address while B writes it down]

A: ... dot H I T C



B: **What's** after the **dot**?

L*+H L*H-H%

- (2) **Which** did you say you **preferred**?



H* L*H-H%

Rising Wh-Questions

(3)[A has been worrying about where she could stay when she visits]

A: But if not I mean I'm just coming anyway but I have no idea like where I'll go-

B: **When** are you **planning** on **coming**?

L*+H

!H*

L*H-H%



(4) A:And the director's in Detroit.

B: Yeah, we're all in Detroit but the area directors um travel to the cities that the volunteers are in, and um you know meet with the communities and stuff like that. So-

A: **What's** your **area** then?

H*

L*H-H%



Rising Wh-Questions

- (5) **Who** did you **work** with at **York**?
L+H* !H* L*H-H%
- Pragmatic explanation:
 - Perhaps the speaker is signaling to the hearer that he does not intend to take the floor with his question.
 - A polite way to interrupt.
- Semantic explanation:
 - Perhaps the speaker is signaling that he is considering a restricted set of possible answers.

Unaccented “Tails” in Yes-No Questions

- (1) So **have** you been **able** to get **close** to them?

H* !H* L*H-H%



- (2) Can **you believe** that?

H* L*H-H%



- (3) And **did** they **mention** their **other** children?

H* H* L- L*H-H%

- (4) Did you **get** my **letter** yet?

L+H* L*H-H%

- (5) Did I **send** it to **you** on **computer** paper?

H* !H* L*H-!H%



“High-rises” in Yes-No Questions

(6) Do you **know them**?

L* H*H-H%



(7) Could there **be a reason for that**?

L* L*+H H*H-H%



(8) Is that **really** such an **awful job**?

L*+H L*+H H*H-H%

(9) Did **she enjoy coming visiting here**?

H* L*HH% H* L*+H !H*H-H%

(10) Do y- would you like an **area code**?

L*+H H*H-H



Post-Nuclear Accents

- Perhaps these “high-rises” are really post-nuclear accents.
 - Material constituting part of the rise (an edge tone) gets associated with a stressed syllable.
 - Post-nuclear accents have been reported e.g. in Eastern European languages that have a rise-fall ($L^*H-L\%$) question contour.
- If so, this supports the idea that American English yes-no questions are canonically $L^*H-H\%$.

Ladd 2008: Greek Question Tune:

$L^*H_L\%$

$L^*HL\%$

x o r é v i

s/he-dances

'Is she dancing?'

$L^* \quad H \quad L\%$

x o r é v i a p ó p s e?

s/he-dances tonight

'Is she dancing tonight?'





- The $H_L\%$ that clearly serves as edge tone sequence in (6a) exhibits some sort of link with the stressed syllable of *apópsē* in (6b).
- More or less by definition, a tone that seeks to associate with a lexically stressed syllable is a pitch accent.
- This accent remains in some important sense subordinate to the L^* accent, which much be regarded as the nucleus.
- In (6b), for example, the focus of the question remains broad. If we want to focus on 'tonight', we must shift the nucleus onto *apópsē*:

$H^* \quad L^* \quad HL\%$

x o r é v i a p ó p s e?

'Is she dancing *tonight*?'

Presence of final pitch accent?

- Which one has an accent on 'card'?
 - Did you get her postcard? 
 - Did you get my postcard? 
- Which one has an accent on 'that'?
 - Did you know that? 
 - Do you know that? 

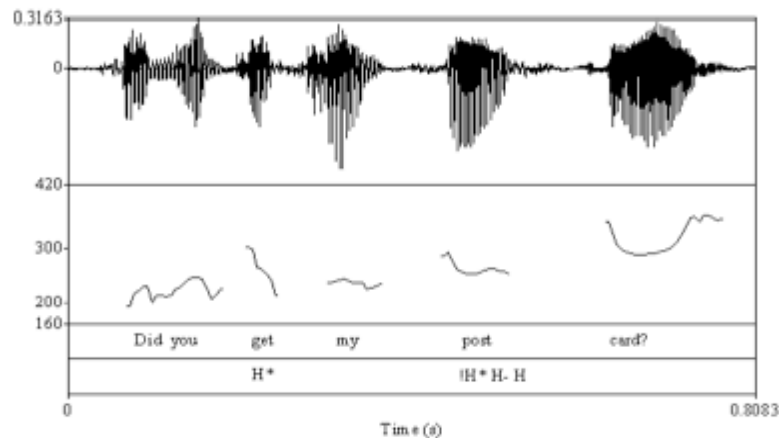


Figure 5. *Final unaccented 'card' (98)*

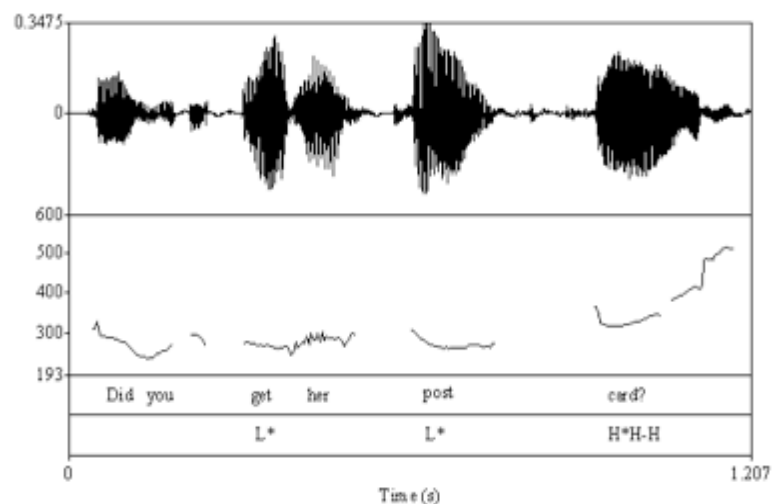


Figure 6. *Final high accented 'card' (99)*

- A small difference in relative duration: 'card' takes up 54.2% of the total length of the compound in (98) but only 51.6% in (99).
- In terms of pitch movement, the rising slope begins with 'card' in (99), whereas the rise begins with 'post' or even 'my' in (98). The perception of prominence is correlated with the beginning of the rise.

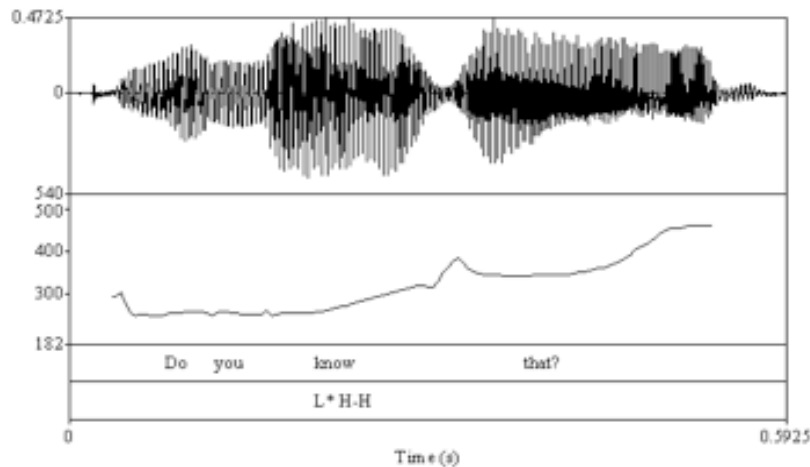


Figure 7. *Final unaccented 'that' (100)*

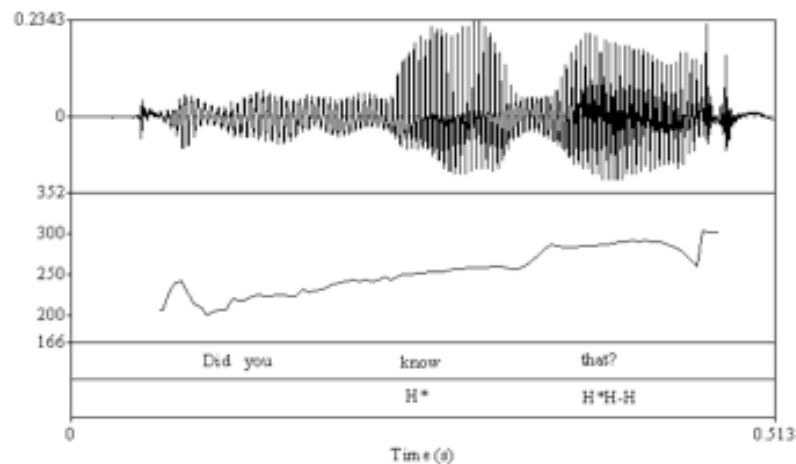



Figure 8. *Final high-accented 'that' (101)*

- In (100), the rise begins with 'know', which rises from 253 to 320 Hz. (67 Hz. total), and continues on 'that', which rises from 344 Hz. to 464 Hz. (120 Hz. total). Because the rise begins on 'know', this word is perceived as prominent.
- In (101), 'know' is quite flat (rising only 9 Hz. from 250 to 259). 'That' is quite flat also (rising only 6 Hz. from 284 to 290). However, there is a 25 Hz. step up from 'know' to 'that'. This upstep seems to localize the perception of the rise onset on 'that', which makes it sound prominent.



(100)1096.37 1099.60 B: eh Lizzy Lizzy
everybody feels that way who's worth his salt
1097.98 1099.00 A: (())
1100.06 1100.83 B: Do you **know** that?
L*H-H%

(101) 289.03 290.07 A: Is he working now
290.63 292.55 B: No, in fact he got laid off. Did
you **know that**?
H* H*H-H%

Phrasing and Parenthetical Verbs

- Parenthetical verbs (Urmson 1952) can appear in a wide variety of syntactic positions.
 - [(So he TOOK um) (english- COMP)] [(which he GOT a) (an A **MINUS** in*#i believe*)] [(because he REALLY)(he's a really good WRITER)]. 
 - So *he * took * English Comp * which *he * got *an A minus in * because *he * is * a really good writer *.
 - They “guide the hearer to an appreciation of the matrix statement in its social, logical, or evidential context.”

Phrasing and Parenthetical Verbs

- In terms of prosodic phrasing, the PVP tends to attach to the material in its semantic scope.
 - [(There's a TRIP coming up) (i **think**#like December the **EIGHTH**)]. 
 - [(The airport TERRORISTS that) (you KNOW) (were in CONTROL during) (nine ELEVEN)] [(they ALL had) (FAKE ah) (DRIVERS license from) (i **believe**#**FLORIDA**)]. 

Phrasing and Parenthetical Verbs

- Focus can affect the truth conditions of a sentence when there is a focus-sensitive adverb (Rooth 1985):
 - a. Fred only introduced Bill to SUE_F .
 - b. Fred only introduced $BILL_F$ to Sue
- PVPs associate with the focus of the utterance.
 - Now it's (it's the **BLACKS#i think**)(more than the WHITES) (that are keeping it ALIVE).



References

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- Hedberg, Nancy and Noureddine Elouazizi. 2012. Epistemic parenthetical verbs and association with focus. To be presented at the Parenthetical Verbs Colloquium. Paris, May 2012.

Corpora for Hedberg/Sosa work

- The McLaughlin Group
 - Political discussion program.
 - PBS (Public Broadcasting Service), U.S.A.
- CallHome Corpus of American English.
 - Telephone conversations between people who know each other.
 - Available from the Linguistic Data Consortium, University of Pennsylvania.
- Fisher Corpus of American English
 - Telephone conversations between strangers, assigned a topic to discuss.
 - Available from the Linguistic Data Consortium, University of Pennsylvania.