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THE PROSODY OF TOPIC AND FOCUS
IN SPONTANEOUS ENGLISH DIALOGUE[*]

Abstract. This paper addresses the putative prosodic contrast between topic and focus and the tonal phonology underlying such information structure phenomena. We show that while there are systematic correlations between intonation and information structure categories, these correlations are not as straightforward as is suggested in the literature. In particular we deny that there is any prosodic category as distinctive as a 'topic accent' as opposed to a 'focus accent' in English. We innovate in this study by basing our investigation on naturally occurring spontaneous speech instead of on constructed examples or on experimentally-induced speech.

1. INTRODUCTION

Our research addresses the interface between meaning and prosody. In particular, it concerns the way intonation plays a part in the interpretation of an utterance. For example, we are concerned with the extent to which a falling versus a falling-rising intonation at the end of an utterance or an extra tonal height on a specific word or phrase affects the way the utterance is interpreted.

Information structure categories such as topic and focus have been correlated with specific types of contours. Many authors have stated that there is a peak associated with focus, while others have stated that there is also a peak associated with topic. Claims have been made as to the specific sequence of underlying tones associated with these categories, at least for constructed examples; for instance, that focus will be marked with H* and topic will be marked with L+H*. Here, we test these claims by analyzing the intonation and information structure of a sample of spontaneous dialogue in English.

2. DATA

The data were taken from six half-hour episodes of the PBS political discussion television show, The McLaughlin Group, videotaped in April and May 2001. The host, John McLaughlin, discusses current issues of the day with four journalist guests. The journalists have widely differing political beliefs and therefore the discussions get heated and the speakers produce speech that we believe to be quite spontaneous. The guests vary somewhat from week to week. Each half-hour episode consists of four issues discussed. For the first five episodes, we selected the first issue because it was the longest. For the sixth episode, we analyzed a combination of issue two and three. Each issue is introduced by John McLaughlin in a monologue. We didn't analyze these portions of the videotapes. All participants are native speakers of American English.

An advantage to analyzing the McLaughlin Group as a source of data is that transcripts of the sessions are available on the World-Wide Web. In the few cases where we found discrepancies between the transcript and the videotape in the portions of the transcript we were analyzing, we corrected the transcript.

3. INFORMATION STRUCTURE CODINGS

One of us, Hedberg, coded the transcripts for five information-structure categories and then listened to the videotape to confirm these codings. The five information-structure categories are contrastive focus, plain focus, contrastive topic, unratified topic and ratified topic. We follow Gundel (1988) in defining topic, comment, and focus.

<u>Topic</u>
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.

<u>Comment</u>
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.

<u>Focus</u>
That part of the linguistic expression that realizes the comment.

The focus is very long in the majority of cases, and consists of multiple pitch accents and sometimes multiple intonational phrases. For that reason, Hedberg picked the final pitch-accented phrase to annotate, except in the case of it-clefts where she picked the clefted constituent since all three it-clefts in the data were either topic-clause it-clefts or all-comment it-clefts (Hedberg, 2000). To explain the five categories, we'll illustrate with examples from the passage shown in (1). Topics are italicized and foci are bold-faced. Contrastive elements receive double underlines, and unratified topics receive a single underline.

(1)   Ms. Clift: Look, *John McCain* would be the first one to say *this* doesn't improve the system to **perfection**; *it* makes it marginally **better**. And there's still a possibility that *Tom DeLay*, who is an enemy of the bill, will forge an unholy alliance with **<u>Democrats in the House</u>**. Because *Democrats* have figured out, *they* do worse under this bill than **the Republicans** do. <u>But the big thing that comes out of this, to me</u>, is that it's **<u>John McCain</u>** who gets the big legislative triumph so far in this first 100-day period, while *President Bush* is looking rather passive on a number of issues across **the board**, especially foreign policy. (3/31/01)

       Ratified Topic
       <u>Contrastive Topic</u>
       <u>Unratified Topic</u>
       <u>Contrastive Focus</u>
       Plain Focus

The topic of the entire issue is the McCain-Feingold bill on campaign finance reform. John McCain has just gotten it passed through the Senate and the question is how it will do in the House. John McCain is an unratified topic because Eleanor

Clift is re-establishing him as the topic here and thus he is not already established as a topic. The bill itself is already established as the topic and thus references to it with 'this' and 'it' are coded as ratified topics. The terms 'ratified' and 'unratified' topic come from Lambrecht and Michaelis (1998). Both 'John McCain' and 'this' are marked as topics here because John McCain is the topic of the matrix clause and the referent of 'this' is the topic of the embedded clause. The focus of both the matrix clause and the embedded clause falls on 'perfection.' Plain foci are marked in bold-face. Tom DeLay is a Republican representative and is the topic of the next sentence. Here 'Democrats in the House' is marked as a contrastive focus because there is an implicit contrast with 'Republicans in the House'. Likewise 'John McCain' is a contrastive focus because it explicitly contrasts with 'President Bush.' The whole it-cleft expresses a comment here, and thus there is no topic indicated for this sentence. In the next sentence, President Bush contrasts with John McCain and is a topic, and hence the phrase denoting him is marked as a contrastive topic.

To help identify the topic, Hedberg used Gundel's (1974) 'as for' test and Reinhart's (1981) 'said about' test. For example, in (2), 'you' is identified as the topic because the sentence can be paraphrased, 'As for you, what do you think?'.

(2)   Mr. McLaughlin: What do _you_ **think**? (6.16)

A total of 1,669 phrases were coded for information structure category, distributed as shown in Table 1. As can be seen from the table, the distribution of the five information structure types was roughly equivalent across the five transcripts. This rough equality serves as a broad check on the reliability of the information-structure coding. Ideally we would have two information-structure coders, so that we could compare their coding and come up with an inter-coder reliability statistic. We plan to adopt this methodology in future work on this project.

Table 1. Distribution of Information Structure Types across the Six Transcripts

Tran-script	Ratified Topic	Contras-tive Topic	Un-ratified Topic	Contras-tive Focus	Plain Focus	Total
1	109 **33.4%**	16 **4.9%**	45 **13.8%**	14 **4.3%**	142 **43.6%**	326
2	61 **22.2%**	7 **2.5%**	45 **16.4%**	24 **8.7%**	138 **50.2%**	275
3	36 **21.4%**	7 **4.2%**	39 **23.2%**	15 **8.9%**	71 **41.2%**	168
4	79 **28.5%**	17 **6.1%**	36 **13.0%**	31 **11.2%**	114 **41.2%**	277
5	84 **25.7%**	15 **4.6%**	57 **17.4%**	20 **6.1%**	151 **46.2%**	327
6	89 **30.1%**	10 **3.4%**	44 **14.9%**	23 **7.8%**	130 **43.9%**	296
Total	458 **27.4%**	72 **4.3%**	266 **15.9%**	127 **7.6%**	746 **44.7%**	1669

We decided to select seven examples of each of the five categories from each transcript for prosodic coding. For each transcript, Hedberg counted the total number

of each category and divided by seven. For example, there were 142 plain foci in transcript 1. Division by 7 yields 20.3, so she selected every 20th example for prosodic analysis. In this way, we acquired seven examples of each category spread evenly across the transcript. She then printed a new copy of the transcript and identified the 35 phrases to be analyzed with a highlighting pen, with no indication of information structure category. This transcript was given to Sosa, along with the videotape, for prosodic coding. Because there were 6 transcripts, we subjected 210 phrases to prosodic coding. There were a total of 42 examples of each of the five information-structure categories.

Sosa then listened to the videotapes and digitized each of the 210 phrases along with some of their surrounding context. Using the Computerized Speech Lab (CSL 4300), he then analyzed the target phrases prosodically and assigned an autosegmental sequence of tones to each phrase. He used annotations for pitch accents (H*, L*, L+H*, H*+!H, H*+L, L*+H and H+L*), boundary tones (L%, H%), intermediate phrase tones (L, H), downstep (!H), upstep (¡H), and increased range (↑H). Again, in future work on this project, we plan to have two prosodic coders, so that we can calculate an intercoder reliability statistic, to be more sure that the prosodic coding is accurate.

4. INTONATIONAL CODINGS

The intonational analysis and annotation of all digitized utterances was performed following closely the Guidelines for ToBI Labelling (Beckman and Ayers Elam, 1997) and taking into consideration other published materials on the intonational structure of English, notably Pierrehumbert and Hirschberg (1990) as well as other autosegmental-metrical approaches to the phonology of intonation. The ToBI conventions and assumptions were followed, although we introduced two additional pitch accents that we felt were necessary in order to account for certain distinct patterns. For example, we rescued the H*+L pitch accent (which was originally designed to trigger downstep) to generate a dip between two H* pitch accents, which is not captured by the notation H* ... H* alone.
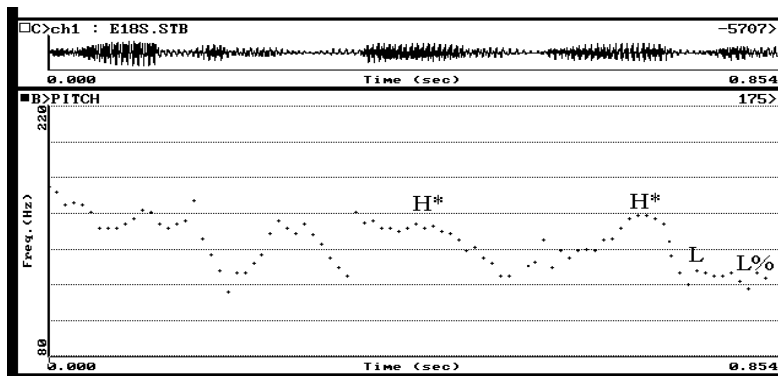

*Figure 1. [Even] **Dan Gol**din (unratified topic, 5.18)*
H*   H* LL%

Our independent feature downstep !H allowed us to free the H*+L notation and use it for this effect. An example of this distinction is shown in figure 1 versus figure 2.[1]
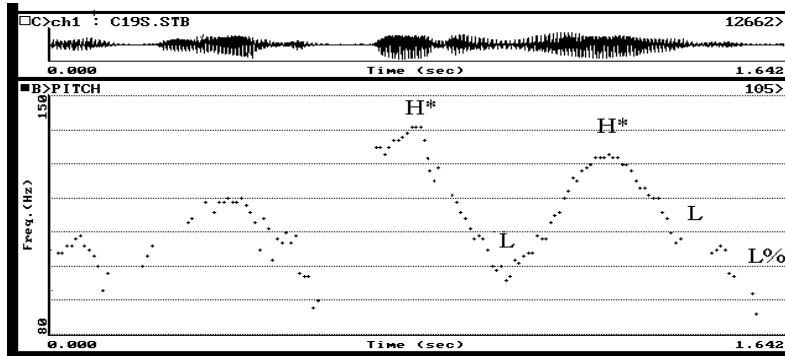

Figure 2. **Thir**ty years *[of serious anthropological consideration] (plain focus, 3.19)*
H*+L   H* LL%

We noted that the sequence H* ...H* (equivalent to the *high head* in the British tradition) is quite scarce in the data since the great majority of the utterances show some kind of downdrifting pattern. The very few instances of sequences of straight H* sequences may show a contrast with British English, which is said to typically have this recurring high-pitched pre-nuclear pattern.

As already mentioned, the rest of the pitch accents used in this paper were H*, L*, L+H*, L*+H, H+L*, and H*+!H, all of them with the value assigned to them in the ToBI notation and previous work on English intonation. Given the emphasis on this pitch accent in this paper, we present two instances of the L+H* in figures 3 and 4.
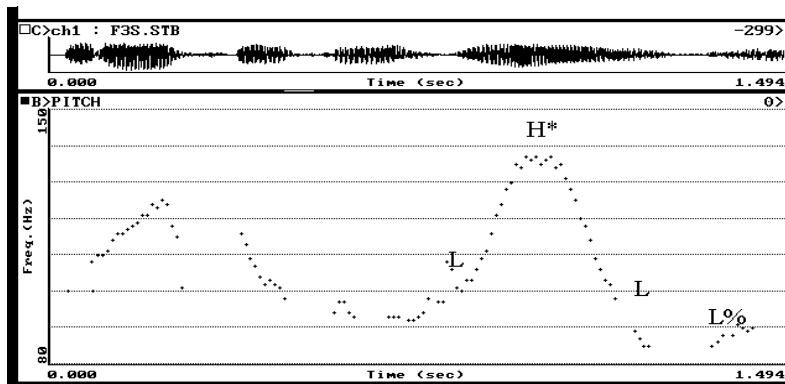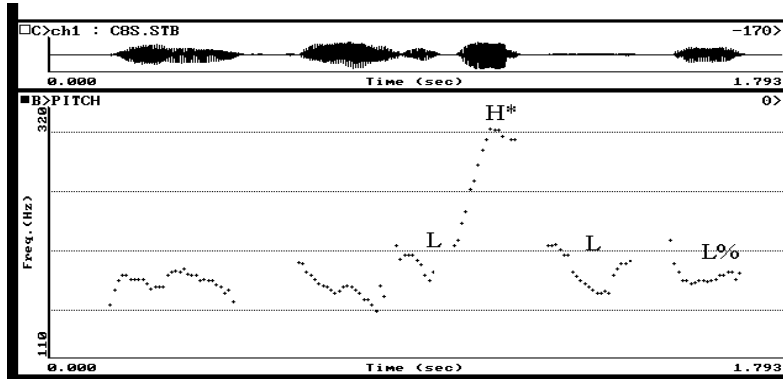

*Figure 3. Our **vo**yeurism   (plain focus, 6.3)*
L+H* LL%

*Figure 4. In **Bri**tain, in fact... (contrastive topic, 3.8)*
L+H* LL%

The feature 'increased range' as well as the 'upstep' pitch accent ¡H* were added to the tonal analysis, to specify high pitch excursions. Range is characterized by higher peaks and low valleys, as shown in figure 5.
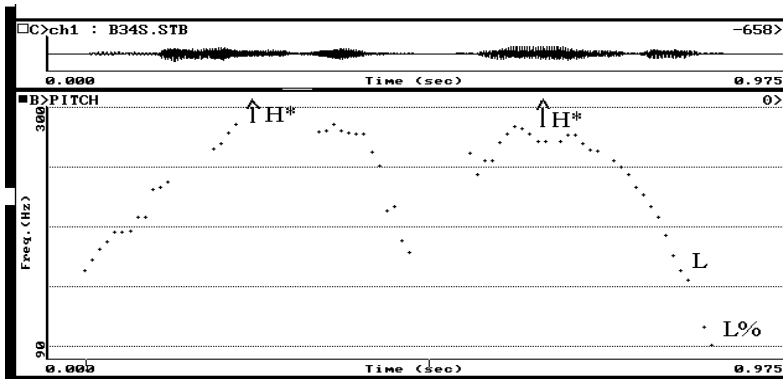

*Figure 5. **Made** in **China** (plain focus, 2.34)*
↑H*   ↑H* LL%

On the other hand, upstep is mostly a H* that is higher than any previous H*, reversing any downdrift of declination effect, as shown in figure 6.
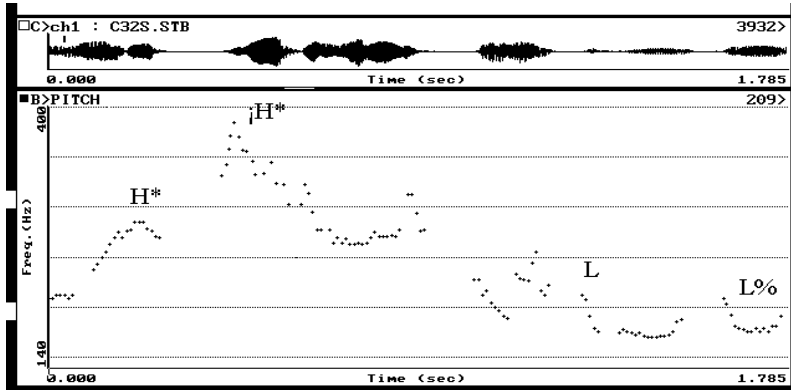
*Figure 6. **Not** a **PBS** documentary (contrastive focus, 3.32)*
H*   ¡H* LL%

The overwhelming majority of our utterances showed a downdrift most of the time realized as one or more downstepped !H* in the tonal tier.

We noticed that many long utterances that were semantically coherent, also had overall prosodic patterns or designs that were larger than the intonational phrase. For lack of a better term we tentatively called them 'intonational macro-units.' Two examples are shown in figures 7 and 8.

Figure 7. Mr. McLaughlin: Can you handle that last question? Where do you think the
international community is? (2.14)

*Figure 8. Ms. Clift: It requires a leap of faith, however, to believe that the historical
Jesus was, in fact, the son of God. (3.27)*

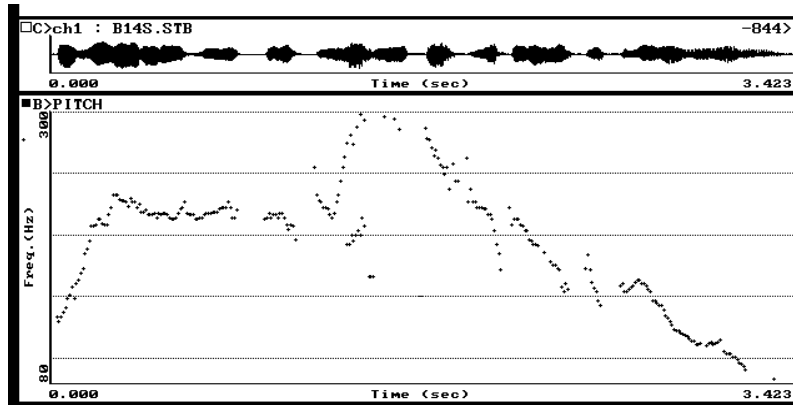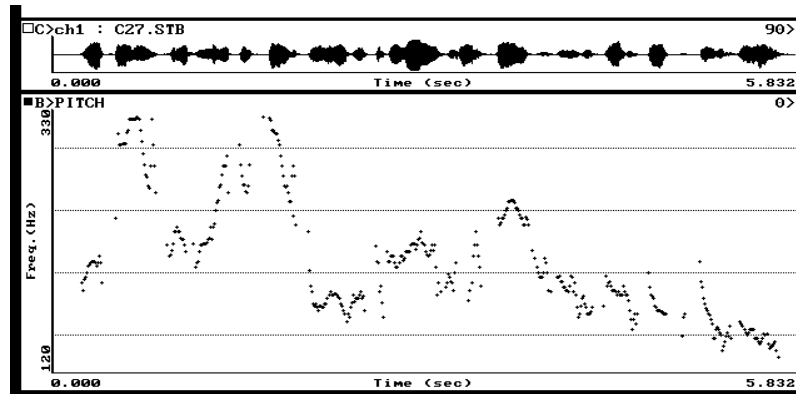This macro-unit doesn't necessarily coincide with Nespor and Vogel's (1986) phonological utterance, and is certainly perceptible in oral discourse and visible as such in pitch tracks.

After the intonational coding was completed, it was entered on the data spreadsheet and we proceeded with correlating the intonational coding with the information-structure coding.

5. TOPIC ACCENT VERSUS FOCUS ACCENT HYPOTHESES.

One important issue is whether there is a special 'topic accent.' Jackendoff (1972) was the first to propose a distinction between 'topic accents' and 'focus accents'. He proposed that topics receive a fall-rise ('B') accent and that foci receive a fall ('A') accent. Gundel (1978) follows Jackendoff in distinguishing between comment (focus) accents and topic accents, but points out that topic accents only fall on unactivated or contrastive topics. Pierrehumbert (1980) follows up with the observation that Jackendoff's B ('background') accents receive an H*LH% tune and that Jackendoff's A ('answer') accents receive a H*LL% tune. See Table 2 for Pierrehumbert's (1980) hypothesis and also hypotheses of researchers after her.

Table 2. Hypotheses of Researchers Concerning Topic Accent and Focus Accent

	Topic accent	Focus accent
Pierrehumbert 1980	H* LH%	H* LL%
Steedman 1991	L+H* LH%	H* LL%
Vallduví & Engdahl 1996, Gundel 1999, Steedman 2000a, Steedman 2000b, Gundel & Fretheim (in press)	L+H*	H*
Lambrecht & Michaelis 1998	H%	L%

Steedman (1991) states that foci ('rhemes') receive the H*LL% accent and tune and that topics ('themes') receive a L+H*LH% (the so-called 'scooped fall-rise')

accent and tune. Vallduvi and Engdahl (1996) state that noncontrastive links (Gundel's (1978) 'unactivated topics' or Lambrecht and Michaelis's (1998) 'unratified topics') receive an L+H* pitch accent, that contrastive links are obligatorily so marked, and that foci are marked with the pitch accent H*. Gundel (1999) claims that topics, both new and contrastive, are marked with L+H*, and that her category of 'semantic focus' (contrastive or noncontrastive) is marked with H*. Steedman (2000a, 2000b) and Gundel and Fretheim (in press) also claim that topics are marked with L+H* and foci with H* pitch accents. Lambrecht and Michaelis (1998) distinguish topic accents from focus accents but don't claim that there is any prosodic difference between them; however, they mention in a footnote that H% may mark topics and L% mark foci.

Pierrehumbert and Hirschberg (1990) suggest that L+H* is used to mark contrast, or in their terms, to mark the selection of an item on a contextually-evoked salient scale. They don't specify whether this contrastiveness is associated with the information structures of topic and focus. Presumably either a topic or a focus can be marked by L+H*, according to them, just so as long as the category is contrastive in their sense. We speculate that Gussenhoven's (1983) fall-rise tone, which he says is used to 'select' an entity from the background, corresponds to a topic accent, and that his fall tone, which he says is used to introduce an entity into the 'background', corresponds to a focus accent.

The major goal of our research was to put these hypotheses to the test.

6. PITCH ACCENTS

6.1 .Does L+H* mark contrast, or topic?

With regard to L+H* marking information structure and/or contrast, we came up with the results in Table 3:

Table 3. Distribution of L+H Relative to Information-Structure Type*

	L+H*	% out of 42
Ratified Topic	1	2%
Contrastive Topic	10	24%
Unratified Topic	13	31%
Contrastive Focus	11	26%
Plain Focus	6	14%

As can be seen from the table, we did find a significant number of L+H* pitch accents marking contrastive topics or contrastive foci, e.g. the examples shown in (3) and (4):

(3)   Mr. Kudlow: And we need to drill oil and gas in the Rockies. And
                 Jeb Bush is wrong and **George Bush** is right; we need
                 L+H* !H*   **L+H* !H***
                 to drill in the Gulf of Mexico.
                 (contrastive topic, 6.27, 28)

(4)   Mr. McLaughlin: This exit question may be superfluous, but I'm
                                going to hit you with it anyway. Tito cracked the
                                space barrier between civilians and professionals.
                                For the most part, was his way the right way, or
                                for the most part was his way the **wrong** way, as
                                                                 L+H* LH%
                                Goldin would lead you to believe, Michael
                                Barone? (contrastive focus, 5.32)

However, Pierrehumbert and Hirschberg's (1990) proposal that L+H* is
associated particularly with contrast does not seem to be borne out by the number of
noncontrastive topics (6) and noncontrastive foci (14) marked by this tone. Examples
of noncontrastive topics are shown in (5) and (6):

(5)   Ms. Clift: A good working-class guy may well be what Jesus was.
                           And in fact, this is discussed in a documentary that was
                           produced in England. And there they can talk about
                           these kinds of things. I think in this country we're still a
                           little nervous about suggesting that Jesus may not fit the
                           Westernized, romanticized ideal. In Britain, in fact, the
                           archbishop of **Canterbury there** has called Britain a
                           L+H*   **L+H***   **L* HH%**
                           nation of atheists. In a country of 60 million people, only
                           a million people go to church. (unratified topic, 3.9)

(6)   Mr. Barone: I used to be an editorial writer, and I'll tell you
                           something, there's a temptation to harumph when
                           you're an editorial writer – (laughter) – and I'm
                           afraid that that was the New York Times
                           harumphing.
             Mr. McLaughlin: Well, **they** could have pointed out that $20
                               L+H*
                               million given to Russia probably wound up with
                               Russian scientists, and that might keep them
                               from   making   Iranian   nuclear   bombs.
                                           (unratified topic, 5.26)

Similarly, examples of noncontrastive, plain foci marked by L+H* are shown in
(7) and (8):

(7)   Mr. McLaughlin: Well, what is – do you think that NASA has **egg**
                                on its **face?**   (plain focus, 5.29)   **L+H***
                                                                                 !H* HL%

(8)   Mr. Kudlow: I have a different view, with all respect. I think it
                                        turns this guy into a **celebrity**, and I think that
                                        L+H*LL%
                                        actually   encourages   more   of   these   heinous
                                        actions. (plain focus, 6.5)

Example (7) is about NASA's unwillingness to allow Mr. Tito to pay $20 million to
go up in the Space station. Example (8) is about the pending excecution of Timothy
McVeigh.

It is clear from Table 3 that L+H* is not significantly correlated with topic as
opposed to focus, since there are 11 contrastive foci marked by this pitch accent and
6 examples of plain foci, although the raw number of 17 foci versus 24 topics
represents a trend in this direction.   Example (4) shows an L+H*-marked contrastive
focus, and (7) and (8) show L+H*-marked plain foci. We present in figure 9 a pitch
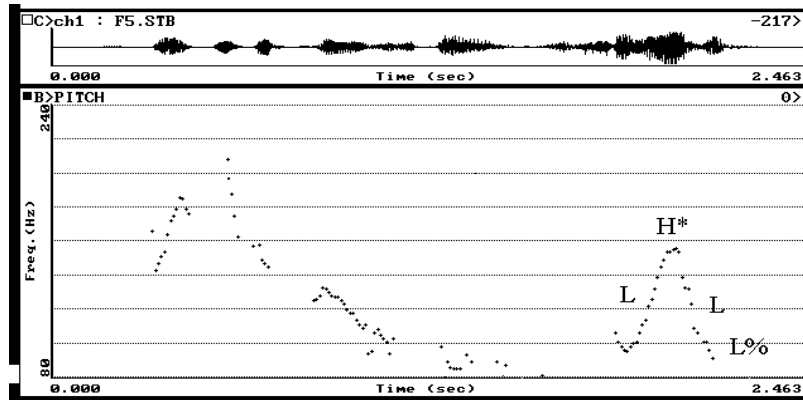track for example (8):

Figure 9. I think it turns this guy into a celebrity. (plain focus 6.5)
L+H*LL%

The Information Structure category from the literature that seems to best fit the
data concerning L+H* is Gundel's (1999) category of 'Contrastive Focus'. Her
category of 'Contrastive Focus' encompasses our 'Contrastive Topic', 'Unratified
Topic' and 'Contrastive Focus'. This composite category accounts for 83% of our
L+H* marked phrases (34 out of 41).

6.2. Which Pitch Accents Mark Information Structure Categories?

It is important to determine what pitch accent information-structure categories are
marked with if they are not marked with L+H*. Table 4 shows the distribution of
primary pitch accent relative to information structure type.

Table 4. Distribution of Pitch Accents or their Absence Relative to
Information Structure Type.

	H*	H*+L	H*+!H	L+H*	L*	L*+H	H+L*	o
Ratified Topic	10	1	0	1	4	0	0	26
Contrastive Topic	23	1	0	10	1	2	0	5
Unratified Topic	19	4	0	13	0	3	1	2
Contrastive Focus	22	1	0	11	7	0	0	1
Plain Focus	26	1	1	6	8	0	0	0
TOTAL	**100**	**8**	**1**	**41**	**20**	**5**	**1**	**34**

Except for ratified topics, which tend to be unaccented, most phrases in each information structure category are marked by H*. Except for H*+!H, we abstracted away here from high tones further marked with increased range, upstep or downstep. It is interesting that L+H* is the second most frequent pitch accent in the data, after H*. This shows that the attention to this pitch accent exhibited in the literature has not been misplaced.

Ratified topics, unsurprisingly, tend to be unaccented. 34 out of 42 ratified topics were encoded as personal pronouns. Four ratified topics were coded as L*. In the case of two of these, we were unsure as to whether they really received an L* pitch accent, or simply exhibited an unaccented rhythmic beat.

Except for the four cases of unratified topics, L* tends to mark focus, either contrastive or plain. The five cases of L*+H all mark topics. The other pitch accents, except for L+H*, do not exhibit any particular pattern.

We were especially curious about the phrases coded as contrastive focus, contrastive topic or unratified topic that did not receive the L+H* pitch accent. Is this an error of our information structure coding, or does it represent the actual prosodic marking system of English?

One interesting class of examples to check in this regard is cleft sentences, of which there were three in our data. We coded the clefted constituent in each case as a contrastive focus since the meaning of the cleft sentence involves an exhaustiveness condition on the clefted constituent. For example, in (9), it is asserted that nobody other than the Communist Chinese are behaving as a Cold War power right now; in particular not the United States. The proposition that the United States has been behaving as a Cold War power has been previously evoked.

(9)   Mr. Buchanan: What the United States should do, John, is pull the ambassador home right now. The president of the United States should say, 'I understand why Americans are boycotting Chinese goods, and I believe that if this thing is not resolved satisfactorily, it will be time to suspend PNTR for exactly one year.' It is the **Communist Chinese**
                                          ↑**H***   !**H***
        HL%

who are behaving as a Cold War power right now. (contrastive focus, 2.23)

Like the other two it-clefts, the clefted constituent here is marked by some variant of the H* pitch accent, but it is contrastive. It is interesting that the three it-clefts are the only examples in the data of a subject receiving narrow focus. All three are subject clefts.

Some narrow foci were coded as contrastive, but perhaps were not treated as contrastive by the prosodic system. For example, at the end of transcript 4, participants were asked to grade President Bush on style and substance during his first 100 days. Because there was a limited set of possible answers (the grades A, B, C, D, and F), we coded the resulting narrow focus answer as a contrastive focus. Perhaps a more refined definition of contrastive focus, one that requires the explicit ruling out of alternatives, would exclude these cases. An example is shown in (10):

(10)   Mr. McLaughlin: Yeah, what about substance?
        Ms. Clift: Substance, **C-minus**.
                           H* !H* LL% (contrastive focus, 4.25)

There nevertheless are several cases of focus phrases coded as contrastive which do rule out alternatives but are not marked L+H*. The examples shown in (11) and (12) are explicitly contrastive in this way:

(11)   Mr. Page: Thank you, I want to concur with my colleagues in saying that I think – well, actually, Tito will be remembered as a pioneer; the first space tourist. And this is the wave of the future, and NASA, like most bureaucracies, has a difficult time 'turning around in the water.' It's a **big ship**, not a speedboat.
                     H* !H* (contrastive focus 5.17)

(12)   Mr. McLaughlin: I think we've reached the end of our seminar here today. Exit question: Will the Richard Neave Jesus enure Michael Barone?
        Mr. Barone: No. This is just a guess.
        Mr. McLaughlin: Eleanor?
        Ms. Clift: I don't think so. This is a BBC documentary, not a **PBS** documentary. Republicans on Capitol Hill
                           ¡H* LL%
                           would go nuts if this ever showed on PBS. (contrastive focus 3.32.)

6.3. Can Topics be Marked H?*

It can be seen from Table 4 that topics are frequently marked with H*, contrary to predictions made in the literature that topics or at least contrastive topics should be marked L+H*. Examples of H*-marked contrastive topics are shown in (13) and (14):

(13)   Ms. Clift: And the stakes in this confrontation are huge for China. They have 54,000 students in this country. They want to

get the Olympics. They want to keep trade going.
And the **stakes** for **this country** are also huge. We
H%   H*   !H* L*
don't want to create an enemy where where there is
none.   (contrastive topic 2.8)

(14)   Mr. Page: What you call small, but which Democratic contributors
call $1,000 a lot of money. The **Republicans** have a lot
                                           H*   L
more of those kind of hard-money contributors and now
you're going to raise that limit while killing soft money.
(contrastive topic, 1.18)

In general, it seems best to conclude that contrastive topics are only sometimes
marked L+H*. The same goes for non-contrastive topics, as examples (15) and (16)
show:

(15)   Mr. McLaughlin: Can you handle that last question? Where do you
think the international community is, especially
the Third World?
         Mr. O'Donnell: The **international community** is very
                             H*   !H*
sympathetic to the Chinese. They're wondering
what are we doing with the reflexive old Cold
Ward mentality of flying these missions in the
first place. (Unratified topic, 2.15)

(16)   Mr. McLaughlin: Tony, what was his best move?
         Mr. Blankley: I think there were two. One, coming off the
Florida event, establishing his legitimacy as
president….On a policy basis, his biggest success
is taxes….
         Mr. McLaughlin: Do you see his best move as the tax cut's
tenacity?
         Mr. O'Donnell: Yes, I do. I agree with Eleanor it's not a good tax
cut, it's not a good policy; but it is an amazing
accomplishment to come from where it's come
from….
         Mr. McLaughlin: **Actually,** his **best move** was the handling of the
                             H*   !H* !H*
China spy plane. He kept his cool; he kept the
country cool, he was measured and moderate.
And it worked.   (unratified topic, 4.7)

In (15), 'the international community' expresses the topic, as it is repeated from the
question; similarly in (16), 'his best move' clearly expresses the topic. Indeed these
two phrases are so topical in their contexts that perhaps they should be considered
ratified topics. However, both are marked with H* (or !H*) instead of L+H*. We
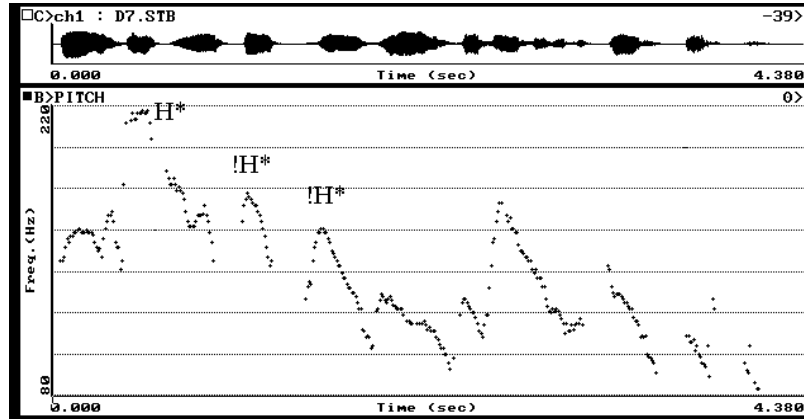present in figure 10 a pitch track for example (16):

*Figure 10. **Actually** his **best move** was the handling of the China spy plane. (4.7)*
                    H*   !H*   !H*

In our future work on this project, we will explicitly distinguish topic-comment utterances from all-comment utterances (Gundel, 1988). Some of our unratified topics and contrastive topics could have alternative codings. For example the subject in (17) was coded as a contrastive topic, but the utterance could probably have been coded as an all-comment one, so that 'Eisenhower' would be coded as part of the focus, and thus the H* which marks it would not constitute a counterexample to theories that associate H* only with foci.[2]

(17)   Mr. Buchanan: I'll just remind you of one thing. **Eisenhower**
                                                              H*   !H* HL%
                                 refused to apologize for the U-2, and even blew up a summit, and we were a lot more at fault then. (contrastive topic, 2.25)

Here the entire event of Eisenhower's refusal is being put forth as the 'new information' in the discourse. The entire clause answers the question 'What happened?' Nevertheless, we believe that the bold-faced constituents in (21)-(24) do express topics, and are marked H*, contrary to predictions in the literature.

7. INCREASED PITCH RANGE, UPSTEP, AND DOWNSTEP:

We believe that the L+H* pitch accent is a mechanism for emphatically highlighting an element relative to its context. Two other prosodic devices for emphatic highlighting are pronouncing a high-pitch tone with increased pitch range or pronouncing it with upstep. Another variation on a high pitch tone is pronouncing it with downstep relative to a previous high pitch tone. The distribution of these three alternatives to a plain high tone across information type categories is shown in Table 5.

Table 5. Distribution of Increased Range, Upstep and Downstep
Relative to Information Structure Type

	range ↑H	upstep ¡H	downstep !H
Ratified Topic	0	0	3
Contrastive Topic	4	0	15
Unratified Topic	5	0	16
Contrastive Focus	5	4	12
Plain Focus	3	5	12
TOTAL	**17**	**9**	**58**

It is clear from the table that downstep is distributed across the four substantive information structure categories approximately equally, as is increased range. Upstep, however, seems to mark focus, either contrastive or plain, although the data are few. It might be worth following up on this latter tentative conclusion in a more detailed study.

8. BOUNDARY TONES

Some of the claims and suggestions in the literature concerning topic and focus accents have involved boundary tones. For example, Lambrecht and Michaelis (1998) suggest in a footnote that H% might mark topic and L% mark focus. Table 6 shows the distribution in our data of intermediate phrase + boundary tone relative to information structure type.

Table 6. Distribution of Phrase Accents and Boundary Tones
Relative to Information Structure Types

	Fall	Level	Rise	Rise from Bottom	
	LL%	**HL%**	**HH%**	**LH%**	**TOTAL**
Ratified Topic	2	0	0	0	**2**
Contrastive Topic	7	4	1	1	**13**
Unratified Topic	12	2	6	0	**20**
Contrastive Focus	29	1	4	5	**39**
Plain Focus	26	4	4	5	**39**
TOTAL	**76**	**11**	**15**	**11**	**113**

It can be seen from Table 6 that LL% is associated primarily with foci, whether contrastive or plain, and foci are most likely to be marked by this boundary tone. It is not surprising that foci as opposed to topics are marked by LL% since this sequence tends to come at the end of the sentence, and topics tend to precede foci in the sentences of the data.

Some non-final topics are, nonetheless, marked by LL%, as shown in example (18):

(18)   Mr. Barone: … we're going to reconsider this decision that Clinton made that would apply in six years from now, or 2006. So nobody's putting any extra arsenic in the water, but **Bush** has given the Democrats a good talking point.
H*LL%   (Unratified topic, 4.8)

There were three wh-questions and four yes-no questions that ended in phrases we examined. Interestingly none of them received H% boundary tones. Two wh-questions and two yes-no questions ended in LL%, and one wh-question and two yes-no questions ended in HL%. The one alternative question in our data did end in LH%, see example (4).

8.1. Does H% mark topic?

Lambrecht and Michaelis's (1998) hypothesis, in particular, is not borne out by the data. Table 7 shows that three quarters of both topics and foci are marked by L%, so there is no difference between them in this regard.

Table 7. Boundary Tones Relative to Topic and Focus.

	L%	H%	TOTAL
Topic	27 (75%)	8 (25%)	**35**
Focus	60 (77%)	18 (23%)	**78**
TOTAL	**87**	**26**	**113**

9. ENTIRE TUNES

Finally, Pierrehumbert (1980) and Steedman (1991) proposed that topics are associated with entire tunes, H*LH% and L+H*LH%, respectively. Let us first look at H*LH%.

9.1 Does H* LH% mark topic?

As Table 8 shows, there are perhaps surprisingly only four examples of H*LH% in our data.

Table 8. H*LH% Tune Relative to Information Structure Type

	H*LH%
Plain Focus	4

All four of these mark plain focus, and all seem to mark continuation. For example (19) is a rejection of a previous participant's contribution. It is continued with a correction:

(19)   Mr. McLaughlin: Lawrence and ah two other members are correct. His style rating is probably a B, but your analysis

of how much he should be doing in the first 100 days is **absurd**. He's taking one piece at a time
                              H* LH%
and he's being very successful. He gets an A on substance. (plain focus, 4.35)

9.2. Does L+H* LH% mark topic?

Steedman's (1991) hypothesis that the L+H*LH% tune is associated with topics in particular is also not borne out by the data. Although the data are few, Table 9 shows that the distribution of L+H*LH% primarily targets contrastive foci, instead of topics.

Table 9. L+H*LH% Tune Relative to Information Structure Type

	L+H*LH%
Contrastive Topic	1
Contrastive Focus	5
Plain Focus	1

It is interesting that the function of four out of five of the contrastive foci examples of this tune are contradictions. See, for instance, examples (20) and (21):

(20)   Ms. Clift: 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**.
                                         L+H* LH%
         (contrastive focus, 3. 5)

(21)   Mr. McLaughlin: Well, he's been a successful politician, and he's been a successful statesman, has he not?
         Mr. O'Donnell: 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**.
                                         L+H* LH%
         (contrastive focus, 4.20)

The speaker in (20) is contradicting the proposition expressed by other participants that the likeness of Jesus being discussed is unattractive. The speaker in (21) is contradicting the proposition evoked by other participants that Bush's 63% approval rating after his first 100 days was due to his behaving in an extraordinary fashion, in particular with regard to his handling of the Chinese fighter plane crisis.[3] We present in figure 11 a pitch track for example (21):
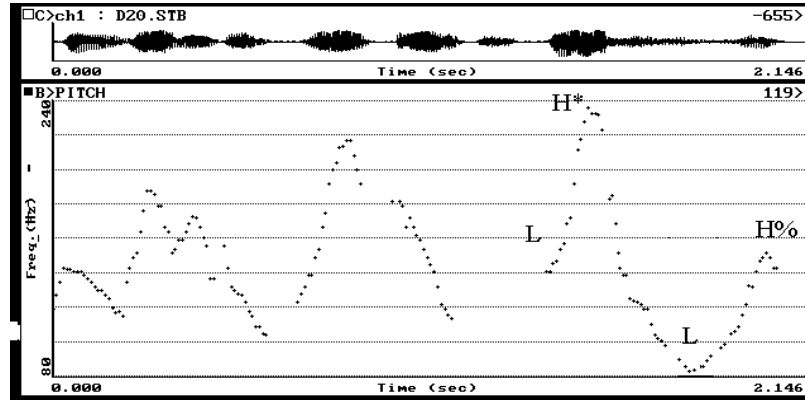
*Figure 11. He hasn't done any ex**trao**rdinary. (contrastive focus, 4.20)*
L+H*LH%

In future work on this project, we intend to correlate information structure with entire tunes, i.e. full intonational phrases with specific combinations of heads and nuclei, according to the sentence type.

10. CONCLUSION

We conclude that while there are systematic correlations between intonation and information structure categories, these correlations are not as straightforward as is suggested in the literature. In particular we deny that there is any prosodic category as distinctive as a 'topic accent' as opposed to a 'focus accent.'

With regard to L+H*, we found that it falls on contrastive topics and unratified topics and contrastive foci 24-31% of the time and on plain foci 14% of the time. It doesn't just fall on topics. L+H* occurred in 41 of our analyzed phrases, or approximately 20%,which is a significant number. This shows that this accent deserves the reputation it has received in the literature.

Minor conclusions, given the relative lack of data, are that L* tends to mark focus and that L*+H tends to mark topic. Upstep also seems to mark focus, although again the data are few.

Except for ratified topics which tend to be unaccented, all information structure categories were extensively marked with H*, including unratified and contrastive topics. The fact that pitch accents with some kind of H* occur six times more often than L* (150 versus 26) shows that American English is an H* language, as opposed to other languages such as Spanish in which L* predominates, at least in prenuclear positions (Sosa, 1999).

Finally, given the fact that our results mitigate the conclusions assumed in the literature, it is clear that investigations into intonation should be carried out on naturally-occurring spontaneous dialogue as well as on constructed examples and experimentally induced speech.

11. NOTES

[1] For the contour in figure 2 the ToBI Guidelines would prescribe a notation H* L+H*. The reason for which we decided to use the H*+L is that the salient fall is completely realized during the word 'thirty'. The point here is that there is an important descent during this word, not that there is a rise for H* on the word 'years'.

[2] We thank Jeanette Gundel for pointing out this general problem to us.

[3] In (20) and (21), it has been suggested to us by Mark Steedman and Chungmin Lee that an alternative information structure analysis would treat the marked phrase as topic. Note that this alternative analysis can be justified by the 'as for' test as follows: 'As for whether he is unattractive, I don't find him so' and 'As for whether he has done anything extraordinary, he hasn't.' The point here is that the questions of whether or not the Christ image is attractive and whether or not Bush has done something extraordinary are relevant in their contexts and to some extent are already under discussion. Büring (2000) would also analyze the accents in (20) and (21) as contrastive topic accents since (20) and (21) can be seen as answers to implied subquestions in the discourse, e.g. (21) in the context of the explicit question 'Has Bush been a successful politician?' negatively answers the subquestion 'Has he done anything extraordinary?'.

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