

PHONETIC CORRELATES OF THE 'NEW/GIVEN' PARAMETER

MERLE HORNE

Dept. of Linguistics, U. of Lund
Helgonabacken 12, S-223 62 Lund

ABSTRACT

Production data from American and British English speakers are examined to see whether the discourse parameter 'new/given' has phonetic correlates as regards accentual patterning in initial subject constituents. The results show no significant difference for the American speakers. For the British English speakers, however, it was observed that differences in Fo register width in the H* tone as well as the use of categorically different tonal patterns correlate with the discourse parameter 'new/given'.

1. BACKGROUND

In a previous study [3], we made a preliminary investigation to ascertain whether British and American speakers use intonation to distinguish between sentence-initial subjects which are contextually 'new' (brand new) versus those which are contextually 'given' (i.e., mentioned previously). In a related study, Eady et al. [2] measured Fo peak height and found no significant difference in this parameter for a group of American English speakers. In our study, we decided to measure in addition Fo register width on the subject, since it is known that differences in the size of an Fo obtrusion can lead to perceptually significant differences in prominence levels [4]. Results of our study indicated that, for both dialects, speakers do not make any distinction as regards Fo peak height on the stressed vowel (this result is in agreement with Eady et al. [2]). As regards register width on the tested word, however, it was found that the British, but not American speakers tested used this parameter to distinguish between new and given, with new information being assigned a wider register than given. That is to say, significant variations in the H*(igh) L(ow) tonal contour on the head

word of the subject phrase were used to distinguish between contextually new vs given information. However, the data presented there were very limited (subject constituents containing one lexical word with one accentable syllable (*man*, *Mormon*) as well as the structurally ambiguous *young man* (compound or phrase?). Since there was for the most part only one accentable syllable present in the data, the speakers were very restricted in their choice of tonal contours for the subject constituent. This is because an accented syllable ('nucleus' [1] (which is normally H* in the dialects studied) is necessary somewhere in the intonational phrase ('tone unit') if it is to be well-formed. Thus, it is not possible to delete the accent (H* tone) on the subject if it is the only accent in the intonational phrase even if it is contextually given. Consequently, varying register width within a tonal category is a possible strategy for creating linguistic distinctions using prosodic parameters. For the present study, therefore, we decided to examine an additional number of cases with more than one lexical word and consequently more than one accentable syllable to ascertain if speakers use the same or different strategies in handling these more complex cases. With more than two accentable syllables, e.g. *new miller*, one could expect that in the 'given' cases, either the speaker could narrow the H*L tonal contour register as the British English speakers did in the previous study, or even use a different Fo contour (e.g. delete the accent on *miller*, provided an accent on *new* was realized in order to make the intonational phrase well-formed).

2. DATA AND SUBJECTS

The data in (1) were used in the investigation. Four speakers participated

in the experiment (2 American English, one male (Kansas) and one female (Louisiana), and 2 British English, both female (one from N.E. England and one from N.W. England). All but the speaker from N.W. England had participated in the previous experiment and all but this subject have some degree of linguistic and/or phonetic background. The sentence pairs were typed on cards and were presented in random order along with 10 other filler sentences used in other experiments. The heads of the subject constituents in the final sentence of each sentence pair constituted the material to be investigated in detail, i.e. *miller*, *milliner*, *millionaire*, *Milan* and *Milwaukee*. The test words were also recorded in sentences where they functioned as subjects of embedded clauses, but, at the present time, these cases have not been analysed.

(1) (a) According to the farmers, there is a shortage of workers. *A new miller* will be very welcome.

(b) According to rumours, there will soon be a new miller. *The new miller* will be very welcome.

(2)(a) According to the merchants, there is a shortage of shops. *A new milliner* will be very welcome.

(b) According to rumours, there will soon be a new milliner. *The new milliner* will be very welcome.

(3)(a) According to the bankers, there is a shortage of investors. *A new millionaire* will be very welcome.

(b) According to rumours, there will soon be a new millionaire. *The new millionaire* will be very welcome.

(4)(a) According to reports, there is a need for a new tourist attraction. *A new Milan* will be very welcome.

(b) According to reports, a new Milan will be needed in the future. *The new Milan* will be very welcome.

(5)(a) According to the dope dealers, there is a shortage of marijuana in the East. *The marijuana in Milwaukee* is wanted in Washington.

(b) The gangsters in Milwaukee have just got a message from the East. *The marijuana in Milwaukee* is wanted in Washington.

Notice that in (5), it is just the phrase-final lexical item, and not the whole phrase, which is either given or new as is the case in the other test sentences.

3. ANALYSIS PROCEDURE

The sentence pairs in (1) were read four times and recorded in the sound studio at the Dept. of Linguistics, U. of Lund. This resulted in 5 test words x 2 parameters (new/given) x 4 speakers x 4 readings = 160 target sentences. Acoustic analysis of the final sentence in each of the pairs was performed using Lund University Prosodic Parser, a program developed by Lars Eriksson and implemented on a Macintosh II computer. The speech was first digitized at a sampling rate of 10 kHz. Examination of the Fo contours revealed that the speakers did not always use the same tonal pattern. In the majority of cases, the lexically stressed syllable of the subject head bore a H* tone as in our previous study. However, in a number of the 'given' cases, the British English speakers produced another pattern, with a falling or L(ow) tone on the stressed syllable of the phrasal head. These categorically different cases were not analyzed together with the H* tone data. The results, which are thus based on between 2 and 4 readings, are presented below. The following measurements were made: a) Fo peak (highest Fo value) in the lexically stressed syllable of the phrase-final lexical word, and b) the size of the Fo register on this word, i.e. the distance between the Fo peak and the bottom of the fall (L) after the final H* on the subject.

4. RESULTS

Results are presented below in Table 1.

Table 1. Means, standard deviations and ratios ('new/given') for four speakers. Test words are printed in bold type.

	Fo Peak (Hz)		Fo Register (Hz)	
	NEW GIVEN		NEW GIVEN	
<i>Am.Male Miller</i>				
\bar{x}	167	178	63	73
s	6.1	7.4	6.1	8.8
Ratio	0.94		0.86	
<i>Milliner</i>				
\bar{x}	166	178	67	75
s	13.0	12.0	10.0	8.0
Ratio	0.93		0.89	

	Fo Peak (Hz)	Fo Register (Hz)		Fo Peak (Hz)	Fo Register (Hz)
	NEW	GIVEN		NEW	GIVEN
Milan					
\bar{x}	154	154	58	52	
s	4.4	11.1	2.8	6.7	
Ratio	1.00		1.11		
Millionaire					
\bar{x}	175	166	84	74	
s	5.1	4.3	4.4	3.3	
Ratio	1.05		1.13		
Milwaukee					
\bar{x}	163	150	65	55	
s	8.2	5.7	5.6	4.6	
Ratio	1.09		1.18		
American Female					
Miller					
\bar{x}	246	250	64	63	
s	6.8	8.8	8.3	5.5	
Ratio	0.99		1.02		
Milliner					
\bar{x}	249	244	65	62	
s	7.4	4.6	6.9	4.1	
Ratio	1.02		1.04		
AE					
\bar{x}	245	242	64	55	
s	4.3	14.8	5.0	14.8	
Ratio	1.00		1.16		
Millionaire					
\bar{x}	254	252	78	76	
s	5.2	7.7	6.9	3.4	
Ratio	1.00		1.02		
Milwaukee					
\bar{x}	256	243	72	66	
s	4.5	2.4	3.7	10.5	
Ratio	1.05		1.09		
British (NE)					
Miller					
\bar{x}	249	246	65	54	
s	5.6	19.2	11.8	20.3	
Ratio	1.01		1.20		
Milliner					
\bar{x}	257	259	66	71	
s	4.7	17.2	1.9	15.0	
R	0.99		0.92		
Milan					
\bar{x}	260	237	66	40	
s	10.5	2.1	13.5	0.7	
Ratio	1.09		1.65		
Millionaire					
\bar{x}	251	243	64	48	
s	2.6	11.3	8.3	12.0	
Ratio	1.03		1.33		

Fo Peak
(Hz)
NEW GIVEN

	Fo Peak (Hz)	Fo Register (Hz)
	NEW	GIVEN
Milwaukee		
\bar{x}	259	258
s	14.9	17.6
Ratio	1.00	

	Fo Peak (Hz)	Fo Register (Hz)
	NEW	GIVEN
British (NW)		
Miller		
\bar{x}	284	253
s	9.5	1.6
Ratio	1.12	
Milliner		
\bar{x}	322	257
s	29.1	27.0
Ratio	1.25	
Milan		
\bar{x}	234	226
s	0	17.0
Ratio	1.03	

	Fo Peak (Hz)	Fo Register (Hz)
	NEW	GIVEN
Millionaire		
\bar{x}	322	257
s	29.1	27.0
Ratio	1.25	

	Fo Peak (Hz)	Fo Register (Hz)
	NEW	GIVEN
Milwaukee		
\bar{x}	234	226
s	0	17.0
Ratio	1.03	

	Fo Peak (Hz)	Fo Register (Hz)
	NEW	GIVEN
Millionaire		
\bar{x}	234	No H*
s	6.3	data
Ratio	1.03	

	Fo Peak (Hz)	Fo Register (Hz)
	NEW	GIVEN
Milwaukee		
\bar{x}	259	212
s	18.7	12.5
Ratio	1.22	

In Table 2 are presented the average ratios (New/Given) for each speaker:

	Fo Peak	Fo Register
Am. Male	1.00	1.03
Am. Female	1.02	1.06
Br. N.E.	1.02	1.26
Br. N.W.	1.15	1.42

These results show that, as in the previous study, the American speakers do not differentiate between the categories given and new as far as peak height and register width are concerned. The biggest difference in register width, 1.18, corresponds to 1.1 semitones which is not perceptually distinctive (excursion size differences of 1.5 semitones have been found to cause a difference in the perception of prominence [4]). Even the British (NE) speaker does not in this study show any convincing variation of register width as was the case in the previous study, where a ratio of 1.54 (corresponding to about 6 ST) was obtained. The present mean ratio, 1.26,

corresponds to an actual difference of around 18 Hz, or 0.8 ST which is not sufficient to create any perceptual difference between new and given cases. However, in 25% of the given cases here, the speaker actually used a categorically different tonal pattern, 'deaccenting' the subject head (see Fig 2). This suggests that the speaker does have the option of distinguishing prosodically between the two discourse categories. The speaker from NW England, however, presents more convincing results; a mean 'new' vs 'given' ratio of 1.42 in register width corresponds to an actual difference of about 35 Hz or 2.44 ST, a difference which can be assumed to be perceptually distinct. This speaker, furthermore, used a categorically distinct tone in 35% of the 'given' cases, i.e. without a H* on the stressed syllable of the subject head.

5. CONCLUSION

The data presented here indicate that the discourse parameter 'new/given' can, but does not necessarily have prosodic correlates. The American speakers studied show no difference on this parameter. With respect to the difference in register width of the H* tone, it was seen, however, that one of the two British

English speakers used perceptually significant differences between 'new' and 'given' as regards this correlate. Moreover, in 30% of the given cases, categorically different tonal patterns with respect to those produced in the 'new' cases were produced by the Br. English speakers.

6. REFERENCES

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- [4] RIETVELD, A.C.M. & GUSSENHOVEN, C. (1985), "On the relation between pitch excursion size and prominence", *Journal of phonetics* 13, 299-308.

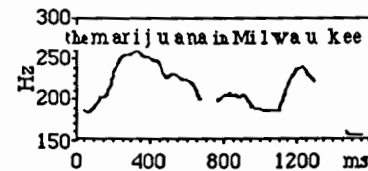


Fig. 1a. Fo contour produced by Br. Eng. (NW) speaker for *Milwaukee* 'new'.

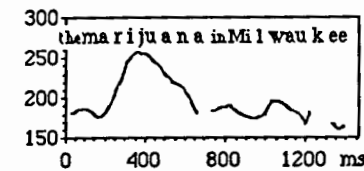


Fig. 1b. Fo contour produced by Br. Eng. (NW) speaker for *Milwaukee* 'given'.

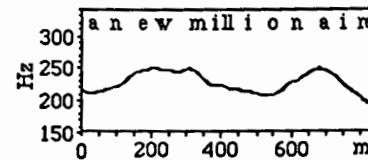


Fig. 2a. Fo contour produced by Br. (NE) speaker for *millionaire* 'new'.

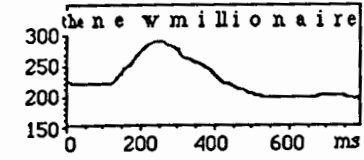


Fig. 2b. Fo contour produced by Br. (NE) speaker for *millionaire* 'given'.