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PHONETIC CORRELATES OF THE 'NEW/GIVEN' PARAMETER

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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*(F₀) 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)
<i>Am-Male</i>		
<i>Miller</i>	167 178	63 73
<i>s</i>	6.1 7.4	6.1 8.8
Ratio	0.94	0.86
<i>Milliner</i>		
<i>s</i>	166 178	67 75
Ratio	13.0 12.0	10.0 8.0
Ratio	0.93	0.89

Fo Peak (Hz) Fo Register (Hz)
NEW GIVEN NEW GIVEN

Milian
x 154 154 58 52
s 4.4 11.1 2.8 6.7
Ratio 1.00 1.11

Millionaire
x 175 166 84 74
s 5.1 4.3 4.4 3.3
Ratio 1.05 1.13

Milwaukee
x 163 150 65 55
s 8.2 5.7 5.6 4.6
Ratio 1.09 1.18

American Female
x 246 250 64 63
s 6.8 8.8 8.3 5.5
Ratio 0.99 1.02

AE
x 249 244 65 62
s 7.4 4.6 6.9 4.1
Ratio 1.02 1.04

Milian
x 245 242 64 55
s 4.3 14.8 5.0 14.8
Ratio 1.00 1.16

Millionaire
x 254 252 78 76
s 5.2 7.7 6.9 3.4
Ratio 1.00 1.02

Milwaukee
x 256 243 72 66
s 4.5 2.4 3.7 10.5
Ratio 1.05 1.09

British (NE)
x 249 246 65 54
s 5.6 19.2 11.8 20.3
Ratio 1.01 1.20

Milliner
x 257 259 66 71
s 4.7 17.2 1.9 15.0
Ratio 0.99 0.92

Milian
x 260 237 66 40
s 10.5 2.1 13.5 0.7
Ratio 1.09 1.65

Millionaire
x 251 243 64 48
s 2.6 11.3 8.3 12.0
Ratio 1.03 1.33

Fo Peak (Hz) Fo Register (Hz)
NEW GIVEN NEW GIVEN

Milwaukee
x 259 258 84 72
s 14.9 17.6 17.8 12.7
Ratio 1.00 1.16

British (NW)
x 284 253 121 97
s 9.5 1.6 9.4 5.5
Ratio 1.12 1.24

Milliner
x 322 257 165 108
s 29.1 27.0 40.0 22.3
Ratio 1.25 1.52

Milian
x 234 226 83 69
s 0 17.0 1.4 5.0
Ratio 1.03 1.20

Millionaire
x 234 No H* 81 No H*
s 6.3 data 8.4 data
Ratio 1.03 1.20

Milwaukee
x 259 212 103 58
s 18.7 12.5 22.6 6.1
Ratio 1.22 1.78

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. NE	1.02	1.26
Br. NW	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, 'decenting' the subject head (see Fig 2). This suggests that the speaker does have the option of distinguishing categorically 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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Fig. 1a. Fo contour produced by Br. Eng. (NW) speaker for Milwaakee 'new'.

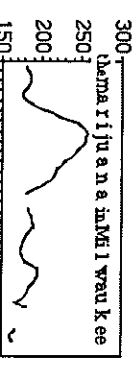


Fig. 1b. Fo contour produced by Br. Eng. (NW) speaker for Milwaakee 'given'.

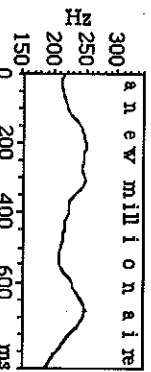


Fig. 2a. Fo contour produced by Br. (NE) speaker for millionaire 'new'.

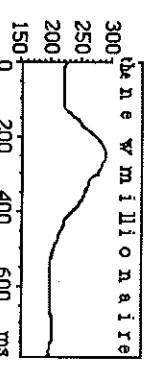


Fig. 2b. Fo contour produced by Br. (NE) speaker for millionaire 'given'.