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The British English rising contour: an exception in read speech?

Sophie Herment, Anne Tortel, Laetitia Leonarduzzi

Aix Marseille Univ, Laboratoire Parole et Langage, CNRS UMR 7309, Aix-en-Provence, France
sophie.herment@univ-amu.fr, anne.tortel@univ-amu.fr, laetitia.leonarduzzi@univ-amu.fr

Abstract

This paper focuses on rising contours in English read speech. Our hypothesis is that they are very few in this particular speech style. This is confirmed by quantitative and qualitative analyses, conducted on a corpus of read speech by native English speakers with a standard British English accent. The main result of the quantitative analyses is that out of 1076 tone units, 82% (whether final or not) are uttered with a falling contour, which is much more than could be expected. The qualitative analyses consisted in a thorough examination of the intonation contours in relation with the syntactic characteristics of our data, as well as an analysis of the pragmatic functions of the contours. They allow us to revisit the generally accepted idea that falling contours are associated with final statements and rises with yes-no questions and continuation. We show that the tonal sequence fall plus fall is by far the most common in read speech, whatever the syntactic structure, except for enumerations. Contrary to what is stated in the literature, the main function of rising contours is not to indicate non-finality and continuation, but rather to convey attitudes, at least in read speech.

Index Terms: British English intonation, read speech, rising contours, non-finality, tonal sequences.

1. Introduction

In this paper we focus on a particular speaking style, read speech, and on rising intonations. For this purpose, two parallel corpora were analysed: the English corpus [1] and the AixOx corpus [2]. They were both firstly recorded for other studies on the acquisition of English L2 by French learners. The first one is a collection of read speech, repeated sentences and monologues recorded by 20 native English speakers and 40 French learners of English divided into two groups (beginners and advanced). The second one gathers recordings of read speech only, by 10 native French and native English speakers and 20 French and 20 English learners, also divided in two groups. The read speech in English consists in 4 texts of the Eurom 1 [3] English corpus, while the 40 texts of Eurom 1 are recorded in AixOx, in French and in English. When we listened to the recordings of the British English natives so as to make comparisons with the learners, we noticed an amazingly high proportion of falling contours in the read speech. We decided to analyse this speech style in order to extract the proportion of rising and falling tones, and to determine where rises and falls occur and why. The present study therefore examines the speech of native English speakers (see 3.1). Our hypothesis is that incomplete statements (non-final tone units), usually described as displaying a non-fall contour, can be and frequently are pronounced with a falling tone in read speech contrary to what is generally admitted.

First, we introduce our theoretical framework and give a quick overview of what the literature reports on rising and falling tones and incomplete statements. We clarify this concept of ‘incomplete statement’, using that of dependency. The intonation of dependent and independent units are then analysed in our corpora and the results discussed in the light of syntax and attitudinal functions.

2. Theoretical framework

Various systems describing English intonation were developed but took different paths in Europe and North America. The British descriptions of intonation are based on a configurational approach using the tone unit as the main constituent and defined as a complete coherent intonation contour. A tone unit comprises at least one syllable, necessarily the nuclear syllable (or nucleus). The melodic movement starts on the nucleus and spreads on the post-nuclear syllables, if any. Pre-nuclear syllables form the head of the tone unit (see [4] or [5] for details). Fall, rise, rise-fall and fall-rise are the melodic movements commonly used to describe intonation in the British tradition (with a few variants according to authors). While the British intonation system refers to the form of the global contour, the American description system (see [6]) defines tonal targets to describe melodic accents. In this paper, we will stick to the British tradition (following amongst others [7], [8] and [9]) and we will focus on Standard British English (henceforth SBE).

2.1. Basic functions of intonation contours

Basic functions of intonation contours have largely been described for SBE. Falling contours are usually associated with the idea of finality and completeness whereas rises are associated with continuity. For questions, falls are typically found in WH-questions whereas yes-no questions are usually pronounced with a rise ([9], even though this has been questioned by [10]).

As for complex contours, fall-rises can have different functions. They can be associated with continuity (along with simple rises) as in initial adverbial phrases for example. Fall-rises can also be associated with some implication (“implicational fall-rise”): “the speaker implies something without necessarily putting it into words” ([9:27]). Fall-rises can also be used to express a contrast ([8][11]) or to draw attention on what is being said ([12][5]). Rise-falls are less common in SBE and they can express surprise or irony ([13]).

To sum up, according to [9], non-finality is signalled by a non-fall, *i.e.* a rise or a fall-rise. [14:291] also reports that rises and fall-rises are more frequently used to indicate that a sentence is not finished, especially in reading.

2.2. Urban Northern British intonation and HRT

It is to be noted that what is described above is true for SBE, but that some varieties of English display a rising terminal intonation known as Urban Northern British Intonation (UNBI varieties). A rising terminal intonation is the default intonation for complete sentences in Northern urban areas: Belfast ([15]), Derry ([16]), Glasgow ([17][18]), Newcastle ([19]), Liverpool ([20]), Manchester ([21]), Leeds ([22]) and Birmingham ([23]). This rising intonation heard at the end of sentences and also in WH-questions for example, is part of the intonation system for Northern speakers.

Another type of rising intonation which differs from SBE is referred to as high rising terminals (HRTs, also known as ‘uptalk’, see [24]). This rising intonation is used where a fall would be expected, that is at the end of declarative sentences, exactly as in UNBI. Unlike UNBI though, it is not systematic. HRT/Uptalk is documented mainly in Australia, New Zealand and North America. However, it is spreading quickly in Great Britain, even in UNBI varieties ([25]). HRT results in a choice from the speaker (see [26][23][27][28]). It is therefore often referred to as a stylistic use, which has pragmatic purposes. It can express linguistic insecurity or incorporate the idea of a question such as “are you following me”, “Do you see what I mean?” ([29]).

2.3. Rising contours and speaking styles

Finally, it is known that intonation will vary according to speaking styles. In their study of cleft sentences on the ICE-GB corpus ([30]), [31] remark that rising contours are much less frequent in Parliament recordings: speakers have a certain speaking time, they will not be interrupted so they do not have to utter rising contours in order to keep their speech turn. On the contrary, in spontaneous conversations, the speaker will tend to use rising contours until they have finished speaking and are ready to give up their speech turn. Rising contours with pragmatic functions (HRTs, see 2.2) will also be more frequent in conversations. Hesitations are more common in non-prepared speech and will often trigger a rising contour. In a very peculiar speaking style like sports commentaries (a football game or a horse race for example), the journalist tends to use a lot of rising contours because they do not know what is going to happen. These rising contours allow the commentator to raise the suspense ([32]). Finally, in reading, a canonical intonation is expected, that is a rising contour on non-final clauses and a falling contour on final clauses.

3. Analysis of read speech

In order to test our hypothesis that rising contours are not that common on non-final tone units in reading style, we analysed two corpora of read speech by native British English speakers.

3.1. Data

We used the recordings of Eurom 1 texts from English and AixOx (see introduction). We analysed the native speakers (who are not professional readers). We selected 10 native English female speakers reading 4 texts from English, and 10 speakers (5 females and 5 males) reading 7 texts from AixOx, so that we have 11 different texts (the Eurom 1 texts are short 5-sentence texts). All the speakers have an SBE accent, which is an important piece of information as far as rises are concerned (see 2.2). In total, we analysed 110 texts of an average 17 seconds, which represents about 30 mns of speech.

3.2. Perception analysis

A perception analysis was performed so as to divide the speech of the readers into tone units. The total number of tone units analysed amounts to 1071. Final and non-final tone units were annotated following [33][34]’s tri-tonal approach: fall (F), rise (R) and fall-rise (FR) are distinguished. The theoretical framework is the British school of intonation. Below is an example of the first lines of an annotated text (English T01). The text is divided into tone units (the boundaries are represented by the slashes), the nuclear syllables are underlined and the tone given (∨ for a fall, ↑ for a rise and ∨↑ for a fall-rise) as read by English native speaker F03.

I’ve always found it difficult to ∨ sleep / on long train journeys in ∨ Britain. / For ∨ one thing, / I can never make myself comfortable in the ∨ seats. / Then the other ∨ passengers / usually talk so ∨ loudly, / or worse still they ∨ snore.

3.3. Acoustic analysis

The perceptive analysis was confronted with the acoustic signal using the PRAAT software ([35]), as shown in figure 1.

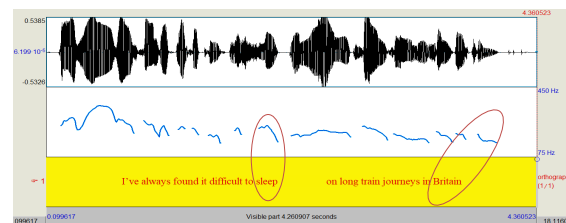


Figure 1: English, Text T01, speaker F03

4. Results and discussion

4.1. Quantitative analysis

4.1.1. Tonal distribution in the corpus

The results for the reading task recorded by native English speakers show that the most common tone (for all types of tone units) is the falling tone, with 82%, followed by rises and fall-rises, reaching 9% each (Figure 2, top right).

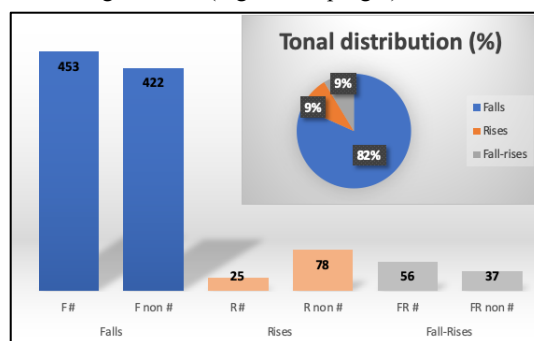


Figure 2: tonal distribution in the corpus (top right) and number of final (#) and non-final (non #) falls, rises and fall-rises (out of 1071 tone units).

Concerning non-final tone units (symbolized by ‘non #’ in Figure 2), out of 537 tone units, 78.5% are produced with a fall. Contrary to what is generally admitted, the rising tone is far from being the most common contour for incomplete statements as only 14.5% were found and 7% were falling-

rising tones, which amounts to only 21.5% if we add both types of rises.

As far as final tone units ('#') are concerned (534 tone units), the most common tone is the fall with 85%, followed by 10.5% of fall-rises and 4.5% of rises.

The results are indisputable: falls overwhelmingly dominate read speech.

4.1.2. Results per speaker

Table 1 and Figure 3 show the results per speaker respectively in the AixOx corpus (5 females and 5 males reading the same 7 texts) and in the English corpus (10 females reading the same 4 texts).

Table 1: Number of tones pronounced by each speaker of AixOx for 7 texts.

	F#	F non#	R#	R non#	FR#	FRnon#
F1	30	37	1	1	4	1
F2	31	31	0	1	3	2
F3	32	26	1	8	2	2
F4	30	31	0	4	4	3
F5	31	28	0	5	3	1
M1	29	28	0	7	4	3
M2	32	37	1	4	1	1
M3	31	36	1	2	2	1
M4	30	25	1	7	3	3
M5	31	30	0	4	3	1

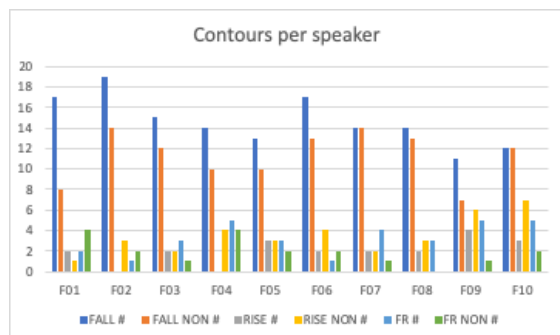


Figure 3: Number of tones pronounced by each speaker for the 4 texts of English.

The high number of falling tones, whether the tone unit is final or not, is clearly not gender related (see Table 1, where the speakers F are females and M are males), nor is it speaker-dependent: even if 4 speakers in AixOx (F3, F5, M1, M4, figures in bold in Table 1) and 2 in English (F09 and F10) pronounce more rising tones on non-final units (and therefore fewer falls) than the other speakers, they still pronounce many more falls than rises. As for English speaker F01, she pronounces very few non-final rises and prefers fall-rises but the number of non-final falls remains very high.

4.2. Qualitative analysis: syntax and attitudinal functions

Read speech is characterised by falling contours: once this general trend is stated, it is interesting to conduct a qualitative analysis of the corpus, so as to take a closer look at the types of sentences, clauses and phrases, and see how the tones are distributed in relation with syntax and attitudinal functions As

mentioned above, non-finality is supposed to be signalled by a non-fall (whether in read or non-read speech). If we go into more details, [8:103] describes 2 main tonal sequences in which a rise (either a simple rise or a fall-rise) is involved:

- R/F: the rise “typically occurs on an adverbial, or a noun-phrase subject, or on a subordinate or coordinate clause”.
- F/R: the rise “typically occurs on an adverbial or on a tag-question of the reversed polarity kind where the listener is given considerable latitude to disagree”.

[8] mentions a third common sequence, fall plus fall, with reverse polarity where speaker is demanding agreement and with a reinforcing adverbial.

The notion of dependency is crucial here. An independent element is an independent clause, or a main clause in a complex sentence, or the last clause in compound sentences. The elements which are not complete in themselves are dependent on some other structure. According to [9:70] “the typical patterns are

- Fall-rise plus fall, for the order dependent-independent, and
- Fall plus rise for the order independent-dependent”.

In other words, a fall is found on the main part of the utterance, and a non-fall on the subordinate or dependent part, whether final or initial (as in adverbials in trailing position). The sequence fall plus fall is also commonly found: the information is presented as two separate and potentially complete items, as is often the case with coordinate clauses, related by *and*, *but* and *or*.

Is this true in our data? The advantage of analysing read speech is that the punctuation gives the syntactic structure. In the rest of the paper we focus on sentences which are divided into several tone units (2 or more) by the speakers. We examined the sequences of tones. Each passage (11 in total) is read by 10 speakers. The division into tone units can be different among the speakers, but there is not much variation.

4.2.1. Tonal sequences and syntax

The first type of clauses analysed is coordinate clauses. When introduced by *and*, *but* and *or*, coordinate clauses in our data are separated from the preceding clause by a tone unit boundary and both clauses are uttered on a falling tone. The tonal sequence in coordinate clauses is fall plus fall (F/F) for 76 occurrences out of 80 (95%); the remaining 4 sequences are rises (or fall-rise for 1 speaker) plus fall. This corroborates the literature, since coordinate clauses are independent elements. A few examples are given hereafter. The tone boundary is symbolized by a slash, and the sequence of tones given. The number before the sequence indicates the number of speakers who used it (out of 10). The nuclear syllable is underlined or given in brackets after the tone when there is variation.

... to the Far East for a holiday | and she needs... 10 F/F
His flight's not leaving until 7.50 | but he has to... 10F/F

Subordinate clauses, when forming separate tone units, also mainly display with the main clause the tonal sequence F/F, whatever the position inside the sentence, which goes against what the literature reports, since subordinate clauses are dependent elements (or minor declaratives) and are usually in the rising group. Out of 58 tone units on subordinate clauses, 48 display a falling contour (which follows the general 82% trend), 9 a rise and 1 a fall-rise. We shall come back on the 9 examples of rises, but we may say for the time being that subordinate clauses do not necessarily trigger rising patterns. In our data we

find a clause introduced by *because* (in final position) and one by *although* (in initial position), infinitive clauses, and *if*-clauses (in the examples below, when the tone boundary and the tonal sequence are in brackets, it means that only the given number of speakers divided the clause into 2 tone units):

... to trace him | *because he sounded desperate* 10F/F
Although the All Blacks ... very well | *they lost 23-6* 9F/F, 1R/F
 ... had to go to the doctor's | *to have some injections* 10F/F
I've always found it difficult (|) *to sleep*... (1F/R, 1F/FR, 2F/F)
Perhaps she'll calm down (|) *if I sing to her* (5F/F)

Noun phrases are sometimes divided into several tone units, again with the sequence F/F. A fall in this particular context is normally used for major information, or to announce a new topic, which might be the reason why it is so frequently used in reading, especially if the reading is not prepared.

the clickety-click (|) *of the wheels*... (3F/F, 1 R/F)
a request (|) *for an early morning taxi* (8F/F)

Adverbials should display a rise, especially in initial position. Our data contradict the idea that rises are predominant in that context. Out of 77 tone units containing adverbials, 60 are pronounced with a fall (83%), 12 with a rise and 5 with a fall-rise. So falls are clearly preferred by our readers. As expected though, the R and FR contours are found more frequently on initial adverbials than on final adverbials. In initial position, we counted 39F (72%), 11R (20%), 4FR (7%)

Last week, 7F 3R | *my friend*...
As far as I know, 10F | *they're not*...
Unfortunately, 10F | *I had*...

With final adverbials, we have only 1R and 1FR against 21F (91%):

...*fetch a bottle of wine* (|) *from the cellar* (7F/F, 1F/R)
She's going to the far east (|) *for a holiday* (9F/F)
I've always found it difficult to sleep (|) *on long train journeys*... (3F/F, 1F/FR).

One occurrence of tone unit boundary occurs between a subject and a predicate and one between the verb and its object, and again F/F predominates:

The N. Z. rugby team | *is called the All Blacks* 9F/F, 1R/F
I'm trying to contact (|) *M & Mrs W. George* ... (2F/F)

Finally, it is in enumerations that rises are most often found. We only have 2 in the data, one with nouns and one with clauses:

.. *an injection against cholera*, | *typhoid fever*, | *hepatitis A*, | *polio* | *and tetanus*. 8R/FR/R/R/F, 2 R/FR/F/F/F.

The compound *typhoid fever* is always pronounced with a fall-rise, probably due to its morphology, which means that FR here is the equivalent of R. It is interesting to see that 8 out of 10 speakers pronounce rises on all the words of the enumeration except the last one, which is the expected sequence.

The next example is an enumeration of actions, and unlike the preceding enumeration, the most common contour is F, even though we also find rising patterns:

Although the All Blacks kept dropping the ball, | *and missing their goal* kicks, | *and had 2 tries disallowed*, | *I think*... 8F/F/F, 1R/R/R, 1FR/R/FR.

4.2.2. Sentence types

If we consider questions, rises or fall-rises in our data appear on yes-no questions, but only marginally: falls dominate again.

Could you arrange to send an engineer | *on Tuesday morning* please? 4FR 6F in the second tone unit
Can you give me their new number please? 1R 2 FR 9F

4.2.3. Attitudinal functions of rises

Syntax does not seem to be the most relevant factor to explain the presence of rises in read speech, so we focused on attitudinal functions.

Coming back to subordinate clauses, among the 9 rises mentioned in 4.2.1, 8 occur on the same sentence, on the word *threatened*, which might imply fear on the part of the speaker: *It would protect her by barking* | *if anything threatened* 2F/F, 4R/R, 1F/FR, 3F/R. The rise could therefore point at the speaker's personal implication.

Another sentence in the corpus is noteworthy because it displays the sequence R/R for 6 speakers out of 10. In the context, the speaker expresses the fact that they are tired of always doing the same things: *Then there's the bath*, | *and getting her ready for bed*. 6R/R, 4R/F. This example might count as an enumeration, but the rising tone also seems to be used to underline the speaker's vexation.

Emphasis can also be expressed with a rising tone, more precisely by a fall-rise rather than a simple rise. The following example is enlightening: *If I do manage to doze off* | *the ticket inspector*... 9 speakers put an emphasis on *do* (which is an emphatic *do* here) with a fall-rise contour, and one speaker pronounced a falling contour with the nuclear syllable on *off*, completely negating the emphasis. In the same way, when *swimming-pool* in the example below is pronounced with a fall-rise, a particular implication from the speaker is felt, some kind of irony here. With an F contour, the utterance sounds more neutral: *Am I supposed to use the cellar as a swimming-pool till then?* 6FR (*swim-*) 3R (2 on *swim-*, 1 on *then*) 1F (on *then*).

We shall mention a last interesting example of a final rise in a declarative. Here, the rise turns the sentence into a declarative question, changing its illocutionary force: *As far as I know*, | *they're not ex-director* 9 F 1R

5. Conclusion

This study helps understanding the distribution of rising and falling contours in read speech. If we sum up, the sequence F/F dominates in our data, the rising contour can be described as exceptional in read speech, even in non-final clauses. Whatever the syntactic structure, the preferred contour is a fall, except in noun phrase enumerations. For all types of dependent elements, our data show that readers pronounce falls, no matter whether the dependent element precedes or follows the main clause. Only initial adverbials function slightly differently, with a relatively higher proportion of rises. The main function of rising contours, contrary to what is stated in the literature, is not here to indicate non-finality and continuation, or dependency, but rather to convey the speaker's implication. Wherever a rising tone is pronounced (if we set apart enumerations and initial adverbials), a particular attitude is indeed conveyed. The rising contour can moreover be used to change the illocutionary force of the sentence in independent clauses.

Future perspectives involve analysing other speech styles, and in particular spontaneous speech, where more rises are expected. Our findings on read speech also have important pedagogical implications for ESL learners. It is indeed very frequent to hear incongruous rises and overuse of rising contours in the speech of learners ([36][37]). The analysis of the speech of learners in our corpora would allow us to compare it with that of natives so as to better understand where drawbacks are in the production of learners.

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