

# The Fall-Rise Tone in English

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## O. Introduction

The Fall-Rise tone is relatively frequently used in English as the following figures show: 16.2% (Crystal 1969), 16.2% (Quirk et al. 1964) and 12.5% in conversation versus 16.6% in reading (Davy 1968). This tone is sometimes divided into two types: the simple tone and the compound tone (Kingdon 1958, Crystal 1969, O'Connor and Arnold 1973, Couper-Kuhlen 1986, Cruttenden 1997 and Roach 2000). The simple tone is also known as a complex Fall-Rise, and the compound tone is sometimes called a compound Fall + Rise or a split Fall-Rise.

According to O'Connor and Arnold (1973: 29-30), there are three main differences between the two tones: (1) a wider range of the Fall in the compound tone, (2) a gradual rise of syllables after the Fall in the simple tone, and (3) weakened stressed syllables after the Fall in the simple tone. They claim, however, that these differences are not always operating and that differences in attitude are the key to differentiating the two tones in such cases. The simple tone may be followed by an 'even if' clause, as in 'I <sup>v</sup>Try not to be 'late<sup>1</sup> (even if it's difficult)' or 'I <sup>v</sup>hope you'll be 'able to 'come (even if it's doubtful)'. In contrast, with the compound tone, these two utterances have different attitudes, as in 'I \Try not to be /late (please!)' or 'I \hope you'll be 'able to /come (I really do.)' There is also a stylistic difference in the type of head: a falling head for the simple tone and a high head for the compound tone, as in 'My \father and <sup>v</sup>mother were 'born in 'Sheffield' and 'My 'father and \mother were born in /Sheffield<sup>2</sup>.

Cruttenden (1997: 101-102) divides meanings of the Fall-Rise into two groups: 'reservations', 'contrast', 'contradiction' and 'self-justification', 'appeal', 'warning'. He gives the following pair of examples: 'I \thought she was /married (but I did not know so and it turned out she wasn't)' and 'I \thought she was /married (and so she was)'. He states that 'although the detailed pitch patterns associated with the two meanings are commonly identical, some speakers will realise the two

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1 Following the convention used in Roach 2000, the stressed syllable in the tail is shown by a dot, not by an under-ring or an over-ring in this paper.

2 It should be noted that the second and third stylistic differences are missing in a pair of examples they cite.

meanings differently when two pitch accents are involved.' He shows a different pitch pattern for the first meaning in which there is a gradual rise in pitch after the fall<sup>3</sup> till the end of the utterance including the stressed (not accented) syllable. This utterance is transcribed as 'I <sup>v</sup>thought she was ·married'. In other words, when an utterance is spoken with the Fall-Rise and there are some intervening syllables before a stressed syllable near or at the end of the utterance, the pitch patterns after the fall tend to be level until the rise for both meanings and that stressed syllable is treated as an accented syllable. However, the first meaning can also be realised by a gradual rise of syllables after the fall including the stressed syllable near or at the end of the utterance. In this case, this stressed syllable is not accented. This pattern exactly corresponds to the second stylistic feature mentioned in O'Connor and Arnold (1973: 29-30).

It follows from this explanation that both the simple tune and the compound tune are used for the two semantic groups assigned to the Fall-Rise, but only the simple tune is used to realise the first semantic group. The purpose of this paper is to examine (1) how the simple tune and the compound tune are used when the Fall-Rise tone is used to mean 'reservations', 'contrast', 'contradiction', and (2) major acoustic features between the two tunes.

## 1. Data Collection

The data used in this paper were taken from a corpus called the MARSEC, which consists of about 52,000 words of contemporary spoken British English and is about 5.5 hours long. It is made up of eleven categories, such as 'commentary', 'lecture', 'religious broadcast' and 'dialogue'. Two professional British phoneticians (Gerry Knowles and Briony Williams) were involved in the transcription, and each of them transcribed half of the corpus auditorily. Part of the data was transcribed by both of them to compare their transcriptions. According to Knowles et al. (1996: 4), the prosodic system is based upon the system used in O'Connor and Arnold (1973), but is slightly modified in three respects. First, no distinction is made between symbols for onsets and nuclei. Second, the distinction between high and low variants is extended to all tones, except for the Rise-Fall tone. Third, high and low are defined not with respect to the pitch range, but to the immediately preceding pitch level.

In order to collect data for the paper, we extracted from the corpus the Fall-Rise utterances which are followed by 'but'. This is because this conjunction is a good signal for the meaning in focus. Not all examples extracted this way, however, were selected for analysis, and there are six

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<sup>3</sup> Unlike O'Connor and Arnold (1973), the lower-case is used for the falling part and the rising part of the Fall-Rise in this paper. The upper-case is used to show a tone.

such cases: (1) When an utterance beginning with 'but' is said by another speaker in a dialogue. This is because the Fall-Rise and 'but' are not directly correlated. (2) When the transcription is obviously erroneous. (3) When the tonic syllable is the last word in a tone-unit (e.g. | for ten <sup>∨</sup>hours | but ... |). This is because the Fall-Rise is always a simple tune. (4) When the tonic syllable is followed only by weak syllables (e.g. | to \see the final <sup>∨</sup>shape of it<sup>4</sup> | but ... |). This is because without at least one stressed syllable after the tonic syllable, the Fall-Rise cannot be a compound tune. (5) When the tonic syllable is immediately followed by a stressed syllable (e.g. | may <sup>∨</sup>sound ·fine | but ... |). This is because without at least one intervening syllable it is not possible to tell which tune is used. (6) When 'but' is used as part of idiomatic expressions (e.g. | not only a <sup>∨</sup>jumbo-sized | <sup>∨</sup>record book | but also a couple of \calculators as \well ... |). This is because the use of 'but' is irrelevant to our analysis.

The following are all the examples found suitable for our analysis<sup>5</sup>:

1. (Camera crews from the American networks) | have been \shooed a way from the /entrance | (but they're still staking the place out from a distance away watching for any impending departures through powerful television camera lenses.)
2. (Officials have described the shooting) | as a do<sup>∨</sup>mestic a·ffair | (but staff have already been told that some extra security measures are being brought into force and a thorough investigation of the security system is being carried out.)
3. (Northern areas will have bright intervals and showers which will be heavy in places) | \rain in some <sup>∨</sup>southern areas will clear a way | (but further rain is likely tomorrow.)
4. (They're all examples of the new medium and were exhibited at the Berlin Dada fair) ||  
↑ They're not o<sup>∨</sup>vertly po·litical in ·content | (but all bear on the Dadaist concept of the new artist.)
5. (At first the French relied on translations of works by Ray) | and <sup>∨</sup>Derham for e·xample | (but soon a truly French tradition of natural theology was established.) |
6. (Natural theology may have been) | pre'dominantly a <sup>∨</sup>Protestant ac·tivity | (but there were natural theologians in Catholic countries too.)
7. (Deists were people who believed in God as a creator, but unlike the theists) | a <sup>∨</sup>similar ·name | (but a very different school, deists rejected revelation.)
8. (They started off with David Gower still as captain, who led the side in the Caribbean. He headed personally a disastrous match in the very first test at Headingley, a game which was

<sup>4</sup> In our transcription, this is transcribed as 'to \see the final <sup>∨</sup>shape of it'.

<sup>5</sup> To make the meaning of the extracted tone-units clear, other tone-units without prosodic information were added before and after them. Some transcriptions are slightly modified.

lost in just over three days against India. Then they came to Lord's, which really should have been the showpiece.) | as far as <sup>v</sup>England ·cricket was con·cerned | (but it went wrong from there as well.)

9. (The little girl said, "This is not a pet. This is my friend, who is coming to school with me.") || The <sup>\</sup>teacher still <sup>v</sup>stared at the ·lion | (but she said to the little girl, "What is his name, then?")
10. ("You mean you want me to fly the plane?" he said. "You must be joking ! ) || I <sup>v</sup>was a ·pilot | (but I flew single-engined fighter planes and that was fifteen years ago ...") |
11. ("Well, actually," said his daughter. "I would rather) | act a\lone if you don't /mind || (but if you really want to act in a charade, I don't mind fetching down the others.") ("Well, actually," said his daughter. "I would rather) | act a\lone | if you don't /mind || (but if you really want to act in a charade, I don't mind fetching down the others.)"<sup>6</sup>
12. (Oh, when I was young, I wasn't like that. I never had the slightest trouble) | \filling in a rainy /day || (but not them, and when I try to get them started on something, give them the benefit of my experience they just don't want to know.)
13. (He scored one rather dubious goal, which irks us, eh, somewhat here in England, a handball goal, the first one) | in the \meeting with /England | (but the second one was truly miraculous.)
14. (Well, thank you very much for that, Martin.) | That's er \football in the ·year ·nineteen eighty-/six | (but a way from football, the year's other major sporting gathering was the thirteenth Commonwealth Games in Edinburgh.) (Well, thank you very much for that, Martin.) | That's >football | in the ,year ,nineteen eighty->six | (but a way from football, the year's other major sporting gathering was the thirteenth Commonwealth Games in Edinburgh.)<sup>7</sup>
15. ("And how long were you there for?" "Hm, just a year. Yes. Just a year.) || I <sup>v</sup>could have re·newed my ·contract | (but somehow I wasn't very keen on staying long ...")
16. ("I'm beginning to wonder what I do want. Are there any more ads here in the paper?") || "<sup>\</sup>well I ·think they're only <sup>v</sup>small ads ·now | (but you know, I look at these small ads and I think, well, am I not overqualified for them?")
17. ("Yes, but life in Sudan is very, very different from life in this country. A lot of children finish school after they've done six years primary in any case. I suppose the children who come) | from the mainly <sup>v</sup>rural ·districts | (but<sup>8</sup> the whole Sudan is a rural district. I suppose they

6 Two labellers were involved in the transcription of this utterance.

7 Two labellers were involved in the transcription of this utterance.

8 This conjunction originally belonged to the previous tone-unit.

- must do some work in the fields.”)
18. (“Ah, that’s totally unlike Sudan, because obviously Sudan is, by and large, a Muslim country, and, of course, there you | don’t have <sup>v</sup>very many ·holidays | (but<sup>9</sup> the month of Ramadan, when people are fasting from sunrise to sunset every day, then very little work does get done ...”)
19. (“Very different from Sudan. Travel is not a problem here) | admittedly <sup>v</sup>foreigners were supposed to have ·travel permits | (but I never got one in all of my three years ...”)
20. (“Well, broken Arabic.) || ‘not par<sup>v</sup>ticularly fluent (but<sup>10</sup> I could manage ... )
21. (“I see. I suppose that was the problem too in Sudan. They did have trains. They might come and they might not. They could be a day late, or five hours late.) | or <sup>v</sup>twelve hours late || (but they usually came in the end ...”)
22. (About that achievement, one of the greatest of all writers on walking, Arthur Wainwright said, officially.) | ‘White\hall cre·ated the ·Pennine /Way | (but those who walk it should remember that it was one man who inspired in his mind and by his patience and effort the freedom they enjoy.)

## 2. Analysis

First of all, one thing needs to be mentioned. Among the 22 utterances that were collected for analysis, there are two types of transcription in Nos. 11 and 14. We will examine these two utterances acoustically below to find out why these differences were made and which transcription would be more suitable.

Six out of the 22 utterances (i.e. Nos. 1, 11, 12, 13, 14 and 22) were transcribed as the complex tune, and only No. 12 was transcribed by Williams. Two utterances (i.e. Nos. 11 and 14) were transcribed by the two labellers. Williams transcribed No. 11 as a Fall and a Rise in separate tone-units and No. 14 as two Levels. Except for these two utterances, 10 utterances (i.e. Nos. 1, 2, 3, 4, 10, 13, 15, 16, 17 and 22) were transcribed by Knowles, and the remaining 10 utterances (i.e. Nos. 5, 6, 7, 8, 9, 12, 18, 19, 20 and 21) were transcribed by Williams.

The 22 utterances can be classified by grammatical categories. In this paper, the classification is based upon words in the tonic element, as our focus is on the form of the Fall-Rise from the tonic syllable. Noun phrases: ‘(do)mestic affairs’, ‘Derham for example’, ‘Protestant activity’, ‘similar

9 This conjunction originally comprised a tone-unit by itself.

10 This conjunction originally belonged to the previous tone-unit.

name', 'meeting with England', 'football in the year nineteen eighty-six', 'small ads now', 'rural districts', and 'very many holidays'. Verb phrases: 'shooed away from the entrance', 'stared at the lion', 'was a pilot', 'filling in a rainy day', 'could have renewed my contract', '(su)pposed to have travel permits'. Adjectival phrases: '(o)vertly political in content', '(par)ticularly fluent', and 'twelve hours late'. Adverbial phrase: '(a)lone if you don't mind'. Sentences: '(rain in some) southern areas will clear away', '(as far as) England cricket was concerned', and '(White)hall created the Pennine Way'.

The vertical value of the F0 is calculated at four points: the highest value of the fall (highF), the lowest value of the fall (lowF), the lowest value of the rise (lowR) and the highest value of the rise (highR). All the values are shown in semitone, not hertz in order to neutralise speaker differences. The result is summarised in Table 1.

Utterances	highF	lowF	lowR	highR
1st	90.8	83.8	80.8	89.2
2nd	83.6	73.9		78.1
3rd	94.5	79.4	78.4	81.8
4th	99.3	87.9	84.3	91.6
5th	84.9	78.9	79.9	84.5
6th	85.6	79.4	81.0	83.8
7th	90.7	77.1		84.0
8th	82.7	80.1	80.6	82.0
9th	81.9	72.6	75.7	80.7
10th	99.4	85.0		97.0
11th	88.5	77.4	76.8	86.1
12th	84.2	80.1	79.2	86.3
13th	80.8	78.1	78.2	80.4
14th	92.1	87.8	81.9	91.5
15th	109.2	93.9	90.9	92.2
16th	95.7	89.6		92.3
17th	88.8	82.2		86.1
18th	93.3	81.9	82.4	84.8
19th	93.3	84.3	82.4	88.5
20th	95.0	82.2		85.4
21st	88.3	83.4	85.4	87.4
22nd	93.6	77.1	77.4	82.6

Table 1 The lowest and highest values of the Fall-Rise utterances

Acoustically, there is only one lowest point in Nos. 2, 7, 10, 16, 17 and 20. This automatically means that these utterances are spoken with the simple tone. We use the 2nd utterance '(as a do)<sup>v</sup>mestic a·ffair' to show what the F0 contour is like.

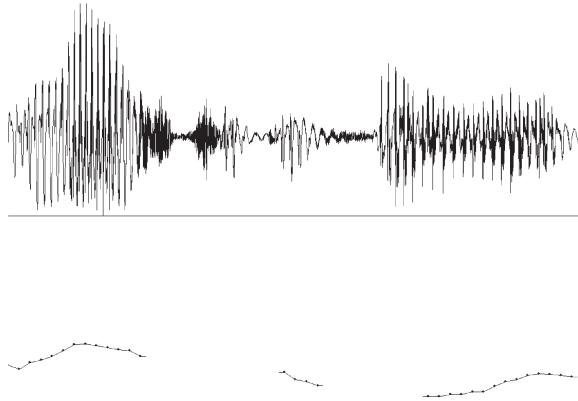


Figure 1 The F0 of '(do) mestic affair'

As this figure shows, the F0 contour of the fall and the rise is connected at one point and there is no level part in-between. The first highest point is higher than the second highest point, and this pattern is also applicable to the other five utterances. The top scale and the bottom scale are set at 107.6 st1 and 67.7 st1, respectively.

From acoustic analyses, we found only one utterance with a gradual rise of the F0 after the fall, and that is the 21st utterance '(or) <sup>v</sup>twelve hours late'.

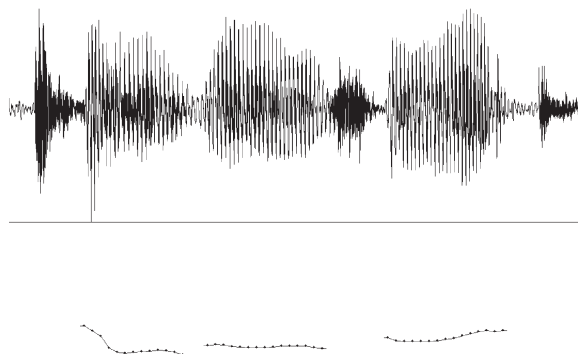


Figure 2 The F0 of 'twelve hours late'

After the fall (88.3 st1 to 83.4 st1), which corresponds to /twe/ of 'twelve', the F0 contour becomes level till the end of this word. After the gap, which corresponds to /v/, it steps up and becomes level (84.8 st1) till the end of 'hours'. Then, there is another gap, which corresponds to /z/ of 'hours'. Then, there is still another step-up. The F0 contour for 'late' is level till the initial part of the first element of /ei/ and then changes to a small rise (85.4 st1 to 87.4 st1). The important point is that the three words or syllables rise step by step till the end of this utterance.

We also found some interesting features about the form of the Fall-Rise and the way it is transcribed. First, the third utterance '(^rain in some) ^southern areas will clear a·way' is compared with the 22nd utterance '(^White)\hall cre·ated the ·Pennine /Way'.

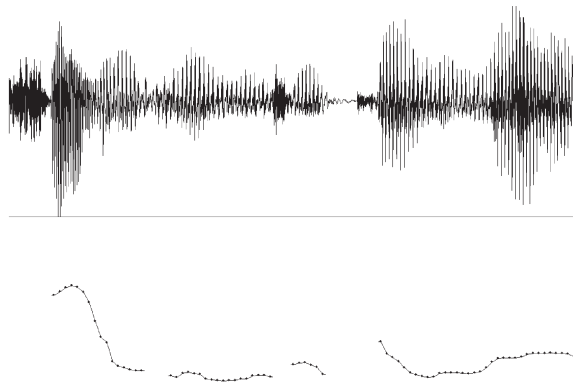


Figure 3 The F0 of 'southern areas will clear away'

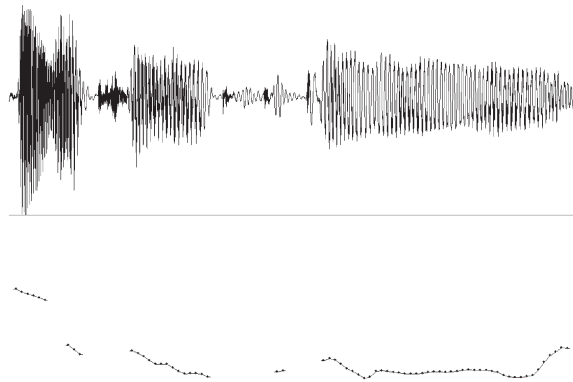


Figure 4 The F0 of '(White) hall created the Pennine Way'



Although the two utterances are interpreted differently, we can tell from the two figures that the F0 contour is almost the same between the two utterances — a big vertical difference in the fall, a small difference in the rise, and relatively level in-between. The vertical difference in the fall is 15.1 st1 (94.5-79.4) in ‘southern areas will clear a way’ and 16.5 st1 (93.6-77.1) in ‘(White)\hall cre·ated the Pennine /Way’. In contrast, the vertical difference in the rise is 3.4 st1 (81.8-78.4) in the former utterance and 5.2 st1 (82.6-77.4) in the latter.

Second, in terms of the utterance-final rise and the transcription, the fourth utterance ‘(↑ They’re not o)vertly po·litical in ·content’ is worth examining. This utterance is interpreted as a simple tune.

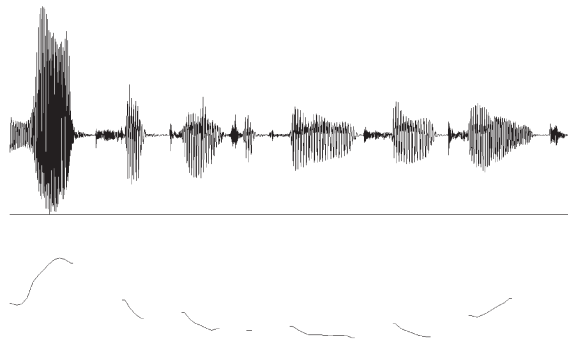


Figure 5 The F0 of ‘(o) vertly political in content’

The F0 contour in this figure is similar to those in Figures 3 and 4 — a bigger difference in the fall and a smaller difference in the rise. The difference in the fall and the rise is 11.4 st1 (99.3-87.9) and 7.3 st1 (91.6-84.3), respectively.

Third, there is one utterance which lacks noticeable differences in the F0 contour. This is the 13th utterance ‘(in the) \meeting with /England’.

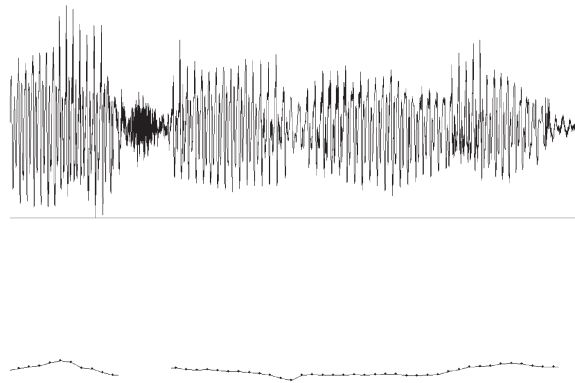


Figure 6 The F0 of 'meeting with England'

The difference in the fall is 2.7 st1 (80.8-78.1), while the one in the rise is 2.2 st1 (80.4-78.2). The labeller's interpretation is a compound tune.

Fourth, there are two utterances which two labellers transcribed differently. The first is the 14th utterance '(That's er) \football in the ·year ·nineteen eighty-/six'. This was transcribed by Knowles, but Williams transcribed this as '(That's) >football | in the ,year ,nineteen eighty->six'.

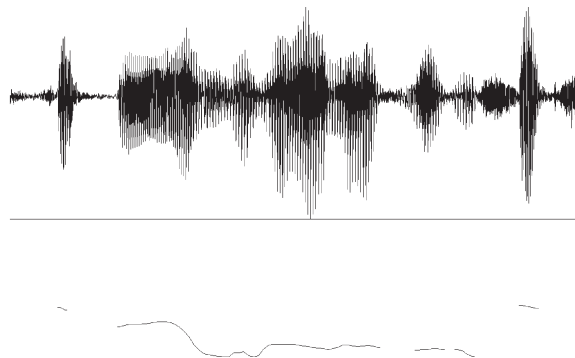


Figure 7 The F0 of 'football in the year nineteen eighty-six'

The second utterance is the 11th utterance '(act a)\lone if you don't /mind' and '(act a)\lone | if you don't /mind'. In this case, the pitch movement is perceived in the same way, but the number of tone-units is perceived differently.

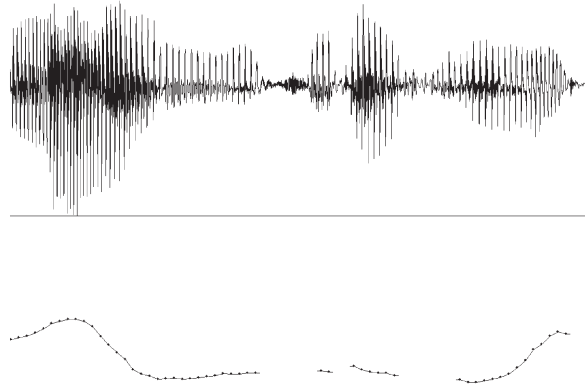


Figure 8 The F0 of '(a) lone if you don't mind'

The fall has a vertical difference of 11.1 st1 (88.5-77.4) and the rise has a difference of 9.3 st1 (86.1-76.8).

Fifth, there are two utterances where the difference in the rise is greater than in the fall. They are the first utterance '(have been) \shooed a way from the /entrance' and the 12th utterance '\filling in a rainy /day'. Both of them are transcribed as compound tunes.

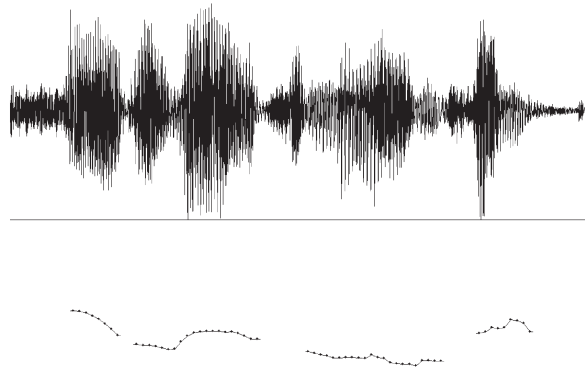


Figure 9 The F0 of 'shooed away from the entrance'

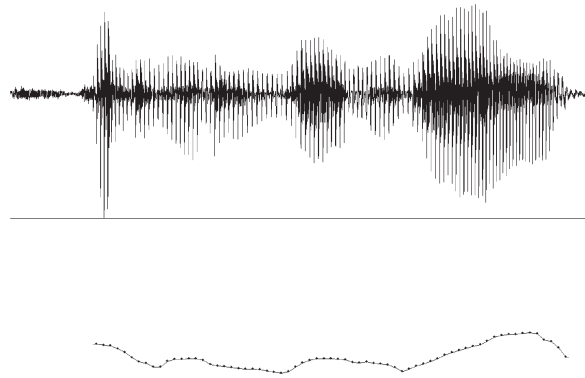


Figure 10 The F0 of 'filling in a rainy day'

In Figures 9 and 10, the vertical difference in the rise is relatively small — 8.4 st1 (89.2-80.8) in 'shooed a·way from the /entrance' and 7.1 st1 (86.3-79.2) in 'filling in a rainy /day', but the difference in the fall is also small — 7.0 st1 (90.8-83.8) in the former utterance and 4.1 st1 (84.2-80.1) in the latter.

Sixth, there is one utterance that may be interpreted differently, and that is the 20th utterance '(not par)<sup>v</sup>ticularly fluent'.

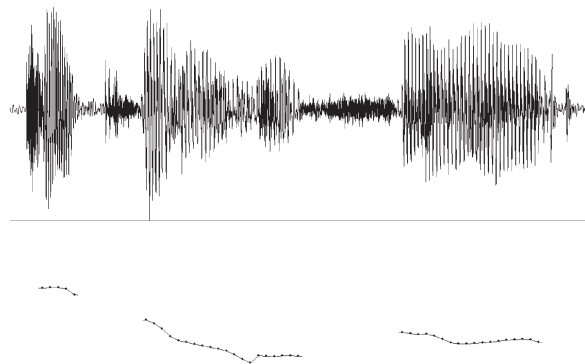


Figure 11 The F0 of '(par) ticularly fluent'

This utterance is not easy to transcribe. Although the initial fall is clearly noticeable, the final rise is not clear. What we have is a step-up from 'ly'. There is no rising movement in 'fluent'. The point is how this step-up should be transcribed. The labeller perceived this as a rising part of a Fall-Rise, but since there is no rising movement in 'fluent', it may be more logical to interpret the

first syllable of this final word as a tonic syllable, whose tone is a Level, and the initial fall as a falling head. I would transcribe this utterance as 'not par`ticularly >fluent'.

### 3. Discussion

Among the 22 utterances we collected, there was only one case of the simple tune having a gradual rise after the fall. The main reason for this very small number may be that the MARSEC is made up mainly of formal style of speech, in which strong emotions are hardly expressed. This utterance was used in a conversation. In total, seven utterances were extracted from this conversation, which accounts for 31.8%. If we had chosen a conversational type of corpus, then the result may have been different. A gradual rise of the F0 after the fall in the simple tune may represent an emotional or colloquial version of this tone. It follows from this that the form of the Fall-Rise is usually flat between the fall and the rise both in the simple tune and in the compound tune.

When 'southern areas will clear away' (Figure 3) is compared with '(White)hall created the Pennine Way' (Figure 4), we noticed that there is no noticeable difference in the F0 between them. It may be more logical to make the same prosodic interpretation of them. It is true that the extent of the rise is somewhat different (3.4 st1 vs. 5.2 st1), but at this moment it is not easy to say that a difference of 1.8 st1 is big enough to distinguish the simple tune from the compound tune. Nor is it easy to say that the value of 5.2 st1 is big enough to label the syllable in question as a tonic syllable. Labeller differences are not relevant as these two utterances were transcribed by the same phonetician. Judging from this small difference, it may be safe to conclude that the two utterances are spoken with the same tune.

When '(o)vertly political in content' (Figure 5) was analysed, we learned that the last stressed syllable ('con' in 'content') was not perceived as a tonic syllable even though the vertical difference in the rise was 7.3 st1. This value is bigger than the difference of 5.2 st1 for '(White)hall created the Pennine Way' (Figure 4), where the last stressed syllable was perceived as a tonic syllable. Both were transcribed by the same phonetician. There is also not much difference in the highest value of the fall among the three utterances: 94.5 st1 ('southern areas will clear away'), 93.6 st1 ('(White)hall created the Pennine Way') and 99.3 st1 ('(o)vertly political in content'). The highest value of the rise, however, is different between the first two utterances (81.8 st1 and 78.4 st1) and the last one (91.6 st1). This value is biggest in the last utterance, but 'con' of 'content' is not perceived as accented. Acoustically, it is not possible to prove this perceptual difference. It may be possible to make some semantic criteria, but they are not always objective. The more objective

a criterion is, the better, because it always works well irrespective of different researchers. Judging from the analysis that has been made so far, it is logical to interpret the tune of the three utterances as the simple tune. Here we would like to make a tentative criterion that an approximate difference of 10 st1 is required for the rise in the Fall-Rise to have a tonic status especially when the difference in the fall exceeds 10 st1.

In 'shoed away from the entrance' (Figure 9) and 'filling in a rainy day' (Figure 10), the differences in the rise are 8.4 st1 and 7.1 st1, respectively. They are smaller than this tentative standard value. Compared with the differences in the fall (7.0 st1 and 4.1 st1), however, each of them is larger by 1.4 st1 and 3.0 st1, respectively. Besides this, in 'shoed away from the entrance', the highest value of the fall (90.8 st1) is almost the same as the highest value of the rise (89.2 st1), and in 'filling in a rainy day', the former value (84.2 st1) is smaller than the latter (86.3 st1). This means that the tonic status of the last stressed syllable is acoustically established in both utterances. The original transcriptions are supported.

On the other hand, 'meeting with England' (Figure 6) has a very small difference in the fall (2.7 st1) and the rise (2.2 st1). In addition to the overall small difference, the latter value is much less than 10 st1. It is very difficult to establish a logical foundation for interpreting the first syllable of 'England' as a tonic syllable. Instead, it is much better to interpret this as the rising part of a simple tune. This utterance should be transcribed as '(in the) <sup>∨</sup>meeting with ·England'.

In 'football in the year nineteen eighty-six' (Figure 7), there is a clear falling-rising movement in the F0 and it appears that this utterance is spoken with a Fall-Rise. In fact, however, this is a good example that shows a careful analysis must be made about the association between the F0 contour and the corresponding segments. The fall actually corresponds to the vowel of 'in' (not 'foot' of 'football') and the relatively level part continues till 'eighty'. It should be noted here that in our speech analysis program, the F0 is superimposed in light blue on a black-and-white spectrogram. Since colour printing is not attainable in this journal, the spectrogram is intentionally deleted in this paper. Without colour printing, it is very difficult to read the F0 contour. Initially this utterance is slightly high-pitched and this corresponds to 'foot'. The level part after the step-down corresponds to 'ball', which is followed by the long fall. In spite of a difference of 4.1 st1 between 'foot' and 'ball', it may be more logical to interpret the tone of 'foot' as a level because the falling movement is missing in 'ball'. In short, this utterance contains two tone-units and the first tone-unit is spoken with a Level and the second with a Rise. This somewhat irregular pitch pattern may have been the reason for the two different types of interpretation. The fall at the vowel of 'in' could be transcribed as a downward arrow, but instead it may be better to use a low head in 'year' and 'nine', which is much simpler in transcription. The big jump (9.2 st1) at the final word 'six' should

be interpreted as a Rise, not as a high Level, because this pitch movement is dynamic, not static. It is better to interpret this utterance as '(That's) >football | in the ,year ,nineteen eighty-/six'.

Like 'football in the year nineteen eighty-six', '(a)lone if you don't mind' (Figure 8) was transcribed differently. Judging from the difference of 9.3 st1 in the rise, it is well assumed that 'mind' can be a tonic syllable. The point is whether there is a break in the F0 contour between 'lone' and the rest. A close examination of the F0 contour with the superimposed spectrogram reveals that the level part after the fall continues until the first part of the first element of /aɪ/, with some gaps caused by voiceless segments. Since there is no break between 'lone' and 'if' and the F0 contour between the fall and the rise is basically level, there is no logical reason why this utterance is divided into two tone-units. It is better to interpret this utterance as a compound tune.

Therefore, for a Fall-Rise to be a compound tune, the rise needs to satisfy a tonic status. The tentative criterion that came from our examples is that acoustically the difference in the rise should be approximately 10 st1. This criterion, however, does not have to be satisfied when the difference in the rise is greater than the difference in the fall and/or the highest value of the rise is greater than the highest value of the fall. Together, the main criterion and the additional criterion can be used to perfectly categorize all the examples that were collected in this study as simple tunes or compound tunes. This automatically means that a gradual rise after the fall is interpreted as the simple tune.

To differentiate the simple tune from the compound tune, acoustic criteria are much better because they are objective. However, there are some cases where semantics can also be good criteria. In the fifth utterance 'Derham for example' and the eighth utterance 'England cricket was concerned', it is highly unlikely that the last stressed syllable can hold the tonic status, because the ones in 'example' and 'concerned' are part of idiomatic expressions and are not semantically rich. Paying attention only to the difference in the highest value of the fall and the highest value of the rise is misleading, as there is not much difference in both cases (0.4 st1 (84.9-84.5) in 'Derham for example' and 0.7 st1 (82.7-82.0) in 'England cricket was concerned') and this fact itself is a good foundation for the compound tune. In these cases, however, this error is avoidable if the difference in the rise is considered: 4.6 st1 (84.5-79.9) in the former utterance and 1.4 st1 (82.0-80.6) in the latter. Both of them are much smaller than the tentative standard value of 10 st1. Still another utterance can be added to supplement the important role of semantics in differentiating the two tunes. In the 9th utterance 'stared at the lion', the word 'lion' was already mentioned several times in the story and there is no logical reason for this word to be accented here.

In the previous section, the 22 utterances were divided into five grammatical categories: noun phrases, verb phrases, adjectival phrases, adverbial phrases, and sentences. We found six utterances

that had no double lowest point, and they are '(do)mestic affairs', 'similar name', 'small ads now', 'rural districts', 'was a pilot', and '(par)ticularly fluent'. The last utterance was excluded from the study because our acoustic analysis revealed that it was spoken with a Level tone. There are two noteworthy features about the remaining five utterances. First, they are short. The number of syllables after the tonic syllable is three, three, two, three, and three, respectively. Second, four utterances out of the five are noun phrases. It follows then that it is less likely to include two accented syllables in relatively short grammatical phrases, especially in noun phrases.

In two recent publications, I found two different approaches toward the compound tune. In Wells (2006: 81-83), the fall and the rise are separated into separate tone-units, as in 'Please | shut the /window.' and 'I 'really \like | /chocolate. || 'Pass it \over.' This is in a sense more faithful to the general claim about intonation, which technically allows one tonic syllable in one tone-unit. On the other hand, Cruttenden (2008: 274) gives a simple and straightforward rule which states 'where the fall and the rise are on separate words, it accords better with tonetic reality to mark the tone with a separated \ and /', and gives such examples as '\John didn't /come.' and '\Nothing's im /possible.' If the latter type of transcription is adopted, all the utterances that were analysed in this paper are transcribed without using the symbol <sup>v</sup>, but this idea may pose a problem. To take a pair of examples from Roach (2000: 178), 'I've seen her' can be said with a Fall-Rise in two different ways — one with the weak form of 'her' and one with its strong form. These two speech patterns can be transcribed as 'I've <sup>v</sup>seen her' and 'I've \seen /her'.

Finally, in extracting utterances from our corpus, tone-unit boundaries were not taken into account. Usually 'but' belongs to the following tone-unit, but there were two cases where this conjunction belonged to the preceding tone-unit: the 17th utterance '(from the mainly) rural districts' and the 20th utterance '(not par)ticularly fluent. The main reason seems to lie in pause. It is much shorter before 'but' than after it: 120 ms vs. 230 ms in No. 17 and 60 ms vs. 147 ms in No. 20. It seems, however, that such a long pause after 'but' is not an established criterion for tone-unit boundaries, as this may be considered as a planning function. Cruttenden (1997: 32) states that a pause after the first word of a tone-unit serves as a planning function, as in 'I do like Elgar's violin concerto. | It's ... quite the most perfect work of its kind.' It is true that the conjunction 'but' is not as closely connected to the following utterance like a subject in relation to its predicate, but since the F0 is discontinued before 'but', it is better not to include 'but' in the preceding tone-unit acoustically. In addition, if there is no obvious tone in 'but', this conjunction should not be separated from neighbouring tone-units. In the 18th utterance '(don't have) very many holidays', the following 'but' constituted a tone-unit by itself, but no tone mark was assigned. This is not a recommendable method of transcription.



## 4. Conclusion

There are six main findings in the present study. First, the Fall-Rise tone is usually flat between the fall and the rise in both the simple tone and the compound tone. Among the 22 utterances that were collected, there was only one utterance where the F0 showed a gradual rise after the fall. Second, to differentiate the simple tone from the compound tone, a criterion was made which stated that an approximate difference of 10 st1 is required for the rise in the Fall-Rise to have a tonic status especially when the difference in the fall exceeds 10 st1. This criterion may need to be modified by analysing more data. Third, this difference of 10 st1 does not have to be satisfied when the difference in the rise is greater than the difference in the fall and/or the highest value of the rise is greater than the highest value of the fall. Fourth, semantic criteria may sometimes be useful. In idiomatic expressions like 'for example', the second syllable of 'example' should not be a tonic syllable as this is not semantically rich. Nouns mentioned repeatedly in the same text hardly hold a tonic status because they do not show important information any more. Fifth, to distinguish the simple tone from the compound tone, grammar also plays an important role. It is less likely to include two accented syllables in a relatively short grammatical phrase, especially in noun phrases. Sixth, a long pause after 'but' should not be used simply as an indicator to make this conjunction part of the preceding tone-unit.

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### References

- Couper-Kuhlen, E. 1986. *An Introduction to English Prosody*. London: Edward Arnold.
- Cruttenden, A. 1997. *Intonation*. Second edition. Cambridge: Cambridge University Press.
- Cruttenden, A. 2008. *Gimson's Pronunciation of English*. Seventh Edition. London: Hodder Education.
- Crystal, D. 1969. *Prosodic Systems and Intonation in English*. Cambridge: Cambridge University Press.
- Davy, D. 1968. 'A Study of Intonation and Analogous Features as Exponents of Stylistic Variation, with Special Reference to a Comparison of Conversation with Written English Read Aloud.' University of London M.A. Thesis.
- Kingdon, R. 1958. *The Groundwork of English Intonation*. London: Longman.
- Knowles, G., Williams, B. and Taylor, L. (eds.) 1996. *A Corpus of Formal British English Speech: The Lancaster/IBM Spoken English Corpus*. London: Longman.
- O'Connor, J. D. and Arnold, G. F. 1973. *Intonation of Colloquial English: A Practical Handbook*. Second Edition. London: Longman.
- Quirk, R., Duckworth, A. P., Svartvik, J., Rusiecki, J. P. L. and Colin, A. J. T. 1964. 'Studies in the Correspondence of Prosodic to Grammatical Features in English', *Proceedings of the Ninth International Congress of Linguistics*. IX, pp. 679-691.
- Roach, P. 2000. *English Phonetics and Phonology: A Practical Course*. Third Edition. Cambridge: Cambridge University Press.
- Wells, J. C. 2006. *English Intonation: An introduction*. Cambridge: Cambridge University Press.