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*The falling-rising intonation in English: its subtypes, functions, and representations**

1 Introduction

1.1 Basic notions

This paper deals with the fairly controversial topic of ‘falling-rising intonation’, or ‘fall-rise’ (FR), of British English. The English falling-rising contours are traditionally divided into two subtypes: the Simple FR and the Compound FR, see e.g. Kingdon (1958: 9–21), O’Connor and Arnold (1963: 27, 1973: 28–30), Halliday (1967, 1970), Cruttenden (1997: 102), Grice, Ladd and Arvaniti (2000: 169–174), Ladd (2008: 114, 142–147).¹ Both subtypes have a fall followed by a rise in the same intonational phrase (IP), but – as we shall see below – there can be considerable differences between them in other respects. However, there are also authors who analyse the Compound FR as a combination of two intonational phrases, one with a fall and one with a rise, i.e. as a fall plus rise: F+R, brought together by means of intonational sandhi, see Tench (1996: 79), Wells (2006: 23–24, 27–32, 69–73, 78–83). Intonational sandhi can indeed be a factor in some cases of the Compound FR, but – as we shall see below – not in all.

Distinguishing the two subtypes is not always easy. It is primarily based on phonetic and semantic differences, but since the phonetic differences are often neutralized, some scholars, e.g. Gimson (1989: 273–4) and Gussenhoven (2004: 297), do not distinguish them explicitly. Others maintain that the two have to be distinguished because, though their phonetic differences can be blurred or even non-existent in particular cases, their meanings are different. Therefore, in phonetically ambiguous cases it is the

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¹ There is considerable variation in the names of these types. The simple FR is also known as ‘genuine fall-rise’ (Cruttenden 1997: 102), or ‘fall-rise’ (Kingdon 1958: 9–21). The compound FR is sometimes referred to as ‘divided fall-rise’ (Kingdon, loc. cit.), or ‘split fall-rise’ (Cruttenden op. cit.: 53, 102), which are not very appropriate names, considering that the Simple FR can also be ‘divided’ or ‘split’, see Section 2. In Halliday’s (1967, 1970) system the two subtypes correspond to Tone 4 and Tone 13, respectively.

meanings of the two subtypes that are the major criteria for distinguishing them, and these meanings can be revealed from the contexts in which the utterances with the FR occur, see e.g. O'Connor and Arnold (1963, 1973), Cruttenden (1997), Wells (2006).

A basic term that we need to clarify before we proceed is the **intonational phrase** (IP). The intonational phrase is the unit of intonation, which has a characteristic internal structure. In English, the only obligatory element in this structure is the **nuclear syllable** or **nucleus**, which is a stressed syllable, associated with the last (rightmost) pitch accent in the IP. This pitch accent initiates the most important melodic pattern within the IP, the **nuclear contour**, which begins on the nucleus and lasts till the end of the IP. In addition to the pitch accent on the nucleus there can be pre-nuclear pitch accents in the IP as well, but post-nuclear pitch accents are not normally possible and occur only in exceptional IPs, including IPs with a Compound FR. This is why the Compound FR is a paradoxical phenomenon. It contains a downgraded pitch accent after the nucleus, see e.g. (1b) below, where the nucleus is the syllable *knew*, and it is followed by a subdued, post-nuclear pitch accent on the syllable *do*.

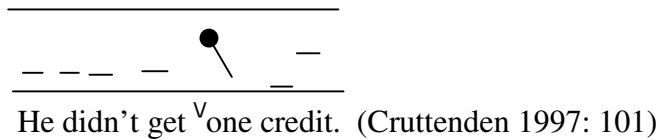
1.2 Phonological status of the Simple and Compound FR

The phonological representation of the two subtypes is also a problematic issue, especially with respect to the Compound FR, which behaves paradoxically. According to the majority view, the two subtypes of the FR are phonologically distinct (even when phonetically they coincide), see e.g. O'Connor and Arnold (1963: 27, 1973: 28–30), Halliday (1967, 1970), Tench (1996: 79), Cruttenden (1997: 102), Wells (2006: 23–24, 27–32, 69–73, 78–83).

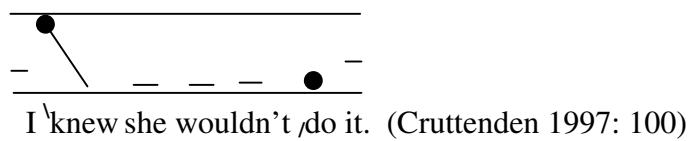
The traditional British literature on intonation (and on FR) is based on **contour-analysis**, which is a kind of phonological analysis, treating intonation contours as wholes. Most varieties of British contour analysis use **tonetic stress marks** for transcribing intonation. These are graphic symbols put in the line of text to simultaneously indicate the contours and the accent-bearing initial syllables of the phrases carrying the contours. In this system the transcription for the Simple FR is commonly $\overset{\vee}{\dots}$, as in (1a), and the transcription for the Compound FR is $\overset{\vee}{\dots} \downarrow \dots$, as in (1b), see e.g. O'Connor and Arnold (1963, 1973), Cruttenden (1997). Those who treat the Compound FR as a combination of two intonational phrases (one with a fall, the other with a low rise) use some kind of boundary symbol, such as the vertical line, between the two consecutive intonational phrases: $\overset{\vee}{\dots} | \dots$, as in (1c), see e.g. Tench (1996), Wells (2006). In my opinion, however, this is unjustified because

within a real Compound FR there is not even a potential IP-boundary between the fall and the rise, and therefore a $\backslash \dots / \dots$ would be more appropriate.²

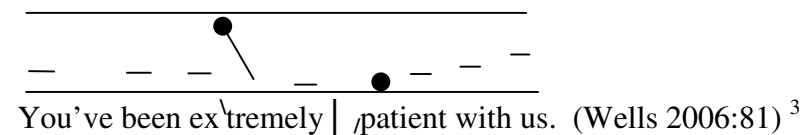
(1) (a) *Simple FR*:



(b) *Compound FR*:



(c) *F+R (= Compound FR in some analyses)*:



The representations $\vee \dots$ and $\backslash \dots / \dots$ are adequate reflections of the phonological difference between the Simple and Compound FR. Therefore, when citing examples from the literature in this paper, I will use $\vee \dots$ for the Simple, and $\backslash \dots / \dots$ for the Compound FR. These normally coincide with the original intonational transcriptions of the examples that we find in the sources. However, whenever I cite Compound FR examples from Tench (1996) or Wells (2006), who transcribe these as $\backslash \dots / \dots$, I will change their transcription to $\backslash \dots / \dots$, thus retaining the transcription $\backslash \dots / \dots$ for genuine combinations of two IPs (in which there is at least a potential IP-boundary between the two IPs, and the first IP has a fall and the second a low rise).

The last three decades have witnessed the emergence of a new kind of phonological analysis of English intonation, and within that, of the FR, viz. the

² Reliable criteria of IP-boundaries include a pause (real or filled), but no pauses are possible between the fall and rise of a Compound FR (apart from those instances of the Compound FR which are derived from two IPs by intonational sandhi, see 5.2.3).

³ The schematic pitch curves of the examples here and elsewhere in the paper are indicated by means of round dots for pitch accented syllables and little horizontal lines for all other (i.e. unstressed, and stressed but unaccented) syllables, situated at different heights between two long horizontal lines which represent the top and bottom pitch of the speaker's voice.

autosegmental approach, which considers intonation contours not as wholes but as sequences of various kinds of high (H) and low (L) tones, see Pierrehumbert (1980), Gussenhoven (2004), Ladd (2008). This involves an even higher degree of abstraction than the contour analysis of the British tradition. According to a recent proposal, couched in autosegmental terms, the Simple FR and the Compound FR are not phonologically distinct but form a kind of continuum, and thus both subtypes should have a unitary representation: H* L- H%, see Grice, Ladd and Arvaniti (2000) and Ladd (2008). I will examine this proposal, and will show that it has problems, which can be solved by adopting an alternative analysis which does distinguish the two subtypes of FR in autosegmental terms.

The Simple and Compound FR have to be treated as phonologically distinct, for several reasons. First, they carry different meanings. Secondly, while the Simple FR can be realized on a single syllable, the Compound FR needs at least two syllables to appear on. Thirdly, they have potential phonetic differences. Fourthly – according to Cruttenden (1997: 102) – in the Simple FR a ‘V-shaped’ realization (in which the fall and rise are adjacent) can always replace a ‘bowl-shaped’ realization (in which the fall and rise are separated by a low level stretch), irrespectively of there being or not being any stressed syllables after the fall in it, but such replacement is not possible in the Compound FR. This reveals that the two subtypes are phonologically different from each other. Although their phonetic realizations may coincide, their phonological representations, *pace* Grice, Ladd and Arvaniti (2000) and Ladd (2008), cannot be identical.

1.3 Structure of the paper

The structure of the paper is as follows. In Sections 2 and 3 I briefly review the functions and phonetic characteristics of the Simple FR and the Compound FR, respectively, on the basis of the descriptions available in the literature. In Section 4 I sum up the phonetic differences that may exist between the two subtypes and show an example in which the phonetic differences are neutralized but the meanings (and contextual preferences) remain different. In Section 5 I turn to the issue of the autosegmental phonological representation of the English FR contours. First, I present Grice, Ladd and Arvaniti’s (2000) and Ladd’s (2008) approach. Then I point out what kinds of problems this approach raises, and offer a possible solution to these problems. I suggest that the two subtypes are phonologically different: under this suggestion the representation of the Simple FR contains a bitonal pitch accent H*+L, followed by a phrase accent L- and a boundary tone H%, whereas the representation of the Compound FR contains a bitonal pitch accent H*+L,

followed by a down-graded pitch accent L^(*), which in turn is followed by a phrase accent L- and a boundary tone H%. The main conclusions are summed up in Section 6.

The data used in the paper have been taken from the literature, but the conclusions and suggestions based on those data are all mine.

2 The Simple Fall-Rise

The Simple FR has various meanings, but I will restrict my attention to the meanings which it has when it embraces a whole clause, i.e. when it appears in an IP which is coextensive with a clause. In such IPs the Simple FR is independent, because its meaning does not depend on a later IP of the utterance.⁴ In **declarative** and **imperative** sentences the independent FR signals some kind of **implication**: it implies an unspoken thought. Implication can be of several kinds. One of them is warning, as in (2a), another is reservation, as in (2b), yet another emerges in negative sentences and its result is that the scope of negation does not include the main verb, as in (2c):

- (2) (a) *Warning*: You won't ^Vlike it.
(b) *Reservation*: (Is that part of the coast very crowded at weekends?)
Well, ^VHastings will be.
(c) *The main verb is outside the negative scope*: ^VAll of them didn't pass the exam (i.e. some did), cf. ^VAll of them didn't pass the exam (i.e. nobody did).
(Examples from Cruttenden 1997: 100–1.)

In all these cases the IP which contains the Simple FR has a **single informational focus**, signalled by the falling part of the Simple FR.

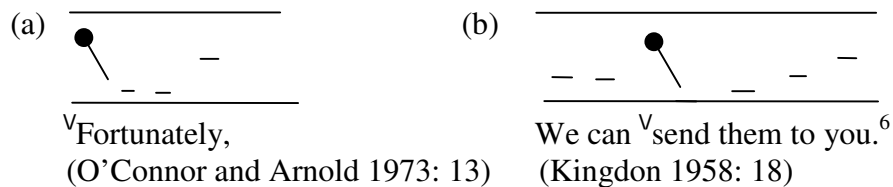
The Simple FR is a nuclear contour. A nuclear contour is one of those meaningful, recurring pitch contours of a language which are able to occupy the final portion of an IP. The Simple FR is like any other nuclear contour in that it can be realized on a single syllable, the nucleus. This happens when the nucleus is the last syllable of the IP, as e.g. in the utterance ^VNo.

Otherwise the rise occurs later, i.e. the fall and the rise occur on separate syllables. In this case the rise appears on a part of the utterance to which **the speaker does not attach any special pragmatic importance** and which, therefore, does not serve as a secondary focus. If the nuclear syllable is

⁴ I am not dealing with cases where the clause has more than one IP and the Simple FR appears in an initial IP. In those cases the Simple FR is a dependent FR, because its meaning depends on a later IP in the clause. On the meanings of the dependent Simple FR in English, see e.g. Cruttenden (1997: 93–7).

followed by one unstressed syllable, as in ^V*Never*, then the first syllable takes the fall and the second the rise.⁵ If there are several unstressed syllables after the nucleus, the Simple FR can be phonetically realized in different ways. First, the rise can take place on the last syllable (or between the last two syllables), and in this case the fall and rise may be separated from each other by a low level stretch. This is what I call the ‘bowl-shaped’ realization, because its schematic pitch curve looks like the side-view of an upward-looking bowl. This is illustrated in (3a). Another possibility is that the rise begins immediately after the nucleus, and the fall and rise are adjacent, forming a melody which is schematically ‘V-shaped’, as in (3b).

(3) *Simple FR, if there are no lexical stresses after the nucleus:*



If the postnuclear part of the IP contains one or more content words with lexical stress, then there are several possibilities in free variation. A typical solution is for the rise to begin on the final lexically stressed syllable.⁷ In this case the schematic picture of the melody is often ‘bowl-shaped’, as in (4a), see Tench (1996: 79). Alternatively, it can happen that the rise ignores the last lexically stressed syllable and begins immediately after the fall. In this case the melody becomes ‘V-shaped’, as in (4b). In such cases the postnuclear stresses can even be suppressed, cf. O'Connor and Arnold (1963: 28, 1973: 30).

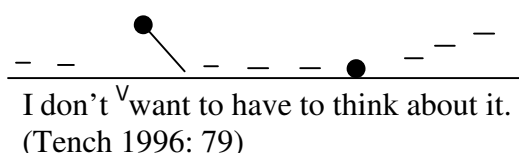
⁵ Alternatively, in such disyllabic realizations either the first syllable can be mid-high level before a low rising second syllable, or the first syllable is falling before a mid-high level second syllable, see e.g. Kingdon (1958: 18), Tench (1996: 79). These are phonetic variations and they do not affect the meaning of the contour.

⁶ It might seem that what I call ‘bowl-shaped’ is just a synonym for Kingdon’s (1958) term ‘divided’. This is not the case. Kingdon uses the term ‘Divided FR’ in the sense of Compound FR, in order to express the fact that in the Compound FR the focus of the message is ‘divided’ into a primary focus and a secondary focus, while in the Simple FR there is only one, undivided focus. As a matter of fact, both the ‘bowl-shaped’ and the ‘V-shaped’ realizations are possible in both the Simple and the Compound FR.

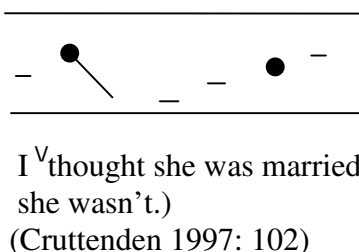
⁷ Barnes et al. (2006) found that the beginning of the rise could be located not only in a final but also in a penultimate postnuclear stress, but not in an antepenultimate postnuclear stress.

(4) *Simple FR, if there are lexical stresses after the nucleus:*

(a) *The rise begins on the last lexically stressed syllable:*



(b) *The rise begins immediately after the fall, irrespectively of there being or not being postnuclear lexical stresses:*



3 The Compound Fall-Rise

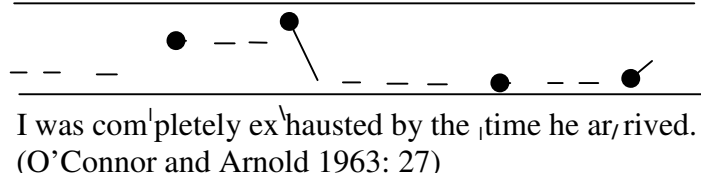
3.1 The phonetic realizations of the Compound FR

The Compound FR is a contour which usually embraces a whole clause. In **declarative** and **imperative** sentences the falling part usually begins on the stressed syllable of a word which the speaker regards as **primary focus (major information)**, and the rising part begins on the stressed syllable of a word which the speaker regards as **secondary focus (minor information)**, see Halliday (1967: 37), Tench (1996: 80). The fall in the Compound FR is somewhat stronger than the rise, it is 'phonetically dominant' (Crystal 1969: 219), while the rise is subdued, 'downgraded'. The falling part of the Compound FR usually has a wider range (i.e. starts higher and ends lower) than in the Simple FR (see O'Connor and Arnold 1963: 27, 1973: 29), and the rising part ends lower than in the Simple FR, it is a low rise, (see Tench 1996: 83).

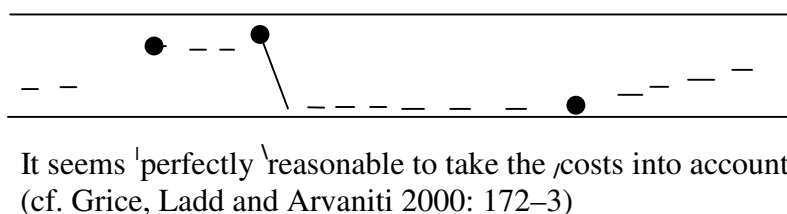
The rising part here starts on the secondary focus, i.e. on the audibly stressed syllable of **a word to which the speaker attaches some special pragmatic importance**. This syllable may but need not coincide with the last lexically stressed syllable in the IP, cf. (5a) and (5b), respectively.

(5) *Compound FR:*

(a) *The secondary focus coincides with the last potential lexical stress:*



(b) *The secondary focus does not coincide with the last potential lexical stress:*



In (5a) the secondary focus is the word *arrived*, and the stressed syllable of this word coincides with the last lexically stressed syllable (*-rived*). In (5b) there is a different situation: the secondary focus (*costs*) and the last lexically stressed syllable (*-count*) do not coincide.

Since the falling part marks major information and the rising part minor information, the Compound FR cannot be realized on a single word; **it needs at least two words (and consequently at least two syllables) to appear on.** The melody is typically ‘bowl-shaped’, i.e. the fall and rise are typically separated by an intervening low stretch between them, but a ‘V-shaped’ realization cannot be excluded either, i.e. the fall and the rise can be adjacent, too, if the syllable initiating the fall and the syllable initiating the rise happen to be next to each other, as in (13b) below.

In sum, we shall accept the view that in the Compound FR the nuclear syllable, initiating the fall, is not the last pitch accent in the IP, as is normal, but **the last non-downgraded pitch accent**, which is followed by a downgraded pitch accent, initiating the rise, in the same IP. This may seem paradoxical, but the Compound FR is a paradoxical phenomenon, under any interpretation. According to Kingdon (1958: 10), the Compound FR (i.e. his ‘Divided FR’) is a plurisyllabic nucleus which embraces ‘a wider idea than that conveyed by a single word’. Under this view, there is one nucleus in the IP, but instead of being a single syllable, the nucleus embraces a sequence of (minimally two) syllables, starting with the syllable on which the fall begins, and ending with the syllable on which the rise begins. This view is in contrast

to the ‘normal’ concept of the nucleus, under which the nucleus is a single syllable within the IP. According to O’Connor and Arnold (1963: 27, 1973: 28–30) and Roach (1983: 133), the Compound FR is a combination of two nuclear contours (a fall and a low rise), which are ‘welded together’ into one IP. Here the problem is that a ‘normal’ IP is not supposed to have two nuclei and two nuclear contours. According to Tench (1996) and Wells (2006: 82) the Compound FR has two IPs (with a falling nucleus in the first and a rising nucleus in the second). This opinion is based on the assumption that the Compound FR comes into being simply as the result of intonational sandhi. This view is in conformity with the ‘one IP – one nuclear syllable’ principle, but it ignores two facts. One such fact is that there is no phonetic IP boundary between the two wings of the Compound FR. Another is that intonational sandhi serves as an explanation in only a minority of the occurrences of the Compound FR (see 3.2 below).

3.2 Meanings of the Compound FR

In declarative and imperative sentences it often happens that the low rising part of the FR, i.e. the minor information, is a **syntactically ‘foreign’ element**, which can be omitted or added as an afterthought. These are what Bing (1979: 21–52) terms ‘Class O expressions’ (or ‘the Outside class’) and Gussenhoven (2004: 291–2) calls extra-sentential material. They include disjuncts, viewpoint adjuncts, vocatives, quoting clauses, epithets, positive question tags attached to positive main clauses, etc., like the italicised parts in (6a–f).

(6) *Fall on the major information, rise on the minor information; the latter is a syntactically ‘foreign’ element:*

- (a) He went a way **un**fortunately. (Cruttenden 1997: 36),
where *unfortunately*: disjunct.
- (b) We are in a poor \shape **eco**nomically. (Tench 1996: 67),
where *economically*: viewpoint adjunct.
- (c) They’re \here, **John**. (loc. cit.),
where *John*: vocative.
- (d) Don’t \run, **he** said. (loc. cit.),
where *he said*: quoting clause.
- (e) He shouldn’t have \done it, **the** fool. (loc. cit.),
where *the fool*: epithet.
- (f) John’s going \out, **is** he? (op. cit.: 39),
where *is he*: question tag of the copying type.

In sentences (6a–f) the parts having the rising melody have a certain degree of independence and are inorganic or extra-sentential material. The emergence of the Compound FR contour in these examples can rightfully be explained by means of **intonational sandhi**, see Cruttenden (1997: 36). Consider, for instance, (7a, b), in which a sentence with a falling nuclear contour (*He went away*) as a first IP, and a sentence-final disjunct with a low rising nuclear contour (*unfortunately*) as a second IP, are brought together in a single IP, by deleting the boundary between them.

- (7) (a) He went a\way | un/fortunately. →
 (b) He went a\way unfortunately. (Cruttenden 1997: 36)

While in (7a) the speaker expresses the importance and relative independence of the disjunct *unfortunately* (the disjunct can even be an afterthought), in (7b) the speaker treats the disjunct as an addition slightly more strongly connected to the main clause. The feeling of separation can be further lessened by deleting the accent on the disjunct altogether and realizing it as a tail of the fall, as in (7c):

- (7) (c) He went a\way unfortunately. (Cf. similar cases in Tench 1996: 67)

In the same fashion as in (7b), we can say that all the Compound FR examples in (6a–f) are also created by intonational sandhi.

However, in many other cases the minor information, having the rising melody of the compound FR, is **not a syntactically ‘foreign’ element**. For instance, the fall signalling major information is often on a **word that refers to a mental state**, in relation to which the subclause having the rise is just minor information, but this subclause is, nevertheless, an organic part of the sentence, see (8).

- (8) I’m \glad you found it /interesting. (Wells 2006: 81)

Division into major information—minor information is also present in so called **self-justificatory sentences**. In these, an initial past tense verb, which expresses saying or thinking, takes the fall because it is the most important piece of information: it confirms the truth of the following subclause. The subclause that follows conveys minor information and therefore takes the rise, see (9a, b).

- (9) (a) I \knew she wouldn't /do it. (Cruttenden 1997: 100)
(b) I was \sure I could count on /you. (O'Connor and Arnold 1963: 252)

The falling part of the contour may fall on an **intensifying word**, too, because it expresses a great degree of the speaker's emotion and this is what the speaker considers to be the most important part of the message, in relation to which the continuation is only of secondary importance, but something which needs to be expressed, nevertheless.

- (10) (a) You've been ex\tremely /patient with us. (Wells 2006: 81)
(b) \So /sorry. (O'Connor and Arnold 1963: 253)
(c) That's \quite all /right. (op. cit.: 254)

Somewhat similar is the case in **appealing imperatives**, in which the primary importance is laid on the word that expresses the directive function of the sentence and so the falling nucleus falls on the sentence-initial *do* or *don't* or *please*, or on the verb, see (11a–d).

- (11) (a) \Do keep it /short. (Wells 2006: 82)
(b) Oh \don't just /sit there. (O'Connor and Arnold 1963: 258)
(c) \Open the /door. (loc. cit.)
(d) \Please stay a little /longer. (op. cit.: 259)

The examples in (8)–(11) are clearly different from those in (6), where reference to sandhi provided a feasible account. In (8)–(11), where the sentence part with the rising melody is not a syntactically 'foreign' element, we can hardly believe that the Compound FR is a sequence of a falling IP and a low rising IP. In these cases a sandhi-based explanation would be unconvincing.

4 Potential Phonetic Differences Between the Simple and the Compound FR

In the previous sections I have made scattered remarks about the systematic phonetic differences between the Simple and Compound FR. Some of these are very subtle, others are more noticeable, but in any case, they are all optional. I present an inventory of these differences in (12):

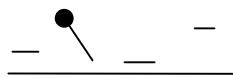
(12) *Summary of phonetic differences between the Simple and Compound FR:*

- i. The Simple FR can appear on a single syllable, the Compound FR cannot, since it needs two words, and thus at least two syllables (see O'Connor and Arnold 1973: 29).
- ii. The stresses after the fall are often weakened or suppressed in the Simple FR, but not in the Compound FR (see O'Connor and Arnold 1973: 29).
- iii. The falling part often has a wider range (i.e. can start higher and end lower) in the Compound FR than in the Simple FR (see O'Connor and Arnold 1973: 29).
- iv. The rising part often ends higher in the Simple FR than in the Compound FR (see Tench 1996: 83).
- v. A 'bowl-shaped' realization can be replaced by a 'V-shaped' realization in the Simple FR, but not in the Compound FR (see O'Connor and Arnold 1973: 29, Cruttenden 1997: 102).

Since some or all of these differences may be missing, the Simple and Compound FR cannot always be distinguished phonetically. For instance, in isolation the responses in (13a, b) can be practically indistinguishable and can be regarded either as Simple FR or as Compound FR. While in the Simple FR the syllable *choc-* has a weakened or suppressed lexical stress, in the Compound FR the syllable *choc-* has a secondary focus on it.

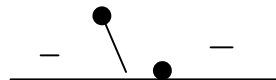
(13) (a) *Simple FR:*

- (I've got some chocolate here.)
- (O, dear.) I ^Vlike chocolate. (But I'm on a diet.)



(b) *Compound FR:*

- (I've got some chocolate here.)
- (Oh, good.) I ^Vlike _χchocolate. (Pass it over.)



(cf. O'Connor and Arnold 1973: 28–9, 83; Wells 2006: 82–3)

Nevertheless, even in examples like these it is advisable to distinguish the Simple and the Compound FR in notation because ‘these two patterns have different tone meanings: they convey different speaker attitudes’ (Wells 2006: 82). In (13a) the word *chocolate* could be replaced by the pronoun *it*, whereas in (13b) ‘the speaker wants to give some importance to *chocolate*’ (O’Connor and Arnold 1973: 83). When the phonetic differences in such examples are completely neutralized, it is practically only the context of the utterance which can help us decide about the subtype of the FR, because the context reveals the meaning of the contour. Thus (13a) is likely to be a Simple FR because it implies some sort of reservation, while (13b) is more likely to be a Compound FR, because it implies no reservation but rather expresses major information plus minor information. (The F₀- and intensity curves of the two utterances are given in the Appendix.)

5 Autosegmental Phonology of the Falling-Rising Contour

5.1 Simple FR and Compound FR: phonologically the same?

We have seen that the Simple and Compound FR contours do not necessarily differ in their phonetic realizations and the differences are often gradual. This is why the opinion is spreading that the attempt to phonologically distinguish the two kinds of FR is unnecessary. Ladd (2008: 146–7) claims explicitly that the Simple and Compound FR contours form a kind of continuum. Compare the utterances in (14a, b, c). (14a) is a short, monosyllabic utterance, whose melody is obviously a Simple FR. (14b) displays the ‘bowl-shaped’ Simple FR melody of a somewhat longer utterance with a postnuclear lexical stress (the latter being on the syllable *-struct-*). And in (14c) we can observe the Compound FR contour of a lexically-syntactically richer utterance, in which the final rise is even more separate and signals the special prominence (i.e. the secondary focus-status) of the postnuclear word *dancing*. According to Ladd (ibid.), the intonations of these utterances do not show any phonological differences at all. The longer the utterance, the more likely it is that there appears a downgraded accent on the rise after the fall.

- (14) (a) ^VSue!?
 (b) A ^Vdriving instructor!? = A \driving in/structor!?
 (c) I ^Vthought she was ,dancing tonight!
 (cf. Ladd 2008: 146–7)

The same view was expressed earlier by Grice, Ladd and Arvaniti (2000: 169–73), who were of the opinion that the phonological representations of both subtypes of the FR were identical, namely (15).

(15) *The common phonological representation of the Simple and Compound FR (as suggested by Grice, Ladd and Arvaniti 2000: 169–73):*

H* L- H%

Note: The L- is copied to two locations within the IP, in both subtypes of FR.

In this representation, the H* (H-star) is a high pitch accent, the H% (H-percent) is a high boundary tone, and the L- (L-hyphen) is considered to be a **phrase accent** because its timing in the English FR depends on postnuclear stresses (see Grice, Ladd and Arvaniti 2000: 173). This opinion is also shared by Pierrehumbert (1980), Beckman and Pierrehumbert (1986), Pierrehumbert and Beckman (1988), as well as Ladd (2008: 142–7), even though formerly he criticised this view, cf. Ladd (1983).

In the underlying phonological representation the so-called edge tones, i.e. the L- phrase accent and the H% boundary tone, are both associated with the right edge of the IP. Then the H% boundary tone is aligned with the end of the IP, and the L- phrase accent is copied from the right edge of the IP to two places within the IP. In the **Simple FR** these two places are the nuclear syllable and the syllable with the last postnuclear lexical stress, or, if there is no postnuclear lexical stress, then the nuclear syllable and the final syllable of the IP, see (16).

(16) *Copying the phrase accent in the Simple FR (as suggested by Grice, Ladd and Arvaniti 2000: 169–71):*

∴ L- is copied to the nuclear syllable and to the final postnuclear lexically stressed syllable, or in lack of a postnuclear lexical stress, to the nuclear syllable and the final syllable.)

H*	H*	H*	H*	=>

They 'didn't 'take the 'car 'LAST 'time they 'went] — L- H%

i.e. H*+L.⁸ This is shown in (18):

(18) *The common phonological representation of the Simple and Compound FR (Suggestion 1):*

H*+L L- H%

Note: The L- is copied to one location within the IP in both subtypes of FR.

In this way Grice, Ladd and Arvaniti's (2000) and Ladd's (2008) analysis becomes simpler because the L- phrase accent is copied to only one place in both subtypes. In the Simple FR this place can be (a) the syllable accommodating the fall, or (b) the final lexically stressed syllable in the postnuclear region, or (c) – in lack of a postnuclear lexical stress – the final syllable of the IP. In the Compound FR this place is the stressable syllable of the secondary focus (i.e. the pragmatically most prominent postnuclear syllable). Under this revision the derivations shown in (16) and (17) should be modified to (19) and (20), respectively.

(19) *Copying the phrase accent in the Simple FR (based on Suggestion 1):*

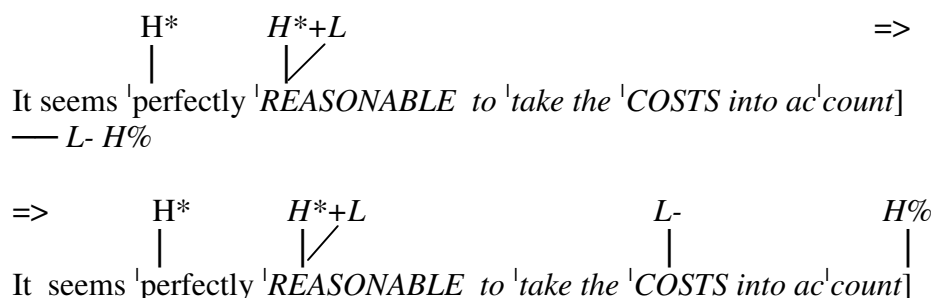
(The L- is copied to the final postnuclear lexically stressed syllable, or in lack of a postnuclear lexical stress, to the final syllable.)

H*	H*	H*	H*+L	=>	
They	'didn't	'take the	'car	'LAST	
				'time they	
				'went]	
				— L- H%	
=>					
H*	H*	H*	H*+L	L-	H%
They	'didn't	'take the	'car	'LAST	'time they
					'went]

⁸ The feasibility of the bitonal pitch accent analysis of the falling part of the FR can serve as an argument in favour of analysing the Fall, too, as having a bitonal pitch accent, i.e. as H*+L L- L%, rather than as H* L- L%. Although the latter representation seems to have gained the upper hand recently (see e.g. Beckman and Elam 1997, or Grice, Ladd and Arvaniti's 2000), the debate is far from settled (see e.g. Gussenhoven 2004).

- (20) *Copying the phrase accent in the Compound FR (based on Suggestion 1):*

(The L- is copied to the pragmatically most prominent syllable of the postnuclear region.)



5.2.2 The phonological representations of the Simple and Compound FR should be different

But Suggestion 1, presented in (18), turns out to be insufficient because the phonological conflation of the two kinds of FR, as proposed in Grice, Ladd and Arvaniti (2000) and Ladd (2008), raises further problems. One such problem is the following. It can happen that the last lexically stressed syllable of the Simple FR and the stressable syllable of the secondary focus of the Compound FR coincide. We have already seen examples of this kind in (13a) and (13b) above. Another pair of examples, consisting of longer sentences, is provided by (21a) and (21b). Following Cruttenden (1997: 102), I claim that (21a) contains a Simple FR, and (21b) a Compound FR, even though the phonetic differences that are generally possible between the Simple and Compound subtypes (shown in (12) above) are neutralized, and (21a) and (21b) are practically homophonous. (Their F₀- and intensity curves are shown in the Appendix.)

- (21) (a) *Simple FR:*

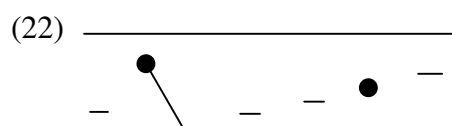
I^vthought she was married. (But I did not know so and it turned out she wasn't.)

- (b) *Compound FR:*

I[\]thought she was _/married. (And so she was!)

(cf. Cruttenden 1997: 102)

As a matter of fact, Cruttenden (1997: 102) transcribes (21a) in the same way as (21b), i.e. as *I^v thought she was married*, because of the ‘bowl-shaped’ nature of the FR in (21a) and because of the practical homophony of (21a) and (21b). But he then goes on to say that the two must be distinguished, nevertheless, for two reasons. The first reason is that they have different intonational meanings: (21a) expresses an implication, (21b) divides the sentence into a more important and a less important part. Thus (21a) and (21b) suit different contexts. Secondly, and this is extremely important, according to Cruttenden (*loc.cit.*), only (21a), but not (21b), can be alternatively realized as (22):

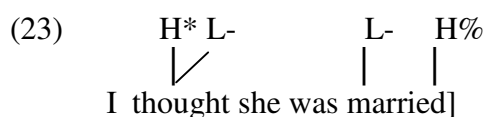


I^v thought she was married. (But I did not know so and it turned out she wasn't.)

(Cruttenden 1997: 102)

That is to say, if Cruttenden is right, it is solely (21a), i.e. the Simple FR, that can have an alternative ‘V-shaped’ realization (22), and the V-shape is not an option for (21b). This is a crucial difference, ultimately related to the semantic difference between the Simple and Compound FR.

Despite this crucial difference (and the potential phonetic differences that are otherwise usually possible between the Simple and Compound FR, even though missing here), Grice, Ladd and Arvaniti’s (2000) analysis would yield the same representation (23) for both (21a) and (21b).



But this cannot be adequate for both (21a) and (21b). Therefore I suggest that the Simple and Compound FR should be treated as two phonologically separate, though related, subtypes of the English FR contours. The two subtypes are related in the sense that both have an initial bitonal pitch accent (H*+L) and a final sequence of edge tones, i.e. the phrase accent L- and the boundary tone H%. The difference between the Simple and Compound subtypes must lie in what happens to be between the initial pitch accent and the final edge tone combination.

I propose that in the phonological representation of the **Simple FR** there is nothing between the initial pitch accent and the final sequence of edge tones, see (24).

(24) *Simple FR (Suggestion 2):*

H*+L L- H%

Notes: The L- phrase accent

- (a) can always be copied to the syllable accommodating the fall,
- (b) can be copied to the final lexically stressed syllable of the IP if there is a postnuclear lexical stress,
- (c) can be copied to the final syllable of the IP if there is no postnuclear lexical stress.

Therefore the autosegmental phonological representation I suggest for (21a) is (25):

(25) *The Simple FR (analysis based on Suggestion 2):*

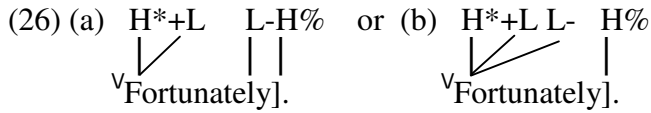
(a) H*+L L- H%
 | | |
 I^VTHOUGHT she was married.] (But I did not know so and it turned
 out she wasn't.)

or:

(b) H*+L L- H%
 | |
 I^VTHOUGHT she was married.] (But I did not know so and it turned
 out she wasn't.)

Interpolation between the L- and the final H% boundary tone will yield a steady rise. In (25a) the rise is carried by the syllables *mar-* and *-ried*, while the syllables *she* and *was* form a low level stretch ('bowl-shape'). In (25b) there is a steady rise on the string *she, was, mar-* and *-ried*, and there is no low level stretch between the fall and the rise ('V-shape').

If there are no postnuclear lexical stresses, the L- phrase accent is copied to the beginning of the last syllable of the IP, as in (26a), or to the syllable that has the fall, as in (26b).



By contrast, the phonological representation of the **Compound FR** has a L^* pitch accent between the initial bitonal pitch accent (H^*+L) and the final sequence of edge tones ($L- H\%$); it is: $H^*+L \quad L^* \quad L- \quad H\%$. In this underlying representation the L^* in the middle is temporarily the nucleus of the IP. But the L^* in the middle is obligatorily downgraded by the pitch accent downgrading rule (27). This rule changes the status of the L^* to ‘downgraded pitch accent’, when the L^* appears between H^*+L and $L-H\%$ within an IP. This will be shown by putting the star diacritic in parentheses: $L^{(*)}$.

(27) *Pitch accent downgrading:*

$$L^* \rightarrow L^{(*)} / \dots H^*+L \quad ___ \quad L- \quad H\% \\ \text{obl}$$

By downgrading the L^* to $L^{(*)}$, the $L^{(*)}$ is no longer the rightmost non-downgraded pitch accent of the IP, and the syllable to which it is attached ceases to be the nucleus. The status of nucleus is automatically shifted back to the syllable taking the rightmost remaining non-downgraded pitch accent, which is the bitonal H^*+L .

(28) *Compound FR (Suggestion 3):*

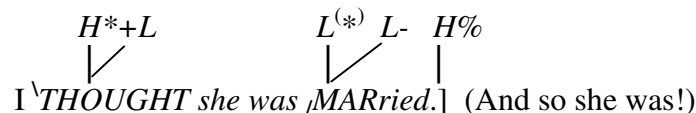
$$H^*+L \quad L^* \quad L- \quad H\% \rightarrow H^*+L \quad L^{(*)} \quad L- \quad H\% \\ \text{obl}$$

Notes (a): $L^{(*)}$ is aligned with the pragmatically most prominent syllable of the postnuclear region.

(b): $L-$ is copied to the syllable taking the $L^{(*)}$.

The autosegmental phonological representation I suggest for (21b) is (29):

(29) *Compound FR (analysis based on Suggestion 4):*



In this way the puzzle of having different meanings (and often different phonetics) for apparently identical phonological representations disappears. The phonological representations in question are no longer identical.

5.2.3 The derivability of cases where intonational sandhi is responsible for the Compound FR should be explicitly shown

The last problem that needs dealing with is a minor one: the special subset of sentences, exemplified in (6a–f) above, where the Compound FR is explainable as the result of intonational sandhi, is not covered by Grice, Ladd and Arvaniti’s (2000) analysis given in (15) or its revised version offered as Suggestion 1 in (18).

I claim that the utterances belonging here can be realized as two IPs: [IP...H*+L L- L%] [IP L* L- H%], but also as Compound FRs in single IPs. The connection between the two possibilities should be explicitly recognized. This needs a separate mechanism, which is sketched in (30), where the underlying representation is (30a), composed of two IPs. This is submitted to (30b), where the edge tones of the first IP (i.e. the L-L%) are optionally deleted, resulting in a single IP, containing the sequence H*+L L* L- H%.

(30) *Derivation of the sandhi-based Compound FR (Suggestion 4):*

- (a) ... H*+L L- L% L* L- H%
- (b) L- L% → 0 / ... H*+L ___ L* L- H%
opt

The resulting sequence is submitted to the Pitch accent downgrading rule (27), which obligatorily changes the status of the L* to ‘downgraded pitch accent’, i.e. to L^(*), when it appears between H*+L and L- H%.

As a result of applying (30) and (27), (31a) will become (31c). The L-phrase accent is copied directly to the syllable taking the L^(*).

- (31) (a) H* H*+L L- L% L* L-H%
- | / | | |
- He went away,] unfortunately].
- (b) H* H*+L L* L-H%
- | / | |
- He went away, unfortunately].



The intermediate representation (31b) is a sequence of three pitch accents (H*, H*+L, L*) plus two edge tones: a phrase accent (L-) and a boundary tone (H%). The last pitch accent in this sequence (L*) is temporarily the nucleus of the IP. In the final representation (31c), however, the last pitch accent is downgraded and so it loses its nuclear status, which automatically shifts back to the last remaining non-downgraded pitch accent of the IP, which is H*+L, in the same way as in ordinary (non-sandhi-based) Compound FRs.

6 Conclusion

In this paper I have examined the controversial issues of the Simple and Compound subtypes of the Falling-Rising contour (i.e. Fall-Rise or FR) of British English intonation. I have taken for granted the phonetic and semantic descriptions found in the literature. Confronting these descriptions with a large mass of newly obtained data may have been desirable but collecting and analysing such data would have gone beyond the limits of the present paper. Here I have concentrated on, and challenged, the existing phonological analyses of the English FR and have offered new suggestions to amend them.

First I compared the English Simple and Compound FR in terms of their meanings and phonetic realizations. At the same time I pointed out that the rather wide-spread account of the Compound FR as being a manifestation of intonational sandhi (i.e. as being a merger of two IPs, one with a fall and another with a rise) is feasible in some cases, but there are a number of other cases in which the Compound FR cannot be explained as a sandhi phenomenon.

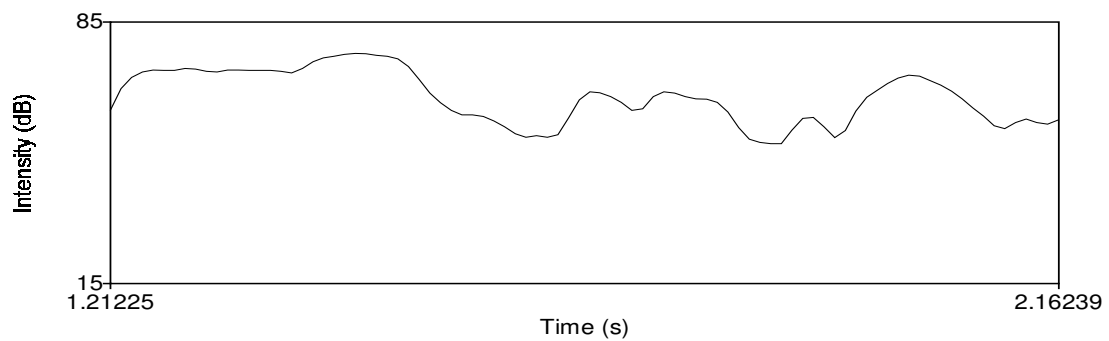
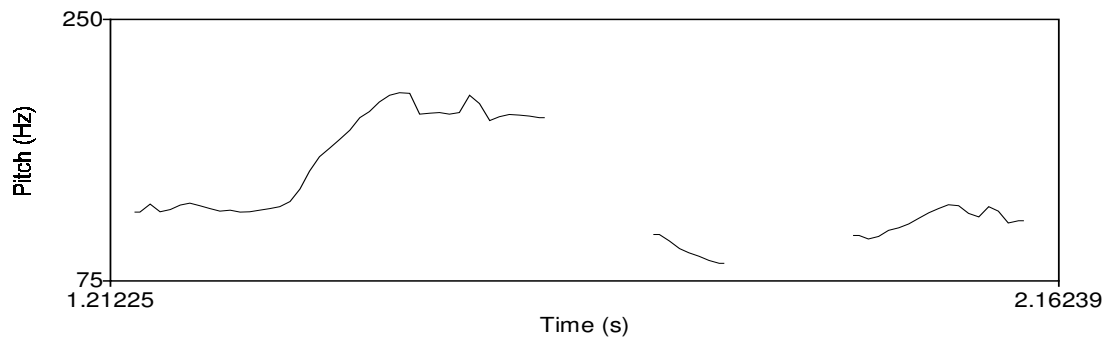
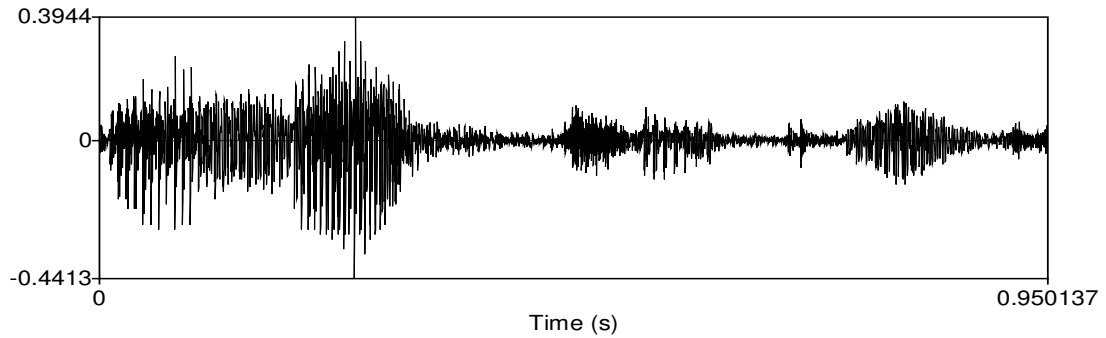
Then I examined the recent suggestion, by Grice, Ladd and Arvaniti (2000) and by Ladd (2008), viz. that the two subtypes are phonologically identical, both representable in autosegmental terms as H* L- H% (where the L- is copied to two places within the IP and the second place differs in the Simple and the Compound FR). I rejected this suggestion because the two subtypes have systematic differences in their semantics (and potential differences in their phonetics), even when the second place for the copy of the L- phrase accent happens to be the same in the Simple and the Compound FR, as in (13a) and (13b), or in (21a) and (21b). The semantic and phonetic differences between the two subtypes cannot be accounted for by offering a unitary phonological representation for both.

Therefore, instead of the unitary $H^* L- H\%$ representation proposed by Grice, Ladd and Arvaniti (2000) and by Ladd (2008), I suggested two different phonological representations, viz. (24) and (28), i.e. $H^*+L L- H\%$ for the Simple FR, and $H^*+ L L^{(*)} L- H\%$ for the Compound FR. Both of these satisfy the generally accepted structural requirements for regular English IPs (see e.g. Beckman and Elam 1997), viz. they both contain a pitch accent, a phrase accent and a boundary tone. However, they are in contrast to the majority analysis in two respects. First, the falling part of both subtypes of FR is represented here as a **bitonal pitch accent** (H^*+L), rather than a monotonal one (H^*). This is not only in conformity with the phonetic facts, but it actually makes the analysis of the two kinds of FR simpler. (At the same time, the success of its use in the FR presents a strong argument for its use in the simple Fall as well, which I recommend to be $H^*+L L- L\%$, rather than $H^* L-L\%$.) Second, I introduce the notion of **pitch accent downgrading**, which downgrades a L^* by turning it into $L^{(*)}$ between H^*+L and $L- H\%$ and, as a consequence, automatically shifts the nuclear status from the L^* to the preceding pitch accent (H^*+L). Finally I introduced a mechanism for deriving Compound FRs by way of intonational sandhi, where appropriate.

Appendix

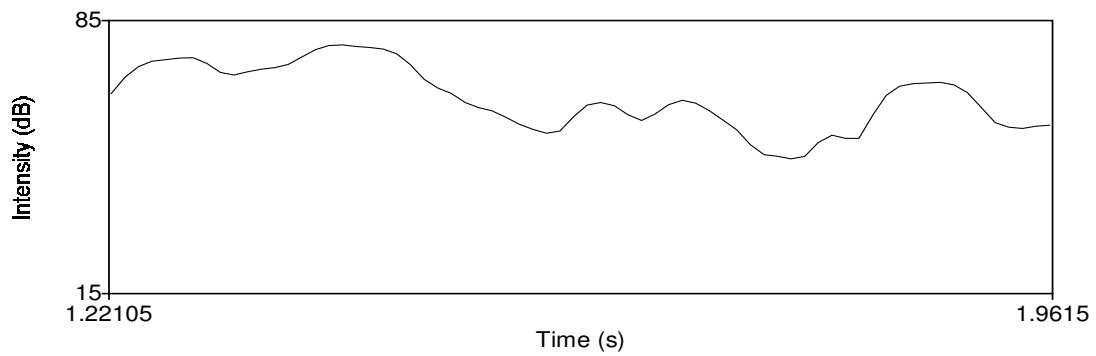
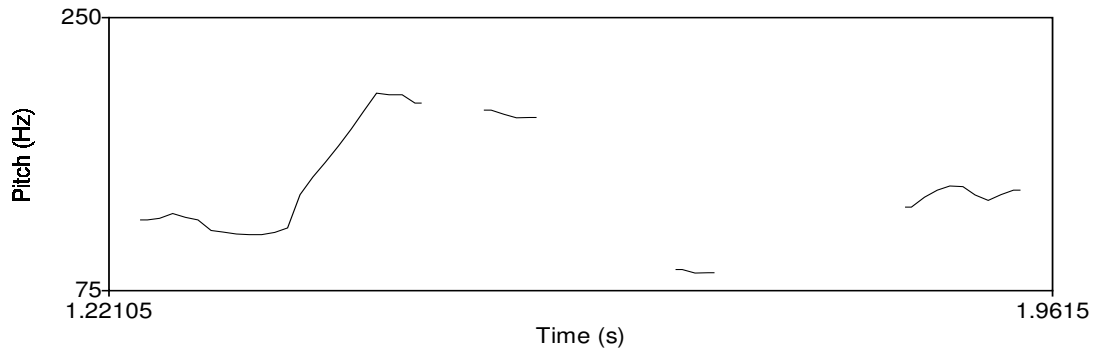
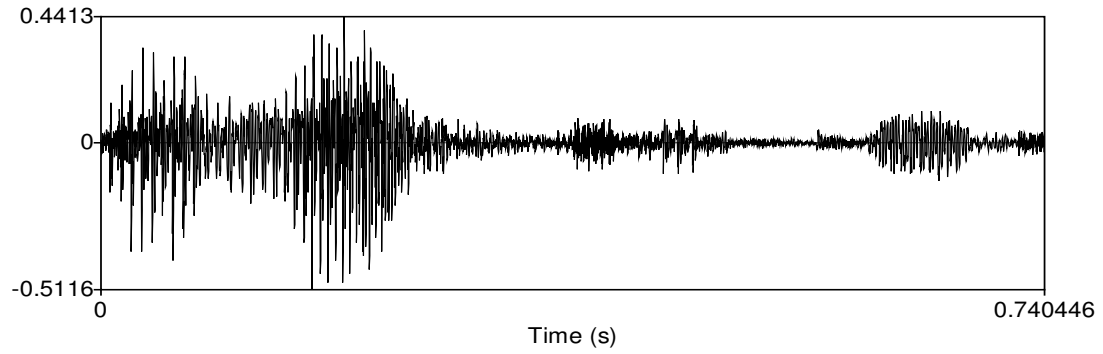
The examples have been analyzed by Praat, Version 5.3.09.

- (13a) -- (I've got some chocolate here.)
-- (Oh, dear.) I ^Vlike chocolate (but I'm on a diet).



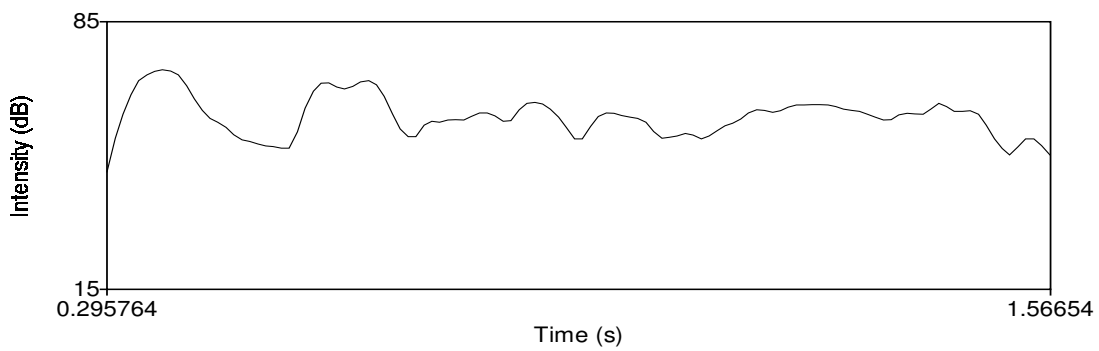
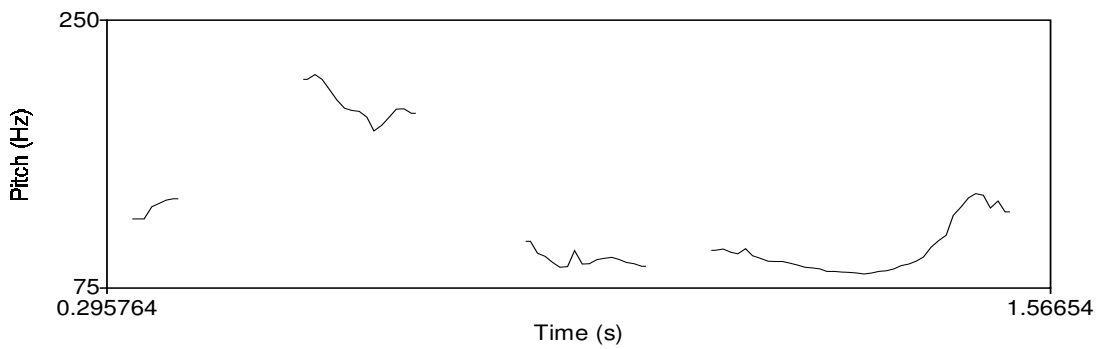
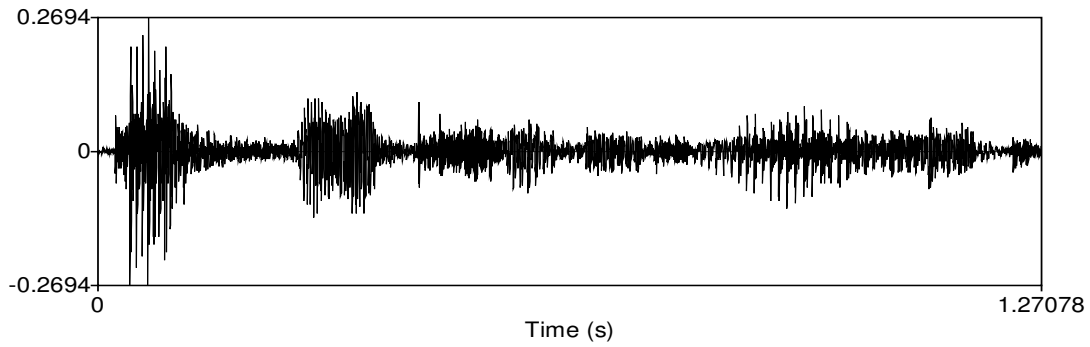
aɪ ^Vlaɪ k tʃ ɒ kl ɪ t

(13b): -- (I've got some chocolate here.)
 -- (Oh, good.) I [\]like _ɹchocolate. (Pass it over.)



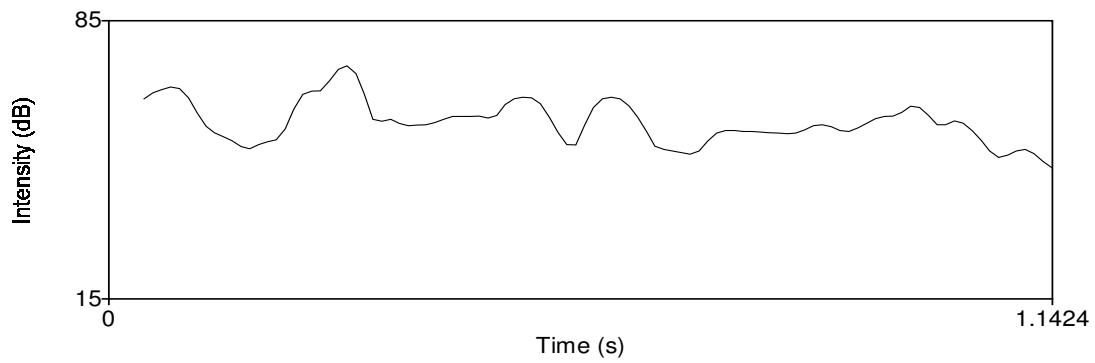
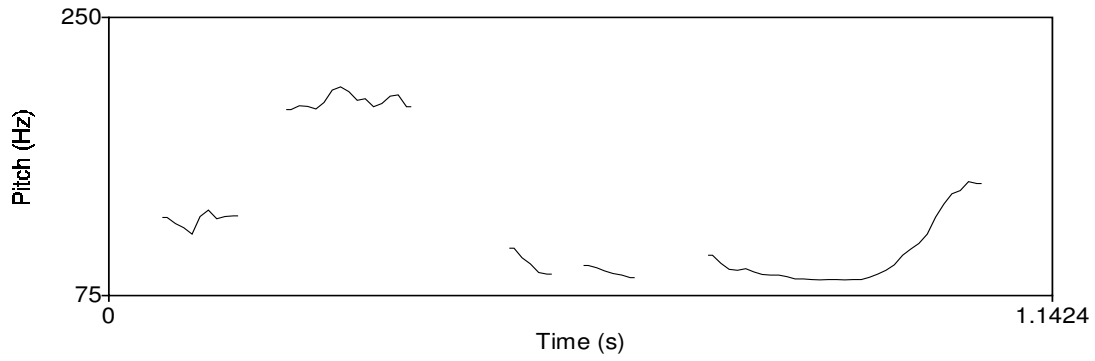
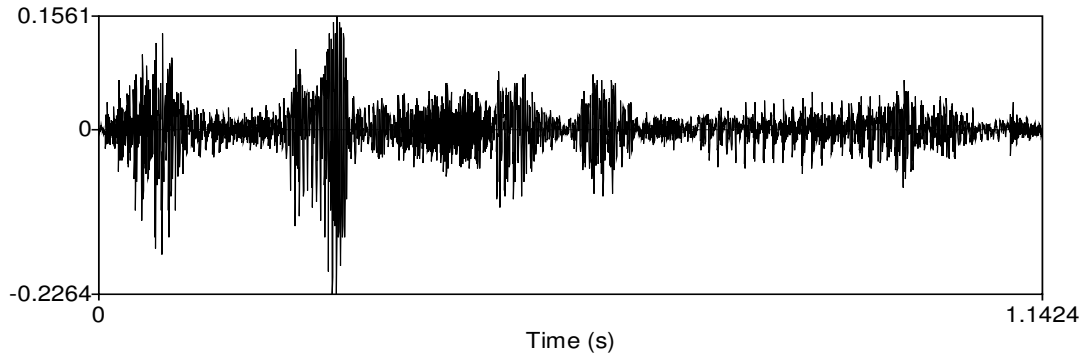
aɪ \laɪ k /tʃ ɒ kl ɪ t

(21a): I ^vthought she was married, (but I didn't know so and it turned out she wasn't).



aɪ ^vθɔ: tʃ i: w ə z m æ r i d

(21b): *I \thought she was ,married, (and so she was!)*



aɪ ˌθɔ: tʃ i: w ə z ,m æ r ɪ d

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