Clausal parentheticals, intonational phrasing, and prosodic theory[1]

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Abstract

It is a common assumption in syntactic and prosodic theory that parentheticals are obligatorily phrased in a separate intonational domain. This assumption is mainly based on syntactic criteria. However, it has long been understood that prosodic phrasing in general and Intonation Phrase boundary placement in particular is not determined by syntactic constituency alone. Instead, other syntactic, prosodic, semantic and pragmatic factors play a role, too. Moreover, we know that the intonational features of parentheticals depend on their syntactic, prosodic and pragmatic properties. It would therefore be surprising if the intonational phrasing of parentheticals were a result of syntactic constituency alone.

This paper reports the results of a prosodic analysis of a large set of spoken corpus data. It shows that clausal/ sentential parentheticals and non-restrictive relative clauses may depart from the commonly assumed prosodic separation in various ways. The observed intonational patterns are often motivated by well-studied prosodic constraints, as well as pragmatic principles. The results serve as evidence for a syntactic analysis of parentheticals which allows for a hierarchical relation between parenthetical and host. They can best be explained in a prosodic theory that assumes more than one level in the phonological component of the grammar and allows for an interface between phonology/ phonetics and pragmatics.

1 Introduction

Parentheticals are expressions of varying length/complexity, syntactic category and function, which are interpolated into the current string of the utterance. Among the elements that have been considered parentheticals in the literature are such elements as one-word expressions (e.g., *what*, see Dehé & Kavalova 2006), sentence adverbials (e.g., *however*) and adverbial clauses, comment clauses (e.g., *I think, I suppose, you know*), reporting verbs (e.g., *he said, said she*), vocatives, nominal appositions, non-

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restrictive relative clauses (NRRC), question tags, and full or elliptical clauses (see Dehé & Kavalova 2007, Kaltenböck 2007 for recent overviews).

It is a common assumption in the linguistic literature that parentheticals have a specific intonational pattern and that intonation is a defining feature of parenthetical constructions (see Astruc 2005 for a recent overview). Most specifically, NRRCs and parentheticals are assumed to be obligatorily phrased in a separate Intonational Phrase (Nespor & Vogel 1986: 188; see also Selkirk 1984: 295, 1995: 567; Truckenbrodt 2005: 275). For NRRCs, Selkirk (1984: 296) claims that they "are always separate IPs, not included in the same IP with the constituent they modify". Intonational separateness of parentheticals and related expressions is also commonly taken for granted among linguists discussing the syntax or semantics of parentheticals, see e.g. Potts (2002, 2005), D'Avis (2005: 262), Burton-Roberts (2006: 180), among many others. Haegeman (1988: 250) maintains that "[c]omma intonation is a syntactically determined PF property of parentheticals". Potts (2002: 650) claims that examples such as (2) below, "are ungrammatical if read without an intonation break at the onset of the parenthetical and another such pause at its coda", i.e. if read without comma intonation. The examples in (1) are taken from Nespor & Vogel (1986: 188; 190); square brackets indicate Intonational Phrase boundaries; (2) is taken from Potts (2002: 649).

(1) a. Comment clauses:
   a'. Lions [as you know] are dangerous.
   a". Charles wouldn't [I imagine] have done such a thing.
   b. NRRC:
   My brother [who absolutely loves animals] just bought himself an exotic tropical bird.

(2) Joan, as Chuck can attest, owns a unicycle.

Accordingly, parentheticals are often assumed to be separated from the rest of the utterance by intonation breaks. This assumption is mainly based on syntactic criteria: parentheticals are commonly argued to be either external to the syntactic structure of their host sentence (e.g., Haegeman 1988; Peterson 1999; Espinal 1991; Burton-Roberts 1999, though naturally these accounts differ in the way they handle this lack

of structural relation), or only very loosely related to it, e.g. in terms of adjunction (e.g., Ross 1973, Emonds 1973, 1976, 1979, McCawley 1982, Corver & Thiersch 2002, Potts 2002, D'Avis 2005), Insertion (Ackema & Neeleman 2004), or adjunction of a maximal projection which involves the application of b-Merge (Vries 2005, 2007).[2] Similarly, NRRCs have often been assumed to be outside the syntactic representation of the containing sentence (e.g., Fabb 1990, Espinal 1991, Burton-Roberts 1999, Peterson 2004, see Arnold 2007 for a recent overview and critical account). The idea is that a constituent that is outside the syntactic structure or only loosely related to it cannot be prosodically integrated with the same material, but must be in its own domain. Intonation breaks, though usually not further specified, seem to be mostly understood as pauses, but various prosodic cues pointing to strong prosodic boundaries before and after the parenthetical have been identified. Among these cues are pauses (e.g., Altmann 1981, Bolinger 1989, Taglicht 1998, Payà 2003, Astruc 2005), a falling-rising pitch at the end of the immediately preceding domain (Local 1992) which can be interpreted as a high boundary tone (H%; see, e.g., Pierrehumbert 1980, Beckman & Pierrehumbert 1986, Beckman & Elam 1997), and the blocking of sandhi rules (e.g., Frota 2000 for fricative voicing, syllable degemination and vowel adjacency resolution in European Portuguese). Moreover, experimental work using read speech has confirmed the idea about separate phrases (e.g., Frota 2000, Fagyal 2002, Astruc 2005).

However, it has long been understood on the basis of both research in prosodic theory and psycholinguistic research that prosodic phrasing in general and Intonation Phrase boundary placement in particular is not determined by syntactic constituent boundaries alone, even if the syntactic boundaries are strong. Instead, other factors play a role too. These factors include syntactic length/complexity (e.g., Cooper & Paccia-Cooper 1980, Gee & Grosjan 1983, Nespor & Vogel 1986, Ferreira 1991, Watson & Gibson 2004), prosodic length in terms of number of syllables or number of prosodic words in one phrase (e.g., Frota 2000, Sandalo & Truckenbrodt 2002, Jun 2003, Prieto 2005, Elordieta, Frota & Vigário 2005, D'Imperio et al. 2005, Hellmuth,

[2] In Vries' (2007) framework, b-Merge is a kind of Merge which produces a paratactic hierarchy (as opposed to subordination). If A and B are b-Merged into C, then C b-includes A and B, and A and B are paratactically construed with respect to C. Crucially, b-inclusion blocks c-command relations. A paratactic phrase/clause does therefore not interact with the host in terms of c-command-based relations (Vries' 2007 *Invisibility*).

to appear), prosodic weight in terms of prosodic branching or number of accents (e.g., Selkirk 2000, Sandalo & Truckenbrodt 2002, Watson & Gibson 2004, Elordieta, Frota & Vigário 2005, D'Imperio et al. 2005), balanced prosodic constituents (e.g., Gee & Grosjean 1983, Ghini 1993, Frota 2000), performance factors such as speech rate (e.g., Nespor & Vogel 1986, Ghini 1993, Frota 2000, Jun 2003, Hellmuth, to appear) and style of speech (e.g., Nespor & Vogel 1986), focus and contrastive prominence (e.g., Ferreira 1993, Selkirk 2000, 2005, Jun 2003), and semantic coherence (e.g., Sense Unit Condition; Selkirk 1984, Frazier et al. 2004). Particularly relevant in the present context is the strong empirical evidence that Intonational Phrases and syntactic phrases are not always isomorphic. While it has been claimed that certain syntactic structures such as parentheticals, NRRCs, preposed adverbials and certain other moved elements, tag questions, expletives, and vocatives are obligatorily parsed into separate IPs (e.g., Nespor & Vogel 1986: 188, 190, Selkirk 1984: 295, 1995: 567, Bing 1985: Chapter 2), various factors have been identified as being involved in the placement of Intonational Phrase boundaries. Nespor & Vogel (1986: 193-196), for example, discuss constituent length, speech rate, style and contrastive prominence as factors that determine "restructuring" of an Intonational Phrase. Similar factors have been discussed by other authors, too, as responsible for where speakers place Intonational Phrase boundaries (e.g., Gee & Grosjan 1983, and the references given above).

Moreover, it has previously been argued that the intonational features of parentheticals depend on various factors, among them their length/ relative weight (e.g., Schubiger 1958, Bolinger 1989), syntactic make-up (Bolinger 1989) and position (e.g., Bolinger 1989), and that any one of the defining prosodic features can thus be suspended (e.g., Bolinger 1989, see Wichmann 2000: 96f. for examples). In the light of all this, it would be surprising if parentheticals were indeed obligatorily phrased separately on the basis of their syntactic separateness, i.e. if their intonational phrasing were a result of syntactic structure alone. It has in fact been shown in previous work that certain types of relatively short parentheticals such as comment clauses, reporting verbs, question tags and vocatives may come without a preceding pause and may be prosodically integrated into either the preceding or following intonation domain (e.g., Armstrong & Ward 1926, Schubiger 1958, Crystal 1969, Taglicht 1998, Wichmann 2001, Gussenhoven 2004, Peters 2006, Wells 2006, Dehé 2007, Dehé & Wichmann 2007). Peters' (2006) data show a link between prosodic

integration and the size of the interpolation in terms of number of syllables, such that shorter parentheticals are more likely to be prosodically integrated than longer ones. For NRRCs, it is the result of psycholinguistic research that the placement of an intonational boundary before the relative clause is far from obligatory, and that it depends on sentence position along with discourse status (Watson & Gibson 2004).

The aim of the present study is to look at the phrasing of comment clauses and longer parentheticals, such as NRRCs and other sentential parentheticals, in actual spoken language, and to show that although prosodic integration may be a function of the size of the parenthetical to some extent, longer, more complex parentheticals do not have to be phrased separately. Rather, just like elsewhere in intonational phrasing, syntactic structure may be overridden by other factors determining prosodic phrasing. The study is based on corpus material taken from the British Component of the International Corpus of English (ICE-GB; version 3.0; see Nelson, Wallis & Aarts 2002). The nature of the data comes with the obvious drawback that it does not allow for experimental control and manipulation of the materials, but it has the crucial advantage over previous (experimental) studies that the analysis is based on spontaneous and semi-spontaneous speech. The following hypotheses are tested:

(3) Hypotheses

a. By default, due to strong syntactic boundaries preceding and following parentheticals, parentheticals are phrased in separate intonation domains.

b. However, parentheticals are not obligatorily phrased separately. Just like elsewhere in intonational phrasing, syntactic constituency may be overridden by other factors, most notably prosodic and pragmatic factors.

The paper is organised as follows. Section 2 will give a brief overview of intonational phrasing as relevant to the present study. Section 3 provides details on the data and the respective analysis. In Sections 4 and 5, the results of the analysis are first reported and then discussed. Section 6 serves as a conclusion.

2 Intonational phrasing and cues to prosodic boundaries

A brief introduction to intonational domains assumed in the literature on parentheticals in general and in this study in particular is in order. As outlined above,

parentheticals have been argued to be phrased in a separate prosodic constituent, specifically the Intonational Phrase (IP) or intonation domain. Prosodic constituents have been defined in a number of different approaches (see Shattuck-Hufnagel & Turk 1996 for an overview). In the framework of Pierrehumbert (1980), Beckman & Pierrehumbert (1986) and Pierrehumbert & Hirschberg (1990), for example, the IP is intonationally defined. It is the domain of a complete intonational contour, i.e., it has at least one nuclear pitch accent, and its edge is aligned with a boundary tone (T%). Each IP is made up of one or more prosodic constituent one level down in the prosodic hierarchy, i.e., the intermediate phrase (ip) in Pierrehumbert's and related work. Similarly, Nespor & Vogel (1986: 188) maintain that the IP is the domain of an intonation contour, and that pauses may occur at its right edge. Moreover, IP edges in their approach are defined along the lines of segmental rule application rather than tonal properties. For example, the IP delimits the application of *Gorgia Toscana* in Tuscan Italian, Nasal Assimilation in Spanish, and s-voicing in Greek (Nespor & Vogel 1986), among others. Selkirk (2005) identifies the Intonational Phrase with a Comma Phrase, which is marked by the comma feature (Potts 2005). Semantically speaking, the Comma Phrase is independent of the at-issue entailments of the sentence to which it is adjoined.

An intonation domain (a.k.a. *tone unit* or *tone group*) in the British tradition of intonation analysis is similar to the Intonational Phrase as just described in that it, too, is defined in terms of a complete tonal contour. An intonation domain consists of an obligatory nucleus, which is optionally preceded by the prehead (any unstressed syllables preceding the head) and head (reaching from the first accented syllable preceding the nucleus to the nucleus), and followed by the tail (any unstressed syllables following the nucleus before the end of the intonation domain). The structure is schematized in (4) (Crystal 1969: 207f, 1972: 112; optional components in parentheses). For a recent description of tonal contours occurring in English see for example Gussenhoven (2004: Chapter 15).

(4) Intonation Domain: (prehead) (head) nucleus (tail)

Along with the complete tonal contour, a number of other internal and external criteria have been identified which help to determine the extension of an intonation domain/ IP in both the British tradition and the American autosegmental model,

among them phonological rule application as mentioned above. Domain-internally, along with the nuclear tone, there must be pitch movement to or from at least one accented syllable. The major patterns of nuclear tones identified in the British tradition of intonation analysis include the fall (from a high accented syllable), rise (from a low accented syllable), fall-rise, and rise-fall. Nuclear tones begin on the nucleus and cover the stretch of utterance up to the right-hand boundary of an intonational domain. While in the British tradition it is the shape of the tonal contour that is described, the autosegmental system uses tonal targets to describe pitch accents. Thus, a fall corresponds to H*L (a high, stressed target followed by a fall to a low target), and a rise corresponds to L*H (a low, stressed target followed by a rise). A fall-rise corresponds to a H*L nuclear pitch accent followed by a high boundary tone, while a rise-fall corresponds to a L*H pitch accent followed by a low boundary tone. Moreover, pauses, both filled and silent, have been considered boundary markers. According to Nespor & Vogel (1986: 188), "the ends of intonational phrases coincide with the positions in which pauses may be introduced in a sentence". However, since they are not obligatory and both their occurrence and length depend on a number of factors such as speaker, speech rate, prosodic structure, phrase length, syntax and discourse (see Krivokapić 2007 for a recent overview), pauses cannot be considered a reliable cue to IP boundaries. Pauses may be absent at IP boundaries and pauses owed to performance factors may be present within an IP. More reliable cues are a change in pitch level and/or direction on unaccented syllables following a nuclear tone (see Cruttenden 1997: 34) and domain final (pre-boundary) lengthening (Gussenhoven & Rietveld 1992, Ferreira 1993, among others).

In the present study, prosodic boundaries in the immediate vicinity of the relevant parentheticals were analysed on the basis of these criteria. In particular, complete tonal contours (nuclear pitch accents and boundary tones) and pauses were identified, and the pitch on series of unaccented syllables was studied. Final lengthening effects were kept in mind but were difficult to obtain due to the nature of the data.

3 Data analysis

3.1 Data source and treatment

The data for this study were drawn from the spoken part of the British Component of the International Corpus of English (ICE-GB version 3.0; see Nelson, Wallis and Aarts 2002). The corpus contains approximately 640,000 words from various text types, ranging from direct casual conversations and private telephone calls to scripted monologues and broadcast news, all recorded in the 1990s. A key to the text types from which the examples used in the present study are taken is given in Appendix 1 at the end of this article.

The comment clauses, NRRCs and sentential parentheticals studied here were retrieved together with other types of parenthetical expressions, using a systematic search followed by manual sorting. 397 utterances containing 402 comment clauses, 55 utterances containing 56 NRRCs, and 127 utterances containing 131 sentential parentheticals were initially retrieved from the corpus.[3] In a first step, all utterances for which sound files of good enough quality were available entered the auditory analysis. In the auditory analysis, the decision was taken whether or not the comment clause, NRRC or sentential parenthetical was clearly separate from the rest of the utterance. The key criteria were perceived prominence, pauses preceding and following the interpolation, perceived change in speech rate and perceived pitch level and change. Since by definition all intonation domains have to have a pitch accent, a parenthetical could not be separate if it was not intonationally prominent. All items which were judged either 'not separate' or 'unclear' entered a second round of analysis, in which the items were again analysed auditorily and, where possible, also instrumentally. At this second step, a final decision was taken whether or not intonation phrase boundaries were located both before and after the parenthetical. If boundaries could not be identified in the target position, their real position was identified and the occurring pattern was described.

For the purpose of the instrumental analysis, the respective sound files were edited into individual files containing the parenthetical and as much surrounding material as necessary for the analysis. The instrumental analysis was done in Praat

[3] For the purpose of this study, the comment clauses *you know, you see* and *I mean*, also previously analysed as discourse marker (e.g., Murphy 1993, Aijmer 1997), were excluded from the analysis. Also, sentence-initial pronoun-verb combinations (e.g., initial *I think*, *I suppose*) were disregarded.

(Boersma 2001), which was also used to visualise and print the tonal contour. Praat was used to measure the length (in ms) of pause(s) preceding and/or following the target parentheticals, to identify the tonal contours associated with the parenthetical material and the material in its immediate environment, and to identify boundary tones at the edges of the parenthetical or the immediate vicinity. Intonational domain boundaries were identified based on domain-external and domain-internal criteria as outlined in Section 2 above.

All items were analysed by the author. Cases that remained unclear after the second round of analysis were given to another experienced linguist trained in intonational analysis. Items for which a final analysis could not be agreed upon were coded 'unclear'.

3.2 Comment clauses (CCs)

Of the 397 utterances containing 402 CCs initially retrieved from the corpus, the sound files of 75 utterances (76 CCs) were either unavailable or defective, or essentially useless due to their bad recording quality. Sound files were useless, for example, if they were incomplete, too quiet or too noisy, if there was overlapping speech or noise in the target area, or if the target words were unclear or (partly) missing. The remaining 322 utterances containing 326 CCs entered the auditory analysis. Since for CCs the percentage of non-separate CCs was very high (see Section 4.1 below), all available CCs also entered the second round of analysis. 203 sound files (204 CCs) were of good enough quality to be analysed instrumentally. An overview of the types of CCs that entered the analysis and respective numbers is given in Appendix 2.

3.3 Non-restrictive relative clauses (NRRCs)

Of the 55 utterances containing 56 NRRCs initially retrieved from the corpus, the sound clips of 3 utterances were either unavailable or essentially useless for an auditory analysis due to their bad recording quality. The remaining 52 utterances containing 53 NRRCs entered the auditory analysis. 46 (of 53) NRRCs were judged clearly separate. The remaining 7 NRRCs were either clearly not separate or unclear and entered the second round of analysis. 5 utterances were of good enough quality to enter the instrumental analysis, while 2 utterances could not be instrumentally analysed.

3.4 Clausal/sentential parentheticals

The group of clausal/sentential parentheticals was very heterogeneous. Members of this group varied in length and complexity, but also in category. This was because in this group, PPs/NPs modified by clauses were also included (see, e.g., example (9)c) below). 127 utterances containing 131 sentential parentheticals were initially retrieved from the corpus. Of these, the sound clips of 24 utterances were either unavailable or essentially useless for an auditory analysis due to their bad recording quality. The remaining 103 utterances, containing 107 parentheticals, entered the auditory analysis. Of these 107, 78 (73%) sentential parentheticals were judged clearly separate. The remaining 29 items were either clearly not separate or unclear and entered the second round of analysis. 25 utterances were of good enough quality to enter the instrumental analysis, while 4 utterances could not be instrumentally analysed.

4 Results

4.1 Comment clauses (CCs)

For CCs, several intonational patterns were identified. Of the 326 CCs that entered the analysis, only 75 (23%) were clearly separate with a nuclear accent on either the pronoun or the verb/ lexical element. In addition to these 75, 9 (2.7%) carried nuclear prominence, but were not alone in their domain. Instead, they were joined by material from the embedding utterance either preceding or following the CC (see also Dehé 2007: 277-279, Dehé & Wichmann 2007). 40 CCs (12.2%) functioned as preheads in their intonational domain, i.e. they were (part of) unstressed material preceding any prominent material in their domain (see also Crystal 1969: 235, Dehé & Wichmann 2007). In an as yet unobserved pattern, 51 CCs (15.6%) appeared as (part of the) head of the intonational domain. They either carried a prenuclear pitch accent (22 CCs, 6.7%; see Figure 1), or they were unstressed but were placed between prenuclear and nuclear material in their domain (29 CCs, 8.9%; see Figure 2). Figure 1 illustrates example (5)a) from *because…*, including a CC carrying prenuclear prominence. IP1 has a prenuclear accent on *choice* and a nuclear fall-rise (H*LH%) associated with *candidate*. IP2, starting with the relative pronoun *which*, has a prenuclear accent on the pronoun *I* of *I think* and a nuclear fall (H*LL%) on *brilliant*. Figure 2 illustrates the first part of example (5)b). The target IP has a prenuclear accent on *answer*

followed by unstressed material of which *I think* is part, and then the nuclear fall-rise (H*LH%) on *no*.

(5) CC as part of the head of the domain

a. And he said I can well believe that you've gone through an exhaustive search <,> because you've made a choice of candidate which **I think** is brilliant <,> (ICE-GB: s2a-028 #134)

b. the answer **I think** must be no <,> because the great strength of the self-employed sector is precisely that most of these people do not want the kind of intervention or interference or even pseudo-protection that the honourable lady suggests (ICE-GB: s1b-059 #87)

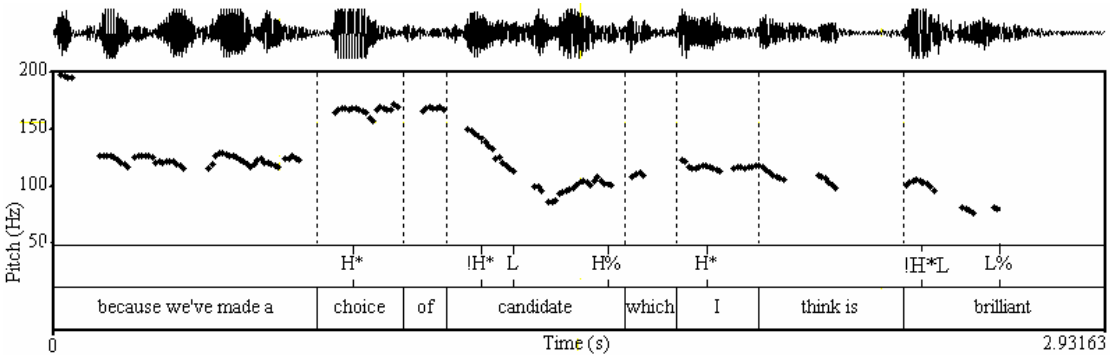


Figure 1 (see example (5)a))

(because we've made a choice of candidate)$_{IP1}$ (which **I think** is brilliant)$_{IP2}$

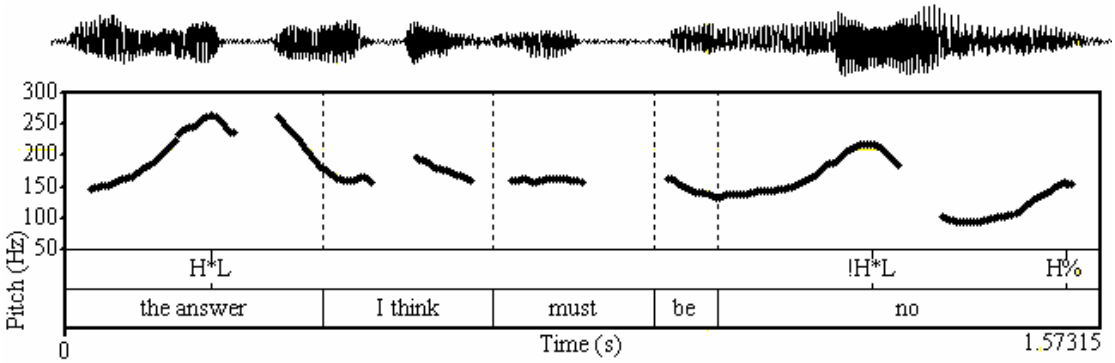


Figure 2 (see example (5)b))

(the answer **I think** must be no)$_{IP1}$ (…

143 CCs (43.8%) were integrated as part of the intonational tail, i.e. as unstressed material following the nuclear accent in their domain (see also Crystal 1969: 268, Wichmann 2001: 186, Dehé 2007: 270-272, Dehé & Wichmann 2007). In this group, three different patterns were observed: (i) 52 CCs (16 %) either continued a nuclear fall or were realised at the low pitch level reached on a nuclear fall before the right boundary of the IP. (ii) 81 CCs (24.8%) were aligned with the final rise in a fall-rise (H*LH%) pattern. Patterns (i) and (ii) have been analysed by Gussenhoven (2004: 291) as "incorporations". (iii) 10 CCs (3%) were also unstressed and followed the nuclear accent, but were preceded by a boundary tone indicating the end of a domain and by a pause. This pattern has often been described in the literature (e.g., Bing's 1985 "0 contour") and has been analysed by Gussenhoven's (2004: 291) as "encliticisation". The encliticised material, i.e. here the CC, receives a copy of the tones after the last stressed syllable. If the nuclear pattern is H*LL%, then L is copied onto the encliticised material. If the nuclear pattern is H*LH% (fall-rise), then LH is copied onto the encliticised material. This has been referred to as 'tone copy', see Gussenhoven (1990, 2004). The NRRC example pictured in Figure 3 below includes the encliticised CC *I'm afraid*; see also fn. 4. Finally, 6 CCs (1.8%) were part of a hesitant phase either between two IPs or within a single IPs (see also Dehé & Wichmann 2007). The phrasing of 2 CCs (1 *I'm sure*, 1 *I guess*) remained unclear.

The intonational patterns found with CCs in the present corpus are summarized in (6). Notice once again that only the case of full separation (see (6)a)) corresponds to the assumption found in the literature and illustrated for CCs in (1)a) above, viz. that parentheticals are phrased separately.

(6) Intonational patterns of CCs
- a. full separation: CC is prominent; CC is preceded and followed by an intonational boundary
- b. CC with nuclear prominence, but not phrased separately
- c. CC integrated as prehead: CC is unstressed and precedes any stressed material in its domain
- d. CC integrated as head
  - d1. CC with prenuclear prominence
  - d2. CC unstressed, between prenuclear and nuclear accent in its domain

e. integration as (part of) nuclear tail: CC unstressed, following the nuclear accent

e1. CC at low pitch continuing (the low level reached at the end of) a H*L nuclear tone (fall) (Gussenhoven's 2004: 291 'incorporation')

e2. CC with final rise in H*LH% (fall-rise) (Gussenhoven's 2004: 291 'incorporation')

e3. CC unstressed but preceded by boundary tone and pause/break; CC receives a copy of the tones after the last stressed syllable (Gussenhoven's 1990, 2004 encliticisation and tone copy)

f. CC as part of hesitant phase either between IPs or within an IP

4.2 NRRCs

Of the 7 NRRCs that entered the second step of analysis, two could not be conclusively analysed because the bad recording quality of their sound clips made an instrumental analysis impossible. The remaining 5 NRRCs were analysed instrumentally. Of these 5 NRRCs, 1 NRRC, given in (7) below, turned out to be preceded and followed by IP boundaries. The preceding boundary was identified on the basis of tonal criteria: a L% boundary tone preceding the NRRC, and a slight step-up in pitch on the relative pronoun following the completed fall (H*L) on *Conservative Party*. At the right edge of the NRRC, *with* is associated with a distinct L%, a silent pause of 471 ms, and a step-up in pitch on following unstressed *of*. The NRRC is associated with its own tonal contour, but it is not preceded by a pause. (Here and below, the target NRRC is bold-printed.)

(7) Intonationally separate NRRC

You present us with a view in this book [uh uh] and in this adaptation a a view of the Conservative Party **which is what you mainly deal with** of a a chief whip who is devoted to blackmail, of MPs […] (ICE-GB: s1b-024#71)

More interestingly in the present context, 4 NRRCs were indeed not preceded by an intonational phrase boundary. All 4 cases showed the same pattern: the relative pronoun *which* was part of unstressed material at the end of the preceding domain and was followed by an IP boundary separating the relative pronoun from the rest of the

NRRC. The four utterances are given in (8). For illustration, the pitch contour of the example in (8)a) is plotted in Figure 3.

(8) NRRC not preceded by IP boundary: pronoun *which* joins preceding IP

a. I was programming in Pascal **which really wasn't very exciting** I'm afraid (ICE-GB: s1a-008#1)

b. And kind of this last year's been been uhm kind of commissioned work which **which in one sense is I guess on paper looks great** (ICE-GB: s1a-096 #157)

c. And I put forward the argument **which could certainly be contested** uh but which I have some faith in that some residue remains some flickering ember that would allow for some religious renewal within our culture (ICE-GB: s1b-028 #30)

d. And the first **which I have to say sounds to those who don't share this point of view always sounds the noisier one** uh is dominated by a view which I can express as follows (ICE-GB: s2a-021 #19)

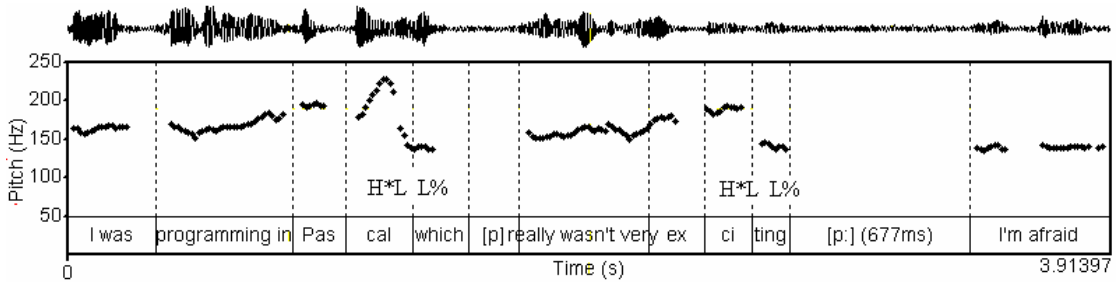


Figure 3 (see example (8)a))

(I was programming in Pascal which)$_{IP}$ (really wasn't very exciting)$_{IP}$ I'm afraid)$_{IP}$[4]

In the contour pictured in Figure 3, the nuclear syllable of the first IP is the lexically stressed, second syllable of *Pascal*. The nuclear fall is thus associated with -

[4] *I'm afraid* is a comment clause, thus another parenthetical. It is unaccented, at low level pitch, but it is preceded by a boundary tone associated with the end of *exciting* and by a considerable pause. The phrasing indicated here follows Gussenhoven's (2004: 291) encliticisation analysis. The encliticised IP receives a copy of the tones after the last stressed syllable. Since *exciting* is associated with a fall (H*L), L is copied onto the comment clause (Gussenhoven 1990, 2004).

cal and it continues on the relative pronoun *which*. No change in pitch level or direction can be made out on the relative pronoun. The IP is terminated by a low boundary tone (L%) associated with *which*, which is followed by a short pause of 185 ms. We then find a step-up in pitch at the beginning of the second IP, which has its nuclear pitch accent on *exciting*. Note that the two domains (*I was programming in Pascal which* and *really wasn't very exciting*) show tonal parallelism (see Bolinger 1989: 205ff., Wichmann 2000). They begin at approximately the same mid pitch level which rises towards the peak on the nuclear syllable (-*cal* and -*ci*-, respectively). The nuclear tone is a fall (H*L) associated with the nuclear syllable and continued on the immediately adjacent one (*which* and -*ting*, respectively). Both domains are terminated by a low boundary tone. Note also that both domains have the same number of syllables.

4.3 Sentential parentheticals

Of the 29 utterances that entered the second analysis, 25 were analysed instrumentally while 4 could only be analysed auditorily due to the quality of the sound files. Overall, 17 parentheticals were analysed as intonationally separate, while 11 turned out to be not separate and one item remained unclear. The 11 parentheticals which were not separate against predictions are given in (9) together with their immediate contexts.

(9) Sentential parentheticals; intonationally not separate

a. Was the First World War a great divide **do you think** in British music <,> (ICE-GB: s1b-032 #157)

b. uh ACPO **as it's called** uh accountable to nobody has become a national organisation for police policy hasn't it (ICE-GB: s1b-033 #69)

c. I think it is certainly the case that uh s uh the representations **for example the ones to which the honourable lady referred** from the National Federation of uh the Self-Employed were made and I put it slightly more specifically were made before they had the details of the reductions that had to take place in employers ' National Insurance contributions (ICE-GB: s1b-058 #18)

d. He was **and I think you would agree with me** at the outset looking at expanding his business <,,> at that time not selling it (ICE-GB: s1b-064 #172)

e. but I mean just off the top of your head <,> if we were jammy enough which we won't be but if we were jammy enough to keep the Mercedes <,> which I would be the main **if you like you could put it down as the only** driver of <,> and we carried on keeping the Escort as well <,> (ICE-GB: s1b-080 #333)

f. First then the <,> the context <,> the wider context within which discussion <,> on education **of which uh teacher education's only a part but I can't disentangle it** <,> is taking place **(**ICE-GB: s2a-021 #17)

g. First the people of Judah his audience have uh married foreign women or **as he puts it** the daughter of a strange god <,> and they have betrayed their wives (ICE-GB: s2a-036 #36)

h. The other sort of i in interesting thought for me **and perhaps you'd reflect on it too** is if you say following this line of thought that uhm well really good learning organisations must be the ones that last an awful long time <,> (ICE-GB: s2a-049 #51)

i. Customs officers are questioning twenty-three Irishmen in connection with an alleged two million pound VAT fraud which **it's expected** could be linked to the IRA (ICE-GB: s2b-019 #46)

j. It was much the same **as my right honourable friend the Prime Minister will recall** in Milan some five years befo five years ago <,> (ICE-GB: s2b-050 #32)

k. We commit a serious error <,> if we think always in terms of surrendering sovereignty <,> and seek to stand pat for all time on a given deal <,> by proclaiming **as my right honourable friend the Prime Minister did two weeks ago** <,> that we have surrendered enough <,> (ICE-GB: s2b-050 #46)

The following patterns occur. The intonational phrasing in (9)a) is such that *was the first World War a great divide* forms one domain with a nuclear fall on *divide*, followed by the domain *do you think in British music* with the interrogative parenthetical as part of the unstressed prehead and a nuclear rise on *music*. The result

of this intonational phrasing is a sequence of two IPs where the first domain has 9 syllables and the second one has 8 syllables, thus a sequence of two domains of approximately equal prosodic length.

The clausal interpolation in (9)b), illustrated in Figure 4, behaves similarly to some comment clauses discussed above and in Dehé & Wichmann (2007) in that it forms one intonation domain with preceding material, being unaccented and following the nucleus in its domain. The nucleus is located on the first syllable of the acronym *ACPO*. The nuclear tone is a fall (H*L) which continues on the second syllable of *ACPO*. The parenthetical *as it's called* is realised at the low pitch level reached on *ACPO*. It is followed by a pause consisting of a stretch of silent pause, then filled pause (*uh*) and again silent pause, altogether 0.964 ms. There is a step-up in pitch on the filled pause and then on the first (unstressed) syllable of *accountable*, which, together with the long pause, serves as a boundary marker.

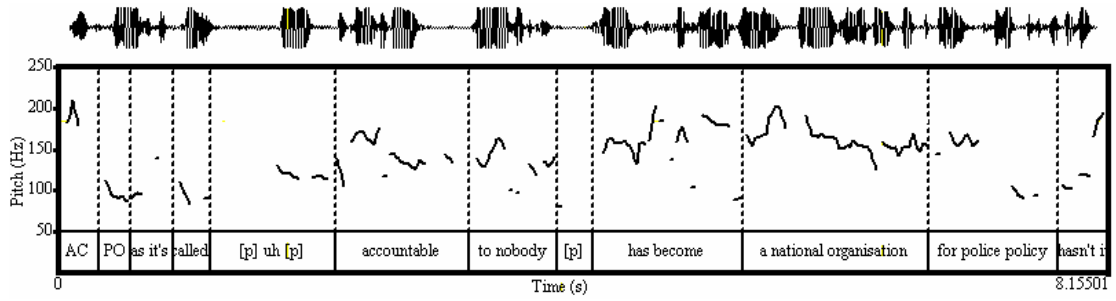


Figure 4 (see example (9)b))

(ACPO as it's called)$_{IP}$ (accountable to nobody)$_{IP}$ (…

Syntactically speaking, the parenthetical insertion in (9)c), plotted in Figure 5, is the string *for example the ones to which the honourable lady referred*. Prosodically, it is separated by an IP boundary after *for example*. While *for example* phrases with preceding material forming the IP *that the representations for example*, the remainder of the parenthetical, *the ones to which the honourable lady referred*, is in its own IP. The respective boundaries can be identified as follows. The first IP *I think it is certainly the case* has a prenuclear H*L (fall) accent on *think* and a nuclear fall-rise (H*L H%) with the nuclear syllable being the first syllable of *certainly*, and the final rise being associated with *case*. The second IP (*that the representations for example*) starts with hesitational material (*that the*) followed by a prenuclear accent on *representations* and a nuclear fall (H*L) associated with *example*, followed by a low

boundary tone. Note that the prenuclear accent is associated with the first syllable of *representations* rather than the lexically-main-stressed syllable *-ta-*. Shattuck-Hufnagel & Turk (1996: 223), referring to Shattuck-Hufnagel et al. (1994), maintain that "Nuclear Pitch Accents almost invariably occur on the lexically-main-stressed syllable of their word. In contrast (as predicted by several theories), Prenuclear Pitch Accents may occur on a Full-Vowel syllable earlier in the word". It follows from this that the accent on *representations* can only be a prenuclear one, and the prominence on *example* corresponds to the nuclear syllable of this IP. The right edge of this IP is marked by the low boundary tone and a step-up in pitch on the following unstressed syllable *the*. The third IP, the domain of the remainder of the parenthetical, has a nuclear fall on *lady* followed by a rise, thus marking the edge of this domain by a high boundary tone (H%).

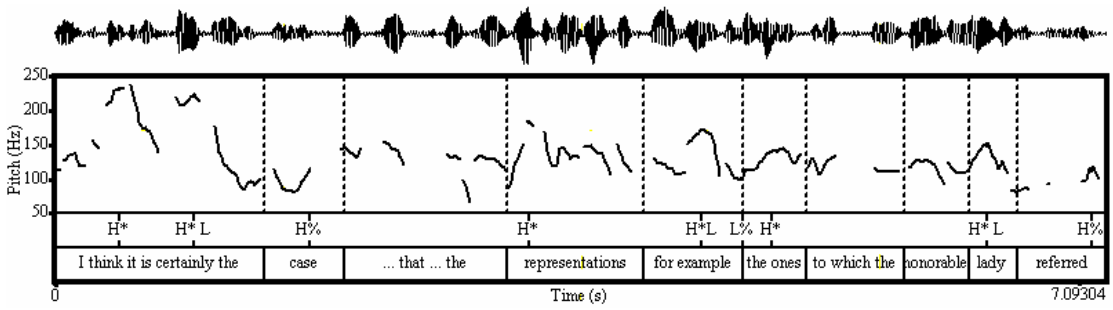


Figure 5 (see example (9)c))

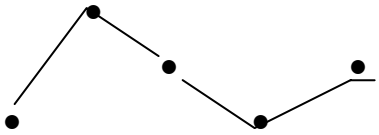
(I think it is certainly the case)$_{IP}$ (that the representations for example)$_{IP}$ (the ones to which the honourable lady referred)$_{IP}$ (…

In (9)d), the string *and I think you would agree with me at the outset* forms one IP which has a prenuclear accent on *think* and a nuclear accent (fall) on *outset*. Looking at the syntactic structure, there is an attachment ambiguity concerning *at the outset*. It can either modify the VP *agree with me*, or it can modify the following VP *looking at expanding his business*. The way the corpus is annotated, *at the outset* modifies and is syntactically related to the main clause VP (*looking at expanding his business*). Note that this interpretation also seems to follow from the larger context of the utterance, which is part of a dialogue taken from a cross-legal examination. It is directed to the accused, a businessman who specialises in selling companies in the janitorial and the cleaning industry. The examination is about a business relationship with a customer, who during their first meeting ("at the outset") indicated that he

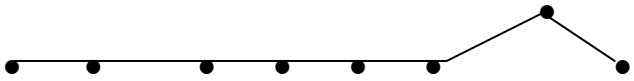
intended to expand his business. At a later stage, it apparently became clear that rather than expanding, he in fact wanted to sell his company to the accused. However, under this interpretation, the intonational phrasing produced by the speaker is odd for two reasons: (i) the right edge of the parenthetical *and I think you would agree with me* is not separated from the following host clause material by an intonational break, and (ii), perhaps more importantly, it has been shown in much previous literature that prosody helps to disambiguate structurally ambiguous sentences, among them sentences containing PP attachment ambiguities (see, e.g., Schafer et al. 2000, Warren et al. 2000, and references given there). If the PP *at the outset* modified the main clause VP, we would predict an IP boundary preceding the PP. In the light of this, given the intonational phrasing in (9)d), it would perhaps be more fruitful to reanalyze the structure of the utterance and count the PP *at the outset* as part of the parenthetical, with an interpretation along the following lines. The host clause means that "he was at that time looking at expanding the business rather than selling it", and the parenthesis is "I am pretty sure you will agree with me also that this was so from the outset" (Anne Wichmann, p.c.).

The syntactic structure of (9)e) is complex. Here we are interested in the parenthetical *if you like you could put it down as the only* interpolated in the NRRC *which I would be the main driver of*, which modifies *the Mercedes*. The NRRC and the parenthetical interpolation share the head noun *driver*, i.e. this is an instance of amalgamation, a construction which has often been compared to parentheticals in previous research (e.g., Lakoff 1974, Espinal 1991: 748). Interestingly, the head noun *driver* (and the stranded preposition *of*) is not only shared syntactically by the two constituents, but also intonationally, such that it functions as the tail of both the nuclear fall-rise started on *main* and the nuclear fall-rise started on the first (stressed) syllable of *only*. This pattern is schematised in (10).

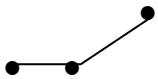
(10) Example (9)e): Intonational phrasing (PN = prenuclear)



(which I would be the main
H*L (PN) H*



(if you like you could put it down as the on ly
H*L (PN) H*L



dri ver of $)_{IP})_{IP}$
(L) H%

(9)f) is very similar to the NRRCs discussed above. Into the NRRC *within which discussion on education is taking place*, another relative clause has been inserted: *of which teacher education is only a part but I can't disentangle it*.[5] The intonational phrasing is such that *of which* joins the preceding IP which has a nuclear fall on *eduCAtion* followed by a rise and H% associated with *(of) which*. The falling-rising nuclear pattern of this IP is repeated on the following two IPs: *teacher education is ONly a part* and *but I can't disenTANgle it*.

In (9)g), the syntactic structure is such that the parenthetical insertion is *as he puts it*, while the coordinating conjunction *or* connects the two NPs *foreign women* and *the daughter of a strange god*. In intonational phrasing, however, the conjunction goes with the parenthetical forming the IP *or as he puts it*. The boundary preceding this IP is marked by a high boundary tone (nuclear fall-rise on *women*), which is followed by a step-down in pitch on unstressed *or as he*. The nuclear accent in the IP *or as he puts it* falls on the only lexical element (*puts*). The nuclear fall is continued towards a low boundary tone on *it*, which is then followed by step-up in pitch on

[5] This interpolation is being discussed under sentential parentheticals rather than NRRCs because it is more complex than the NRRCs investigated above due to the coordinated clause *but I can't disentangle it*.

unstressed *the* which marks the beginning of the new domain (*the daughter of a strange god*). Note that the average pitch level on the parenthetical and the maximum pitch on *puts* are lower than the corresponding pitch levels outside the parenthetical. Pitch compression has often been noted as a prototypical prosodic feature of parentheticals (Crystal 1969, Bolinger 1989, Local 1992, Wichmann 2001, Astruc 2005, among many others).

Similar to the relative pronouns introducing the NRRCs in (8) and Figure 3 above, conjunctions and other functional elements introducing sentential parentheticals, such as *and* and *as*, often join the preceding intonation domain as unstressed material following the nucleus. This holds for the items in (9)h) and j). It is typically the case that a nuclear fall preceding the conjunction is continued on the conjunction, and the (optional) pause and the change in pitch direction can then be found on material following the conjunction, rather than on the conjunction itself. Examples like (9)j) and (9)k) also show that *as*-clauses do not have to be produced with intonational breaks before and after the insertion, as claimed by Potts (2002).

In (9)i), the short clause *it's expected* is inserted into the relative clause *which could be linked to the IRA*. Here, the relative pronoun forms an IP with the parenthetical, yielding the IP *which it's expected*. This item comes from broadcast news (BBC4, The World at One, November 1990), represents read speech and is therefore not further considered here.

In the last example (see (9)k), the parenthetical insertion *as my right honourable friend the Prime Minister did two ago* forms one rather long IP together with *by proclaiming* from the embedding utterance, and is thus not phrased separately. The IP is preceded and followed by silent pauses (727 ms and 433 ms, respectively). Other boundary markers are the distinct nuclear fall to L% on preceding *deal*, followed by a step-up in pitch on unaccented *by* at the beginning of the target IP, and the nuclear fall on *ago* to a low boundary tone on the target IP-final *ago* with subsequent pitch reset. In the target IP, a prenuclear pitch accent is aligned with the second syllable of *proclaiming*.

Overall, it seems clear from these results that the common assumption about the prosodic separateness of parentheticals and related expressions is too strong in the light of the present data. Some possible implications for prosodic theory will be discussed in the next section.

5 Discussion

In Section 1, we started off with the two hypotheses repeated in (11) below:

(11) Hypotheses

a. By default, due to strong syntactic boundaries preceding and following parentheticals, parentheticals are phrased in separate intonation domains.

b. However, parentheticals are not obligatorily phrased separately. Just like elsewhere in intonational phrasing, syntactic constituency may be overridden by other factors, most notably prosodic and pragmatic factors.

As for the first hypothesis in (11)a), the results of the present study suggest that certain types of parentheticals, arguably relatively long and heavy ones, such as NRRCs and sentential parentheticals, are indeed phrased separately by default. Only 4 (7%) out of 56 NRRCs and 11 (10.3%) out of 107 sentential parentheticals were not phrased separately. However, for the comment clauses under investigation here (and elsewhere), the picture is less clear. Only 75 (23%) out of 326 comment clauses were indeed phrased separately. Comment clauses were in fact found to occur with several different prosodic patterns, almost all of which ignore syntactic boundaries. Separate phrasing by default thus has to be discarded for this type of parentheticals. In principle, this is not surprising in the light of previous research on comment clauses and related constructions (see the Introduction above). However, these findings will have to be explained in a model of syntax-prosody mapping that relies heavily on syntactic structure.

The NRRC results reported above are consistent with Watson & Gibson's (2004) results in that NRRCs do not have to phrase separately. However, in their experimental study of the intonational phrasing of relative clauses in language production, almost 40% of all tested NRRCs (49.1% of object-modifying and 27.7% of subject-modifying NRRCs) were not directly preceded by an intonational boundary. Both against the backdrop of their findings and taking into account research on intonational phrasing in general, it comes as no surprise that NRRCs are not obligatorily phrased separately in the corpus under study here. Also, Watson &

Gibson's (2004) results are hardly compatible with the default analysis of prosodic separateness as formulated in hypothesis (i).

It is clear therefore that the second hypothesis (see (11)b) is borne out, too: in the intonational phrasing of parentheticals, just like elsewhere in intonational phrasing, syntactic constituency may be overridden by other factors. In the remainder of this discussion I will first address the factors that are involved in the intonational phrasing of parentheticals, and will then outline some of the implications for (parentheticals in) prosodic theory.

5.1 Factors involved in the intonational phrasing of parentheticals

Although this study is not based on experimental data carefully manipulated for specific factors that have an impact on intonational phrasing, the findings suggest that the same patterns influence the intonational phrasing of parentheticals that have also been identified in previous studies on intonational phrasing in general. Recall from Section 1 above that among the factors involved in intonational phrasing we find prosodic length in terms of number of syllables or number of prosodic words in one phrase and prosodic weight in terms of prosodic branching or number of accents, and also pragmatic factors. The same factors are at work in parenthetical phrasing, as I will demonstrate in this section.

Since by definition an intonation domain has to have at least one nuclear accent, a string of elements can only be phrased separately when carrying nuclear prominence. However, CCs are semantically and pragmatically variable (see, e.g., Aijmer 1997, Dehé & Wichmann 2007). They may function as epistemic adverbials, in which case they carry prominence and may be prosodically separated, but they may also participate in hesitational phases or function as interpersonal markers. In the latter two cases, they will not bear prosodic prominence and will thus fail to form an intonation domain of their own. One factor leading to prosodic integration of CCs is therefore their pragmatic function. Examples are given in (12) and (13) below. (12) illustrates the use of CCs in hesitational phases ((12)a) from Aijmer 1997; see also Dehé & Wichmann 2007). *I think* in (12)a) and *I suppose* in (12)b) co-occur with other pausing strategies such as silent and filled pauses, repetition of lexical material and occurrence of verbal fillers. The comment clauses in (13) are prosodically integrated such that *I suppose* in (13)a) joins the preceding domain, while *I think* in (13)b) functions as the prehead of the following domain. In their prosodic-pragmatic

analysis, Dehé & Wichmann (2007) argue that these CCs are not used to express speaker attitude, but that they function as part of politeness strategies or as mitigators. Accordingly, they are prosodically non-prominent and integrated in another prosodic domain.

(12) a. I mean there's a *I think* there's a limit to how much a m a man can take.
b. There's no point in uhm <,> *I suppose* undertaking experiments if people can't read them … (ICE-GB: s1a-059#286)

(13) a. Eh the other thing *I suppose* to learn about it is how much simple qualities like friendly and helpful matter to people <,> (ICE-GB: s1a-037#191)
b. And uh that marvellous tone poem Shropshire Lad *I think* shows what might have come from a a most talented man (ICE-GB: s1b-032#159)

Another factor involved in the phrasing of CCs is their prosodic length. *I think*-type CCs consist of only one prosodic word, and only up to 4 syllables. Phrasing CCs separately would thus result in short intonational domains. In the interest of sequences of prosodic constituents that are approximately balanced in size, CCs will often be phrased together with preceding or following material. The example in (14) is taken from Dehé (2007: 270). *I think* is phrased together with *the voters*. Separate phrasing of the CC would lead to a sequence of two very short IPs (*The voters* and *I think*, respectively), followed by a longer one (*just have an opportunity*). Dehé (2007) also argues that tonal parallelism plays a role here. The two adjacent IPs show tonal parallelism such that they both exhibit a fall-rise pattern, the nuclear syllables being *vo-* and *just*, respectively. Just like balanced prosodic constituent size, the tonal parallelism would have been difficult to achieve under separate phrasing of the CC.

(14) a. The voters *I think* just have an opportunity to stick two fingers up to whoever seems to be on top of the moment. (ICE-GB: s1b-029, #92)
b. (The voters *I think*)$_{IP}$ (just have an opportunity)$_{IP}$
H*L H% H*L H%

Moving on to NRRCs, the relative pronoun introducing the NRRC in Figure 3 above joins the preceding intonational domain as part of the unstressed material following

the nuclear fall. Since the syntactic boundary precedes the relative pronoun, the placement of the intonational phrase boundary after (rather than before) *which* cannot be determined by syntactic structure. Instead, prosodic and pragmatic factors are at work here. The two adjacent domains *I was programming in Pascal which* and *really wasn't very exciting* have exactly the same number of syllables, 9 syllables each. Also, the tonal pattern is completely parallel. Both contours start at a mid-level pitch, rising towards a high peak followed by a nuclear fall associated with the penultimate syllable of each contour and followed by exactly one unstressed syllable (*which* and *-ting*, respectively). The conversational context of this utterance, retrieved from the ICE-GB, is such that after the target utterance, an interlocutor steps in saying "What do you mean by programming in Pascal?", which connects with the head noun of the utterance (*Pascal*) rather than the content of the NRRC. It seems likely, therefore, that the speaker placed the prosodic break after the relative pronoun as a floor-holding device, while the listener signaled his wish to ask a question about the content of the main clause. This is reminiscent of results from discourse analysis which show that coordinating conjunctions may phrase with the preceding rather than the following material (Barth-Weingarten 2007) against the predictions of the syntactic structure, but in line with the needs of the speaker in the ongoing discourse. This pattern was also observed for examples (9)h) and j) (in Section 4.3 above).

The factor prosodic length is also at work in the case of example (9)a) and in (9)b), which is plotted in Figure 4. Prosodic separation of the parenthetical in (9)b), for example, would have resulted in a series of two rather short (*ACPO* and *as it's called*) followed by a longer (*accountable to nobody*) intonational phrase, a pattern which is ruled out by the constraint on the size of adjacent prosodic constituents. According to Nespor & Vogel (1986), there is a preference for IPs in a sequence to be of uniform average length (see also Gee & Grosjean 1983; Ghini 1993; Selkirk 2000; among others). Phrasing *ACPO as it's called* together into one domain results in a more balanced prosodic structure than phrasing the parenthetical separately.

Example (9)c), illustrated in Figure 5, prosodic and pragmatic factors again seem to interact in determining the prosodic surface structure, overriding syntactic constituency. Firstly, phrasing *for example* with the previous material results in a sequence of IPs approximately balanced in size. The adjacent IPs are also much alike in their tonal pattern, featuring an early pre-nuclear high pitch target on *think,* the first syllable of *representations*, and *ones*, respectively. Phrasing *for example* with the rest

of the parenthetical would have ruled this parallelism out since *representations* in the second IP would have been aligned with the nuclear pitch accent. As for discourse, phrasing *for example* with the preceding material from the host clause may serve as a floor-holding device such that the speaker signals that he is going to give an example, which is, with the help of prosody, directly attached to its reference notion *representations*.

What these items show is that the intonational phrasing of parentheticals allows for syntactic factors to be overridden by exactly the same factors that also interact with syntax in intonational phrasing in general, most notably prosodic factors such as prosodic length, and pragmatic factors. In the next section I will outline some resulting implications for prosodic theory.

5.2 Theoretical implications

I will argue in this section that current prosodic theory cannot fully account for the observed pattern, despite the fact that parentheticals follow constraints on intonational phrasing that have also been identified elsewhere in intonational phrasing. At this stage, there are at least three questions that present themselves: 1) Does current prosodic theory cover structures such as parenthetical insertions? 2) If it does, how can the intonational phrasing patterns found for parentheticals be accounted for in current prosodic theory? 3) Where do pragmatic factors enter the picture?

The question of whether or not current prosodic theory covers parentheticals is not trivial, because parentheticals have often been argued to be hierarchically unintegrated constituents of their host sentence (see the Introduction above for references). The relevant approaches account for linearisation and apparent surface relationships between parenthetical and host along the lines of semantic association (e.g., Peterson 1999), utterance interpretation (e.g., Haegeman 1988), or serialization in the phonetic component (e.g., Haider 2005). However, prosodic theory has as its input the output of the syntactic component. If parenthetical and host are separate syntactic structures and linearisation is a matter of one of the interface modules, in particular if this is the interpretational module, prosodic theory does not have access to both the host and the parenthetical in the same mapping process. Prosodic integration will thus be hard to come by.

In recent work, the janus-faced properties of parentheticals of being syntactically unrelated to their host but showing some surface relationships at the

same time have been taken as evidence for a syntactic structure where parentheticals are adjuncts to the host but may differ in their syntactic properties from other types of adjuncts. Potts' (2005) analysis, for example, involves a certain feature specification. Parentheticals and related expressions are assigned a comma feature [+comma], which in intonation represents the separateness of the relevant phrase, and in semantics indicates that the phrase is outside the at-issue entailments of the proposition expressed by the host sentence. Vries (2005, 2007) argues for b-Merge as a kind of Merge which produces a paratactic hierarchy and renders the b-merged constituent invisible for c-command-based relations such as binding and other dependency relations. For the present purpose, nothing hinges on the details of the syntactic analysis, but crucially, under adjunction analyses such as Pott's and Vries', parenthetical and host may be mapped onto the same larger prosodic structure. The relation between parentheticals and their host structures will then be covered by prosodic theory and the fact that parentheticals follow the same prosodic patterns as have been observed elsewhere in intonational phrasing follows straightforwardly.

Given that prosodic structure is mediated by syntactic structure, another word on the relation between syntactic constituency and the Intonational Phrase is in order. It is a common assumption in prosodic theory that a root clause in syntax corresponds to an Intonational Phrase (IP) boundary in prosody (e.g., Nespor & Vogel 1986). Root clauses include NRRCs as well as clausal parentheticals. In Selkirk (2005), it is the Comma Phrase (Potts 2005) rather than the root clause that corresponds to the Intonational Phrase. This relation, Selkirk argues, can be captured in terms of the alignment constraint given in (15), which belongs to the family of well-known prosodic edge alignment constraints and aligns the right edge of a Comma Phrase with the right edge of an Intonational Phrase.

(15) Align R (CommaP, IP)
Align the right edge of a constituent of type Comma Phrase in syntactic representation with the right edge of an Intonational Phrase in phonological representation.

At first sight, an asymmetric alignment constraint like (15) seems to account for the NRRC and sentential parentheticals data discussed above: All cases of non-separation displayed an intonational phrase boundary at the right edge, even if the left edge of

the parenthetical did not coincide with the edge of an intonational phrase. However, a closer look at the data reveals that asymmetric edge alignment is not sufficient to account for the data. For example, NRRCs whose relative pronouns phrase with the preceding material violate right alignment not because their left edge is not aligned with a syntactic edge, but because the right edge of the preceding syntactic phrase is not aligned with the right edge of a prosodic constituent; see for instance the noun phrases with the head nouns *Pascal, work* and *argument* in (8)a), (8)b) and (8)c), respectively. Note also that Truckenbrodt's (2005) WrapCP constraint, which demands that each CP is contained in a single Intonational Phrase, and which, Truckenbrodt argues, is tied to an AlignCP constraint which demands for the right edge of a CP to coincide with the right edge of an Intonational Phrase, does not account for the NRRC and parenthetical patterns observed above. According to WrapCP, NRRCs and sentential parentheticals should be wrapped in one Intonational Phrase.

Moreover, as illustrated above, comment clauses occur in prosodic patterns that do not involve an intonational boundary at their left edge. This concerns at least the patterns 'integration as prehead' (see (6)c)) and 'integration as head' (see (6)d)), and occasionally the patterns 'hesitant phase' (see (6)f)) and 'CC with nuclear prominence, but not phrased separately ' (see (6)b)).

Prosodic structures that do not obey syntactic alignment can possibly be taken care of in a model (as suggested by, e.g., Ghini 1993, Monachesi 2005, Neeleman 2005) which proceeds in at least two stages and involves the creation of an initial (abstract) prosodic representation on the basis of syntactic information and subsequent adjustment of the initial representation based on the phonological properties of the surface material such as weight and size effects. In yet more recent work, Kratzer & Selkirk (2007) suggest that prosodic phrasing is assigned as part of the phase-based spellout of syntactic structure. In their account, it is during spellout that phonological form is given to terminal elements. The partial phonological representation which is defined during spellout allows for satisfaction of the interface constraints on prosodic phrasing and stress, including constraints on intonational phrasing. The Intonational Phrase is "produced by independent principles of spellout" and "could be the spellout of 'comma phrase'" (Kratzer & Selkirk 2007: 125; see also Selkirk 2005 on relating the Intonational Phrase to Potts' 2005 comma phrase). Kratzer & Selkirk (2007: 126) suggest a prosodic theory that includes universal interface principles of prosodic

spellout, as well as a phonological component which defines a full, language-specific phonological surface representation as the result of an optimality-theoretic ranking of prosodic constraints, and which in turn serves as the input to phonetics.

These accounts look promising in that they can account for the interaction of various factors in intonational phrasing by assuming that they may be at work at different stages in the mapping process, i.e. at different levels in the architecture of the grammar. In models like these, parentheticals would be phrased in separate intonational domains at the output of the syntax-phonology interface. In Selkirk's (2005) and Kratzer & Selkirk's (2007) account, this would be taken care of by the comma feature of Potts (2005). This intonational phrasing would then serve as the input to the phonological component, where modification according to prosodic constraints takes place. Among these constraints, as an inherent part of the phonological component, constraints taking care of prosodic length and weight and balanced prosodic constituents would be active and would participate in defining the surface representation, taking the actual phonological material into account (Ghini 1993, Neeleman 2005, Kratzer & Selkirk 2007). What cannot be accounted for, however, is the way in which pragmatic factors affect the surface representation - unless we allow for an interface between pragmatics and either the phonological component of Kratzer & Selkirk (2007) or phonetics. This concerns parentheticals as well as other constructions. Among the pragmatic factors involved are floor-holding and the use of target expressions in hesitant phases or as mitigators (see above). Evidence that the effect of floor-holding and related discourse phenomena on intonational phrasing is not a parenthetical-specific phenomenon comes from coordinated constructions, in particular from coordinated clauses. In structures such as (16)a), prosodic theory predicts an Intonational Phrase boundary after the first root clause, and crucially before the conjunction, as in (16)b). However, just like the relative pronouns in the NRRCs in (8) above, coordinating conjunctions often phrase with the preceding root clause, as illustrated in (16)c) (see e.g. Barth-Weingarten 2007 for English; Dehé, to appear, for Icelandic). Since unlike syntactic and prosodic factors pragmatic factors are not inherent to either the syntactic or the phonological component, they cannot be captured by current prosodic theory.

(16) a. syntax: [root clause] [*and* root clause]

b. prosody, option 1: (root clause)$_{IP}$ (*and* root clause)$_{IP}$

c. prosody, option 2: (root clause *and*)$_{IP}$ (root clause)$_{IP}$

In other words, the parentheticals data observed here call for an interface between prosody and pragmatics, since pragmatic factors affect prosodic surface structure just like syntactic and prosodic factors do. One possible way of ensuring this interface is to employ Jackendoff's (2002) tripartite model, where the different generative components of the grammar work in a parallel fashion with relating interface systems. Discourse factors would be part of Jackendoff's conceptual structure, which is "part of thought" rather than part of language per se. "It is the locus for the understanding of linguistic utterances in context, incorporating pragmatic considerations" and it is where "reasoning and planning take place" (Jackendoff 2002: 123). The interface between syntax and phonology could still be modulated as suggested in current prosodic theory and outlined above. Intonational properties related to pragmatic features would be dealt with at the pragmatics-phonology interface.

6 Conclusion

This study has looked at the intonational phrasing of clausal parentheticals. A considerable amount of data from actual spoken language was considered. It is clear from the empirical results that the common assumption that parentheticals are generally phrased into separate intonational domains is too strong. However, since the prosodic constraints shaping the intonational phrasing of parentheticals are constraints familiar from previous research on other constructions, current prosodic theory can account for the impact of both syntactic and prosodic factors on the intonational phrasing of parentheticals, assuming that there is a syntactic relation between parenthetical and host structure. What current prosodic theory cannot account for is the impact of discourse factors on intonational phrasing in general and thus intonational phrasing of parentheticals. A way out of this would be to allow for an interface between phonology/ phonetics and pragmatics at some stage in the grammar.

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Appendix 1: Key to the text types from which the examples are taken

Example in text	***Corpus Text ICE-GB***	*Description (participants, date); (from Nelson, Wallis and Aarts 2002)*
(5)a), Figure 1	s2a-028	Unscripted speech: Dr. D.M. Roberts, Introduction to Prof. Peter Cook's Inaugural Lecture, UCL, 1 May 1991
(5)b), Figure 2	s1b-059	Parliamentary debate: Education/Employment Debate, 26 Nov 1990
(7)	s1b-024	Broadcast discussion: *Start the Week*, BBC Radio 4, 12 Nov 1990
(8)a), Figure 3	s1a-008	Direct conversation: Friends, 7 June 1991
(8)b)	s1a-096	Telephone call: Friends, February 1992
(8)c)	s1b-028	Broadcast discussion: *The Persistence of Faith*, BBC Radio 4, 27 Jan 1991
(8)d), (9)f)	s2a-021	Unscripted speech: Sir Peter Newsam, 'Teaching the Teachers', Frederick Constable Memorial Lecture, RSA, 22 May 1991
(9)a), (13)b)	s1b-032	Broadcast discussion: *Richard Baker Compares Notes*, BBC Radio 4, 9 Feb 1991
(9)b), Figure 4	s1b-033	Broadcast discussion: *The Scarman Report*, BBC Radio 4, 16 June 1991
(9)c), Figure 5	s1b-058	Parliamentary debate: Tony Newton et al., 26 Nov 1990
(9)d)	s1b-064	Legal cross-examination of prosecution witness by defence counsel and judge: Queen's Bench, Lehrer v Lampitt, 5 July 1990
(9)e), (10)	s1b-080	Business transaction: Insurance company and clients, 25 March 1992
(9)g)	s2a-036	Unscripted speech: Dr. M. Weitzmann, Hebrew and Jewish Studies seminar, UCL, 16 May 1991

Example in text	***Corpus Text ICE-GB***	*Description (participants, date); (from Nelson, Wallis and Aarts 2002)*
(9)h)	s2a-049	Unscripted speech: Prof. John Burgoyne, 'Creating a Learning Organisation', RSA Lecture, 8 Jan 1992
(9)i)	s2b-019	Broadcast news: *The World at One*, BBC Radio 4, 1 Nov 1990
(9)j), (9)k)	s2b-050	Non-broadcast speech (scripted): Sir Geoffrey Howe, Resignation Speech, House of Commons, 13 Nov 1990
(12)b)	s1a-059	Direct conversation: Counseling interview, February 1991
(13)a)	s1a-037	Direct conversation: Student friends, May 1991
(14)	s1b-029	Broadcast discussion: *Tea Junction*, BBC Radio 4, 5 April 1991

Appendix 2: Overview of CC types and results of the analysis

Table A: Numbers of CCs retrieved from the ICE-GB and analysed auditorily/instrumentally

CC	*No of utterances containing CC*	*No of CCs*	*sound files unavailable or useless*	*CCs unavailable*	*utterances analysed (auditorily)*	*CCs analysed (auditorily)*	*utterances analysed (instrumentally)*	*CCs analysed (instrumentally)*
I think	204	207	38	38	166	169	102	102
I suppose	67	68	15	16	52	52	31	31
I believe	18	18	3	3	15	15	14	14
I guess	8	8	1	1	7	7	5	5
I imagine	1	1	0	0	1	1	1	1
I'd/would imagine	3	3	1	1	2	2	0	0
I understand	2	2	0	0	2	2	2	2
I expect	1	1	1	1	0	0	0	0
I reckon	2	2	0	0	2	2	2	2
I assume	1	1	0	0	1	1	1	1
I wonder	2	2	0	0	2	2	2	2
I suspect	2	2	1	1	1	1	1	1
I thought	4	4	1	1	3	3	1	1
I would have thought	3	3	1	1	2	2	0	0
I would/should think	5	5	1	1	4	4	3	3
I don't think	13	13	2	2	11	11	8	8
I would/should/'d say	11	11	3	3	8	8	6	6

CC	*No of utterances containing CC*	*No of CCs*	*sound files unavailable or useless*	*CCs unavailable*	*utterances analysed (auditorily)*	*CCs analysed (auditorily)*	*utterances analysed (instrumentally)*	*CCs analysed (instrumentally)*
I would suggest	3	3	0	0	3	3	2	2
I'm afraid	10	10	0	0	10	10	6	6
I fear	3	3	0	0	3	3	3	3
I hope	7	7	1	1	6	6	5	5
I argue	1	1	0	0	1	1	0	0
I don't know	9	9	2	2	7	7	3	3
I might say	2	2	1	1	1	1	0	0
I may say	2	2	0	0	2	2	1	1
I must say	2	2	1	1	1	1	1	1
I'm sure	5	5	0	0	5	5	3	3
Miscellaneous	7	7	2	2	5	5	1	1
Overall	*398*	*402*	*75*	*76*	*323*	***326***	*204*	*204*
Overall adjusted[6]	*397*	*402*			*322*	***326***	*203*	*204*

[6] I utterance contained both *I think* and *I suppose*.

Table B: Comment clauses: Intonational patterns observed

CC	*full separation*	*nuclear prominence, but not phrased separately*	*integrated as prehead*	*integrated as (part of) head*		*integrated as (part of) tail*			*(part of) hesitant phase*	*unclear*	*overall*
				with prenuclear stress	*unstressed between prenuclear and nuclear*	*at low pitch*	*associated with final rise*	*encliticised (tone copy)*			
I think	23	0	29	17	18	25	49	6	2	0	169
I suppose	10	4	5	1	1	8	21	1	1	0	52
I believe	7	1	1	2	1	1	2	0	0	0	15
I guess	2	1	1	0	0	1	1	0	0	1	7
I imagine	0	0	0	0	0	1	0	0	0	0	1
I'd/would imagine	0	0	0	0	0	0	2	0	0	0	2
I understand	1	0	0	0	0	1	0	0	0	0	2
I expect	0	0	0	0	0	0	0	0	0	0	0
I reckon	1	0	0	0	0	0	1	0	0	0	2
I assume	0	0	0	0	0	1	0	0	0	0	1
I wonder	1	0	0	0	0	1	0	0	0	0	2
I suspect	0	0	0	0	1	0	0	0	0	0	1
I thought	1	0	1	0	0	1	0	0	0	0	3
I would have thought	1	0	0	0	0	1	0	0	0	0	2
I would/should think	2	0	0	0	0	1	1	0	0	0	4

CC	*full separation*	*nuclear prominence, but not phrased separately*	*integrated as prehead*	*integrated as (part of) head*		*integrated as (part of) tail*			*(part of) hesitant phase*	*unclear*	*overall*
				with prenuclear stress	*unstressed between prenuclear and nuclear*	*at low pitch*	*associated with final rise*	*encliticised (tone copy)*			
I don't think	5	0	0	0	0	5	0	1	0	0	11
I would/should/'d say	4	1	1	0	1	1	0	0	0	0	8
I would suggest	1	1	0	0	0	0	1	0	0	0	3
I'm afraid	1	0	0	0	5	2	1	1	0	0	10
I fear	0	1	0	0	1	0	1	0	0	0	3
I hope	3	0	0	1	0	1	0	1	0	0	6
I argue	1	0	0	0	0	0	0	0	0	0	1
I don't know	3	0	1	0	0	0	0	0	3	0	7
I might say	1	0	0	0	0	0	0	0	0	0	1
I may say	0	0	0	0	1	1	0	0	0	0	2
I must say	1	0	0	0	0	0	0	0	0	0	1
I'm sure	2	0	0	1	0	0	1	0	0	0	5
Miscellaneous	4	0	1	0	0	0	0	0	0	1	5
Overall	*75*	*9*	*40*	*22*	*29*	*52*	*81*	*10*	*6*	*2*	***326***
				51		*143*					