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

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1 Introduction

Parentheticals are expressions of varying length/complexity, syntactic category and function, which are interpolated into the current string of the utterance. According to many authors, they are linearly, but not hierarchically integrated in the structure of the host clause. Among the elements that have been considered parentheticals in the literature are such elements as one-word expressions (e.g., *what*; see (1)a)), sentence adverbials (e.g., *however, unfortunately*; see (1)b)) and adverbial clauses, comment clauses (e.g., *I think, I believe, I suppose*; see (1)c)), reporting verbs (e.g., *he said, said she*; see (1)d)), vocatives, nominal appositions, non-restrictive relative clauses (NRRC; see (1)e)), question tags, and full or elliptical clauses (see (1)f) and g)). See Dehé & Kavalova 2007, Kaltenböck 2007 for recent overviews. Examples are given in (1); parentheticals are in italics.[2]

(1) Parentheticals

a. uh you get it out of the computer every *what* six months or something and have a look at it (Dehé & Kavalova 2006: 290)

b. He is, *unfortunately*, ill. (Urmson 1952: 486)

c. There were no other applicants, *I believe*, for that job. (Quirk et al 1985: 1113)

d. The reason for the Prime Minister's resignation *she said* was to enable Cabinet colleagues to enter the ballot (ICE-GB: s2b-020 #13)

e. so the word disability *which is this nebulous thing that exists somewhere between the two people* has a part on each side (ICE-GB: s1a-001 #59)

[1] Acknowledgements

[2] Here and below, all data taken from the ICE-GB are presented as they appear in the corpus, where the spoken material is not marked by any punctuation.

f. […] if the plaintiff has succeeded on those four points then he or she will get damages because there's no defence like justification or truth *I shall say a little bit more about that later* put forward (ICE-GB: s2a-061 #85)

g. For those of us who remember nineteen sixty-five *one or two of our listeners may* Tory party leadership contests used to be as the cardinals in Rome and leaders would emerge (ICE-GB: s1b-024 #1)

It is a common assumption that intonation is a defining feature of parenthetical interpolations (see Astruc 2005 for a recent overview). Parentheticals are marked by variations in pitch, tempo and loudness (Crystal 1969, Bolinger 1989, Wichmann 2000, 2001 among many others). Most importantly in the present context, NRRCs and parentheticals are assumed to be obligatorily phrased in a separate Intonational Phrase (Nespor & Vogel 1986: 188-190; see also Selkirk 1984: 295f, 1995a: 567, Truckenbrodt 2005: 275; the assumption goes back at least to Downing 1970). Intonational separateness is also commonly taken for granted among linguists discussing the syntax or semantics of parentheticals (e.g., Haegeman 1991: 250, Potts 2002, 2005, D'Avis 2005: 262, Burton-Roberts 2006: 180 among others). The idea is mainly based on syntactic criteria: parentheticals are commonly argued to be either external to the syntactic structure of their host (e.g., Haegeman 1991, Peterson 1999, Espinal 1991, Burton-Roberts 1999, Haider 2005, though naturally these accounts differ in the way they handle the lack of structural relation), or only very loosely related to it, e.g. in terms of adjunction (e.g., Emonds 1973, 1976, 1979, Ross 1973, 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 (de Vries 2005, 2007).[3]

[3] In de 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 (de Vries' 2007 *Invisibility*).

Similarly, NRRCs have often been assumed to be outside the syntactic representation of the embedding sentence (e.g., Safir 1986, Fabb 1990, Espinal 1991, Burton-Roberts 1999, Peterson 2004, see Arnold 2007 for an overview and critical account). The idea is that a constituent that is at best loosely related to the syntactic structure of the host cannot be prosodically integrated at the same time. Among the attested cues to intonation breaks around parentheticals 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), and the blocking of sandhi rules (e.g., Frota 2000). 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 that prosodic phrasing in general and Intonation Phrase boundary placement in particular is not determined by syntax alone, even if the syntactic boundaries are strong. Other relevant factors include syntactic and prosodic length/complexity/weight, balanced prosodic constituent size, performance factors such as speech rate and style, focus, contrastive prominence, and semantic coherence (see, e.g., Cooper & Paccia-Cooper 1980, Gee & Grosjean 1983, Selkirk 1984, 2000, 2005, Nespor & Vogel 1986, Ferreira 1991, 1993, Ghini 1993, Frota 2000, Sandalo & Truckenbrodt 2002, Jun 2003, Frazier et al. 2004, Watson & Gibson 2004, Prieto 2005, Elordieta et al 2005, D'Imperio et al 2005, Hellmuth, to appear).

Moreover, the intonational features of parentheticals have been argued to depend on various factors, among them their length/ relative weight, syntactic make-up and position (e.g., Bolinger 1989). Certain types of relatively short parentheticals such as comment clauses, reporting verbs, question tags and vocatives 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, to appear). Peters' (2006) data reveal 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, psycholinguistic research has shown that the placement of an intonational boundary before the NRRC is far from obligatory. Instead, it depends on sentence position along with discourse status (Watson & Gibson 2004).

The present study focuses on three types of expressions commonly considered parentheticals in previous research: comment clauses (CCs), non-restrictive relative clauses (NRRCs), and sentential parentheticals. The study makes use of a large set of data from actual spoken British English. It 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 use of spoken corpus data is a valuable undertaking for the following reasons. From an empirical perspective, most previous studies on parentheticals have been based on native speaker intuition, on a relatively small number of made-up examples, or on carefully manipulated experimental data. The present study investigates whether the assumptions about the behaviour of parentheticals hold to be true for actual spoken language. From a theoretical perspective, data from natural speech, as archived in corpus material, has not yet been systematically exploited in prosodic theory. This study will therefore make an important contribution to the debate in this area, in particular the discussion on intonational phrasing. The remainder of the paper is organised as follows. Section 2 introduces the theoretical prosodic background. Section 3 provides details on the nature of the data, their source, retrieval and analysis. In Section 4, the results of the analysis will be presented. The findings will be discussed against the background of prosodic theory in Section 5. Section 6 serves as a conclusion and outlook.

2 Background

2.1 Intonational phrasing

As outlined above, parentheticals have been argued to be phrased in a separate prosodic constituent, specifically the Intonational Phrase (IP) or intonation domain. Therefore, a word is due on the nature of the relevant prosodic constituent, and on intonational phrasing in general.

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), 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 it is terminated by a boundary tone (T%). English has two types of boundary tones: high (H%) and low (L%) (Beckman et al 2005, Jun 2005, and much previous work). H% serves to indicate continuation as well as the end of yes-no questions, while L%, if in sentence-final position, typically terminates declaratives and wh-questions (see Pierrehumbert & Hirschberg 1990, Hirschberg 2004, Nolan 2006 among others). In the prosodic hierarchy, the IP is dominated by the Phonological Utterance. Each IP is made up of one or more prosodic constituent one level down in the hierarchy: the intermediate phrase (ip) in Pierrehumbert's and related work, which in turn is made up of one or more prosodic words (PWd). Like Pierrehumbert and colleagues, Nespor & Vogel (1986: 188) see the IP as the domain of an intonation contour. Moreover, in their framework IP edges are defined along the lines of segmental rule application (Nespor & Vogel 1986: 205-216; see also Frota 2000).

A root clause in syntax is commonly assumed to correspond to an IP in prosody (e.g., Downing 1970, Emonds 1976, 1979, Nespor & Vogel 1986). According to Selkirk (1984) the IP is semantically rather than syntactically constrained, such that it is subject to the *Sense Unit Condition*. More recently, Selkirk (2005) identifies the IP 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 IP in that it, too, is defined in terms of a complete tonal contour. It consists of an obligatory nucleus, which is optionally preceded by a 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 domain); see, for example, Crystal (1969, 1972); see Gussenhoven (2004: Chapter 15) for a recent description of tonal contours occurring in

English. Along with a complete tonal contour and phonological rule application, a number of internal and external criteria have been identified which help to determine the extension of an intonation domain/ IP. Domain-internally, 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 intonation domain.

While in the British tradition the shape of the tonal contour is referred to, Pierrehumbert's system uses tonal targets to describe pitch accents. A fall would correspond to H*L (a high, stressed target followed by a fall to a low target), a rise to L*H (a low, stressed target followed by a rise). There is no equivalent for T% in the British tradition. Instead, "British nuclear tones such as fall-rise conflate the pitch movement on the last accent (e.g. fall) with the pitch movement at the end of the phrase (e.g. rise)" (Ladd 1996: 88). At the end of an intonation domain, a fall-rise would thus correspond to H*L+H%, a rise-fall to L*H+L%.

Pauses, both filled and silent, have also been considered boundary markers (e.g., Nespor & Vogel 1986: 188). However, since they are not obligatory and their occurrence, length and position depend on a number of factors (see Krivokapić 2007 for a recent overview), pauses cannot be considered reliable cues. It is therefore important to distinguish between structure-related (breath-) pauses on the one hand, and hesitational or performance-related stretches on the other hand.[4] Potentially more reliable cues include pitch reset (Gussenhoven 2004 and references given there), and domain final lengthening (e.g., Gussenhoven & Rietveld 1992, Vaissière 1983, Ferreira 1993). Furthermore, the change in pitch level and/or direction on unaccented syllables following a nuclear tone has been seen as "a fairly clear boundary marker" (Cruttenden 1997: 34). Specifically, after falling tones

[4] In the Tone and Break Indices system (ToBI; see Beckman & Elam 1997), the p diacritic is used to indicate disfluencies related to hesitation and word searching phases.

followed by low unaccented syllables there will be a step-up to the pitch level of the unaccented syllables at the beginning of a new intonation domain, while after rising tones, there is "a step-down to the pitch level of any unaccented syllables at the beginning of the following" domain (Cruttenden 1997: 34).

Of further interest in the present context is the work documenting the prosodic transcription and labelling in the Lancaster/IBM Spoken English Corpus (see Knowles 1991). The boundary cues fall in three categories: temporal discontinuities essentially include silent and filled pauses and final lengthening, and combinations of these; pitch discontinuities essentially correspond to Cruttenden's (1997) change in pitch level as outlined above; segmental discontinuities refer to processes of connected speech such as the blocking vs. presence of assimilation, elision, r-linking, [j, w] glides after close vowels, gemination of stop phases, and contractions (Knowles 1991: 151ff).

2.2 Parentheticals in prosodic theory

The idea that parentheticals are obligatorily phrased into their own IP is mostly based on the assumptions that IPs are syntactically constrained and parentheticals are syntactically independent. Selkirk (1984: 295) puts this idea on semantic grounds: IP formation is constrained by the Sense Unit Condition. A sense unit is defined in terms of modifier-head and argument-head relations (Selkirk 1984: 291). Since elements such as "vocatives, certain types of parentheticals, tag questions, and other sorts of nonargument, nonmodifier expressions" do not form a sense unit with the host or any of its parts, they "should be fated to constitute IPs on their own" (Selkirk 1984: 295).

Nespor & Vogel (1986: 189f) assume that the strings preceding and following parentheticals also form IPs on their own, even if they would not do so otherwise. This yields the phrasing patterns in (2). The examples in (3) (from Nespor & Vogel 1986: 189, 190), illustrate (2)a).

(2) a. … $_{IP}$[…]$_{IP}$ $_{IP}$[parenthetical]$_{IP}$ $_{IP}$[…]$_{IP}$ …

b. $_{IP}$[parenthetical]$_{IP}$ $_{IP}$[…]$_{IP}$ …

c. … $_{IP}$[…]$_{IP}$ $_{IP}$[parenthetical]$_{IP}$

(3) a. $_{IP}$[Isabelle is]$_{IP}$ $_{IP}$[as you know]$_{IP}$ $_{IP}$[an artist]$_{IP}$

b. $_{IP}$[Charles wouldn't]$_{IP}$ $_{IP}$[I imagine]$_{IP}$ $_{IP}$[have done such a thing]$_{IP}$

Ladd (1986, 1996) takes parentheticals as evidence for his Compound Prosodic Domain (CPD; see (4)) which is related to a compound in morphosyntax and which allows for limited recursion in prosodic structure. The idea is based on experimental work by Cooper & Sorensen (1981) using data of the kind given in (5)a), according to which parentheticals do not affect the overall declination of the utterance. Ladd (1986) argues that this makes sense under the CPD structure in (5)c) instead of (5)b). The CPD structure allows the matrix clause to form one domain across which declination applies, regardless of whether or not it is interrupted by another domain. Empirical support for the CPD has been provided by Frota (2000: 60-77) using data involving parenthetical insertions. She finds that the IP which embeds the parenthetical has one intonational contour, while sandhi processes bound by the IP apply at the boundary separating the IP spanning the parenthetical from the matrix IP. Dehé & Kavalova (2006) argue for an analysis of the prosodic phrasing of parenthetical *what* along the lines of the CPD.

(4) Compound Prosodic Domain (Ladd 1996: 244):

A CPD is a prosodic domain of a given type X whose immediate constituents are themselves of type X.

(5) a. The book on the table, it seems to me, was a gift from my mother.

b. [The book on the table] [it seems to me] [was a gift from my mother]

c. [The book on the table [it seems to me] was a gift from my mother]

Also relevant is Gussenhoven's (2004: 290-292) analysis of certain 'extra-sentential elements', including reporting verbs, comment clauses, and vocatives among others (Bing's 1985 'Class 0 expressions'). According to Gussenhoven (2004: 291), they come in two types, both of which are unaccented: (i) they may be included in the preceding IP ('incorporation'), or (ii) they may be encliticised. Accented extra-sentential elements are phrased separately. The respective phrasings are given in (6), examples in (7).

(6) (adapted from Gussenhoven 2004: 291; ES = extra-sentential element)

a. $_{IP}$[… ES]$_{IP}$ incorporation

b. $_{IP}$[$_{IP}$[…]$_{IP}$ ES]$_{IP}$ encliticisation

c. $_{IP}$[…]$_{IP}$ $_{IP}$[ES]$_{IP}$ separation

(7) (adapted from Gussenhoven 2004: 292)

a. $_{IP}$[Is it TRUE *she asked*]$_{IP}$ incorporation

b. $_{IP}$[$_{IP}$[Is it TRUE]$_{IP}$ *she asked*]$_{IP}$ encliticisation

c. $_{IP}$[It's TRUE]$_{IP}$ $_{IP}$[*ISn't it*]$_{IP}$ separation

Unlike incorporated material, enclitised material is set off from preceding material by a boundary tone (Gussenhoven 1990). It receives a copy of the tones after the last stressed syllable. For example, if the nuclear pattern is H*LL% (fall), then LL 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).

Under the assumption that parentheticals are hierarchically unintegrated constituents of

their host sentence it is not so clear whether current prosodic theory covers parentheticals at all. 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 explain. De Vries (2007: 220) arrives at the same conclusion. He argues that since parentheticals "are interpreted as well as pronounced […] they must be present at the LF interface and at the PF interface" and that "[a]ccording to standard assumptions about the organization of the grammar, there is only one way to get at these interfaces, namely via the overt syntax". He concludes that "parataxis must be represented in syntax".

Under the assumption of syntactic integration of any kind, on the other hand, parentheticals are subject to the interface constraints of prosodic theory. The types investigated here have been conceived as root clauses (e.g., Downing 1970, Emonds 1979, Nespor & Vogel 1986, Safir 1986, Fabb 1990 for NRRCs, Espinal 1991) or sentence adverbials (e.g., Jackendoff 1972 for CCs). A root clause in syntax corresponds to an IP in prosody (see also Downing 1970, Emonds 1976, 1979, Nespor & Vogel 1986; (8) is from Truckenbrodt 2005).

(8) Root clauses (but not embedded clauses) are bounded by obligatory intonation phrases boundaries.

In Selkirk (2005), it is the Comma Phrase (Potts 2005) rather than the root clause that corresponds to the IP. This includes parentheticals. The relation between Comma Phrase and IP, Selkirk argues, can be captured in terms of the alignment constraint given in (9), 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 IP. This constraint thus predicts an IP boundary at the right edge but not the left edge of a parenthetical, and thus predicts the

structures in (10) along with (2) above. In a footnote, Kratzer & Selkirk (2007: 125) suggest that there might be full correspondence between CommaP and IP.

(9) 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.

(10) a. $_{IP}[\ldots]_{IP}\ _{IP}[\ldots \text{ parenthetical}]_{IP}\ _{IP}[\ldots]_{IP}$

b. $_{IP}[\ldots\ _{IP}[\ldots \text{ parenthetical}]_{IP}\ \ldots]_{IP}$

c. $_{IP}[\ldots \text{ part of parenthetical}]_{IP}\ _{IP}[\text{part of parenthetical}]_{IP}\ _{IP}[\ldots]_{IP}$

Also for Complementiser Phrases (CPs), Truckenbrodt's (2005) WrapCP constraint demands that each CP is contained in a single IP. It is tied to an AlignCP constraint which demands for the right edge of a CP to coincide with the right edge of an IP. This constraint pair thus predicts phrasing of NRRCs and other sentential parentheticals in one IP, but allows for additional material in the same domain at its left periphery. It thus predicts (2) and (10)a) and b), but not (10)c).

Under the assumption that sentence adverbials project their own phrase in syntax which is adjoined to the clause they modify, they will also be mapped onto their own domain.

Based on this background, the predictions for the data analysis can be summarised as follows:

(11) Predictions

a. The right edge of a parenthetical coincides with the right edge of an IP.

b. According to Nespor & Vogel's (1986) obligatory phrasing of parentheticals, the left edge of a parenthetical also coincides with an IP boundary, and phrasing is non-recursive. However, according to Selkirk's (2005) align constraint and

Truckenbrodt's (2005) constraint tie, the left edge of a parenthetical does not have to coincide with the left edge of an IP unless preceded by a clausal boundary in syntax.

c. According to Ladd's (1986, 1996) CPD analysis, the parenthetical may form a separate IP which is embedded in the IP of the host material.

d. The prosodic properties of parentheticals and the relation between their syntax and prosody provide supportive evidence for syntactic integration of parentheticals.

3 Data analysis

The current section provides details on the nature, source and treatment of the data used here to find out more about the intonational phrasing of parentheticals and to test the predictions based on previous research in prosodic theory.

3.1 Data: types of parentheticals under investigation

The following three types of parenthetical elements as used in actual spoken language are investigated: non-restrictive relative clauses (NRRCs), sentential parentheticals, and comment clauses (CCs).

3.1.1 Non-restrictive relative clauses (NRRCs)

NRRCs function as modifiers that add information to the constituent they modify. Examples are given in (12) (from Quirk et al 1985: 1257, Arnold 2007: 272).

(12) NRRCs

a. I spoke to Dr. Spolsky, *who was unwilling to give further details*.

b. I bought the cheapest book, *which was not a paperback*.

c. Kim won the race, *which was a relief*.

As opposed to restrictive relative clauses, NRRCs do not delimit the interpretation of their referent (Arnold 2007: 272). Often, NRRCs modify proper nouns, which have a single referent by their very nature, and the function of the NRRC is to add further information about this referent (see (12)a)). NRRCs are often optional, and they can usually occur as a separate clause (e.g., Quirk et al 1985: 1258f, Arnold 2007: 272). They are used to modify noun phrases, as well as other categories. In (12)c), for example, the NRRC modifies the constituent *Kim won the race* of type S (see Arnold 2007: 274 for examples of NRRCs modifying PP, AP, and VP). In writing, NRRCs are typically separated from their host by commas (Arnold 2007: 272, Quirk et al 1985: 1258). In prosody, they are commonly assumed to be phrased in a separate domain (Selkirk 1984, Arnold 2007: 272). NRRCs have often been assumed to be outside the syntactic structure of their containing host, and to be structurally identical to parentheticals (e.g., Emonds 1979: 216, Safir 1986).

3.1.2 Sentential parentheticals

A *sentential parenthetical* belongs to one of the following types:

(i) interpolations which are syntactically complete and could stand alone as independent sentences (see (13)a) for a declarative, (13)b) for an interrogative);[5]

(ii) clausal *as*-parentheticals (e.g., Potts 2002; see (14));

(iii) *and*-parentheticals (e.g., Blakemore 2005, Kavalova 2007; see (15)).

(13) Complete, independent sentences

a. Newcastle and North you find uhm there's a marvellous walled garden *I don't know where it is* with hyacinths (ICE-GB: s1a-065 #298)

[5] Sentential parentheticals may be semantically related to (see (13)a), or they may be semantically detached from the rest of the sentence (see (13)b)). Both types have been included in the analysis, but semantically related parentheticals outnumbered detached parentheticals in the data set by far.

b. Well esterases are able in organic solvents to carry out a number of useful *can you hear me all right now* organic uhm processes to produce things like food products (ICE-GB: s2a-034 #13)

(14) Clausal *as*-parentheticals

a. Ames, *as the FBI eventually discovered*, was a spy. (Potts 2002: 624)

b. Heliopolis today is effectively a suburb a north-eastern suburb of Cairo and is *as you can see perhaps from this slide* remarkably industrial wasteland […] (ICE-GB: s2a-026 #54)

(15) *and*-parentheticals

a. In fact I was very candidly told *and I repeat my acknowledgement of the candour* that it was placed before him in January last (ICE-GB: s2a-063 #83)

b. Will the Minister confirm that come the single uh Common Market that three hundred million EEC nationals could *and I emphasise could* seek employment in this country without the need to obtain a work permit (ICE-GB: s1b-059 #40)

Other types of sentential parentheticals, such as elliptical parenthetical clauses (see (1)g)), were disregarded for the purpose of the present analysis in order to keep this data group as homogenous as possible.

3.1.3 Comment clauses (CCs)

Comment clauses (CCs) are elements such as *I think, I suppose, I imagine, I'm afraid*, etc (e.g., Quirk et al 1985: 1112ff). They typically consist of a first-person pronoun and a verb of knowledge, belief or conjecture or a corresponding adjectival construction.[6] CCs occur sentence-finally and sentence-medially between or within syntactic constituents (see (16);

[6] For the purpose of this study, the comment clauses *you know, you see* and *I mean*, also previously analysed as discourse markers (e.g., Murphy 1993, Aijmer 1997), were excluded from the analysis.

from Emonds 1973: 333, Quirk et al 1985: 1113, Nespor & Vogel 1986: 190).

(16) CCs

a. John came later than Sue, *I think*.

b. John came, *I think*, later than Sue.

c. John, *I think*, came later than Sue.

d. There were no other applicants, *I believe*, for that job.

e. Charles wouldn't, *I imagine*, have done such a thing.

Due to its nature as incomplete clause, the parenthetical analysis of CCs, which goes back at least to Jespersen 1937, is more controversial than that of NRRCs and sentential parentheticals. The parenthetical analysis is common in the semantic-pragmatic literature (e.g., Urmson 1952, Thompson & Mulac 1991, Aijmer 1997), and recent work has added prosodic evidence for their parenthetical status (Dehé & Wichmann, to appear). In the syntactic literature, however, there has been a debate as to whether CCs are best analysed as base-generated parentheticals (e.g., Jackendoff 1972: 94-100, Emonds 1973, 1976, Peterson 1999) or whether they are derived by some syntactic movement operation from an underlying structure which features the CC as a main clause taking the rest of the sentence as complement (e.g. Ross 1973).[7] Arguments in favour of the movement analysis include the superficial relation between sentences such as (16)a), b) and c) on the one hand and (17) on the other hand, which suggests that (17) is the underlying structure and (16)a), b) and c) are

[7] The focus in the present study is on English data. However, the syntactic debate is not confined to English CCs. The related verb-initial construction in German, for example, has also been subject to discussion along the same lines (see, e.g., Tappe 1981, Grewendorf 1988, Haider 1993, Reis 1995, 2002, Wagner 2004). Kiziak's (2007) experimental study provides support for the parenthetical analysis suggested by Reis (1995, 2002). Notice also that Schelfhout, Coppen & Oostdijk (2004) argue for a parenthetical analysis for Dutch, and that Schneider (2007a, b) refers to related elements in Romance as "reduced parenthetical clauses".

derived from it by syntactic movement across the CC, for example under topicalization or focus movement, or some other stylistically driven operation.

(17) *I think* (that) John came later than Sue. (from Emonds 1973:133)

Other cases that seem structurally ambiguous between a parenthetical and a structure derived by movement include relative clauses such as the ones given in (18). According to standard syntactic assumptions, the relative pronoun ends up in the clause-initial position as a result of wh-movement into the specifier of a functional projection. A structure where the relative pronoun moves across not only material inside its clause but also across the CC (then main clause) can therefore not be entirely ruled out.

(18) 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. I think it is far better to increase the amount of democracy rather than to go ahead and reduce it which *I believe* would be wrong at this time (ICE-GB: s1b-053 #46)

However, often the string preceding the CC is not a syntactic constituent; see (16)b), d) and e). Surface structures like these cannot reasonably be seen as the result of syntactic movement (see also Jackendoff 1972: 96f). Further arguments in favour of the parenthetical analysis include the fact that they do not lend themselves to certain main clause phenomena. In (19), for example, the main verb *left* and its complement, but not the interpolated CC can be questioned. In (20), simple present tense can be used for future reference only when the future event is predictable due to the presence of the matrix verb *hope*, but not when *hope* is part of a CC (see Peterson 1999). This also holds when the string preceding the CC is a constituent, such as the subject in (20)e).

(19) A: Mary, I think, left early. B: # Do you?

B: Did she?

(20) Tense (a) through d) from Peterson 1999: 235; examples reordered)

a. The rain will stop before Sunday.

b. *The rain stops before Sunday.

c. I hope the rain stops before Sunday.

d. *The rain stops, I hope, before Sunday.

e. *The rain, I hope, stops before Sunday.

Moreover, CCs can occur with interrogatives and imperatives, but neither interrogatives nor imperatives can occur as subordinate clauses in Standard English (see the contrasts in (21) and (22), respectively; examples from And Rosta, personal e-mail). Jackendoff (1972: 97) notes that "the parenthetical must be of 'positive' import, and there is no convenient way" to account for this under a movement analysis (see (23)).

(21) a. Will she, I wonder, be late?

b. *I wonder will she be late.

(22) a. Do not, I beg you, be late.

b. *I beg you do not be late.

(23) (from Jackendoff 1972: 97)

a. John is, I think, a fink.

b. *John is, I don't think, a fink.

c. *John is, I doubt, a fink.

d. John is, I don't doubt, a fink.

Finally, according to Quirk et al (1985: 1113), (24)b) is not an exact paraphrase of (24)a). While the CC in (24)b) has a hedging meaning, they argue, the main clause in (24)a) may have "a more definite meaning". That the alleged "transformation does not preserve meaning" has also been noted by Jackendoff (1972: 97). Quirk et al (1985: 1113) suggest a "reversal of syntactic roles", of "the relationship of subordination between the two clauses". This implies that (24)b) cannot have been derived from (24)a) by a syntactic movement operation, since movement does not alter the underlying relation between constituents (see Emonds' 1976 Structure-Preserving Constraint).

(24) a. *I believe (that)* there were no other applicants for that job.

b. There were no other applicants, *I believe*, for that job.

In light of all this evidence, intermediate and final CCs are considered parentheticals. However, in order to avoid any remaining ambiguity in syntactic structure, all CCs in a position preceded by a syntactic constituent such as a subject (see (25)a)), full clause (see (25)b)) or relative pronoun (see (18)) have been discarded from the analysis.

(25) a. The voters *I think* just have an opportunity to stick two fingers up to whoever seems to be on top at the moment (ICE-GB: s1b-029 #92)

b. The rice is marvellous *I think* (ICE-GB: s1a-022 #92)

3.2 Data source and data treatment

3.2.1 Data source and retrieval

The data for this study were drawn from the spoken part of the British Component of the International Corpus of English (ICE-GB; Release 1, ICE-CUP version 3.0; see Nelson, Wallis & Aarts 2002). The spoken part contains approximately 640,000 words from various text types, ranging from direct casual conversations and private telephone calls, public dialogues and discussions, to unscripted and scripted monologues and broadcast news, all recorded in the 1990s.[8] The corpus is fully parsed syntactically, but not prosodically, except that pauses (i.e., silent stretches of all kinds) are indicated in the transcriptions.[9] The corpus comes with accompanying sound files which can be used for prosodic analysis. The NRRCs, sentential parentheticals and CCs studied here were retrieved together with other types of

[8] The ICE-GB corpus and accompanying materials (Nelson, Wallis & Aarts 2002) provides detailed information on the source of the corpus data. In the spoken part of the corpus, files whose names begin *s1a* are from the private domain, comprising speech material from direct conversations (s1a-001 - s1a-090) and telephone conversations (s1a-091 - s1a-100). They thus represent casual, informal speech. Files whose names begin with s1b, s2a or s2b are from the public domain, representing more formal speech. They consist of dialogues (s1b: classroom lessons, broadcast discussions and interviews, parliamentary debates, legal cross-examinations, and business transactions), unscripted monologues (s2a: spontaneous commentaries, unscripted speeches, demonstrations, and legal presentations), scripted monologues (s2b-021 - s2b-050: broadcast talks and non-broadcast speeches), and a category "mixed" from broadcast news (s2b-001 - s2b-020). See Appendix 2 to Nelson, Wallis & Aarts (2002) for more information on the sources of the ICE-GB texts.

[9] Silent stretches are indicated in the corpus transcriptions by <,> or <,,>; the number of commas indicates the perceived (but not measured) length of the pause. For the purpose of the present analysis, these pause indicators have been removed and they do not occur in the examples given throughout the paper. This is because silent stretches do not automatically correspond to boundaries of phrasal prosodic constituents (see above) and any conclusions drawn from the transcriptions as to the status of silent stretches as structure-related breath pauses or mere hesitation were intended to be avoided.

parenthetical expressions, using a systematic search followed by manual sorting. The ICE-GB grammar contains a number of functions and categories, among them Detached Function (DEFUNC), which includes parentheticals. The automatic search was for this category. During the manual sorting procedure, items were excluded for which the author did not agree with the corpus annotators as to the syntactic status of the target elements.

57 utterances containing 63 NRRCs, 74 utterances containing 77 sentential parentheticals, and 397 utterances containing 402 CCs in medial or final position were initially retrieved from the corpus. Given the limited availability and varying quality of sound files, not all items retrieved from the corpus entered the analysis.

Of the 57 utterances containing 63 NRRCs, the sound clips of 3 utterances (3 NRRCs) were unavailable. Of the remaining 54, 5 utterances were discarded because of unclear structure or unclear words in the target area (3 items), or because the right edge of the NRRC was unclear due to the end of the sound file, and the right edge of the target domain could thus not be identified (2 items). The remaining 49 utterances containing 55 NRRCs entered the analysis.

Of the 74 utterances containing 77 sentential parentheticals, 19 utterances (19 parentheticals) were unavailable or useless due to bad recording quality.[10] The remaining 58 sentential parentheticals were 14 declarative independent sentences, 3 interrogative independent sentences, 35 *and*-parentheticals and 6 *as*-parentheticals.

Of the 397 utterances containing 402 CCs initially retrieved from the corpus, 226 utterances (229 CCs) were discarded because they were syntactically ambiguous between a parenthetical and a structure derived by movement. Of the remaining 171 utterances (173 CCs), the sound files of 33 utterances (34 CCs) were either unavailable or defective, or essentially useless due to their bad recording quality. The remaining 138 utterances

[10] The term 'bad recording quality' summarises various factors that led to the exclusion of an item, among them incompleteness of the sound file, quiet recordings, overlapping speech or noise in the target area, and unclear or missing words.

containing 139 CCs entered the analysis.

3.2.2 Data treatment

All items were analysed auditorily, and, if at all possible, instrumentally. In the auditory analysis, the locations and types of pitch accents and pauses were identified, and the overall prosodic structure of the utterance was described. For the purpose of the instrumental analysis, the larger sound files as retrieved from the corpus materials 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 (Boersma 2001; Boersma & Weenink 2008), which was also used to visualise and print the tonal contour. Praat was used to measure the length of pause(s) preceding and/or following each target parenthetical, and to identify the tonal contours associated with the parenthetical and the material in its immediate environment, including pitch accents in the parenthetical string and boundary tones at the edges of the parenthetical or in the immediate vicinity. If boundaries could not be identified in the target position, their real position was identified and the occurring pattern was described. The criteria for IPs followed those discussed in the literature (see Section 2.1). They are given in (26) and addressed in turn below.

(26) Criteria for the identification of an IP/intonation domain

- a. domain internal criteria:
  - a1. complete tonal contour (CTC)
  - a2. domain across which declination applies
- b. external criteria:
  - b1. presence and nature of pauses
  - b2. pitch on unaccented syllables following a nuclear tone
  - b3. domain final lengthening
  - b4. presence or absence of segmental processes

The domain internal criteria in (26)a) are tonal features which apply across the target domain. As outlined in Section 2.1, the IP/intonation domain is intonationally defined in terms of a complete tonal contour (CTC). The pitch accents and boundary tones were identified for each target domain, i.e., the domain spanning the parenthetical as well as at least two adjacent (preceding and following) domains. The IP/intonation domain is also the domain across which declination applies such that later pitch peaks within an IP are downstepped with regard to earlier ones, and pitch reset indicates a new domain (see Ladd 1986, 1996). This has to be seen in context: parentheticals have often been argued to be realised at lower pitch; moreover, pitch peaks in later domains may not be reset to the same maximum level as pitch peaks in earlier domains (Ladd 1986).

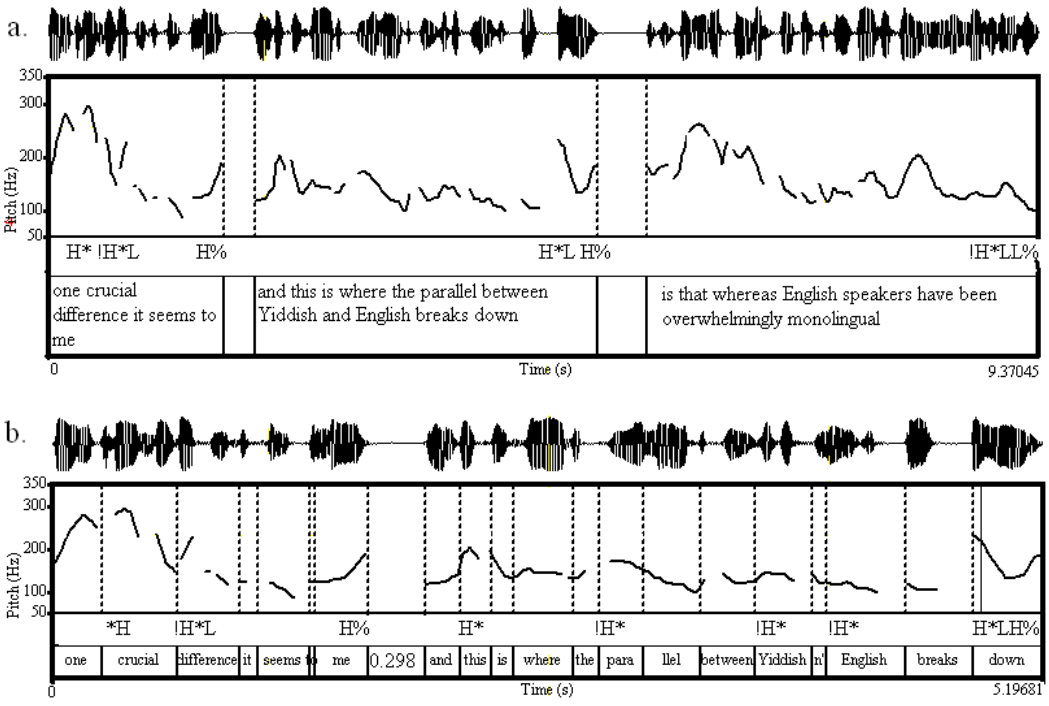
The external criteria listed in (26)b) apply at boundaries between domains. First, all pauses were identified and their length measured. They were carefully studied as to their nature. In particular, structure-related breath pauses, but not pauses due to performance factors such as hesitational stretches were interpreted as boundary marker. Second, the pitch on unaccented syllables following a nuclear tone was studied. Pitch discontinuities and a step-up in pitch on an unaccented syllable after a nuclear fall, and a step-down in pitch on an unaccented syllable following a rise were seen as evidence for a boundary. Pitch continuation, i.e. a continuous rise or fall or no change in pitch level/direction in a target position, was taken as evidence against a boundary. Third, final lengthening, in particular lengthening of the very last syllable of a domain, the last stressed syllable and the last word, was taken into account but served only as an impressionistic factor. A systematic analysis of this factor was impossible due to the nature of the data. Finally, the presence or absence of segmental processes was taken into account, but not analysed systematically, since due to the nature of the corpus data, it was impossible to control for possible environments for segmental processes (see also Knowles 1991: 155).

All items were analysed by the author. Cases that remained unclear were given to another experienced linguist trained in intonational analysis. Items for which a final analysis could not be agreed upon were coded 'unclear'. The analytic procedure is exemplified for the

and-parenthetical in (27)/Figure 1, and for the CC in (28)/Figure 2. Dashed vertical lines represent word or syllable boundaries. Straight lines mark a relevant tonal landmark where appropriate. Square brackets in the examples mark IP boundaries.

(27) a. One crucial difference it seems to me *and this is where the parallel between Yiddish and English breaks down* is that whereas English speakers have been overwhelmingly monolingual since the disappearance of Anglo-Norman at least Yiddish speakers like Jews everywhere since the Babylonian exile have been predominantly bilingual if not polylingual (ICE-GB: s2b-042#32)

b. $_{IP1}$[One crucial difference it seems to me]$_{IP1}$ $_{IP2}$[*and this is where the parallel between Yiddish and English breaks down*]$_{IP2}$ $_{IP3}$[is that whereas English speakers have been overwhelmingly monolingual]$_{IP3}$ …



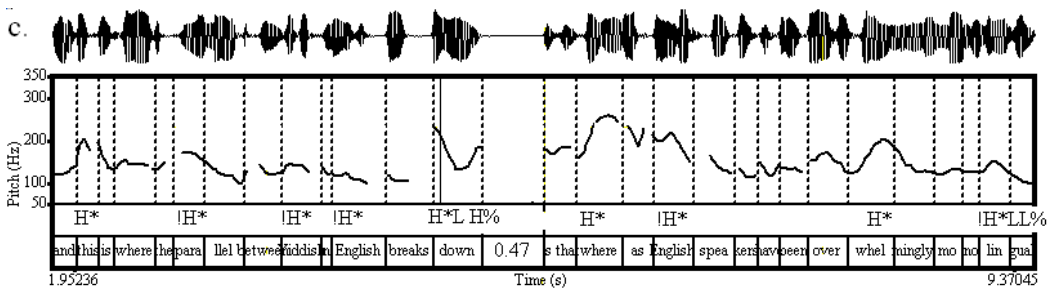


Figure 1 Example (27)

Figure 1a) shows the three adjacent IPs given in (26)b), Figure 1b) zooms in on the parenthetical *and this is where the parallel between Yiddish and English breaks down*, the preceding domain and the boundary between the two, and Figure 1c) focuses on the parenthetical and following domain and the respective boundary. The auditory analysis suggested a series of IPs as indicated in (26)b), with the parenthetical phrased separately in a non-recursive structure. This finding was predominantly based on perceived pauses before and after the parenthetical, and complete tonal contours with H% terminating IP1 and IP2. The instrumental analysis confirms these findings:[11]

1. Cf. (26)a1): All three IPs are the domain of a CTC. IP1 has a prenuclear pitch peak on the first syllable of *crucial* and a downstepped nuclear fall associated with the first syllable of *difference*, followed by a rise terminating in H%. IP2, spanning the parenthetical, has a series of prenuclear accents followed by a nuclear fall rise (H*LH%) associated with *down*. IP3 has three prenuclear pitch peaks followed by a nuclear fall associated with the first syllable of *lingual* and terminating in L%.
2. Cf. (26)a2): Although pitch peaks in the parenthetical do not reach the high level of peaks in the preceding and following domains, each IP is a domain across which declination applies. We observe pitch reset in the domain following the parenthetical (see the local peak on *where* as compared to pitch peaks in IP2). The fact that the pitch

[11] The example also contains the CC *it seems to me* which is not phrased into its own IP but forms the rising tail of the domain *One crucial difference it seems to me*. However, this CC has been discarded from the analysis due to its position following a subject (see Section 3.1.3 above).

is lower in the parenthetical is consistent with previous research results.

3. Cf. (26)b1): There are structure-related pauses of 0.298 seconds before and 0.47 seconds after the parenthetical.

4. Cf. (26)b2): At the boundaries, there are pitch discontinuities (related to the pauses) such that there is (i) a step-down in pitch on *and* as the first syllable of IP2 following the H% terminating IP1 (see Figure 1b), and (ii) a slight step-down in pitch associated with the first syllable of the IP3 after the H% terminating IP2 (see Figure 1c).

5. Cf. (26)b3): The (prominent) final syllable of the target IP (*down*) is lengthened.

6. Cf. (26)b4): The presence of silent pauses blocks the application of any segmental processes between segments on either side of a IP boundary.

The second example illustrating the criteria used for boundary identification is one where a CC is integrated in another IP:

(28) a. The second thing that's happened is *I fear* even more disturbing (ICE-GB: s2b-050 #75)

b. $_{IP1}$[The second thing that's happened is *I fear*]$_{IP1\ IP2}$[even more disturbing]$_{IP2}$

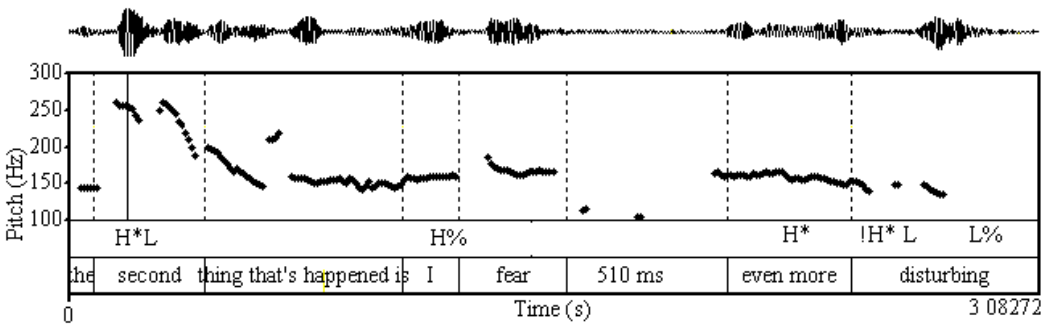


Figure 2 Example (28)

For the CC in (28)/Figure 2, the auditory analysis suggested an intonational pattern such that *I fear* is the intonational tail in its domain, i.e. part of unstressed material following the nuclear

syllable (the first syllable of *second*). It is associated with the final rise towards H%. IP1 is followed by a structure-related pause of noticeable length. The instrumental analysis confirms these results. The key criteria for the phrasing given in (28)b) are as follows.

1. Cf. (26)a1): The two adjacent IPs are the domain of a CTC each: IP1 has a nuclear fall-rise terminating in H%; IP2 has a prenuclear H* followed by a downstepped nuclear !H*L and a domain-final L%.
2. Cf. (26)a2): Declination applies across each domain, even though the maximum pitch level in the second IP does not reach the height of the maximum pitch level in the first IP.
3. Cf. (26)b1): There is a structure-related pause of 0.51 seconds following the CC, but no pause before the CC.
4. Cf. (26)b2): There is no pitch discontinuity before the CC. Instead, there is a continuous falling-rising pattern, which spans the whole string from the nuclear syllable to and including *fear*. After the pause separating the two IPs, there is a step-down in pitch from the high level reached on *fear*.

All parentheticals for which sound files of good enough quality were available were analysed in this way. The results are reported in the next section.

4 Results

4.1 Non-restrictive relative clauses (NRRCs)

Of the 49 utterances (55 NRRCs) that entered the analysis, 4 utterances (5 NRRCs) could only be analysed auditorily but not instrumentally due to the bad quality of the sound files. However, since in the auditory analysis the respective NRRCs turned out to be clearly separate on the basis of perceived boundary criteria, these items were not discarded from the analysis. For 2 NRRCs, the positions of right and/or left boundaries remained unclear after auditory and instrumental analysis and they were thus discarded. Of the 53 NRRCs that were

conclusively analysed, 48 (90.5%) followed pattern (2)a), i.e. they were clearly separate, and were preceded and followed by separate IPs. None of the utterances containing NRRCs showed prosodic recursion of the kind suggested by Ladd (1986, 1996). Typical cues to intonational separateness included a CTC, boundary tones terminating the IP spanning the NRRC and the preceding IP, pauses in target position, and changes in pitch level/direction.

Only 5 out of 53 (9.5%) NRRCs turned out to be nonseparate on the surface. All non-separate NRRCs showed the same phrasing pattern: while the right syntactic edge of the NRRC coincided with an IP boundary, the left edge did not. Specifically, the relative pronoun *which*, or a pied-piped preposition along with *which*, is part of unstressed material at the end of the preceding domain and is followed by an IP boundary separating the relative pronoun from the rest of the NRRC. The pattern is given in (29) (round brackets indicating optional material; P=preposition).

(29) $_{IP}$[… (P) *which*]$_{IP}$ $_{IP}$[*NRRC*]$_{IP}$ ($_{IP}$[…]$_{IP}$)

For illustration, consider example (30), plotted in Figure 3.[12] The nuclear syllable of IP1 is the second syllable of *Pascal*. The nuclear fall continues on the relative pronoun *which*. No pitch discontinuity or change in pitch level or direction can be found on the relative pronoun. The IP is terminated by L%, which is followed by a pause of 185 ms. There is a step-up in pitch on the first syllable of *really* at the beginning of IP2. The two domains 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-*,

[12] The phrasing of *I'm afraid* indicated here follows Gussenhoven's (2004: 291) encliticisation analysis. *I'm afraid* is unaccented, at low level pitch, but it is preceded by a boundary tone associated with the end of the domain ending in *exciting* and by a considerable pause. The encliticised IP receives a copy of the tones after the last stressed syllable. Since *exciting* is associated with a fall and the domain ends in a low boundary tone (H*L L%), L L% is copied onto the CC (Gussenhoven 1990, 2004). Note that *I'm afraid* here is proceeded by a full clause. It was thus discarded from the analysis of CCs.

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, and they both have the same number of syllables.

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

b. $_{IP1}$[I was programming in Pascal *which*]$_{IP1}$ $_{IP2}$[$_{IP3}$[*really wasn't very exciting*]$_{IP3}$ I'm afraid]$_{IP2}$

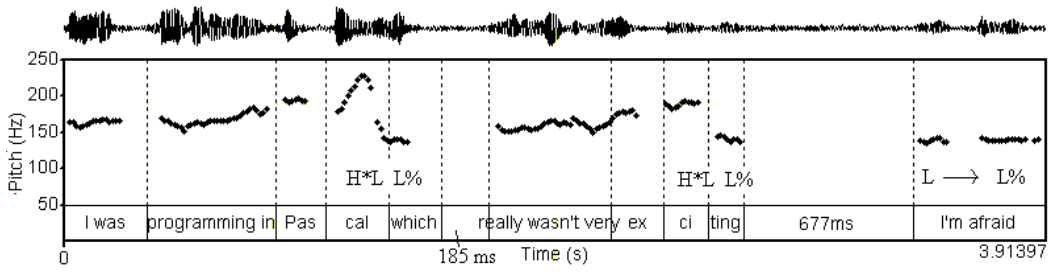


Figure 3 Example (30)

The results for NRRCs are summarised in Table 4.1.

overall :	separate: […] [*(which)* NRRC] […]	[…*(of) which*] [NRRC] […]
53 (50)	48	5

Table 4.1 NRRCs: Results[13]

4.2 Sentential parentheticals

Of the 55 utterances containing 58 sentential parentheticals that entered the acoustic analysis, 52 utterances (55 parentheticals) were analysed instrumentally while 3 could only be analysed auditorily due to the quality of the sound files. Since they were clearly phrased separately,

[13] The number in parentheses in the first column represents items which were analysed instrumentally.

they were not discarded from the analysis. Overall, 52 parentheticals (90%) were phrased according to (2)a), i.e. separately in a non-recursive structure. The remaining 6 parentheticals were either phrased in a CPD structure (Ladd 1986, 1996; see (31) and the example in (32)) or they were phrased such that material from the parenthetical formed an IP with material from the host.[14]

(31) CPD structure: … $_{IP1}$[… $_{IP2}$[parenthetical]$_{IP2}$ …]$_{IP1}$ …

(32) a. In all across the world we employ directly some six hundred and fifty people in our various activities including *and Jimmy's put this in* fifty chartered surveyors (ICE-GB: s2a-045 #62)

b. … $_{IP1}$[including $_{IP2}$[*and Jimmy's put this in*]$_{IP2}$ fifty chartered surveyors]$_{IP1}$

The sententential parentheticals in a CPD structure all have their own CTC, while another contour spreads across the surrounding material making up IP1. Crucially, the first part of the embedding IP, i.e. the part preceding the parenthetical, is not terminated by a boundary tone, and while there may be prenuclear accents in the first part of IP1, the nuclear accent follows in the second part. We also find pauses before and/or after the parenthetical.

Only 3 out of 58 parentheticals (5.2%) were phrased such that material from the parenthetical formed a domain with material from the host utterance. They were the *and*-parenthetical given in (33) and the two *as*-parentheticals given in (34) and (35).

[14] It is striking that two of the three CPD cases contain parentheticals which are semantically detached from their host and are related to it only via the situational context. This suggests that the speakers pause during the production of their utterance to include a parenthetical, but that this parenthetical does not affect the intonational pattern of the independently planned host clause.

(33) a. 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)

b. $_{IP1}$[He was $_{IP2}$[*and I think you would agree with me* at the outset]$_{IP2}$ looking at expanding his business]$_{IP1}$ […][15]

(34) a. 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)

b. $_{IP1}$[It was much the same *as my right honourable friend the Prime Minister will recall*]$_{IP1}$ $_{IP2}$[in Milan]$_{IP2}$ $_{IP3}$[some five years befo five years ago]$_{IP3}$

(35) a. 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)

b. $_{IP}$[We commit a serious error]$_{IP}$ $_{IP}$[if we think always in terms of surrendering sovereignty]$_{IP}$ $_{IP}$[and seek to stand pat for all time on a given deal]$_{IP}$ $_{IP}$[by proclaiming *as my right honourable friend the Prime Minister did two weeks ago*]$_{IP}$ $_{IP}$[that we have surrendered enough]$_{IP}$

In (33), the string *and I think you would agree with me at the outset* forms one IP with 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* of the parenthetical, or the following VP *looking at expanding his business* of the host clause. The corpus annotation is such that *at the outset* modifies and is syntactically related to the main clause VP (*looking at expanding his business*). However,

[15] *He was* forms a domain with *looking at expanding his business*, thus together with the interpolated parenthetical forming a CPD.

under this interpretation, the intonational phrasing produced by the speaker is odd: 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 (see (33)b)). It is well known 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; see also Hirschberg 2004). If the PP *at the outset* modified the main clause VP, an IP boundary preceding the PP would be predicted. In light of this, and given the actual intonational phrasing, it would perhaps be more fruitful to reanalyse the structure such that the PP *at the outset* forms 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.). This interpretation, which phrases *at the outset* with the parenthetical also syntactically, results in a CPD structure with the parenthetical corresponding to an IP, reducing the number of prosodically non-separate ones to two.

IP1 and IP2 of example (34) are plotted in Figure 4. The *as*-parenthetical together with preceding material forms one large IP. Across this IP, declination applies. There is pitch reset in the following IP spanning *in Milan*, though not complete pitch reset. The target IP has a series of prenuclear peaks followed by a nuclear fall rise (H*LH%) associated with the second syllable of *recall*. There is a structure-related pause of 0.397 seconds after *recall*, and lengthening of the final syllable of the target IP. There is no reason to assume an IP boundary in the predicted position between *same* and *as*: there is no pitch discontinuity or tonal landmark such as a boundary tone, and pitch reset is not until the peak on the second syllable of *Milan*. Moreover, there is no articulatory offset between *same* and *as*, such as a glottalised onset on *as*.

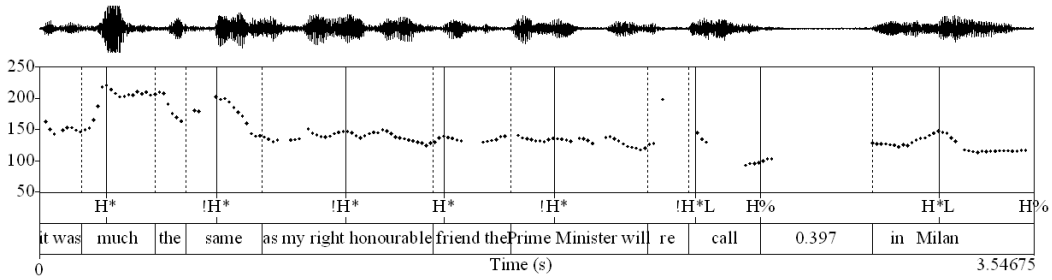


Figure 4 Example (34)

Finally, the parenthetical *as my right honourable friend the Prime Minister did two weeks ago* in (35)/Figure 5 forms one rather long IP together with *by proclaiming* from the host. The IP is preceded and followed by silent pauses (727 ms and 433 ms, respectively; not plotted here for reasons of space). Other boundary markers include the fact that declination applies across the target IP, the distinct nuclear fall to L% on preceding *deal* (not plotted here), a step-up in pitch on unaccented *by* at the beginning of the target IP, and the nuclear fall on *ago* to L% terminating the target IP with subsequent pitch reset. In the target IP, the prenuclear peaks are followed by a nuclear fall associated with the second syllable of *ago*. There is no pitch discontinuity or any other prosodic cue before or inside the parenthetical that would justify the assumption of an additional IP boundary. In particular, there is no reason to assume an IP boundary between *proclaiming* and *as*.

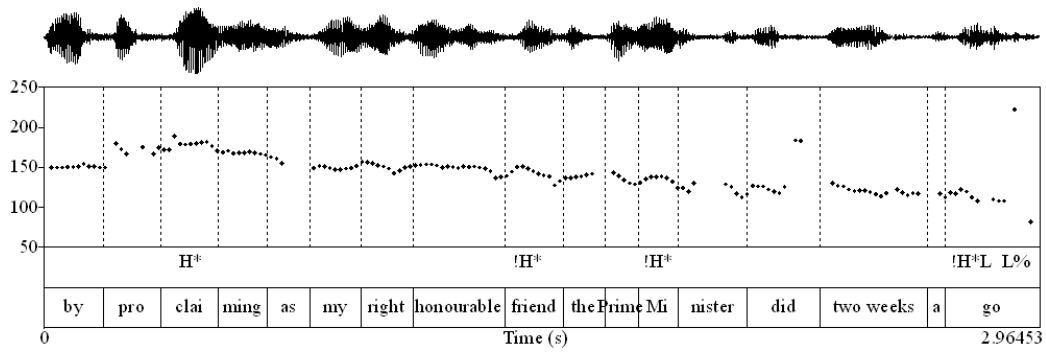


Figure 5 Example (35); target IP

The results for sentential parentheticals are summarised in Table 4.2.

overall:	separate: […] [SP] […]	CPD: [… [SP] …]	non-separate: […] [… SP] […]	reanalysed separate
58 (55)	52	3	2	1

Table 4.1 Sentential parentheticals (SP): Results

4.3 Comment clauses (CCs)

Of the 138 utterances (139 CCs) that entered the acoustic analysis, the sound files of 95 utterances (95 CCs) were of good enough quality to also be analysed instrumentally. The results are much more varied than those for the other two groups. The phrasing of 2 CCs (1.4%) remained unclear. The intonational phrasings found with all other CCs are summarized in (36). As will be outlined below, (36)c)-e) correspond to more than one intonational pattern.

(36) CCs; phrasing

a. … $_{IP}$[…]$_{IP}$ $_{IP}$[CC]$_{IP}$ $_{IP}$[…]$_{IP}$ … 26 CCs (18.75)

b. … $_{IP}$[… $_{IP}$[CC]$_{IP}$ …]$_{IP}$ … 9 CCs (6.55)

c. … $_{IP}$[…]$_{IP}$ $_{IP}$[… CC]$_{IP}$ $_{IP}$[…]$_{IP}$ …

d. … $_{IP}$[…]$_{IP}$ $_{IP}$[CC …]$_{IP}$ $_{IP}$[…]$_{IP}$ … } 104 CCs (74.8%)

e. … $_{IP}$[…]$_{IP}$ $_{IP}$[… CC …]$_{IP}$ $_{IP}$[…]$_{IP}$ …

Of the 139 CCs that entered the analysis, only 26 (18.7%) followed pattern (2)a) (= (36)a)). They are clearly separate such that they have their own CTC with a nuclear accent on either the pronoun or the verb/ lexical element, and an IP boundary before and after the CC. The preceding and following material is also phrased in a separate domain. An example is given in (37). IP1 has a final nuclear fall-rise, terminating in H% (see (37)b)). This is followed by a

pitch discontinuity and break (but no measurable pause) before *I*. The pronoun bears the nuclear accent of the IP spanning *I believe*, which is also a fall-rise, thus the IP terminates in H%. *I believe* is followed by a pause of 0.633 seconds. The following IP has a prenuclear peak associated with the first syllable of *underestimating* and a final nuclear fall. The last IP shows a similar pattern.

(37) a. But we have lost a tremendous amount of time time in which the Western powers simply failed to respond time that went on through the whole of nineteen ninety and nineteen ninety-one and where we are still effectively *I believe* underestimating the scale of what is required for us (ICE-GB: s2b-047 #30)

b. … $_{IP1}$[and where we are still ef fectively]$_{IP1}$ $_{IP2}$[I believe]$_{IP2}$

H*L H% H*L H%

$_{IP3}$[underestimating the scale]$_{IP3}$ $_{IP4}$[of what is re quired for us]$_{IP4}$

H* !H*LL% H* !H*L%

9 CCs (6.5%) were phrased in a CPD pattern (see (36)b)). An example is given in (38)/Figure 6. The host clause *this would be my fourth year* is the domain of one CTC with a prenuclear H* associated with *be* and a nuclear rise at the end of the domain. The CC *I believe* has its own CTC with a nuclear fall associated with the verb and terminating in L%. This does not affect the contour of the host. Along with its own CTC, the parenthetical, with which the repeated possessive pronoun phrases, is also produced at higher speed rate. Discourse-functionally speaking, the CC is inserted into a hesitant phase: the speaker seems unsure about the number of years.

(38) a. For the same bike this would be my *I believe* my fourth year (ICE-GB: s1b-074 #221)

b. $_{IP}$[For the same bike]$_{IP}$ $_{IP}$[this would be my $_{IP}$[I believe my]$_{IP}$ fourth year]$_{IP}$

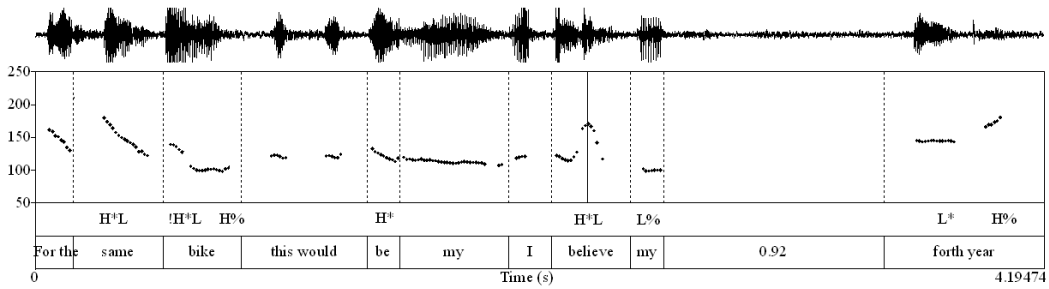


Figure 6 Example (38)

All remaining phrasing patterns, 104 items (74.8%) overall, are such that the CC is not phrased in its own domain, regardless of whether or not it is prominent. In (36)c), the CC may either have nuclear prominence and be preceded by unstressed or prenuclear material from the host clause in its IP, or it may be unstressed, representing a nuclear tail. An example of the former is given in (39)/Figure 7. Target IP2, spanning *which produces I would say*, is set off from the preceding and following IPs by structure-related pauses of 0.45 and 0.34 seconds, respectively. IP1 has a CTC and is terminated by L%. IP2 has a prenuclear pitch peak associated with material from the host, *viz.* the second syllable of *produces*, and a nuclear fall on *say*, and is terminated by L%. There is no reason to assume another IP boundary anywhere within the target IP. In particular, there is no reason to assume an IP boundary between *produced* and the pronoun *I* of the CC, thus at the left edge of the CC.

(39) a. The restructured and reformed training systems which seek to inculcate at an early stage the confidence and the exercise of discretion which produces *I would say* a more thoughtful and caring officer attuned to the needs of his changing community (ICE-GB: s2b-031 #75)

b. $_{IP}$[…]$_{IP\ IP1}$[… the confidence and the exercise of discretion]$_{IP1\ IP2}$[which produces *I would say*]$_{IP2\ IP3}$[a more thoughtful …]$_{IP3}$

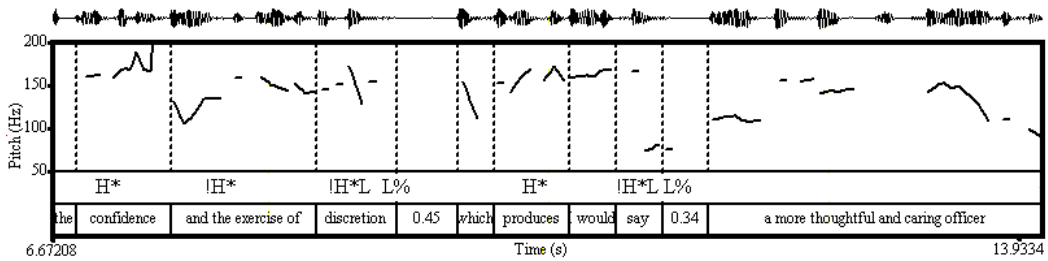


Figure 7 Example (39)

Examples of the second intonational variant of (36)c), the unstressed tail, are given in (40) through to (42). (40) represents CCs which either continued a nuclear fall or were realised at the low pitch level reached on a nuclear fall. In (41), the CC is associated with the final rise in a nuclear H*LH%. These two patterns have been analysed by Gussenhoven (2004: 291) as incorporation. In (42), the CC is unstressed and follows the nuclear accent, but it is also preceded by a boundary tone indicating the end of a domain and by a pause. This pattern represents encliticisation in the sense of Gussenhoven (2004: 291). The encliticised material, the CC *I don't think*, receives a copy of the tones after the last stressed syllable *on*. Since the nuclear pattern is H*LL%, LL% is copied onto *I don't think*.[16]

(40) Low tail

a. It's not recognised *I think* that many poor countries like China are going to have vast numbers of persons as dependent on the second age as the first is dependent on them … (ICE-GB: s2a-038 #76)

b. $_{IP}$[It's not recognised *I think*]$_{IP}$ $_{IP}$[that many poor countries]$_{IP}$

H*L L% H*L L%

[16] Notice that the CC *I don't think* in (42) has not been discarded from the analysis despite being preceded by a full clause. This is because *I don't think* as main clause would be ungrammatical and a movement analysis is therefore implausible. See (x):

(x) a. *I don't think I wouldn't put anything on it because …

b. I don't think I would put anything on it because …

(41) Rising tail

a. But we managed to find somewhere on the motorway *I think* at this service station (ICE-GB: s1a-021 #45)

b. $_{IP}$[But we managed to find somewhere on the motorway *I*

H*L !H*L !H*L

think]$_{IP}$ $_{IP}$[at this service station]$_{IP}$

H%

(42) Encliticisation

a. I wouldn't put anything on it *I don't think* because two feet isn't very high (ICE-GB: s1b-025 #12)

c. $_{IP}$[I wouldn't put anything on it]$_{IP}$ *I don't think*]$_{IP}$ $_{IP}$[because …

H*L !H*L L% L → L%

In (36)d), the CC is preceded, but not followed by an IP boundary. Again, the CC may in principle have nuclear prominence, followed by an intonational tail made up of material from the host clause, or it may be unstressed preceding any prominent material, or it may bear a prenuclear pitch accent. An example of an unstressed CC in this position, representing (part of) the prehead of its domain, is given in (43)/Figure 8. IP1 terminates with L%, followed by a pause of almost a second. (Note that the fall is in fact to a lower pitch level than it occurs from the contour in Figure 8. The continued fall remains invisible in the plotted contour due to overlapping noise in the target area.) The CC *I think* at the beginning of IP2 is unstressed and phonetically reduced to *think*. On *think* there is a step-up in pitch from the level of the preceding L%.

(43) a. But my friend got it *I think* about twelve years ago (ICE-GB: s1a-071 #90)

b. $_{IP1}$[But my friend got it]$_{IP1}$ $_{IP2}$[*I think* about twelve years ago]$_{IP2}$

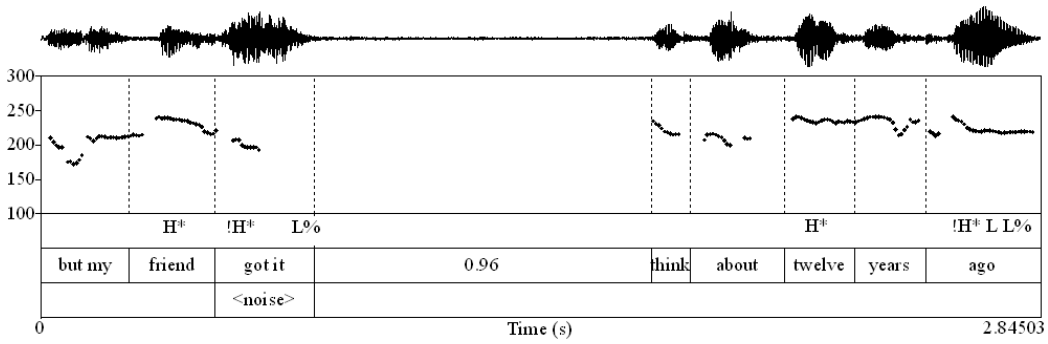


Figure 8 Example (43)

In (36)e) the CC is neither directly preceded nor directly followed by an IP boundary. The CC may be part of the unstressed prehead, optionally preceded by unstressed material from the host clause and followed by more material, or it may be integrated as stressed or unstressed head preceded and followed by material from the host clause, or it may be part of a hesitant stretch inside an IP. Examples of CCs representing (part of) the intonational head of their domain are given in (44) and (45). The target IP in (44) has a prenuclear H* associated with the pronoun *I* of the CC, followed by another, downstepped pitch peak associated with the first syllable of *people*, and a downstepped nuclear H*L on *country* (see (44)b)). It is terminated by L%. The CC *I think* in (45)/Figure 9 is part of unstressed material between two prenuclear pitch accents preceding the nuclear fall-rise associated with *slow*. Declination applies across the plotted IP. The following IP starts after the pause.

(44) a. but that could not be done without a decision coming back to this House and *I believe* to the people of this country (ICE-GB: s1b-053 #37)

b. … $_{IP}$[and *I* *believe* to the people of this country]$_{IP}$

H*L !H*L !H*L L%

(45) a. the Arabs have *I think* been a little bit slow with the sole exception of Syria of President Assad of Syria (ICE-GB: s2b-012 #109)

b. $_{IP}$[the Arabs have *I think* been a little bit slow]$_{IP}$ $_{IP}$[with the sole exception of Syria of President Assad of Syria]$_{IP}$

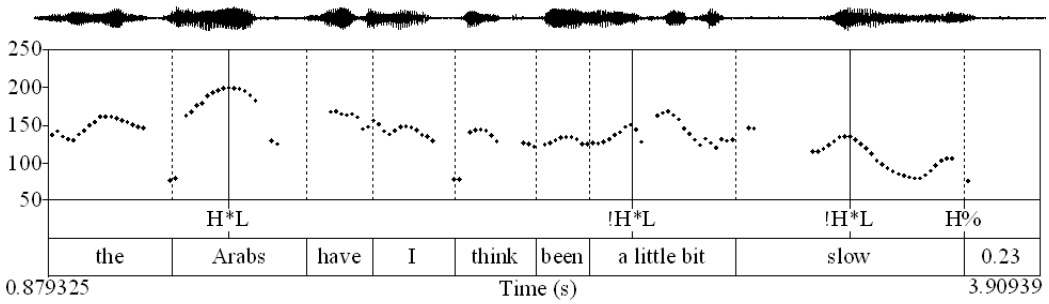


Figure 9 Example (45)

The example utterance in (46), plotted in Figure 10, provides an example of a hesitant CC (see also Dehé & Wichmann, to appear). The utterance is phrased in one IP with a performance-related, hesitational pause between *in* and *undertaking*. The pause is first filled (*uhm I suppose*) then silent. The CC is thus part of a hesitant stretch. The pitch on the filled pause is maintained at the level reached on *in* and changes only after the transitional phase.[17]

(46) There's no point in uhm [silent stretch] *I suppose* undertaking experiments if people can't read them (ICE-GB: s1a-059 #286)

[17] Note that there is no audible pitch movement on the second syllable of *suppose*. What might look like pitch movement on the stressed syllable is due to microprosodic effects, specifically the plosive onset.

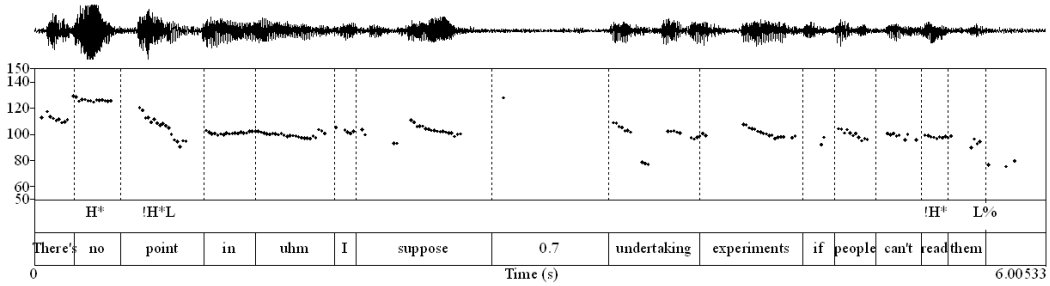


Figure 10 (see example (46))

[There's no point in uhm *I suppose* undertaking experiments if people can't read them]$_{IP}$

These examples serve to illustrate the variety of intonational patterns found with CCs. What is important in the present context is that the majority of CCs, 74.8%, fail to be phrased in a separate IP. This result is in contrast to the findings for NRRCs and sentential parentheticals, for which a large majority was phrased according to the predictions of intonational separation. These results and their implications for prosodic theory will be discussed in the next section.

5 Discussion

These findings for NRRCs and sentential parentheticals largely confirm the general assumption of intonational separateness, which is so often found in the literature, but has not previously been based on a systematic study of data from actual spoken language. For these two types, the right edge was found to coincide with the right edge of an IP across the board. In a very high percentage of the data the left edge also coincided with an IP boundary. The default phrasing is thus as given in (47), confirming the pattern suggested as default for parentheticals by Nespor & Vogel (1986) repeated in (48).

(47) a. … $_{IP}$[…]$_{IP}$ $_{IP}$[*which* NRRC]$_{IP}$ $_{IP}$[…]$_{IP}$ …

b. … $_{IP}$[…]$_{IP}$ $_{IP}$[sentential parenthetical]$_{IP}$ $_{IP}$[…]$_{IP}$ …

(48) … $_{IP}$[…]$_{IP}$ $_{IP}$[parenthetical]$_{IP}$ $_{IP}$[…]$_{IP}$ …

Due to the nature of the data as taken from a corpus of actual spoken language, the target items have not been controlled or even manipulated for factors such as the speech rate or length of the parenthetical or preceding material. However, given that such a high percentage of NRRCs and sentential parentheticals follow the phrasing pattern in (48), it seems safe to conclude that the syntactic and/or semantic nature of the interpolation demands a separate IP in a non-recursive context, and that other factors only play a minor role in the intonational phrasing of these two types of parentheticals. This is despite the fact that variation in intonational phrasing can be found elsewhere as a result of a variety of factors (see Section 1).

Furthermore, as has also been observed by Nespor & Vogel (1986: 189f), the strings preceding the parenthetical interpolations did not have to be syntactic constituents of a kind predicted to correspond to an IP otherwise. Consider the attested phrasing of the utterances in (49) and (50), and in particular the IP boundaries following *applications* in (49) and *acquire* in (50). Looking at the syntactic structure and ignoring the parentheticals insertions, *applications* in (49) is followed by its complement *of the research …*, and *acquire* in (50) is followed by its complement *Iraqi territory*. According to prosodic theory, an IP boundary would not be predicted between a noun and its complement or between a verb and its complement. The respective IP boundaries have thus been inserted as a result of the presence of the parenthetical.

(49) a. However the Danzig said report said that there were sufficient potential applications *these are monolingual as well as multilingual* of the research that had been done to justify the work that'd already been completed (ICE-GB: s2a-032 #76)

b. $_{IP}$[… that there were sufficient potential applications]$_{IP}$ $_{IP}$[*these are monolingual as well as multilingual*]$_{IP}$ $_{IP}$[of the research that had been done]$_{IP}$

(50) a. nor is it uh legitimate for us to acquire *and I underline the word acquire* Iraqi territory (ICE-GB: s1b-027 #54)

b. $_{IP}$[nor is it uh legitimate for us to acquire]$_{IP}$ $_{IP}$[*and I underline the word acquire*]$_{IP}$ $_{IP}$[Iraqi territory]$_{IP}$

That parentheticals do not affect the intonation of the host (e.g., de Vries 2007: 219) does not hold true. The insertion of IP boundaries where there would be no boundaries otherwise is one of several ways in which the intonational pattern of the host is affected by the parenthetical. Only a small number of utterances containing sentential parentheticals or NRRCs did not phrase according to (48). The relevant NRRCs were phrased such that the relative pronoun, a functional element, did not phrase with the rest of the NRRC, but with preceding material.[18] For three sentential parentheticals, but for none of the NRRCs in the data set, the CPD structure was observed. Two sentential parentheticals were phrased such that they formed large IPs together with material from the host clause. These patterns are summarized in (51), (52) and (53), respectively.

(51) … $_{IP}$[…(*of*) *which*]$_{IP}$ $_{IP}$[NRRC]$_{IP}$ $_{IP}$[…]$_{IP}$ …

[18] Although phrasing of the connectives *and* and *as* with the preceding IP along the lines of (51) has not been found for the *and*- and *as*-parentheticals investigated here, it is likely to occur, and it has in fact been observed elsewhere (see Dehé 2007: 275). Note that phrasing of a coordinating conjunction with the preceding material has also previously been observed in structures involving coordination of non-parenthetical root clauses (see, e.g., Barth-Weingarten 2007 for English, Dehé 2008: 745 for Icelandic. See (y): (ya) represents the syntactic structure; (yb) is the intonational phrasing as predicted by syntactic structure; (yc) is the alternative phrasing attested in previous work which allows for the coordinating conjunction to join the preceding IP.

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

b. prosody, phrasing option 1: $_{IP}$[root clause]$_{IP}$ $_{IP}$[*and* root clause]$_{IP}$

c. prosody, phrasing option 2: $_{IP}$[root clause *and*]$_{IP}$ $_{IP}$[root clause]$_{IP}$

(52) $_{IP}[\ldots{}_{IP}[\text{parenthetical}]_{IP}\ \ldots]_{IP}$

(53) $(_{IP}[\ldots]_{IP})\ {}_{IP}[\ldots\ \text{parenthetical}]_{IP}\ {}_{IP}[\ldots]_{IP}$

Pattern (53) has been discussed for examples (34)/Figure 4 and (35)/Figure 5 in Section 4.2. The two examples are from the same corpus text. They are part of a scripted speech.[19] Several reasons may account for the attested phrasing. First, in both cases the parenthetical is a variation of the phrase *as my right honourable friend the Prime Minister* plus a VP. The *as*-phrase is a set phrase which is a routinised part of parliamentary debates and speeches. Intonation therefore does not have to serve the function of indicating a true aside. Second, the speaker produces the utterance at a high speech rate. As Nespor & Vogel (1986: 195) note, "the faster the rate of speech, the longer the [IPs] of a given utterance tend to be". The IP boundary preceding the parenthetical thus falls victim to the high speech rate. In (35), the boundary terminating IP3, i.e. the IP preceding the target IP, is predicted by syntactic structure, since *by proclaiming that …* is a complex adjunct. The remaining host material preceding the parenthetical, *by proclaiming*, would then on its own form a small IP, which the speaker might want to avoid given that all other IPs are considerably longer. Previous research has shown that speakers tend to prefer series of prosodic constituents that are balanced in size (e.g., Gee & Grosjean 1983, Nespor & Vogel 1986, Ghini 1993, Frota 2000). Furthermore, an IP boundary in the position following *proclaiming*, i.e. between a verb and its (clausal) complement, would not be predicted if it were not for the presence of the parenthetical.

How can the observed patterns be accounted for in prosodic theory? Given that (48) is the default phrasing pattern for NRRCs and sentential parentheticals in actual spoken English, Selkirk's (2005) AlignR (CommaP, IP) constraint given in (9) above is not enough to account for the data. This constraint allows for the lack of an IP boundary at the left edge of the

[19] Non-broadcast speech (scripted): Sir Geoffrey Howe, Resignation Speech, House of Commons, 13 Nov 1991 (source from Nelson, Wallis & Aarts 2002).

parenthetical unless the parenthetical is preceded by another phrase of type CommaP. In the present data, however, the absence of a left boundary is the exception rather than the rule. Right-alignment will therefore have to be complemented by other constraints. Similarly, Truckenbrodt's (2005) constraint tie between WrapCP and AlignCP seems too weak to predict the boundary at the left edge. While WrapCP demands that each CP is contained in a single IP, it allows for additional material in the same domain. Under AlignCP, additional material at the right edge is banned, but the inclusion of material at the left edge is still possible.

The results are consistent with Kratzer & Selkirk's (2007: 125) proposal of a direct correspondence between CommaP (Potts 2005, Selkirk 2005) and IP. Instead of CommaP, de Vries (2007: 228-230) assumes a parenthetical projection ParP which embeds a parenthetical phrase via b-Merge. In an account like this, it must be the ParP that corresponds to an IP. In any case, what is needed to derive the default structure is a set of constraints which results in (i) alignment of the right edge of a parenthetical with the right edge of an IP; (ii) alignment of the left edge of a parenthetical with the left edge of an IP; and (iii) alignment of the right edge of the material preceding the parenthetical with the right edge of an IP. (i) may be achieved by Selkirk's AlignR (CommaP, IP) constraint; (ii) follows from a left-alignment constraint; (iii) follows if recursivity is disallowed, e.g. by the Nonrecursivity constraint of Selkirk (1995b) and related work. Note that (i) and (ii) allow for both the default case in (48) and the CPD structure in (52), while (iii) rules out (52). The corresponding constraints are given in (54). Unlike in Selkirk's (2005) version of (54)a), Pott's (2005) CommaP has been replaced by de Vries' (2007) ParP, but nothing hinges on this assumption.

(54) Constraints deriving default structure (48)

a. Align R (ParP, IP) (adapted from Selkirk 2005): Align the right edge of a constituent of type ParP in syntactic representation with the right edge of an IP in phonological representation.

b. Align L (ParP, IP): Align the left edge of a constituent of type ParP in syntactic representation with the left edge of an IP in phonological representation.

c. Nonrecursivity (Selkirk 1995b: 190): No C^i dominates C^j, j=i (where C^n = some prosodic category)

The structure in (52) follows if CPD formation is allowed. This can in principle be achieved by a separate constraint (see (55)), or by a violation of Nonrecursivity. The structure in (51) must be seen as the result of a constraint allowing for the left edge of the parenthetical IP to shift to the right, but not beyond the initial functional element (see (56)).

(55) Allow CPD formation.

(56) Shift IP boundary: Shift the left edge of an IP to the right of an initial element of type F, but not beyond (where F ∈ {relative pronouns, coordinating conjunctions, connectives}).

While the constraints in (54) derive the default pattern, the additional constraints in (55) and (56) may take the structure resulting from (54) as input. In particular, shifting a boundary according to (56) implies its presence in an underlying structure. Factors that drive the boundary shift specified in (56) may include constraints taking care of prosodic length and weight, as well as tonal parallelism. For example, the discussion of example (30)/Figure 3 in Section 4.1 revealed equal numbers of syllables and tonal parallelism of adjacent IPs. However, the phrasing of other utterances from the data set may not be explained along these lines. In (34), for example, the number of syllables would predict a different phrasing pattern.

It is also possible that the discourse situation plays a role in the derivation of the surface pattern in (51). Consider once again the example in (30)/Figure 3. 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 places the prosodic break after the relative pronoun as a

floor-holding device, while the listener signals his wish to ask a question about the content of the main clause. The relation between intonational phrasing and pragmatic factors and the corresponding implications for prosodic theory are important topics for future research. Current prosodic theory does not allow for an interface between prosodic structure and pragmatics.

The observed patterns deviating from default pattern (48) are reminiscent to some extent of Nespor & Vogel's (1986: 193ff) restructuring of the IP. Restructuring applies to form larger or shorter IPs. It is determined by factors such as length, speech rate, style of speech and semantic considerations. It is limited by the syntactic structure of the string involved. While restructuring in Nespor & Vogel's (1986) sense involves an increase or reduction of the number of IPs in an utterance, the boundary shift to the right of the relative pronoun observed here does not change the number of IPs. Instead, it only concerns the exact position of one single IP boundary. What can be explained in terms of IP restructuring, however, is the phrasing in (53), observed for the two sentential parentheticals in (34) and (35). The phrasing can be seen as the result of restructuring such that IP boundaries have been removed. Specifically, the IP boundaries between *same* and *as* in (34), and between *proclaiming* and *as* in (35) have been removed as a result of speech rate, and, in the case of (35) at least, length considerations. Also, as mentioned above, a boundary after *proclaiming* would be due solely to the presence of the parenthetical and avoidance of recursivity, but would not occur in this position otherwise. It therefore seems a likely candidate to be removed in the process of IP-restructuring in the sense of Nespor & Vogel (1986). Restructuring in this sense will also play a key role in the discussion of the phrasing patterns observed with CCs.

A comparison is due between the results reported here for NRRCs and Watson & Gibson's (2004) findings. In their experimental reading study of the intonational phrasing of restrictive and non-restrictive relative clauses, almost 40% of all tested NRRCs were not directly preceded by an intonational boundary. Watson & Gibson (2004: 749) speculate that "[t]he absence of commas in the stimuli may have biased the speakers against producing more intonational breaks" and that "[i]n spontaneous speech, speakers' performance may more

closely match" the intuition that NRRCs must be preceded by an intonational break. The present results seem to support this idea of speaker behaviour in spontaneous speech. Note also that Watson & Gibson (2004) report only on the percentages of test items lacking a phrasal boundary in the position directly preceding the relative pronoun, but they do not detail the actual positions of attested boundaries.

Moving on to the findings for CCs, they show the range of phrasing patterns summarised in (36), repeated in (57).

(57) CCs; phrasing

a.	… $_{IP}$[…]$_{IP}$ $_{IP}$[CC]$_{IP}$ $_{IP}$[…]$_{IP}$ …	(18.7%)
b.	… $_{IP}$[… $_{IP}$[CC]$_{IP}$ …]$_{IP}$ …	(6.5%)
c.	… $_{IP}$[…]$_{IP}$ $_{IP}$[… CC]$_{IP}$ $_{IP}$[…]$_{IP}$ …	(74.8%)
d.	… $_{IP}$[…]$_{IP}$ $_{IP}$[CC …]$_{IP}$ $_{IP}$[…]$_{IP}$ …	
e.	… $_{IP}$[…]$_{IP}$ $_{IP}$[… CC …]$_{IP}$ $_{IP}$[…]$_{IP}$ …	

The CCs phrased as in (57)a) show the default phrasing for parentheticals. They thus follow the constraints in (54) and need not be further addressed, except that it is worth mentioning once again that unlike for NRRCs and sentential parentheticals, this is not the most frequent pattern for CCs. The CCs phrased in CPD structures (see (57)b)) follow the structure in (52), which has also been discussed above. The phrasing patterns in (57)c-e) involve the absence of one or both of the IP boundaries around the CC. It seems that these patterns can be accounted for along the lines of Nespor & Vogel's (1986) restructuring of the IP. Consider the CC examples in (58)-(60), taken from the present data set. They correspond to the patterns in (57)c)-e), respectively.

(58) Compare (57)c)

a. Joe Haines you were the Press Secretary at Number Ten at the time and indeed had been *I think* since nineteen sixty-nine (ICE-GB: s1b-040 #5)

b. (predicted phrasing according to (48); no restructuring)

$_{IP}$[Joe Haines]$_{IP}$ $_{IP}$[you were the Press Secretary at Number Ten at the time]$_{IP}$

$_{IP}$[and indeed had been]$_{IP}$ $_{IP}$[*I think*]$_{IP}$ $_{IP}$[since nineteen sixty-nine]$_{IP}$

c. (attested phrasing: application of IP restructuring)

$_{IP}$[Joe Haines]$_{IP}$ $_{IP}$[you were the Press Secretary at Number Ten at the time]$_{IP}$

$_{IP}$[and indeed had been *I think*]$_{IP}$ $_{IP}$[since nineteen sixty-nine]$_{IP}$

(59) Compare (57)d)

a. The Scots were besieging *I think* Berwick and Edward whoever it was at the time came out to relieve him (ICE-GB: s1a-065 #342)

b. (predicted phrasing according to (48); no restructuring)

$_{IP}$[The Scots were besieging]$_{IP}$ $_{IP}$[*I think*]$_{IP}$ $_{IP}$[Berwick and Edward]$_{IP}$ $_{IP}$[whoever it was at the time came out to relieve him]$_{IP}$

c. (attested phrasing: application of IP restructuring)

$_{IP}$[The Scots were besieging]$_{IP}$ $_{IP}$[*I think* Berwick and Edward]$_{IP}$ $_{IP}$[whoever it was at the time came out to relieve him]$_{IP}$

(60) Compare (57)e)

a. It will not *I believe* be a long conflict but it may be a fierce one (ICE-GB: s2b-014 #44)

b. (predicted phrasing according to (48); no restructuring)

[It will not]$_{IP}$ $_{IP}$[*I believe*]$_{IP}$ $_{IP}$[be a long conflict]$_{IP}$ $_{IP}$[but it may be a fierce one]$_{IP}$

c. (attested phrasing: application of IP restructuring)

$_{IP}$[It will not *I believe* be a long conflict]$_{IP}$

H* !H*L L%

$_{IP}$[but it may be a fierce one]$_{IP}$

H* !H*L L%

With CCs in general, the length factor is likely involved in IP restructuring. They typically consist of a combination of pronoun and verb (*I think, I believe*, etc), or pronoun, auxiliary and verb or adjective (*I would say, I'm afraid*, etc), i.e. of one prosodic word (PWd) (and up to four syllables) only. The sole exception is *I'm glad to say* which consists of two PWds but is represented only once in the data set. With CCs, series of very short IPs and series of IPs of unbalanced size are likely to surface under phrasing according to (48). But this goes against the general tendency to avoid IP series of this kind (Nespor & Vogel 1986). It follows that a short IP such as that spanning a CC is likely to be restructured. For example, the predicted phrasing in (60)b) involves a series of very short IPs, followed by a longer one. Restructuring as in (60)c) leads to a series of IPs more balanced in size.

At least three other factors may play a role in the restructuring of these examples. First, IP-restructuring may help to achieve tonal parallelism between two adjacent IPs. In (60), for example, a prenuclear peak on *not/may* is followed by a downstepped fall associated with *long* and *fierce,* respectively (see (60)c)). Second, IP restructuring occurs where the presence of an IP boundary has been forced by the CC in a position where it would not occur otherwise. In (58), for instance, the presence of the CC forces an IP boundary after *been*. This boundary disappears after restructuring. Similarly, the IPs preceding the CCs in (59) and (60) would not form a separate IP if the CC were absent. Having removed CCs following a constituent of type $NP_{Subject}$ or S from the data set in order to avoid syntactic ambiguity between a CC and a main clause analysis (see Section 3.1.3), the great majority of all remaining CCs occur within a syntactic constituent, thus in a position, where an IP boundary would not be predicted otherwise. Third, restructuring may be due to semantic considerations such as semantic scope. In principle, a CC may have semantic scope over what precedes or follows. In (59), for example, *I think* may relate to *besieging* (as in *I think besieging, but maybe even fighting*) or to the following proper nouns. Erasing the IP boundary before *Berwick* helps to disambiguate between these two meanings. Without the boundary, the CC unambiguously refers to *Berwick and Edward*.

Restructuring is often avoided if the CC carries heavy stress. In (61), for example, *I*

think is phrased in a separate IP with an H*LH% nuclear accent, structure-related pauses before and after the CC, and the pronoun *I* as the nuclear syllable of its IP.

(61) a. So uh I would also add that our armed services are a brilliant exception *I think* to the uh neglect of training which we have in this country because the armed services uh clearly do uh believe deeply in training and are committed to do it (ICE-GB: s2a-031 #81)

b. $_{IP}$[I would also add]$_{IP}$ $_{IP}$[that our armed services]$_{IP}$ $_{IP}$[are a brilliant exception]$_{IP}$ $_{IP}$[*I think*]$_{IP}$ $_{IP}$[to the neglect of training]$_{IP}$ $_{IP}$[which we have in this country]$_{IP}$ […]

Other kinds of semantic/pragmatic considerations may also play a role in determining restructuring such that the separate IP of the CC is dissolved. CCs are semantically and pragmatically variable (see, e.g., Aijmer 1997, Dehé & Wichmann, to appear). 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, thus will not have a CTC, and will therefore be likely to join another IP.

According to Nespor & Vogel (1986: 193), "[IP] restructuring depends largely on rather global aspects of the speech situation, [and] it is [therefore] not possible to predict exactly when it will occur". Factors that play a role in the application or non-application of restructuring IPs formed by CCs have been discussed in this section. Crucially, the grammar provides the means of IP-restructuring and the factors governing it as tools for the speaker to produce her/his utterance in a structured way.

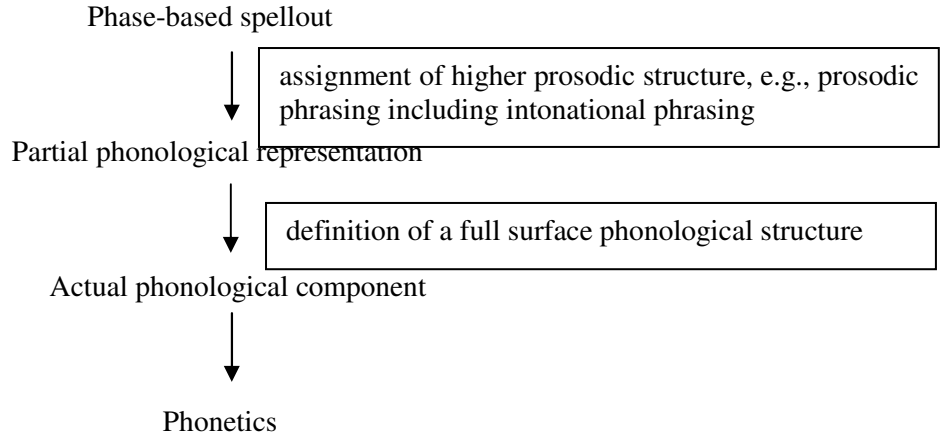
The present data thus provide ample evidence for the option of IP-restructuring for IPs of parentheticals. This contradicts the assumption that parentheticals are obligatorily phrased separately. If this were the case, they should resist restructuring. Instead, IP restructuring is frequently employed for CCs, and it has also been attested for more complex parentheticals (see, in particular, examples (34) and (35)). The fact that restructuring is more common for

CCs is likely due to their length (by their very nature, CCs are shorter and less complex than sentential parentheticals and NRRCs), and possibly to their function. The fact that in previous research other types of short parentheticals, for example, English question tags, reporting verbs, vocatives and other one-word parentheticals have been argued to be often prosodically integrated rather than separate (see Section 1) further supports the finding that IPs of parentheticals may undergo restructuring just like IPs of other constituents and in other contexts. In addition, restructuring of parenthetical IPs seems to follow the same constraints, i.e. it is due to the same factors, as restructuring of IPs of other syntactic strings. The results will now be couched in a model of prosodic theory.

Kratzer & Selkirk (2007) suggest the model sketched in (62). Prosodic phrasing is assigned as part of the phase-based spellout of syntactic structure. According to Chomsky (2001, 2004, 2005 and related work), phases are syntactic phrases of category *v*P and CP. The transfer to the phonological component of the grammar, i.e. the sound interface, is referred to as spellout. As Kratzer & Selkirk (2007: 131) argue, it is conceivable that "during spellout only a partial phonological representation would be defined, precisely that which allows satisfaction of the interface constraints on prosodic phrasing and stress". The constraints on prosodic phrasing include the conditions on major and minor phrasing and prosodic words, and, crucially, the constraints on intonational phrasing. While major phrases (roughly equivalent to intermediate phrases in Pierrehumbert's framework and phonological phrases in Nespor & Vogel's framework, and in any case one level down in the prosodic hierarchy from Intonational Phrases) are the output of phase-based spellout, IPs and prosodic words are produced by independent principles of spellout (Kratzer & Selkirk 2007: 125). These independent principles include the spellout of CommaP as IP.

Kratzer & Selkirk (2007: 132) further suggest that the partial phonological representation "could be the input to the actual phonological component". At this stage, a "full surface phonological representation" would be defined, for example as the result of an optimality-theoretic ranking of prosodic constraints. This representation would in turn serve as the input to phonetics. The model thus proceeds in the stages indicated in (62).

(62) (model after Kratzer & Selkirk 2007: 131f)



If constraints on intonational phrasing are at work to derive the partial phonological representation, the default prosodic structure observed with sentential parentheticals and NRRCs follows straightforwardly under the assumption that the constraints given in (54) are all part of the set of constraints on intonational phrasing that define the partial phonological representation during spellout. At this stage, which has access to syntactic information, parenthetical phrases are parsed into IPs, and IPs are nonrecursive. Structures that deviate from this initial representation may be conceived of as the output of constraint interaction at a later stage, i.e. as part of the definition of the phonological surface structure. Here, boundary shift, CPD formation and IP restructuring, driven by the factors outlined above, apply as the result of a given linguistic and discourse context to derive structures such as (51), (52) and (57)c)-e). This is supportive of the view that syntax has a restricted role in determining sentence phonology (see Kratzer & Selkirk 2007: 132), in particular in determining intonational phrasing. The difference between NRRCs and sentential parentheticals on the one hand, and CCs on the other hand, such that CCs are prosodically integrated more commonly, easily follows from IP-restructuring as a result of prosodic length considerations, as well as other non-syntactic factors. This may be achieved in a model that allows for a postsyntactic, fully phonological component. At the same time, restructuring is syntactically limited such that IP boundaries may not be introduced in an arbitrary position (Nespor & Vogel 1986), and

IP boundaries are readily deleted in positions which do not coincide with the edges of major syntactic constituents (see the discussion of (35), (58) and (60) above). At first sight this implies that the phonological component must have access to some syntactic information. However, a closer look reveals that IP restructuring may in fact proceed on the basis of phonological information. Remember that in Nespor & Vogel's (1986) account, IP-restructuring involves the introduction of IP boundaries to form smaller IPs, as well as the erasure of IP boundaries to form larger IPs. The introduction of IP boundaries is limited in their framework (i) by prosodic structure such that IP restructuring must occur at the juncture between two phonological phrases, and (ii) by the syntactic structure such that it is avoided in any position other than at the end of noun phrases (Nespor & Vogel 1986: 196f). In a phase-based prosodic theory, these syntactic edges will likely coincide with the edges of prosodic constituents of type major/intermediate phrase, thus with boundaries that are part of the partial phonological representation. This representation serves as input to the definition of the full surface structure, which thus operates on the basis of phonological information. Boundaries of type major/intermediate phrase will be strengthened to type IP. The opposite process, which removes IP boundaries in order to form larger IPs, removes boundaries introduced by the constraints on intonational phrasing as part of spellout, thus does not access syntactic information, either. In the case of the parentheticals investigated here, IP-restructuring only involves the latter: the removal of IP boundaries.

It remains to be explained why boundary shifts of the kind observed with NRRCs must obey the constraint in (56), in particular why it is not shifted beyond an initial functional element. It is conceivable, for example, that this relates to the constraints on prosodic phrasing such that the boundary may not be shifted beyond the edge of a spellout domain. For illustration, consider once again the NRRC examples in (63) and (64), where b) represents the intonational phrasing, and c) indicates the syntactic structure as relevant here. Remember that CP is a phase, and C its head. As the result of syntactic movement, *(of) which* is situated in SpecCP, i.e., in the specifier of the phase head C. The rest of the NRRC is part of the complement of the phase head. Shifting the boundary to the right beyond the relative pronoun

would mean to shift it beyond the edge of the spellout domain of CP.

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

b. $_{IP}$[I was programming in Pascal *which*]$_{IP}$ $_{IP}$[$_{IP}$[*really wasn't very exciting*]$_{IP}$ I'm afraid]$_{IP}$

c. I was programming in Pascal $_{CP}$[*which* C $_{TP}$[~~*which*~~ *really wasn't very exciting*]]

(64) a. First then 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)

b. … $_{IP}$[the wider context]$_{IP}$ $_{IP}$[within which discussion on education *of which*]$_{IP}$ $_{IP}$[*uh teacher education's only a part*]$_{IP}$ $_{IP}$[*but I can't disentangle it*]$_{IP}$ $_{IP}$[is taking place]$_{IP}$

c. within which discussion on education $_{CP}$[*of which* C $_{TP}$[*teacher education is only a part* ~~*of which*~~]]

Moreover, Kratzer & Selkirk (2007: 106) have a Highest Phrase Condition, which says that "[t]he highest phrase within the spellout domain of a phase corresponds to a prosodic major phrase in phonological representation". Given that the complement of *v* is another spellout domain, the noun phrase *teacher education* in (64) would be the highest phrase in its spellout domain and would thus correspond to a prosodic major phrase. The IP boundary shifted to the position following the relative pronoun thus coincides with the left edge of a major phrase. However, further research remains to be done to find out whether this is the correct explanation for (56), and what the (desired as well as undesired) consequences of this apparent relation between spellout domains and intonational phrasing would be. Remember that according to Kratzer & Selkirk (2007) the constraints on intonational phrasing are independent of those on prosodic phrasing.

6 Summary and Conclusion

This study set out to investigate the intonational phrasing of parentheticals in actual spoken language, specifically in a corpus of spoken British English from the 1990s. Its aim was twofold: first, the correctness of previous claims about the intonational phrasing of parentheticals was evaluated; second, the implications of the actual intonational phrasing of parentheticals for prosodic theory were analysed.

In the past, parentheticals have often been argued to be obligatorily phrased separately, unlike IPs spanning non-parenthetical material. In addition, each of the strings of material from the host clause preceding and following the parenthetical has been argued to be phrased separately, resulting in a non-recursive prosodic structure. This, the argument goes, holds true even if these strings would not form separate IPs otherwise. Another common assumption in the previous literature is that parentheticals do not affect the intonation of their host. These two views, however, are contradictory. If an IP boundary may be inserted because of the presence of the parenthetical, but against the overall structure of the host clause, then this is one way in which the parenthetical affects the intonation of the host. This is not only a matter of temporal structure. A boundary, in the present framework, is identified also on the basis of tonal features, for example the presence of a boundary tone. The parenthetical thus also affects the melodic features of the host utterance.

The assumption that host and parenthetical are syntactically unrelated poses another problem for the derivation of prosodic structure. If host and parenthetical are unrelated, they should, in a model of the grammar which takes syntactic structure as input to prosodic structure, not be part of the same mapping process. Given that host and parenthetical are linearised, and that parentheticals affect the prosodic phrasing of the host, this is implausible. Prosodic evidence thus provides support for any kind of 'integrated' syntactic approach.

If there is indeed a syntactic relation, and if parenthetical and host are part of the same mapping procedure from syntactic structure onto prosodic surface structure, then they should

be subject to the mapping constraints that also apply elsewhere. De Vries (2007) sees ParP as a clausal adjunct whose internal structure is invisible to the rest of the utterance, but whose linear position in the host is accounted for by the analysis in terms of adjunction. An adjunct like this should be visible in the mapping from syntactic to prosodic structure like other adjuncts. That this is the case follows from the results of the prosodic analysis: ParP forms its own IP, which, however, may in principle be restructured in terms of the same constraints as non-parenthetical IPs. However, part of the exceptional status of parentheticals remains: contraints applying specifically to ParP demand right- and left-alignment of this type of constituent with the respective edges of an IP. It seems too bold at this stage to also assume left-alignment for intonational phrasing in general.

It is one of the major results of this study that IPs spanning parentheticals may undergo restructuring. It is another important result that spontaneous spoken language data confirm previous research using made-up or experimental data, in that there is a strong tendency for longer parentheticals (sentential parentheticals and NRRCs) to be mapped onto separate IPs. Comment clauses, on the other hand, behave differently. The results confirm earlier intuitive studies claiming that shorter parentheticals such as CCs, reporting V, vocatives and question tags do not show the strong tendency to phrase separately. They also confirm Peters' (2006) results which show a relation between the length of a parenthetical and its phrasing. In the future, it will be important to study the factors that lead to IP-restructuring, as well as their interaction in more detail. Several factors have been described, other factors still remain to be studied, such as, for spoken language in particular, the role of the discourse situation, utterance planning, and the like. This might also involve the modeling of a possible interface between surface prosodic structure and discourse context.

As for parentheticals in particular, a number of members of this heterogenous class have been ignored here and remain to be investigated along the same lines, among them reporting verbs, vocatives, sentence adverbs, nominal appositions, and question tags. It is more than likely that due to their length, reporting verbs, vocatives, sentence adverbs and question tags will behave similarly to CCs, such that prosodic integration, i.e. IP-

restructuring, is the rule rather than the exception.

For a model of prosodic theory, the implications seem to be such that syntactic information is relevant at a first stage, namely that of spellout, while restructuring is based on phonological information and serves as evidence for a post-syntactic, phonological level. Future research will have to look in more detail at the nature of the phonological component and the constraints operating there.

References

Ackema, Peter & Ad Neeleman. 2004. *Beyond morphology - Interface conditions on word formation*. Oxford: Oxford University Press.

Aijmer, Karin. 1997. *I think* - an English modal particle. In Toril Swan & Olaf Jansen Westvik (eds.), *Modality in Germanic languages - Historical and comparative perspective*, 1-47. Berlin & New York: Mouton de Gruyter.

Altmann, Hans. 1981. *Formen der "Herausstellung" im Deutschen: Rechtsversetzung, Linksversetzung, Freies Thema und verwandte Konstruktionen* (Linguistische Arbeiten 106). Tübingen: Niemeyer.

Armstrong, Lilias E. & Ida C. Ward. 1926. *A handbook of English intonation*. Cambridge: Heffer & Sons.

Arnold, Doug. 2007. Non-restrictive relatives are not orphans. *Journal of Linguistics* 43(2), 271-309.

Astruc, Lluisa. 2005. *The intonation of extra-sentential elements in Catalan and English*. Ph.D. dissertation, University of Cambridge.

Barth-Weingarten, Dagmar. 2007. Prosody, Construction Grammar and language change. In Sabine Volk-Birke & Julia Lippert (eds.), *Anglistentag 2006, Halle, Proceedings*, 423-433. Trier: Wissenschaftlicher Verlag Trier.

Beckman, Mary E. & Janet B. Pierrehumbert. 1986. Intonational structure in Japanese and English. *Phonology Yearbook* 3, 255-309.

Beckman, Mary E. & Gayle Ayers Elam. 1997. Guidelines for ToBI labelling (version 3.0), http://www.ling.ohio-state.edu/research/phonetics/E_ToBI/ (7 Jan 2008).

Beckman, Mary E., Julia Hirschberg & Stefanie Shattuck-Hufnagel. 2005. The original ToBI system and the evolution of the ToBI framework. In Sun-Ah Jun (ed.), *Prosodic Typology: The Phonology of Intonation and Phrasing*, 9-54 Oxford: Oxford University Press.

Bing, Janet M. 1985. *Aspects of English prosody*. New York & London: Garland.

Blakemore, Diane. 2005. *and*-parentheticals. *Journal of Pragmatics* 37: 1165-1181.

Boersma, Paul. 2001. PRAAT, a system for doing phonetics by computer. *Glot International* 5, 341-347.

Boersma, Paul & David Weenink. 2008. PRAAT: doing phonetics by computer. Available at http://www.praat.org/.

Bolinger, Dwight. 1989. *Intonation and its uses: Melody in grammar and discourse*. London: Arnold.

Burton-Roberts, Noel. 1999. Language, linear precedence and parentheticals. In Peter Collins & David Lee (eds.), *The clause in English*, 33-52. Amsterdam & Philadelphia: John Benjamins.

Burton-Roberts, Noel. 2006. Parentheticals. In Keith Brown (ed. in chief), *Encyclopaedia of language and linguistics*, vol. 9 (2nd edition), 179-182. Amsterdam: Elsevier Science.

Chomsky, Noam. 2001. Derivation by phase. In Michael Kenstowicz (ed.), *Ken Hale: A Life in Language*, 1-52. Cambridge, MA: MIT Press.
Chomsky, Noam. 2004. On phases. Ms., MIT.
Chomsky, Noam. 2005. The factors in language design. *Linguistic Inquiry* 36(1): 1-22.
Cooper, William E. & Jeanne Paccia-Cooper. 1980. *Syntax and speech*. Cambridge, MA & London: Harvard University Press.
Cooper, William & John Sorensen. 1981. *Fundamental frequency in sentence production*. Heidelberg: Springer.
Corver, Norbert & Craig Thiersch. 2002. Remarks on parentheticals. In Marc van Oostendorp & Elena Anagnostopoulou (eds.), *Progress in Grammar. Articles at the 20th anniversary of the comparison of grammatical models group in Tilburg*, http://www.meertens.knaw.nl/books/progressingrammar/ (7 Jan 2007).
Cruttenden, Alan. 1997. *Intonation* (2nd edition). Cambridge: Cambridge University Press.
Crystal, David. 1969. *Prosodic systems and intonation in English*. Cambridge: Cambridge University Press.
Crystal, David. 1972. The intonation system of English. In Dwight Bolinger (ed.), *Intonation: Selected readings*, 110-136. Harmondsworth: Penguin.
D'Avis, Franz Josef. 2005. Über Parenthesen. In Franz Josef D'Avis (ed.), *Deutsche Syntax: Empirie und Theorie*, 259-279. Göteborg: Acta Universitatis Gothoburgensis.
Dehé, Nicole. 2007. The relation between syntactic and prosodic parenthesis. In Nicole Dehé & Yordanka Kavalova (eds.), *Parentheticals* (Linguistik aktuell/ Linguistics today 106), 261-284. Amsterdam & Philadelphia: John Benjamins.
Dehé, Nicole. 2008. To delete or not to delete: The contexts of Icelandic final vowel deletion. *Lingua* 118(5), 732-753.
Dehé, Nicole & Yordanka Kavalova. 2006. The syntax, pragmatics and prosody of parenthetical *what*. *English Language & Linguistics* 10(2), 289-320.
Dehé, Nicole & Yordanka Kavalova. 2007. Parentheticals: An introduction. In Nicole Dehé & Yordanka Kavalova (eds.), *Parentheticals* (Linguistik aktuell/ Linguistics today 106), 1-22. Amsterdam & Philadelphia: John Benjamins.
Dehé, Nicole & Anne Wichmann. To appear. The multifunctionality of epistemic parentheticals in discourse: prosodic cues to the semantic-pragmatic boundary. *Functions of Language*.
D'Imperio, Mariapaola, Gorka Elordieta, Sónia Frota, Pilar Prieto & Marina Vigário. 2005. Intonational phrasing in Romance: The role of syntactic and prosodic structure. In Sónia Frota, Marina Vigário & Maria J. Freitas (eds.), *Prosodies - With special reference to Iberian languages*. 59-97. Berlin & New York: Mouton de Gruyter.
Downing, Bruce T. 1970. *Syntactic structure and phonological phrasing in English*. Doctoral dissertation, University of Texas/Austin.
Elordieta, Gorka, Sónia Frota & Marina Vigário. 2005. Subjects, objects and intonational phrasing in Spanish and Portuguese. *Studia Linguistica* 59(2/3), 110-143.
Emonds, Joseph. 1973. Parenthetical clauses. In Claudia Corum, Cedrik Smith-Stark & Ann Weiser (eds.), *You take the high node and I'll take the low node*, 333-347. Chicago: Chicago Linguistic Society.
Emonds, Joseph. 1976. *A transformational approach to English syntax. Root, structure-preserving, and local transformations*. New York, San Francisco & London: Academic Press.
Emonds, Joseph. 1979. Appositive relatives have no properties. *Linguistic Inquiry* 10(2), 211-243.
Espinal, M. Teresa. 1991. The representation of disjunct constituents. *Language* 67(4), 726-762.
Fabb, Nigel. 1990. The difference between English restrictive and nonrestrictive relative clauses. *Journal of Linguistics* 26, 57-77.
Fagyal, Zsuzsanna. 2002. Prosodic boundaries in the vicinity of utterance-medial parentheticals in French. *Probus* 14(1), 93-111.
Ferreira, Fernanda. 1991. Effects of length and syntactic complexity on initiation times for

prepared utterances. *Journal of Memory and Language* 30, 210-233.
Ferreira, Fernanda. 1993. Creation of prosody during sentence production. *Psychological Review* 100(2), 233-253.
Frazier, Lyn, Charles Clifton, Jr. & Katy Carlson. 2004. Don't break, or do: Prosodic boundary preferences. *Lingua* 114, 3-27.
Frota, Sónia. 2000. *Prosody and focus in European Portuguese. Phonological phrasing and intonation*. New York & London: Garland.
Gee, James P. & Francois Grosjean. 1983. Performance structures: A psycholinguistic and linguistic appraisal. *Cognitive Psychology* 15, 411-458.
Ghini, Mirco. 1993. Phi-formation in Italian: A new proposal. *Toronto Working Papers in Linguistics* 12, 41-78.
Grewendorf, Günther. 1988. *Aspekte der deutschen Syntax. Eine Rektions-Bindungs-Analyse*. Tübingen: Gunter Narr.
Gussenhoven, Carlos. 1990. Tonal association domains and the prosodic hierarchy in English. In S.M. Ramsaran (ed.), *Studies in the Pronunciation of English. A Commemorative Volume in Honour of A.C. Gimson*, 27-37. London: Routledge.
Gussenhoven, Carlos. 2004. *The phonology of tone and intonation*. Cambridge: Cambridge University Press.
Gussenhoven, Carlos & Rietveld, A.C.M. 1992. Intonation contours, prosodic structure and preboundary lengthening. *Journal of Phonetics* 20, 283-303.
Haegeman, Liliane. 1991. Parenthetical adverbials: The radical orphanage approach. In S. Chiba, A. Ogawa, Y. Fuiwara, N. Yamada, O. Koma & T. Yagi (eds.), *Aspects of modern linguistics: Papers presented to Masatomo Ukaji on his 60th Birthday*, 232-254. Tokyo: Kaitakushi.
Haider, Hubert. 1993. ECP-Etüden: Anmerkungen zur Extraktion aus eingebetteten Verb-Zweit-Sätzen. *Linguistische Berichte* 145, 185-203.
Haider, Hubert. 2005. Parenthesen – Evidenz aus Bindungsverhältnissen. In Franz Josef D'Avis (ed.), *Deutsche Syntax: Empirie und Theorie*, 281-293. Göteborg: Acta Universitatis Gothoburgensis.
Hellmuth, Sam. To appear. Prosodic weight and phonological phrasing in Cairene Arabic. *Chicago Linguistic Society* (CLS) 40.
Hirschberg, Julia. 2004. Pragmatics and intonation. In Laurence R. Horn & Gregory Ward (eds.), *The Handbook of Pragmatics*, 515-537. Oxford: Blackwell.
Jackendoff, Ray. 1972. *Semantic interpretation in generative grammar*. Cambridge (MA): MIT Press.
Jespersen, Otto. 1937. *Analytic Syntax*. London: Allen & Unwin.
Jun, Sun-Ah. 2003. The effect of phrase length and speech rate on prosodic phrasing. *Proceedings of ICPhS* , Barcelona , Spain, August 2-9, 2003.
Jun, Sun-Ah. 2005. Prosodic typology. In Sun-Ah Jun (ed.), *Prosodic Typology: The Phonology of Intonation and Phrasing*, 430-458. Oxford: Oxford University Press.
Kaltenböck, Gunther. 2007. Spoken parenthetical clauses in English. A taxonomy. In Nicole Dehé & Yordanka Kavalova (eds.), *Parentheticals* (Linguistik aktuell/ Linguistics today 106), 25-52. Amsterdam/ Philadelphia: John Benjamins.
Kavalova, Yordanka. 2007. *And*-parenthetical clauses. In Nicole Dehé & Yordanka Kavalova (eds.), *Parentheticals* (Linguistik aktuell/ Linguistics today 106), 145-172. Amsterdam & Philadelphia: John Benjamins.
Kiziak, Tanja. 2007. Long extraction or parenthetical insertion? Evidence from judgement studies. In Nicole Dehé & Yordanka Kavalova (eds.), *Parentheticals* (Linguistik aktuell/ Linguistics today 106), 121-144. Amsterdam/ Philadelphia: John Benjamins.
Knowles, Gerry. 1991. Prosodic labelling: The problem of tone group boundaries. In Stig Johansson & Anna-Brita Stenström (eds.), *English Computer Corpora. Selected Papers and Research Guide* (Topics in English Linguistics 3), 149-161. Berlin/ New York: Mouton de Gruyter.
Kratzer, Angelika & Elisabeth Selkirk. 2007. Phase theory and prosodic spellout: The case of verbs. *The Linguistic Review* 24, 93-135.

Krivokapić, Jelena. 2007. Prosodic planning: Effects of phrasal length and complexity on pause duration. *Journal of Phonetics* 35, 162-179.
Ladd, D. Robert. 1986. Intonational phrasing: the case for recursive prosodic structure. *Phonology Yearbook* 3, 311-340.
Ladd, D. Robert. 1996. *Intonational phonology*. Cambridge: Cambridge University Press.
Local, John. 1992. Continuing and restarting. In Peter Auer & Aldo di Luzio (eds.), *The contextualization of language*, 273-296. Amsterdam & Philadelphia: John Benjamins.
McCawley, James D. 1982. Parentheticals and discontinuous constituent structure. *Linguistic Inquiry* 13(1), 91-106.
Murphy, M. Lynne. 1993. Discourse markers and sentential syntax. *Studies in the Linguistic Sciences* 23(1), 163-167.
Nelson, Gerald, Sean Wallis & Bas Aarts. 2002. *Exploring natural language: Working with the British component of the International Corpus of English*. Amsterdam & Philadelphia: John Benjamins.
Nespor, Marina & Irene Vogel. 1986. *Prosodic phonology* (Studies in Generative Grammar 28). Dordrecht: Foris.
Nolan, Francis. 2006. Intonation. In Bas Aarts & April McMahon (eds.), *The Handbook of English Linguistics*, 433-457. Oxford: Blackwell.
Payà, Marta. 2003. Prosody and pragmatics in parenthetical insertions in Catalan. *Catalan Journal of Linguistics* 2, 207-227.
Peters, Jörg. 2006. Syntactic and prosodic parenthesis. *Proceedings of the International Conference on Speech Prosody. 2-5 May 2006, Dresden.*
Peterson, Peter. 1999. On the boundaries of syntax. In Peter Collins & David Lee (eds.), *The clause in English*, 229-250. Amsterdam & Philadelphia: John Benjamins.
Peterson, Peter. 2004. Non-restrictive relatives and other non-syntagmatic relations in an LF framework. Paper presented at LFG 2004, Christchurch, NZ.
Pierrehumbert, Janet. 1980. *The phonology and phonetics of English intonation.* Ph.D. dissertation, MIT.
Pierrehumbert, Janet & Julia Hirschberg. 1990. The meaning of intonational contours in the interpretation of discourse. In Philip R. Cohen, Jerry Morgan & Martha E. Pollack (eds.), *Intentions in communication*, 271-311. Cambridge, MA: MIT Press.
Potts, Christopher. 2002. The syntax and semantics of *as*-parentheticals. *Natural Language and Linguistic Theory* 20(3), 623-689.
Potts, Christopher. 2005. *The logic of conventional implicatures*. Oxford: Oxford University Press.
Prieto, Pilar. 2005. Syntactic and eurhythmic constraints on phrasing decisions in Catalan. *Studia Linguistica* 59(2/3), 194-222.
Quirk, Randolph, Sidney Greenbaum, Geoffrey Leech & Jan Svartvik. 1985. *A comprehensive grammar of the English language*. Harlow: Longman.
Reis, Marga. 1995. Wer glaubst du hat recht? On so-called extractions from verb-second clauses and verb-first parenthetical constructions in German. *Sprache und Pragmatik* 36, 27-83.
Reis, Marga. 2002. Wh-movement and integrated parenthetical constructions. In C. Jan-Wouter Zwart & Werner Abraham (eds.), *Studies in comparative Germanic syntax. Proceedings from the 15th Workshop on Comparative Germanic Syntax* (Linguistik Aktuell/ Linguistics Today 53), 3-40. Amsterdam & Philadelphia: John Benjamins.
Ross, John R. 1973. Slifting. In Maurice Gross, Morris Halle & Marcel-Paul Schützenberger (eds.), *The formal analysis of natural languages*. *Proceedings of the first international conference*, 133-169. The Hague/Paris: Mouton.
Sandalo, Filomena & Hubert Truckenbrodt. 2002. Some notes on phonological phrasing in Brazilian Portuguese. *MIT Working Papers in Linguistics* 42, 285-310.
Safir, Kenneth. 1986. Relative clauses in a theory of binding and levels. *Linguistic Inquiry* 17(4): 663–689.
Schafer, Amy J., Shari R. Speer, Paul Warren & David S. White. 2000. Intonational disambiguation in sentence production and comprehension. *Journal of Psycholinguistic*

Research 29(2), 169-182.
Schelfhout, Carla, Peter-Arno Coppen & Nelleke Oostdijk. 2004. Finite comment clauses in Dutch: A corpus-based approach. *Journal of Germanic Linguistics* 14(4): 331-350.
Schneider, Stefan. 2007a. *Reduced Parenthetical Clauses as Mitigators: A Corpus Study of Spoken French, Italian and Spanish* (Studies in Corpus Linguistics 27). Amsterdam/ Philadelphia: John Benjamins.
Schneider, Stefan. 2007b. Reduced parenthetical clauses in Romance languages - A pragmatic typology. In Nicole Dehé & Yordanka Kavalova (eds.), *Parentheticals* (Linguistik aktuell/ Linguistics today 106), 237-258. Amsterdam/ Philadelphia: John Benjamins.
Schubiger, Maria. 1958. *English intonation. Its form and function*. Tübingen: Niemeyer.
Selkirk, Elisabeth. 1984. *Phonology and syntax: The relation between sound and structure*. Cambridge, MA: MIT Press.
Selkirk, Elisabeth. 1995a. Sentence prosody: Intonation, stress, and phrasing. In John A. Goldsmith (ed.), *The handbook of phonological theory*, 550-569. Oxford: Blackwell.
Selkirk, Elisabeth. 1995b. The prosodic structure of function words. In James E. Morgan & Katherine Demuth (eds.), *Signal to Syntax: Bootstrapping from Speech to Grammar in Early Acquisition*, 187-213. Mahwak, NJ: Lawrence Erlbaum.
Selkirk, Elisabeth. 2000. The interaction of constraints on prosodic phrasing. In Merle Horne (ed.), *Prosody: Theory and experiment*, 231-261. Dordrecht: Kluwer.
Selkirk, Elisabeth. 2005. Comments on intonational phrasing in English. In Sónia Frota, Marina Vigário, & Maria J. Freitas (eds.), *Prosodies. With special reference to Iberian languages*, 11-58. Berlin & New York: Mouton de Gruyter.
Shattuck-Hufnagel, Stefanie & Alice E. Turk. 1996. A prosody tutorial for investigators of auditory sentence processing. *Journal of Psycholinguistic Research* 25, 193-247.
Taglicht, Josef. 1998. Constraints on intonational phrasing in English. *Journal of Linguistics* 34, 181-211.
Tappe, Thilo. 1981. Wer glaubst du hat recht? Einige Bemerkungen zur COMP-COMP-Bewegung im Deutschen. In M. Kohrt and Jürgen Lenerz (eds.), *Sprache: Formen und Strukturen. Akten des 15. Linguistischen Kolloquiums, Münster 1980, Band 1* (Linguistische Arbeiten 98), 203–212. Tübingen: Niemeyer.
Thompson, Sandra A. & Anthony Mulac. 1991. A quantitative perspective on the grammaticization of epistemic parentheticals in English. In Elizabeth Traugott & Bernd Heine (eds.), *Approaches to grammaticalization: Vol. 2: Types of grammatical markers* (Typological Studies in Language 19: 2), 313-327. Amsterdam & Philadelphia: John Benjamins.
Truckenbrodt, Hubert. 2005. A short report on intonation phrase boundaries in German. *Linguistische Berichte* 203, 273-296.
Urmson, J.O. 1952. Parenthetical verbs. *Mind* 61, 480-496.
Vaissière, Jacqueline. 1983. Language-independent prosodic features. In Anne Cutler & D. Robert Ladd (eds.), *Prosody: Models and Measurements*, 53-66. Berlin: Springer.
Vries, Mark de. 2005. Coordination and syntactic hierarchy. *Studia Linguistica* 59(1), 83-105.
Vries, Mark de. 2007. Invisible constituents? Parentheses as B-merged adverbial phrases. In Nicole Dehé & Yordanka Kavalova (eds.), *Parentheticals* (Linguistik aktuell/ Linguistics today 106), 203-234. Amsterdam & Philadelphia: John Benjamins.
Wagner, Michael. 2004. Asymmetries in the syntax and prosody of verb-initial interpolated clauses. In *Proceedings of Console XII*, S. Blaho, L. Vicente and M. de Vos (eds.), 201–215. University of Leiden.
Warren, Paul, Amy J. Schafer, Shari R. Speer & David S. White. 2000. Prosodic resolution of prepositional phrase ambiguity in ambiguous and unambiguous situations. *UCLA Working Papers in Phonetics* 99, 5-33.
Watson, Duane & Edward Gibson. 2004. The relationship between intonational phrasing and syntactic structure in language production. *Language and Cognitive Processes* 19(6), 713-755.
Wells, John C. 2006. *English intonation. An introduction*. Cambridge: Cambridge University Press.

Wichmann, Anne. 2000. *Intonation in text and discourse: Beginnings, middles and ends*. Harlow et al: Longman.

Wichmann, Anne. 2001. Spoken parentheticals. In Karin Aijmer (ed.), *A wealth of English (Studies in honour of Göran Kjellmer)*, 177-193. Göteborg: Acta Universitatis Gothoburgensis.