Linearization-based Word-part Ellipsis*

Rui P. Chaves
Linguistics Center of the University of Lisbon
Av. Gama Pinto, n°2 1649–003 Lisbon – Portugal
rui.chaves@clul.ul.pt

Abstract

This paper addresses a phenomenon in which certain word-parts can be omitted. The evidence shows that the full range of data cannot be captured by a sublexical analysis, since the phenomena can be observed both in phrasal and in lexical environments. It is argued that a form of deletion is involved, and that the phenomena – lexical or otherwise – are subject to the same phonological, semantic, and syntactic constraints. In the formalization that is proposed, all of the above constraints are cast in a parallel and declarative fashion, in the framework of Head-Driven Phrase Structure Grammar (Pollard and Sag 1994), since the various levels of linguistic description are locally and simultaneously available. Building on recent accounts of ellipsis, this paper proposes a unified and general account of word-part ellipsis and phrasal ellipsis.

1 Introduction

Pre-theoretically, Grevisse (1936), Gleitman (1965, 292), Siegel (1974, 147), Strauss (1982, 43) and many others have noted a cross-linguistic phenomenon in which stems and certain affixes can be peripherally unrealized. Consider some attested examples from English:

(1) a. Our therapists are trained in pre- and post-natal care.
b. We can obtain mono- and polychromatic X-ray beams.
c. Most students in my school are either under- or overweight.

(2) a. Omnivores are plant- and meat-eaters.
b. We want to promote drug- and alcohol-free schools.
c. Other documents were made of goat-, sheep-, kid-, or calfskin.

*I am very thankful to Palmira Marrafa, Philip Miller, Ivan A. Sag, Jan Strunk, and Arnold Zwicky for discussion about earlier drafts. I also thank the anonymous *L&P* referees for their detailed comments and suggestions. As usual, the author is the sole responsible for any errors or omissions. This research was supported by Fundação para a Ciência e a Tecnologia, grant SFRH/BD/13880/2003.

One possible account for these data is one in which word-parts are allowed to be conjoined, as Quirk et al. (1985) and Huddleston, Payne, and Peterson (2002) assume. An alternative is put forth in Di Sciullo and Williams (1987, 106), and consists in the idea that certain word parts are both prefixes and independent words. In this paper I provide empirical evidence against both positions, and in favor of a deletion analysis. That is not to say that I deny the existence of lexical coordination, but the fact remains that there is a host of complex cases that call for a more general account.

There is nothing particular to English about this phenomena, as it also occurs in various other Germanic, Romance and Asian languages:

(3) a. déjá a l' état de pré- ou infra-vie (French)
already at the stage of pre- or infra-life

b. trink- und eßbar (German)
drink- and edible

c. dong- he xi-banqiu (Chinese)
east- and west-hemisphere

The reverse pattern targets the left periphery instead, and is more widespread in languages with richer morphological paradigms, like German and Dutch (Booij 1985; Toman 1985). Still, it can occur in many other languages, including English and Japanese as illustrated below in (4) and (5). Note that in order to obtain the intended readings, a break is placed between the coordinator lexeme and the folllowing conjunct. This contrasts with prototypical coordination structures, where the break is preferentially placed before the coordinator marker, as originally noted by Ross (1967). The fact that the coordinator particle typically does not fuse prosodically with the conjunct in these cases suggests that ellipsis has occurred and that the speaker is providing a cue that helps to distinguish an elliptical parse from a direct coordination parse.

(4) a. Elemental mercury is used in gold-mining and -refining.

b. This product was hand-made and -packed.

c. According to the law of intestate succession, half-brothers and -sisters are considered the same as full brothers and sisters.

d. In my opinion, that is one good-looking and -tasting poundcake.

As Yatabe (2001) shows, the verb stem *omoi-* ('to think') is elided in the second conjunct in the Japanese example in (5):

(5) [Omoidasu ka] [~~omoi~~dasanai ka] ga mondai da
[recall-PRES Q] [recall-NEG-PRES Q] NOM problem COP-PRES
'whether (you) can recall-it or (you) cannot recall-it is the problem'

Certain affixoids (affixes that originally came from independent words and often still have the status of a phonological word) can also be omitted, as illustrated in (6).

(6) a. Most anti-wrinkle and -aging creams have vitamin C and retinol.

b. Every employee frowns upon self-aggrandizement or -promotion in the workplace.

c. We regularly work with a multi-cultural and -lingual consulting team.

d. She has considerable experience in planning, forecasting, and analyzing multi-million or -billion dollar mergers.

e. But because he is pro-choice and -gun control, he is as liberal as liberal can be!

The existence of an elliptical parse is more evident if the direct coordination parse where no ellipsis occurs is either unavailable as in (4d), or dispreferred as in (4c). For example, the sentence in (6e) can be interpreted as *pro-choice and pro-gun control* if a break or a pause occurs after the conjunction. Otherwise, a very different reading obtains (i.e. *he is gun control*). Another example comes from Portuguese. The string *protestos globalização* ('protests globalization') is ungrammatical because it is a sequence of two nouns. However, [*protestos anti-globalização*]$_{N'}$ is grammatical because *anti-* can derive a prepositional post-nominal modifier *anti-globalização*. Thus, the example in (7) cannot be parsed as direct coordination, for the coordinate structure is interpreted as *anti-guerra ou anti-globalização*.

(7) Os danos devem-se a protestos anti-guerra ou -globalização.
the damage due-CL to protests anti-war or -globalization
'the damage was due to anti-war or anti-globalization protests'

The structure of this paper is as follows. In §2 I provide an overview of the data under consideration, as well as of the literature devoted to this topic. I conclude that the phenomena are best captured in terms of a deletion operation, sensitive to phonological, morphological, semantic, and syntactic properties. In §3 I compare the core properties of phrasal ellipsis with word-part ellipsis and reach two main conclusions. Firstly, left periphery ellipsis is quite different from right periphery ellipsis, unlike recent claims of the contrary. Secondly, I conclude that left-periphery ellipsis applies uniformly to both phrasal and sub-lexical structures and that right-periphery ellipsis likewise applies uniformly to both phrasal and sub-lexical structures. As such, a general and uniform analysis for both kinds of elliptical phenomena is called for. In §4 I discuss some of the main theoretical proposals recently put forth in the literature, and point out some of their shortcomings. Building on Chaves and Sag (2007), I put forth an account in §5 that captures how lexical constructions condition the ellipsis patterns in complex words.

2 Word-Part Ellipsis

Simpson (1983: 75–77; 1991: 55), Booij (1985), and others note that word-part ellipsis must be peripheral in the local domain of application.

(8) a. *John outran Bill and Mary -swam Patrick.

b. *The man is on top of a five- building or a six-story building?

c. *Is this a neuro- claim or a psycholinguistic claim?

d. *He is a neuroanatomist and a -linguist.

It is tempting to view the phenomena presented above as the result of direct coordination of sublexical items. However, there are good reasons for rejecting a sublexical coordination analysis. First, Booij (1985) and Nespor (1985) provide convincing phonological arguments in favor of a prosodically conditioned deletion account. For example, when *wesp* ('wasp') combines with *steek* ('sting') an additional schwa appears in between: *wespesteek*. This linking morpheme survives ellipsis in German and Dutch, a fact that is hard to explain in a sublexical account:

(9) wespe- en bijesteken
'wasp and bee stings' (Booij 1985)

Other evidence comes from the fact that remnants are phonological units. They are always located at a foot boundary, and can receive stress, as well as an independent prosody. A prosodically conditioned ellipsis account can readily capture these facts without stipulations.

A different kind of problem for a word-part coordination account comes from agreement and semantic interpretation. In some cases, the prefix coordination would have to somehow be equivalent to NP coordination:

(10) Pre- and post-revolutionary France were very different from each other.

In contrast, a deletion account straightforwardly explains the plural agreement and collective interpretation of the subject, because the underlying coordination would be in this case a standard NP coordination '*Pre-~~revolutionary France~~ and post-revolutionary France*'.

The same seems to be true for the reverse pattern, although there is a strong preference for parsing these structures without ellipsis. But given a suitable context, one can elicit the ellipsis reading:

(11) I thought that your half-brother and -sister were living with their common biological father.

A third, more fundamental problem, arises in cases where both left and right peripheries are simultaneously elided. Consider the following examples from German:

(12) a. Krankenvor~~sorge~~ und ~~Kranken~~nachsorge
sick-pre and aftercare
'pre- and post-medical care' (Wesche 1995)

b. Frauenforschungs~~zentrum~~, ~~Frauen~~bildungs~~zentrum~~ und
woman-research, education and
~~Frauen~~informationszentrum
information-center
'research, education and information center for women'

In principle this pattern should occur in any language that allows both left and right periphery ellipsis, even in morphologically less productive languages. Consider the following candidate for English:

(13) Using ultra-*low*, -*wide*-, or -*high*-intensity compression ranges.

It is unclear how complex a sublexical coordination account would have to be in order to encompass the above cases. In contrast, an ellipsis account offers a straightforward account of this cross-linguistic pattern, in the spirit of the Directionality Constraint proposed in Ross (1970): leftmost sites are deleted forward and rightmost sites are deleted backward.

Booij (1985), Toman (1985, 424), Höhle (1991), and Wilder (1997) also note that word-parts can be elided between non-lexical conjuncts, which poses a major problem for sublexical accounts. Such cases often require a pause in the locus of ellipsis and prosodic contrast, similarly to what occurs in *Right-Node Raising* phenomena. For an illustration, I provide the following examples from English:

(14) a. You prefer the heart- or the flower-shaped bead box?
b. Did you order the hard- or the soft-cover edition?
c. It's the difference between a five- and a ten-minute therapy session.
d. You can choose between a single- and a double-digit number.
e. His illusions are usually one- or at best two-sided.
f. This is either a second- or a third-hand copy of the tape.
g. These events took place in pre- or in post-war Germany?
h. We can use either un- or completely oversalted dough.

Booij (1985, 147) also gives examples from Dutch in which both kinds of ellipsis (sub-lexical and phrasal) target both conjuncts in parallel, in clausal coordination:

(15) ... dat [Jan appel~~sap~~ ~~dronk~~]$_S$ en [Piet druivesap dronk]$_S$
... that [Jan apple juice drank]$_S$ and [Piet grape juice drank]$_S$

German informants that I consulted also accept ellipsis of a verb stem between sentential conjuncts. In the naturally occurring example given in (16), the verb *zahlt* is shared between two clauses.[1]

(16) Wenn er Anfang 2005 in die Regelung des Arbeitslosengeldes II
when he start 2005 in the regulation the unemployment-wage
fällt, [[wird ihm die Wohnung zwar be~~zahlt~~], [es werden
falls, [[will him the apartment although will-be-paid], [it are$_{PASS}$
jedoch nur 345 Euro ausgezahlt]]
but only 345 Euro handed-over]]
'when beginning 2005 in the regulation the unemployment-wage falls, [[although the apartment will-be-paid him], [but only 345 Euro will be handed-over]]'
(`http://hartz.blogg.de/eintrag.php?id=80` [September 8, 2004])

[1]Some informants report that ellipsis between *ausgezahlt* and *bezahlt* is not easy to parse because of the preference to make the contrast between *ausge-* and *ausbe-*, and that the sentence improves if ellipsis operates over the pair *bezahlen* and *auszahlen*. The former are not a well-formed prefix group in German. Other informants find the attested example acceptable, and for this reason I chose to reproduce it here.

The word *ausgezahlt* ('give money to somebody') contains a separable item *aus-* originally meaning 'out' but which is lexicalized in this case, and a bound past participle prefix *ge-* which is added to participles. Although the word has both separable and inseparable morphemes, the stem *zahlt* can be elided across distinct clauses.

Note that the phenomena are not circumscribed to coordination structures either. Wiese (1996), Wilder (1997), and others observe that several other constructions also license word-part ellipsis. This includes comparatives, and constructions headed by verbs of comparison or of motion:

(17) a. How to distinguish neuro- from psycholinguistic claims.
b. The report compares a four- with a five-star luxury hotel.
c. I am more interested in pre- than in post-World War II.[2]

(18) a. Explain how signals move from a pre- to a post-synaptic neuron.
b. The passage from a pre- to a post-Vatican Council (...)

Di Sciullo and Williams (1987) argues that in these cases word parts must also be independent words, but such an account fails to explain exactly how a 'NP' *neuro-* is interpreted as *neurolinguistic claims* or how *a four-* is interpreted as *a four-star luxury hotel*. Moreover, nothing is said about why these reduced forms are ungrammatical in isolation: **Describe the behavior of a pre-*.

Booij (1985) provides further evidence from Dutch which are problematic for non-ellipsis accounts. Items with distinct categories which usually cannot coordinate may do so if a suffix is not present.

(19) a. [[zwanger]$_A$ [~~schap~~]$_N$]$_N$ en [[moeder]$_N$ [schap]$_N$]$_N$
pregnancy- and mother- hood
b. [[[ijs]$_N$ [~~beren~~]$_N$]$_N$]$_{NP}$ en [[bruine]$_A$ [beren]$_N$]]$_{NP}$
polar- and brown bears

This is easily explained in a deletion account. Note also that *ijsberen* is a compound and that *bruine beren* is not. Crucially, this kind of evidence shows that there are cases of *mixed* word-part and phrasal ellipsis. Consider data from German and English:

(20) a. eine Vollzeit~~ausbildung~~ oder berufsintegrierte Ausbildung
a full-time or integrated-into-job formation
b. Informations~~beauftragten~~ und andern Beauftragten
information and other agents
c. Tierschutz~~organisationen~~, entwicklungspolitischen
animal-protection, development-political
~~Organisationen~~ und religiösen Organisationen
and religious organizations

(21) a. It is neither un- nor overly patriotic to tread that path.
b. The ex- or current smokers had a higher blood pressure.

[2]Example taken from Alsina (1990).

c. Please list all publications of which you were the sole or co-author.[3]

Movement accounts – and more generally, extraction accounts – are problematic because one would have to allow sublexical items to move out into syntactic structure in (20a–c) and vice-versa in (21c,d), violating Lexical Integrity (Chomsky 1970).[4] Multidominance accounts like McCawley (1987) and others since then, or axiomatic-based approaches like Milward (1990), are also in trouble because in (21) the shared rightmost elements are categorically incompatible: one is phrasal while the other is sub-lexical.

The above evidence calls for a uniform account of phrasal and word-part ellipsis, preferably one that explains both phenomena via the same underlying mechanism. But before discussing ellipsis in more detail, I will briefly discuss some apparent challenges to semantic composition. In a deletion account of the elliptical data under consideration, semantic construction can proceed in a straightforward way. The syntax and semantics of (22a) are essentially the same as in the non-elided counterpart:

(22) a. Pro- and anti-abortion groups rally in Brooklyn.

b. Our team provides pre- and post-treatment support.

(23) Half-brothers and -sisters share either the same mother or the same father.

The most prominent reading of (22a) is one where two distinct groups rallied, which can be obtained with a standard parse for the NP: [*pro-~~abortion groups~~ and anti-abortion groups*]. The reading in which the groups are both pro-abortion and anti-abortion is odd on pragmatic grounds (i.e. [[*pro-~~abortion~~ and anti-abortion*] *groups*]). In (22b) the latter interpretation is possible. Support can concern both the pre-treatment stage as well as the post-treatment stage; [[*pre-~~treatment~~ and post-treatment*] *support*]. In sum, these readings can be captured without extra semantic composition machinery, by virtue of an elliptical operation that basically omits identical peripheral items.

But the view that these data can be captured by a standard semantic analysis is challenged by Artstein (2002). Therein it is argued that the kinds of phenomena we have been discussing in this paper should be obtained by coordination of word parts. It is also argued that the semantic interpretation is located in syntax, via a process called 'Phonological Decomposition'. In a nutshell, Artstein (2002) proposes that prosodic constituents should receive a a semantic analysis. This approach uses last resort operations that only apply to structures which are not already compositional (i.e. where it is argued that there is nothing other than phonology for the semantics to work with). Artstein (2005) concedes not having an account for ellipsis in non-coordinate environments, nor for instances where conjuncts are phrasal. Moreover, it is clear that this approach also runs into problems with cross ellipsis (as well as the Catalan data which I discuss in §3.3). But before dismissing this proposal

[3] Attested example taken from Huddleston et al. (2002, 1325, ft. 44). Another candidate is *They sell new and second-hand books*, also from Huddleston et al. (2002, 1283).

[4] See also the Generalized Lexical Hypothesis (Lapointe 1979,22) and the Word Structure Autonomy Condition (Selkirk 1982,70).

due to a reduced empirical coverage we must look at it in more detail and consider its motivation.

The account put forth in Artstein (2002) revolves around the affixoids *ortho-* and *perio-*, which are assumed to be semantically opaque and to simply denote strings of sounds as in examples like *ortho is dissyllabic* and *perio ends in a tense vowel* (Artstein 2002, 4). The etymological meaning is assumed to be irrelevant. But there are several problems with this view. First, an expression like *ortho is dissyllabic* is not evidence that affixoids can denote sound. This is a form of metalinguistic reference – discourse deixis – which any expression may be subjected to (*cat is monosyllabic* or *dogs is an anagram of gods*). Secondly, *ortho-* is not devoid of meaning. This prefixoid is productive with the meaning 'straight' in biological, medical, and physical science domains. Some examples are *ortho-positronium*, *ortho-cephalometrics*, *ortho-bionomy*, *ortho-phthaloyl chloride*, *ortho-Aminoanisole*, *ortho-chloro-phenols*, *ortho-arylation*, *ortho-substituted nitroaromatic compounds*, *ortho-chloroaniline*, and *ortho--phosphate*. The case is similar for *perio-* in the dentistry domain: *perio-implant*, *perio-prosthodontics*, *perio-therapeutics*, *perio-infection*, *perio-probe*, *perio- -prosthesis*, *perio-medical literature*, *perio-disease*, etc.. Note also that words productively obtained by these prefixoids can systematically undergo word-part ellipsis, while words in which these prefixoids have become lexicalized do not allow for word-part ellipsis (e.g. *orthography* and *periscope*).

Artstein (2005, 387) also offers an argument against ellipsis, by claiming that a deletion operation is implausible because it would have to apply only to coordinate structures like '*big and small monkeys*' but not to non-coordinate structures like **big with small monkeys*. This argument is unconvincing. First, nothing would be strange about having a phenomenon occurring in one kind of construction and not in other kinds. Second, this kind of ellipsis pattern (traditionally referred to as Right-Node Raising), is known to occur in a number of non-coordinate constructions, as noted in Hudson (1976), Goodall (1987, 97), Postal (1994), and Chaves and Sag (2007). Consider some naturally occurring counterexamples to Artstein (2005, 387):

(24) a. We tried to compare small with large firms.

c. It can be tailored to discriminate small from big gas molecules.

In sum, the analysis in Artstein (2002) does not scale to the full range of phenomena, and makes several problematic assumptions about ellipsis and about phonological elements having denotations.

The main motivation behind the proposals in Artstein (2002, 2005) stems from the observation that '*ortho and periodontists*' does not seem to be synonymous with '*orthodontists and periodontists*' in (25):

(25) a. Bill and Martha are ortho and periodontists.

b. Bill and Martha are orthodontists and periodontists.

The particular reading under scrutiny is one where Bill is an orthodontist and Martha is a periodontist. That interpretation is claimed to be possible for (25a) but not for (25b). Most of the native speakers I consulted actually consider this reading to be difficult to process. This seems unremarkable because *periodontists* is plural, not singular, and thus cannot predicate over a

non-pluralic NP. In fact, (25b) cannot have a *respectively* reading precisely because the complement conjuncts denote pluralities while the subject conjuncts denote individual atoms, and thus no pairwise mapping is possible.

I am therefore skeptical about the non-equivalence of the sentences in (25), as any apparent difference in interpretation is more likely to arise from performance factors. In favor of this I offer the data in (26). With plural subjects the effect disappears and the two counterparts are semantically equivalent on all of the possible readings (distributive, cumulative, or 'respectively'):

(26) a. The French and the Germans are excellent ortho and periodontists.
=
b. The French and the Germans are excellent orthodontists and periodontists.

3 General Properties of Ellipsis

So far we have observed that word-parts and phrases may be peripherally elided in certain constructions. The data in (20) and (21) above show that both kinds of ellipsis can occur simultaneously, which suggests that word-part and phrasal ellipsis should be analyzed in a uniform way, as forms of deletion rather than as direct coordination. More specifically, the claim is that there are only two kinds of operations, one for the right periphery and another for the left periphery, which can apply to phrasal and lexical structures in the same way. In this section I compare word-part ellipsis with phrasal ellipsis, and arrive at the conclusion that the core properties of both phenomena are in deed the same. See Chaves (2007, Ch.8) for a more detailed discussion about the superiority of deletion accounts over base generation accounts like Dowty (1988) *inter alia*.

In what follows I adopt the term Peripheral Ellipsis (PE), which I loosely borrow from Sag (1976). Consider first some examples of phrasal Left Peripheral Ellipsis (LPE):

(27) a. Someone gave a tulip to Mary, and a rose to Susan.
b. Several clues were discovered by me in 1982, and by Fred in 1993.
c. I gave your brother a coloring book, and a brand new bike to your sister.

(28) a. That boy and girl are really no different from each other.
b. Each tenant and landlord started to shout at each other.
c. The boy's uncle and aunt were kissing.

The data in (27) are often seen as instances of ellipsis not only for syntactic reasons, but also for semantic reasons. For instance, the sentences in (27) denote two propositions although only one verb is realized. The sentence in (27a) is ambiguous in the sense that ellipsis can apply at the level of VP coordination (in which ellipsis omits the string '*give*' and one single individual is the agent of both events) or at the level of S coordination (in which the elided string is '*someone gave*' and there are two possibly non-coreferential agents). Note that in (27b) the VP coordination interpretation is pragmatically

dispreferred because of the lexical entailments triggered by the verb '*discover*': usually something can only be discovered once.

Similarly, if (28a) is interpreted as NP coordination [*that boy and ~~that~~ girl*]$_{\text{NP}}$ then no further stipulations are needed to explain the plural verbal agreement, reciprocal semantic interpretation, as well as the singular determiner agreement. If [*boy and girl*] were to form a plurality then the determiner would have to agree in number **these boy and girl*.

Consider now some cases of phrasal Right Peripheral Ellipsis (RPE), as seen in (29). This phenomenon is usually associated with a contrastive prosody and prosodic break, and is traditionally referred to as Right-Node Raising (even though most accounts do not actually resort to movement).

(29) a. Mary *buys* and Bill *sells* used books.

b. Tom tried to *open* and Fred tried to *close* the car door.

c. Tracy is on the *cover of* and *featured in* the April 2006 issue.

d. Is deforestation *the only* or is it *the major* factor for primate extinction?

e. You said that deforestation was *the major* or that it was *the only* cause for primate extinction?

In what follows I compare the syntactic, semantic, and phonological underpinnings of phrasal PE and word-part ellipsis.

3.1 Structural Conditions

It is well-known that LPE is syntactically very limited. To begin with, this phenomenon only arises in coordination structures:

(30) a.*John gave a book to Mary although ~~gave~~ a rose to Sue.

b.*I try to not make noise when ~~I try to~~ sneak in late at night.

c.*The study compared people who support the president, with ~~people who support~~ the separation of church and state.

d.*If Tom gave a rose to Mary, then ~~Tom gave~~ a tulip to Sue.

This fact is also true of word-part ellipsis:

(31) a.*I want [anti-wrinkle cream with ~~anti-~~aging properties].

b.*Since the gene is inherited from the mother, [paternal half-brothers of ~~half-~~sisters] will not inherit anything.

Ross (1967), Sag (1976), Neijt (1979) and others have noticed various island constraint effects at work in LPE. For example, PPs and NPs in preverbal position cannot be partially elided in clausal coordination:

(32) a.*Books about math are dull and ~~books about~~ poetry are not.

b.*In London it was hot and ~~in~~ Paris it was cold.

c.*The boys and the girls have arrived but ~~the boys~~ were late.

d.*The shop that sells fossils is open and ~~the shop~~ that sells souvenirs is closed.

e.*A portrait of Turing was on the desk, and ~~a portrait~~ of Gödel was hanging on the wall.

Similar conditions apply in word-part LPE, because these only occur locally between conjuncts, and not over embedded elements:

(33) a. This is the best anti-wrinkle and -aging cream available.

b.*Anti-wrinkle cream is selling well and -aging lotion is too.

On the other hand, it is well-known that Right-Periphery Ellipsis is not sensitive to island constraints such as *wh*-islands, and the complex NP constraint (Wexler and Culicover 1980):[5]

(34) a. John wonders when Bob Dylan *wrote* and Mary wants to know when he *recorded* his great song about the death of Emmet Till.

b. I know a man who *sells* and you know a man who *buys* gold rings and raw diamonds.

c. Who does Mary *buy* and Bill *sell* pictures of?

Word-part instances of RPE are similar in this regard, because they are not sensitive to syntactic or morphological structure: word part ellipsis can target syntactically embedded elements as observed in data from Dutch in (15), and German in (16), but also in English, given sufficient contrastive stress (example (35b) is taken from Wilder (1997, 83)):

(35) a. We ordered the *hard-* but they got us the *soft*-cover edition.

b. Your theory *under-* while my theory *over*generates.

The same goes for morphological embedding. The example below from German shows the deletion of *fähigkeit* ('ability') which crosses several morphological boundaries:

(36) [[[Lern]$_N$-~~fähig]$_{Adj}$ keit]$_N$~~ und [[[kritik]$_N$-fähig]$_{Adj}$-keit]$_N$
learn- and critic-ability

The data in (34) is usually argued to provide strong evidence that RPE does not involve movement or multidominance. There are also a number of other well-known arguments in favor of this. For instance, Levine (1985) and McCawley (1987) note that anaphoric linkages are the same as in the corresponding non-RNR structures.

[5]For completeness, it should be noted that Postal (1998) argues that RPE need not be peripheral, as in examples like *Mike may have talked to* t_i *about love and certainly talked to* t_i *about marriage* [*the tall woman in the black dress*]$_i$. I share with Levine (2001, 163) the view that such examples are ungrammatical. Sabbagh (2007, 354) makes a claim similar to Postal's, but the data assessment is unconvincing. The examples that are offered involve ditransitive constructions in which the two objects can alternate in order. Thus, there is no reason to assume that non-peripheral ellipsis occurs in examples like *Josh will* [*donate* _ *to the library*], *and Maria will* [*donate* _ *to the museum*], *each of these old novels*, rather than standard peripheral ellipsis: *Josh will* [*donate to the library* _], *and Maria will* [*donate to the museum* _], *each of these old novels.* Other data given in Sabbagh (2007) are also prone to objections, including claims about conjunct semantic scope, see Chaves (2007: 86–89).

(37) Mary$_i$ *liked* and I thought she$_i$ *hated* that picture of her$_i$.

In sum, the 'displaced' strings behave as if they were on its original position. Abbott (1976) also notes that non-constituent elements can also be elided, (although some have argued that these cases can be seen as the result of multiple rightward extrapositions):

(38) a. Joan *offered* and Mary actually *gave* a gold Cadillac to Billy Schwartz.

b. I *borrowed* and my sisters *stole* large sums of money from the Chase Manhattan Bank.

c. John *flew* and Tom planned *to drive* to Paris on Monday.

The evidence thus suggests that both phrasal RPE and word-part RPE are the same kind of deletion phenomenon.[6] Further motivation for a uniform account of phrasal and word-part RPE is that both extend to comparatives and subordinates:

(39) a. It's interesting to compare people who *like* with the people who *dis*like, the power of the big unions.
(Hudson 1976)

b. The first experiment involved *a positively* while the second involved a *negatively* charged particle.

(40) a. The report compares a *four-* with a *five*-star luxury hotel.

b. Fred majored in *neuro-* while Mia majored in *socio*-linguistics.

The contrasts between phrasal LPE and phrasal RPE also have a counterpart in word-part ellipsis. Not only the domain of application of word-part LPE is more restricted than RPE, but certain cases only allow RPE. For instance, the German participle prefix *be-* and the negation prefix *un-* from English cannot undergo LPE, but can survive as remnants of RPE:

(41) a. *befahren und ~~be~~laden
sailing and loading

b. be~~laden~~ oder entladen
loading or unloading

(42) a.*Our dependence on unstable and -reliable suppliers.

b.*He is unable and -willing to provide a suitable environment.

c. Allow for un- or over-employment of the capital stock.

d. It wasn't un- or anti-American to criticize Bill Clinton.

Finally, I also note that simultaneous LPE and RPE is possible not only in instances of word-part ellipsis (as for instance, in (12) above), but also in phrasal instances of LPE and RPE:

[6]Vergnaud (1974), Jackendoff (1977), Kayne (1994) and others have noted challenging cases for the ellipsis account, such as *John has read, but he hasn't understood any of my books*, and *Fred was humming, and Sue was singing exactly the same song.* Here the purported non-elided counterparts are either not equivalent or not grammatical. See Beavers and Sag (2004) for a discussion of these cases and of how they can be captured in a deletion analysis.

(43) a. Did Mia manage to *see* and Bo actually *touch* the alleged ghost?

b. The suspect confessed to the police that he *buys* and to his lawyer that he sometimes even *sells* sexually explicit material.

3.2 Sense Identity Conditions

There are a number of relevant identity conditions at work in ellipsis. For instance, the semantic content of the elided items is relevant for Left-Peripheral Ellipsis (cf. Pullum and Zwicky (1986)):

(44) a. *I can tuna and be contacted by phone.

b. *John plays songs on Mondays and chess on Tuesdays.

c. *George fired his advisors and a gun in the oval office.

d. *John grew potatoes and weary of it.

The case is similar for RPE: cases such as (45) which force distinct interpretations for the shared elements are not felicitous. For instance, the problem with (45b) is that *bank* must be simultaneously interpreted as a financial institution and as a sand formation in the shore.

(45) a.*Sue had to erase, and Tom was asked to join, the board.

b.*I put the money, while Roger left the boat, in the bank.

In other words, the above violate the *Anti-Pun Ordinance* (Zaenen and Karttunen 1984, 316), whereby a phrase cannot be used in two different senses at the same time. This shows up in word-part ellipsis also. The cases in (46) are not felicitous because the elided elements and the non-elided counterparts have very different meanings.[7] In (46a) the noun *mills* must be simultaneously interpreted as a mechanism that converts a form of energy into rotary motion (for grinding, pumping water, sawing wood or hammering seeds), and as a building where grain is ground into flour (either powered by water, wind, engine or electricity). In (46b) the noun *boards* must refer both to a wide flat surface designed for writing and to a wood section. Thus, the relevant identity conditions for peripheral ellipsis are not strictly phonological.

(46) a.*We saw a landscape dotted with wind-~~mills~~ and flour-mills.

b.*We need new black~~boards~~ and floorboards.

c.*There stood a one-~~armed~~ and well-armed man.

d.*Did you find a fire~~trap~~ or a mousetrap?

[7]The example in (46a) is from Bauer (1998) and (46b) is taken from Artstein (2005). The example **I saw John put the papers in the safe, and in a difficult position by the local prosecutors* – noted by a reviewer – can be argued to be ruled out because *put* is simultaneously interpreted literally and metaphorically. However, I do not discard the possibility that active/passive distinction may be relevant for the ellipsis operation. It is often the case that linguistic phenomena are sensitive to diverse grammatical as well as extra-grammatical factors. For example, although examples like *I gave John a book and *(gave) a letter to Mary* suggest that ellipsis remnants must be thematically parallel, this oddness is more likely to result from performance factors, given data like *I gave your brother a coloring book, and a brand new bike to your sister.*

Müller (1990) and Smith (2000) also argue that less grammaticalized prefixoids are more easily elided than grammaticalized ones, and that verbal prefixes are more easily elided than nominal ones. This accounts for cases like the ones in (47) for instance, which involve ungrammatical deletion of phonological words in fully lexicalized compounds:[8]

(47) a. *I caught butter~~flies~~ and fireflies.
b. *We bought an hour~~glass~~ and a looking-glass.
c. *We need more floor~~boards~~ and cupboards.

If the degree of lexicalization is not as severe and if the meaning of the word-parts is recognizable then even a frozen word may be partially elided, as argued by Wiese (1992). One example of this can be seen in the morphemes composing the Dutch word *wiskunde* (lit. 'sure-knowledge'), which do not occur independently and have an idiosyncratic meaning:

(48) wis- en sterrenkunde
sure- and stars-knowledge
'mathematics and astronomy' (Booij 1985)

These data call for a lexicalist account, given that there are idiosyncrasies about the degree of lexicalization of compounds, and for an ellipsis operation that is sensitive to the semantics of the morph forms.

But if word-part RPE requires a very weak kind of semantic identity – morphological in nature – then one should expect that phrasal RPE is similarly weak. In deed, the latter does not go as far as to impose referential identity. For instance, nothing requires co-referentiality of the 'RNRaised' elements in the following examples.

(49) a. Sue thought of *writing* and Tom actually *wrote* a letter to Dean.
b. Fred *sent Mary* and Tim actually *handed Sue* a love poem.

In some cases the co-referential reading is possible, but in general it is not necessary. For example, it is well known that RPE allows for both strict and sloppy identity readings:

(50) Chris *likes* and Bill *loves* his friend.

In sum, both Left and Right Peripheral Ellipsis impose rather subtle semantic identity conditions that prevent the arbitrary deletion of peripheral items.

3.3 Phonological Conditions

As we have seen, semantic identity plays an important role both in word-part and in phrasal instances of Peripheral Ellipsis. But there are other relevant identity conditions, namely phonetic:

(51) a. *Tom said that *I* and Ann claimed that *she* is the best swimmer.
b. *I said that *the birds* but you claimed that *the cat* was ill.

[8]These have a very idiosyncratic meaning and have no productivity, cf. **butterbee*, **staring-glass*, and **bowlboard*.

c. *John *loves* and Mary *hates* herself/himself/themselves.

First, elements with different case markings can undergo phrasal RPE but only if marking does not show up phonologically. The data below from German can be seen as elliptical, rather than case syncretism:

(52) Er findet ~~Frauen~~$_{acc}$ und hilft Frauen$_{dat}$.
'he finds women and helps women'
(Ingria 1990)

The verb *findet* requires accusative complements and *hilft* requires dative complements, but the noun *Frauen* does not overtly show that case marking. The same kind of pattern is also true for word-part RPE:

(53) Weil Leituns~~wasser~~$_{nom}$ von Mineralwasser$_{dat}$ unterscheiden ist
Because flat water from mineral water differentiated is
(Wiese 1992)

A second similarity between word part and phrasal ellipsis is that the deletion site is identified with a pause or break, and the non-shared peripheral items typically receive a rising contrastive contour. In the case of word-part ellipsis this becomes more noticeable with larger structures (see also the discussion in Booij (1985, 150)):

(54) The difference between a *five*- and a *ten*-minute therapy session.

Booij (1985) proposes that word-part ellipsis results from a phonological process triggered by the presence of similar items adjacent to the coordinator. Booij observes that remnants must be able to receive phonological word status, which is independently motivated by the fact that compound and affixal items have the same stress patterns, and that both are independent domains of syllabification. This explains why the unrestricted ellipsis of phonetically identical strings is impossible:

(55) a. *Tom studies psycholin~~guistics~~ and sociolinguistics.
b. *Fred is both a alco~~holic~~ and a workaholic.

Although Booij seems to be correct about the phonological word status condition, he is wrong with regard about the idea that ellipsis is triggered by adjacency to the coordinator. First, we have already seen several non-coordinate instances of word-part ellipsis in §2. Second, as noted by Vigário and Frota (2002), the adjacency assumption is refuted by data from Catalan where the linear order of ellipsis of the adverbial suffix *-ment* ('-ly') occurs in reversed fashion. In the examples below, the adjective *psicològica* is unable to function as an adverb *per se*.

(56) Yo estic físicament i psicològica preparat.
I am physically and psychological prepared
'I am physically and psychologically prepared'

(57) *Yo estic física i psicològicament preparat.
I am physical and psychologically prepared

The inverted pattern of ellipsis that Catalan exhibits for the adverbial suffix is unique within Ibero-Romance languages. Spanish and Portuguese, for instance, delete the suffix *-mente* backwards, as usual. These phenomena are addressed in more detail in §5.3.

Wiese (1992,1996:69–72) and others have proposed purely phonological approaches in which phonological words may be deleted at the edge of a phonological phrase. Morphology is argued to be irrelevant because only word-parts with phonological word status can be deleted:

(58) a. *He was both a reaction~~ary~~ and a visionary.
b. *The goalkeeper recovered physical~~ly~~ and mentally.
c. *They were sing~~ing~~ and dancing.

However, we have seen that a purely phonologic analysis is inadequate, given that semantics and morphology also play an important role. The examples in (46) and (47) are not felicitous even though the deleted elements are phonological words. I subscribe to Smith (2000) in concluding that what is needed is a more general and integrated theory which takes into account the various syntactic, semantic, morphologic and phonologic factors.

Interestingly, similar phonologic conditions apply to phrasal instances of RPE. Elements which are not prosodically independent cannot be elided. For instance, pronouns and function words are usually unable to bear normal stress and thus must prosodify with an adjacent element. The fact that these are not phonologically independent explains the oddness of the following examples, due to Hankamer (1973) and Bresnan (1974):

(59) a. *Alice *composed* and Tim *performed* it.
b. *He tried *to persuade* but he couldn't *convince* them.

In the cases above, the pronouns are required to *lean* on a phonological word or a clitic group. Independent instances of this phenomenon are discussed in Zwicky (1986), which shows that unstressed personal pronouns must be able to attach prosodically to their selecting heads:

(60) a. *We took in him right away.
b. *Martha told Noel it.
c. *Across the plains came it.

(61) a. She destroyed him because of it.
b. He had taken it from them.

Not only the 'displaced' string must be phonologically independent, but also the remnant of ellipsis. This is illustrated in the example below, taken from McCawley (1988), in which the cliticised verb is separated from the complement:

(62) a.*I think that *I'd* and I know that *John'll* buy a portrait of Elvis.
b. I think that *I would* and I know that *John will* buy a portrait of Elvis.

This also explains why prefix stranding in post-nominal modifiers as shown in (63) from Portuguese, is very degraded. Prefixes must lean to the right and are in general unable to restructure with the nominal phrase on the left. In this particular case, there is nothing for *pré-* to lean on:

(63) ??Os impulsos transitam [de neurónios pré-] [para neurónios
the impulses move from neurons pre- to neurons
pós-sinápticos]
post-synaptic

This kind of ellipsis pattern can only be licensed if a very strong contrastive stress is placed on both prefixes, precisely because stress allows them to project their own independent prosodic units.

4 Phrasal Ellipsis: Recent Accounts

In this section I briefly compare several accounts of Peripheral Ellipsis in Minimalism and in constraint-based grammar, and conclude that the former lack in empirical coverage and stipulate a large set of non-trivial operations at interface stages. Constraint-based accounts on the other hand, allow to state the syntactic, semantic, morphologic, and phonologic constraints in a more natural way because these levels of description are locally and simultaneously available.

4.1 Peripheral Ellipsis in Minimalism

Ellipsis has recently been the topic of much attention, but many of the accounts in the Minimalism literature do not spell out in a clear and principled way the formal mechanisms and conditions required to achieve the intended results. This makes it difficult (or impossible) to evaluate and compare these proposals objectively. One of the most explicit accounts which addresses roughly the some phenomena presently under discussion is Wilder (1997). Therein it is argued that Right Periphery Ellipsis occurs in the phonological component PF, and that Left Periphery Ellipsis is best captured at LF.

In this approach there are two different ways of generating ellipsis sites: deletion of phonological material in LPE, and base-generation of empty items in RPE. Wilder (1997) notes that this view on forward deletion is not compatible with the Minimalist model, because of the standard assumption that syntactic structure must be projected from lexical material at the start of derivation. Wilder thus stipulates that there are special variants of ordinary lexical items, containing syntactic and semantic features, but lacking phonological content of their overt counterparts. Alternatively, it is conjectured that the insertion of <Pho> forms could be turned into a post-S-structure operation, where now the forward gaps would correspond to items that for some reason fail form insertion.[9]

Wilder (1997) proposes that LPE is conditioned by four structural conditions. These are the Head-Condition, Context-identity, Content-identity, and the Major Constituent Condition. Although it is claimed otherwise, these are fairly complex because they require traversing trees in search of certain structural relations between the target and the remnants of ellipsis. The Head-Condition states that an ellipsis site may not be c-commanded by an overt

[9] At this point, nothing is said about how the combinatorial explosion of possible ellipsis sites (created by the base-insertion of null forms) can be avoided. As it stands, forward deletion would cause the computational system to be extremely inefficient and redundant.

head inside its domain. This has the effect that a non-deleted head blocks ellipsis sites to its right. The Context-identity condition for LPE requires that the antecedent stands in the same hierarchical relation to its conjunct. The Content-identity condition for forward deletion requires that target and source have the same linguistic content at LF. Finally, the Major Constituent Condition (Neijt 1979) essentially stipulates certain island effects for deletion. Not only the latter is a stipulation, it is also empirically wrong because it rules out many cases in which the remnants are not sisters of the elided verbal head:

(64) Asimov gave a talk about relativity on Tuesday, and about natural selection on the day before.

Moreover, the already long set of conditions posited for Wilder (1997) is not sufficient to prevent the deletion of an entire conjunct:

(65)*Should I *just send* the papers to him or ~~should I *just send* the papers?~~

As for RPE, Wilder (1997) proposes an optional deletion operation which applies at the PF-component. This operation erases identical phonological material and is governed by a different set of constraints: the Peripherality constraint, Content-identity, and Context-identity. The Peripherality constraint states that an ellipsis site is right-peripheral in its domain. The Content-identity for RPE states that the phonological forms of the deleted item and the licensing item are identical. Finally, Context-identity for RPE establishes parallelism between source and target by requiring that the relation of an antecedent to its domain is identical to the relation of the ellipsis site. The latter constraint interacts with the Peripherality constraint to enforce that the licensor is also right-peripheral in its phonological domain.

Wilder (1997) does not explain what the assumed phonological representations look like, and thus it is not clear how these constraints can actually be checked. Moreover, the exact syntactic domain of application of the deletion rule is glossed over in Wilder (1997, 88). Further conditions are needed so that a pure PF-based analysis such as this one does not overgenerate, namely, in allowing deletion of semantically distinct homophonous items is not blocked, as discussed in §3.2. Other extensions to Wilder (1997) have been proposed in Johannessen (1998), for instance, in which Wilder's account is further complicated with an operation called *share*. This operation relies on extra configurational conditions, tree rearranging operations, and node-insertion operations.

Hartmann (2000) also argues that RPE results from an operation at PF. Hartmann's proposal hinges on the assumption that focus is rightmost after the right edge has been deleted. That is, when some element is focused, the right-adjacent items can be elided by a virtue of a prosodic phonology operation, namely of *deletion by focus*. However, such claim is at odds the example below, due to Postal (1974), where the focused elements are not at the edge, and the non-focused verbs can be uttered with a relatively flat prosody. In other words, focus does not directly correlate with a potential ellipsis site, and therefore deletion by focus cannot be the correct generalization.

(66) I find it *easy* to believe, but Joan finds it *hard* to believe – that Tom is a dishonest person.

Hartmann (2000, 141) also incorrectly assumes that in RPE, conjuncts must have identical syntactic structure. For some counter-examples see (38c), and the data in Wexler and Culicover (1980, 299) and Goodall (1987, 97). More recently Féry and Hartmann (2005) additionally claims that RPE and LPE are mirror image phenomena, which is known to be a problematic claim. As we have seen in §3, this cannot be true because unlike LPE, RPE extends beyond coordinate environments and imposes no island constraints. The two phenomena do have prosodic similarities, but there are many fundamental differences also.

In sum, the account in Wilder (1997) makes a number of assumptions about empty categories and base-generation, and postulates various conditions that have to perform non-trivial searches on the syntactic tree. Moreover, this account stipulates which constituents form islands, whereas islands in phrasal and lexical instances of ellipsis should ideally be predicted from independently motivated constraints. Finally, it remains unclear how the interactions between phonologic, morphologic, syntactic, and semantic constraints are to be captured at interface stages, given that most of these levels of description are formally underdeveloped in Minimalism.

Surface-oriented constraint-based frameworks like Head-Driven Phrase Structure Grammar offer a formally precise framework in which to state these kinds of interactions, and are ideal for this purpose because all of the various descriptive levels – phonology, morphology, syntax, and semantics – are locally and incrementally available.

4.2 Peripheral Ellipsis in HPSG

There are several accounts of phrasal ellipsis phenomena in HPSG, such as Yatabe (2001), Crysmann (2003), and Beavers and Sag (2004) among others. However, none of these takes into consideration the syntactic, semantic, and phonological properties of phrasal ellipsis that were discussed in §3. For example, none of these accounts resorts to semantic identity for LPE and none can deal with the fact that RNR can apply in non-coordinate constructions and target embedded constituents. However, a more recent refinement of this accounts is proposed in Chaves and Sag (2007), which offers a more comprehensive account of both LPE and RPE. That account is therefore ideally suited for the goal of providing uniform analysis of the data presently discussed. In what follows I briefly present Chaves and Sag's proposal, and proceed to show how the grammar can scale straightforwardly to word-part ellipsis phenomena. The HPSG formalization that I adopt here is in general terms based on the constructional grammar in Sag et al. (2003, Chp.16).

4.2.1 LPE and Linearization Domains

In order to set up the stage for the account of LPE, we must make a brief incursion into linearization theory. The phrase structure rules of HPSG abstract away from categories and from parts-of-speech, and focus on capturing subcategorization patterns. Thus, one rule captures head-complement constructions, another rule captures head-specifier constructions, others capture word-formation rules, and so on. A rule of the form $X \rightarrow Y\ Z$ is encoded in

terms of a feature structure as shown in (67), where *cx* is a polymorphic type that labels the construction (see Figure 1 below for an inventory of types):

(67) $cx \rightarrow \begin{bmatrix} \text{MTR} & \text{X} \\ \text{DTRS} & \langle \text{Y}, \text{Z} \rangle \end{bmatrix}$ which licences the tree:

This grammar rule basically states that in all of the feature structures of type *cx* it must be the case that the mother node has the constraints specified in *X* and the two daughters have the constraints specified in *Y* and *Z*.

Since types are organized in a type hierarchy, we can have grammar rules of different degrees of generality, capturing the fact that some constructions have properties in common. For example, in Figure 1 we see that headed constructions (all of which obey X-Bar Theory) have a supertype that encompasses head-complement, head-specifier, and head-modifier constructions.

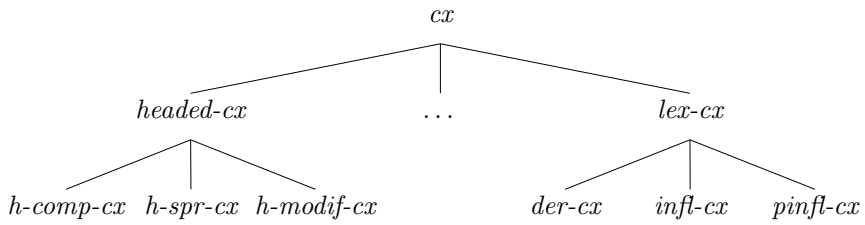

Figure 1: Fragment of a type hierarchy of constructions

Thus, we can declare that for all structures of the type *headed-cx* it is the case that the mother node and the head daughter have identical part of speech information. Similar rules apply in the case of lexical constructions – derivation, inflection and post-inflection word formation – some being more general and others more specific. I shall discuss these below in more detail.

The tree nodes in (67) are not atomic categories, but rather *signs*, represented in terms of feature structures that contain information about phonology (PHON), syntax (SYN), semantics (SEM), and linearizarion domains (DOM). In (68) an NP illustrated. The features SPR and COMPS are used to encode subcategorization constraints, i.e. specifiers and complements, respectively.

(68)
$$\begin{bmatrix} \textit{phrase} \\ \text{PHON} \ \langle \ \ldots \ \rangle \\ \text{SYN} \begin{bmatrix} \text{HEAD} \ \textit{noun} \\ \text{VAL} \begin{bmatrix} \text{SPR} & \langle\rangle \\ \text{COMPS} & \langle\rangle \end{bmatrix} \end{bmatrix} \\ \text{SEM} \ \ldots \\ \text{DOM} \ \ldots \end{bmatrix}$$
(hf. abbreviated as NP)

In this view, linear order is decoupled from syntactic structure (Pollard and Sag 1987; Reape 1994; Pollard, Kasper, and Levine 1994; Kathol 1995; Donohue and Sag 1999; Kathol 2000), which opens the way for a general and relatively uniform theory for languages with different degrees of word order freedom, like English, German, and Warlpiri. Linearization is encoded in a

feature DOM(AIN) rather than in the syntactic tree. Because the two description levels are separated, one can maintain a traditional notion of constituency while dealing with freer word order languages. Consider the examples in (69).

(69) a. I initially studied two particular cases.

b. I studied initially two particular cases.

c. I studied two particular cases initially.

For example, one can attribute exactly the same syntactic structure to all of these sentences. This is made possible by allowing the adverbial DOM list to *interleave* with the DOM list of the VP, via a non-deterministic relation called *shuffle* '$\bigcirc$' (Reape 1994). This relation joins two lists as long as the original linear order is maintained, e.g. $\bigcirc(\langle a, b\rangle, \langle c, d\rangle) = \langle a, b, c, d\rangle \vee \langle a, c, b, d\rangle \vee \langle a, c, d, b\rangle \vee \langle c, a, b, d\rangle \vee \langle c, a, d, b\rangle \vee \langle c, d, a, b\rangle$.

Thus, (69c) is obtained with the parse tree depicted in Figure 2, where the relevant list interleaving step is $\langle$[*studied*],[*two particular cases*]$\rangle \bigcirc \langle$[*initially*]$\rangle$ = $\langle$[*studied*],[*initially*],[*two particular cases*]$\rangle$. The other possible orderings seen in (69) correspond to the other possible resolutions of this shuffle constraint. Below, bracketing indicates linearization domain boundaries.

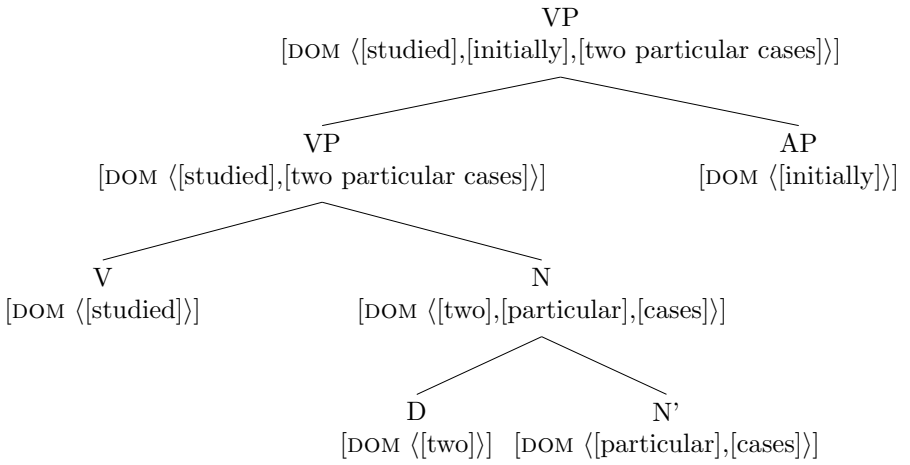

Figure 2: An example of domain composition

A VP category is simply a phrase of *verb* part-of-speech with partially saturated valence specifications, more precisely, with an empty complements list (COMPS), and a non-empty specifier list (SPR). An S differs only in that the specifier list is also empty.

In some nodes the list of domains is 'compacted'. For example, the NP *two particular cases* is compacted into a single domain object as it is selected by the verb in the head-complement phrase. In general, adjuncts and complement phrases are compacted (although in some cases the compaction can be partial, but for perspicuity I shall gloss over this matter). The adverbial domain is allowed to interleave with the sentential domain but compaction prevents it from mixing with the verbal arguments, ruling out cases like **I studied two initially*

particular cases. Compaction will also be very important for predicting island effects in LPE, as discussed below.

Consider for example the head-specifier construction (*h-spr-cx*), in the grammar fragment found in Sag et al. (2003, Chp.16). Among other things, this rule allows a N' category to combine with a specifier, via the SPR feature. In English, it is additionally required that the domain element in the determiner must precede the nominal domain. The result of these two is illustrated in the NP in Figure 3.[10]

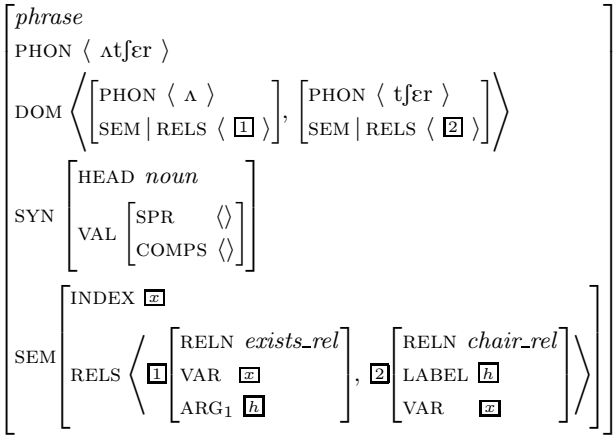

Figure 3: NP *a chair*

Boxed tags like 1 play the role of variables over linguistic descriptions. Note that he members of the DOM list are signs, which means that they also contain the various levels of phonologic, syntactic and semantic description. The reason for this is that word order phenomena depends on a blend of syntactic, semantic, and phonological factors.

The order by which the elements in DOM appear is restricted by a set of language-specific Linear Precedence (LP) constraints which can state, for instance, that the DOM elements contributed by a specifier daughter always precedes the DOM elements contributed by the head daughter. Thus, the admissible orders in DOM determine the possible phonological realizations. This is formalized by a grammar rule due to Reape (1994) that identifies the PHON value of any given phrase with the concatenation ('$\oplus$') of the domain elements PHON values :

(70) CONSTITUENT ORDER PRINCIPLE (preliminary version)

$$\textit{phrase} \rightarrow \begin{bmatrix} \text{PHON } \boxed{1} \oplus \ldots \oplus \boxed{n} \\ \text{DOM } \left\langle \left[\text{PHON } \boxed{1}\right], \ \ldots, \ \left[\text{PHON } \boxed{n}\right] \right\rangle \end{bmatrix}$$

The coordination rule proposed by Chaves and Sag (2007) uses these DOM lists to state the relevant LPE constraints, taking inspiration from Crysmann

[10]The semantic representation is a list of relations, which in this case can be rendered in a more familiar format as: $\exists x\,(\textit{chair}(x))$. See Copestake et al. (2006) for more about this flat and feature-based semantic representation language.

(2003) and Beavers and Sag (2004). Coordination is a binary branching construction of the form $X \rightarrow X\ X_{crd+}$ where the rightmost conjunct is marked by a coordination lexeme (i.e. is specified as *crd+*). The rule can apply recursively because the mother node is underspecified for *crd* marking.

As we have seen, sense identity is a relevant condition for LPE. Chaves and Sag (2007) capture this in terms of *predicate name* identity. For example, the two subformulas $give(x, y)$ and $give(z, k)$ are identical up to sense identity because they are built from the same predicate name '*give*'. In HPSG terms this amounts to identity of RELN values, in peripheral domain elements.

Ellipsis arises from mapping identical linearized predicates from distinct signs to a single realization, as long as these elements are both on the left periphery of the two daughters. More explicitly, each conjunct contains a non-empty list of domain elements $\langle d_0, ..., d_k, d_{k+1}, ...d_i\rangle$ and $\langle d'_0, ..., d'_k, d'_{k+1}, ..., d'_j\rangle$ respectively, and the coordination rule roughly states two things: first, there are (possibly empty if $k = 0$) peripheral sublists $\langle d_0, ..., d_k\rangle$ and $\langle d'_0, ..., d'_k\rangle$ which are identical under sense identity, and second, that the mother's domain corresponds to $\langle d_0, ..., d_k,\ d_{k+1}, ...,\ d_i, d'_{k+1}, ..., d'_j\rangle$. Thus, there is only one occurrence of the identical sublists in the mother's domain list:

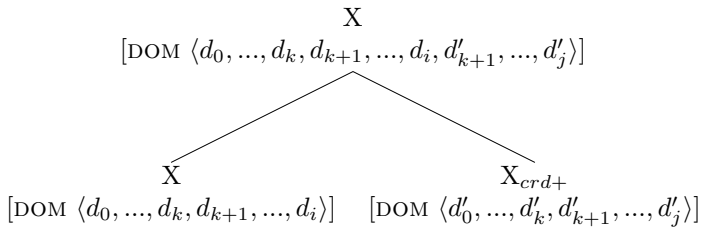

Figure 4: LPE of linearized elements in coordination (schematic)

The actual coordination rule is given in (71). Each of the RELN values in the left-peripheral lists of both conjuncts is required to be pairwise identical, up to predicate name identity.

(71) Coordination Construction

coord-cx →

$$\left[\begin{array}{l}\text{MTR}\left[\begin{array}{l}\text{DOM } \boxed{L}\oplus\boxed{A}_{ne-list}\oplus\boxed{M}\left\langle\left([conj]\right)\right\rangle\oplus\boxed{B}_{ne-list}\\ \text{SYN } \boxed{0}\end{array}\right]\\ \text{DTRS}\left\langle\left[\begin{array}{l}\text{DOM } \boxed{L}\left\langle\begin{array}{c}\left[\text{SEM}\mid\text{RELS}\left\langle\left[\text{RELN }\boxed{R_{00}}\right],\ldots,\left[\text{RELN }\boxed{R_{0n}}\right]\right\rangle\right]\\ ,\ldots,\\ \left[\text{SEM}\mid\text{RELS}\left\langle\left[\text{RELN }\boxed{R_{m0}}\right],\ldots,\left[\text{RELN }\boxed{R_{mk}}\right]\right\rangle\right]\end{array}\right\rangle\oplus\boxed{A},\\ \text{SYN } \boxed{0}\end{array}\right],\right.\\ \left.\left[\begin{array}{l}\text{DOM } \boxed{M}\oplus\left\langle\begin{array}{c}\left[\text{SEM}\mid\text{RELS}\left\langle\left[\text{RELN }\boxed{R_{00}}\right],\ldots,\left[\text{RELN }\boxed{R_{0n}}\right]\right\rangle\right]\\ ,\ldots,\\ \left[\text{SEM}\mid\text{RELNS}\left\langle\left[\text{RELN }\boxed{R_{m0}}\right],\ldots,\left[\text{RELN }\boxed{R_{mk}}\right]\right\rangle\right]\end{array}\right\rangle\oplus\boxed{B}\\ \text{SYN } \boxed{0}\\ \text{CRD}+\end{array}\right]\right\rangle\end{array}\right]$$

for $n, m, k \geq 0$

The tag $\boxed{M}$ is the (optional) conjunction and $\boxed{L}$ is the left periphery of the left conjunct $\langle d_0, ..., d_k \rangle$. Ellipsis is optional because nothing requires that the peripheral lists be non-empty. In case the $\boxed{L}$ list is not empty, LPE is licensed if the semantic relations in each domain element are identical to the ones in the peripheral domains of the second daughter. For an illustration, consider the VP coordination in (72).

(72) [DOM ⟨ [gave] [a book] [to Mary] [and] ~~[gave]~~ [a rose] [to Sue] ⟩]

This realization is obtained via the coordination structure in Figure 5. The list $\boxed{M}$ contains the conjunction lexeme, and the remainder lists $\boxed{A}$ and $\boxed{B}$ contain the lists of domain elements that are not involved in ellipsis. Put informally, the constraints are resolved as: $\boxed{A}$ = ⟨[*a book*], [*to Mary*] ⟩ and $\boxed{B}$ = ⟨[*a rose*], [*to Sue*]⟩.

Note also that arbitrary elisions are not permitted because only domain elements can be omitted. For instance, because nominal arguments and adjuncts are compacted for linearization purposes, the following ungrammatical LPE instances are also ruled out as illustrated by (73):

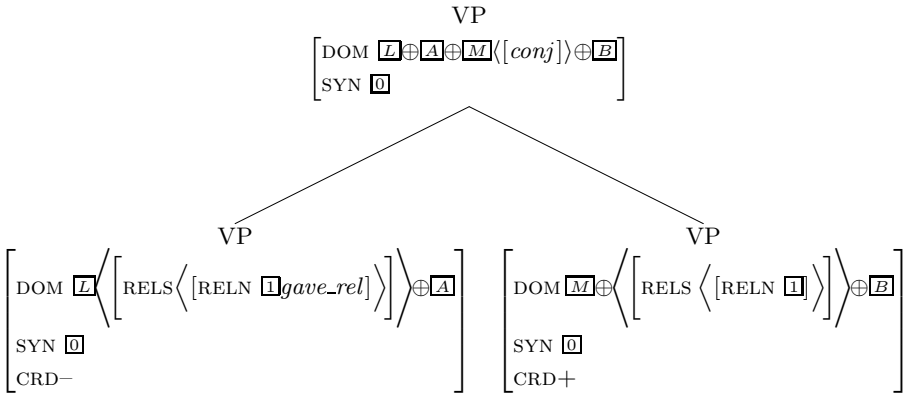

Figure 5: LPE in VP coordination

(73) a.*[Every man] [sang] [and] [~~every~~ woman] [danced].

b.*[The best swimmer] [lost] and [~~the best~~ runner] [won].

c.*[Some of them] [were] [in favor] [and] [~~some of~~ us] [were] [against].

d.*[In London] [it] [was] [hot] [and] [~~in~~ Paris] [it] [was] [cold].

e.*[The boys and the girls] [arrived] but ~~[the boys]~~ [were] [late].

f.*[The shop that sells fossils] [is] [open] [and] [~~the shop~~ that sells souvenirs] [is] [closed].

g.*[A portrait of Turing] [was] [on the desk], [and] [~~a portrait~~ of Gödel] [was] [hanging] [on the wall].

These require no extra stipulations because the coordination construction is unable to split compacted domains. It is not possible to match the elided domain with an identical domain in the left periphery because in these structures adjuncts and the subcategorized NPs have been compacted as they become sisters of the head node. LPE is allowed in structures where where full compaction has not occurred:

(74) a. [Tim] [gave] [a rose] [to Mary] [and] ~~[Tim] [gave]~~ [a tulip] [to Sue]

b. [Every] [man] [and] ~~[every]~~ [woman] [praised] [each other]

Note also that the coordination rule in (71) does not require phonological identity in LPE, which in turn predicts cases like (75), where the elided element and the remnant are semantically identical but have different morphophonological realizations.

(75) a. There was one call yesterday, and two calls on the day before.

b. Is the bridge too tall, or the waters too shallow?

4.2.2 RPE and Morphophonology

The RPE account put forth in Chaves and Sag (2007) boils down to a general ellipsis rule that allows the deletion of non-initial independent phonological

constituents, under morphophonological identity. Ellipsis is local and conditioned by the prosodic boundaries which are determined by independent phonological constituency conditions. That is, if the phonological structure contains several constituents, then these are eligible to undergo RPE.

Following Inkelas and Zec (1990), I assume that phonological structure is processed locally and incrementally, similarly to what occurs in syntax and semantics in HPSG. This enables the account to straightforwardly deal with embedded instances of RPE in which the 'RNRaised' elements are not clause final and/or do not correspond to intonational phrases:

(76) a. [Another important factor is the faith in, or at least the *comprehension* of, inequity], [whether it truly exists or not].

b. Those [[of whom and to whom] he speaks] are carefully selected.

c. [Pre- and post-revolutionary France] were very different.

The case in (76c) is of particular interest to the present paper. Because the affixoid *pre-* is stressed, it can project an independent prosodic phrase. This prominence creates a juncture and the following material is de-accented. In a similar way, the contrastive stress placed on *post-* creates a break and allows it to project an independent prosodic phrase. The result is that the NP is associated to a sequence of phonological phrases, eligible for RPE under morphophonological identity as seen in Figure 6.

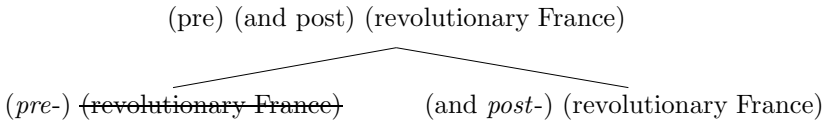

Figure 6: Prosody and Ellipsis

In order to represent phonological domains, I extend the level of representation of phonological representations to include morph forms and prosodic constituency, via a new feature called M(ORPHO)P(HONOLOGY):

(77)
$$\begin{bmatrix} \textit{sign} & \\ \text{MP} & \textit{list}\left(\begin{bmatrix} \textit{morphphon} & \\ \text{PHON} & \begin{bmatrix} \textit{phon} \\ \text{UNITS} \ \textit{list(phon)} \end{bmatrix} \\ \text{FORM} & \textit{list(form)} \end{bmatrix}\right) \\ \text{SYN} & \textit{syn} \\ \text{SEM} & \textit{sem} \\ \text{DOM} & \textit{list(sign)} \end{bmatrix}$$

The type *phon* subsumes the types of the possible phonological units, such as σ (syllables), ε (feet), ω (phonological words), C (clitic groups), ϕ (phonological phrases), I (intonational phrases), and U (utterances):

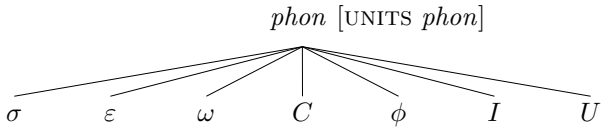

Figure 7: A type hierarchy of phonological layers

Each of these levels can impose further restrictions on the level immediately below. One can for instance specify that ε introduces a non-empty list of σ units, and so on, depending on the kind of layering one chooses to adopt here. I am assuming a prosodic phonology based on Selkirk (1986), Nespor and Vogel (1986), Hayes (1989), and others, although my analysis does not hinge on any particular incarnation of phonological constituency.

While phonological descriptions are specified in the [PHON *phon*] feature, the feature FORM, taken from Beavers and Sag (2004), contains the respective morph forms. For example, there are at least two lexical entries for the verb *lie*. One contains a verb morph form lie_1, which inflects as *lay*, *lain*, *laid*, while the other lexical entry contains a verb morph form lie_2, which inflects as *lied* and derives the nouns *lie* and *liar*. Both morph forms are subtypes of a more general type over which other derivational patterns are specified (e.g. both have the same present and present participle form *lies* and *lying*).

Signs can now be described in more detail, with a representation that includes information about morphophonological, syntactic, and semantic representations. Consider the the verb '*to like*':[11]

(78)
$$\left[\begin{array}{ll}
\textit{word} & \\
\text{MP} & \boxed{1}\left\langle\left[\begin{array}{ll}\text{PHON} & \left[\begin{array}{ll}\omega & \\ \text{UNITS} & \left\langle\left[\begin{array}{ll}\varepsilon & \\ \text{UNITS} & \left\langle\left[\begin{array}{ll}\sigma & \\ \text{UNITS} & \langle \text{lajk} \rangle\end{array}\right]\right\rangle\end{array}\right]\right\rangle\end{array}\right] \\ \text{FORM} & \langle \textit{like} \rangle\end{array}\right]\right\rangle \\
\text{SYN} & \boxed{2}\left[\begin{array}{ll}\text{HEAD} & \left[\begin{array}{ll}\textit{verb} & \\ \text{VFORM} & \textit{fin}\end{array}\right] \\ \text{VAL} & \left[\begin{array}{ll}\text{SUBJ} & \langle \text{NP}_{\boxed{i}} \rangle \\ \text{COMPS} & \langle \text{NP}_{\boxed{j}} \rangle\end{array}\right]\end{array}\right] \\
\text{SEM} & \boxed{3}\left[\text{RELS}\left\langle\left[\begin{array}{ll}\text{RELN} & \textit{like}_1\textit{_rel} \\ \text{ARG1} & \boxed{i} \\ \text{ARG2} & \boxed{j}\end{array}\right]\right\rangle\right] \\
\text{DOM} & \left\langle\left[\begin{array}{ll}\textit{word} & \\ \text{MP} & \boxed{1} \\ \text{SYN} & \boxed{2} \\ \text{SEM} & \boxed{3} \\ \text{DOM} & \langle\rangle\end{array}\right]\right\rangle
\end{array}\right]$$

[11] I follow in general terms Donohue and Sag (1999) in assuming that simple words contain a singleton domain list with an empty domain list.

Phonological representations are combined according to an independent theory of phonology, articulated by function F_A. This function operates on every phrase licensed by the grammar, and is responsible for assembling and aligning linearized phonological representations according to general principles. The Constituent Order Principle in (70) is thus reformulated:

(79) Constituent Order Principle (final version)

$$cx \rightarrow \left[\begin{array}{l}\textsc{mtr} \left[\begin{array}{ll}\textsc{mp} & F_A(\boxed{1} \oplus \ldots \oplus \boxed{n}) \\ \textsc{dom} & \left\langle \left[\textsc{mp}\ \boxed{1}\right], \ldots, \left[\textsc{mp}\ \boxed{n}\right] \right\rangle \end{array}\right] \end{array}\right]$$

This grammar rule states that, in every construction, the MP information conveyed in the linearized daughter domains must be combined in the mother's MP, by that order. With normal stress and speech-rate, the function F_A yields the prosodic structure seen in Figure 8 for an NP like '*a book*' (the representation of feet and syllables are left out for brevity).

$$F_A\left(\left\langle \left[\begin{array}{l}\textsc{ph}\left[\begin{array}{l}\omega \\ \textsc{units}\ \langle \text{ʌ} \rangle\end{array}\right] \\ \textsc{fm}\ \langle a \rangle\end{array}\right], \left[\begin{array}{l}\textsc{ph}\left[\begin{array}{l}\phi \\ \textsc{units}\left\langle \left[\begin{array}{l}C \\ \textsc{units}\left\langle \left[\begin{array}{l}\omega \\ \textsc{units}\langle \text{bʊk} \rangle\end{array}\right] \right\rangle\end{array}\right] \right\rangle\end{array}\right] \\ \textsc{fm}\ \langle book \rangle\end{array}\right] \right\rangle\right) =$$

$$\left\langle \left[\begin{array}{l}\textsc{ph}\left[\begin{array}{l}\phi \\ \textsc{units}\left\langle \left[\begin{array}{l}C \\ \textsc{units}\left\langle \left[\begin{array}{l}\omega \\ \textsc{units}\langle \text{ʌ} \rangle\end{array}\right], \left[\begin{array}{l}\omega \\ \textsc{units}\langle \text{bʊk} \rangle\end{array}\right] \right\rangle\end{array}\right] \right\rangle\end{array}\right] \\ \textsc{fm}\ \langle a, book \rangle\end{array}\right] \right\rangle$$

Figure 8: A possible phonological composition for '*a book*'

It is well-known that the elements that follow a stressed word are usually de-accented and separated by a break or pause. If the standard prosodic constituency conditions are met, the elements following the stressed content word may reside in an independent phonological constituents as illustrated in (80), in which both main verbs are contrastively prominent and the following elements are situated in an independent intonational phrase:

(80) $$\left[\textsc{mp} \left\langle \left[\begin{array}{l}\textsc{ph}\ [^{I}\text{wɪ lajk}] \\ \textsc{fm}\ \langle we, like \rangle\end{array}\right], \left[\begin{array}{l}\textsc{ph}\ [^{I}\text{bʊks}] \\ \textsc{fm}\ \langle books \rangle\end{array}\right], \left[\begin{array}{l}\textsc{ph}\ [^{I}\text{bʌt pæt hejts}] \\ \textsc{fm}\ \langle but, pat, hates \rangle\end{array}\right], \left[\begin{array}{l}\textsc{ph}\ [^{I}\text{bʊks}] \\ \textsc{fm}\ \langle books \rangle\end{array}\right] \right\rangle\right]$$

In this view, RPE is seen as a speaker-driven simplification strategy by which repeated material which is prosodically independent is allowed to be omitted. RPE is defined as a deletion operation that targets non-initial phonologic constituents in the MP list, under morphophonologic identity. This intu-

ition can be captured via a non-branching rule that allows a list of independent prosodic constituents $\boxed{R}$ to be omitted in the mother:

(81) RPE Construction

rpe-cx →

$$\left[\begin{array}{l}\text{MTR}\ \left[\text{DOM}\ \left\langle\left[\begin{array}{ll}\text{MP} & \boxed{A}\oplus\boxed{B}\oplus\boxed{R}\\ \text{SYN} & \boxed{1}\\ \text{SEM} & \boxed{2}\\ \text{DOM} & \boxed{3}\end{array}\right]\right\rangle\right]\\ \text{DTRS}\ \left\langle\left[\begin{array}{ll}\text{MP} & \boxed{A}_{ne-list}\oplus\boxed{R}_{ne-list}\oplus\boxed{B}_{ne-list}\oplus\boxed{R}\\ \text{SYN} & \boxed{1}\\ \text{SEM} & \boxed{2}\\ \text{DOM} & \boxed{3}\end{array}\right]\right\rangle\end{array}\right]$$

The sentence in (80) is thus eligible for undergoing RPE as follows:

$$\left[\text{DOM}\ \left\langle\left[\text{MP}\ \left\langle\left[\begin{array}{l}\text{PH}\ [{}^{I}\text{wɪ lajk}]\\ \text{FM}\ \langle \textit{we, like}\rangle\end{array}\right],\left[\begin{array}{l}\text{PH}\ [{}^{I}\text{bʌt pæt hejts}]\\ \text{FM}\ \langle \textit{but, pat, hates}\rangle\end{array}\right]\right\rangle\oplus\boxed{R}\left\langle\left[\begin{array}{l}\text{PH}\ [{}^{I}\text{bʊks}]\\ \text{FM}\ \langle \textit{books}\rangle\end{array}\right]\right\rangle\right]\right\rangle\right]$$

$$\Big|$$

$$\left[\text{MP}\left\langle\left[\begin{array}{l}\text{PH}\ [{}^{I}\text{wɪ lajk}]\\ \text{FM}\ \langle \textit{we, like}\rangle\end{array}\right]\right\rangle\oplus\boxed{R}\oplus\left\langle\left[\begin{array}{l}\text{PH}\ [{}^{I}\text{bʌt pæt hejts}]\\ \text{FM}\ \langle \textit{but, pat, hates}\rangle\end{array}\right]\right\rangle\oplus\boxed{R}\right]$$

Figure 9: Right Periphery Ellipsis of '*books*'

In this case the elided material corresponds to a simple NP, but nothing prevents any other structure from being rightwards elided. As long as the phonologic constituent is independent, RPE can apply. This means that if RPE applies to a clause then then the elided elements are intonational phrases, and that if RPE applies to phrases, then the elided elements are probably phonological phrases or smaller phonologic constituents. This allows us to explain why ellipsis of word-parts across clausal coordination requires a very strong prosodic contrast, without appeal to stipulations since the account is based on independently motivated prosodic assumptions.

5 Scaling the Account to Word-part Ellipsis

We have seen a number of empirical arguments in favor of a general and uniform deletion account of peripheral ellipsis, and argued that the data is best accounted for in a theory in which the various syntactic, semantic, and morphophonologic levels of description are locally and incrementally available. In what follows the analysis of phrasal ellipsis is extended so that the word-part ellipsis phenomena under discussion are also accounted for. The extension does not entail major changes to the original proposal. Rather, it will scale up in a straightforward and systematic way by introducing general word-formation lexical rules. In §5.1 I focus on word-part LPE, §5.2 addresses word-part RPE, and in §5.3 discusses adverbial suffixes in Ibero-Romance.

5.1 Word-Part LPE

My account of LPE hinges on linearization constraints specified by word formation rules. As such, we are also able to capture idiosyncrasies pertaining to ellipsis of certain word-parts. Let us start with bound affixes. While compounds and words with affixoids typically allow LPE, bound affixes don't:

(82) a. *The cut will heal quicker or ~~quick~~ly?

b. *It was deemed inoperable and ~~in~~tolerable.

c. *This mission is impossible and ~~im~~ponderable.

d. *This is completely unjust and ~~un~~acceptable.

e. *The child is awake or ~~a~~sleep?

We can account for this by specifying that these lexical items have singleton linearization domain elements. In other words, the stem and the affix are compacted in these lexical structures. Consider the adverbial suffixation rule for English given below, formulated as a derivational lexical construction:[12]

(83) Adverbial Lexical Derivation Construction

adv-der-cx →

$$\left[\begin{array}{l}\text{MTR}\left[\begin{array}{l}\textit{lexeme}\\ \text{SYN}\ \boxed{2}\\ \text{SEM}\ \boxed{3}\\ \text{DOM}\left\langle\left[\begin{array}{l}\textit{lexeme}\\ \text{MP}\ F_A\left(\boxed{1}\oplus\left\langle\left[\text{PH}\left[\begin{array}{l}\sigma\\ \text{UNITS}\left\langle \text{li}\right\rangle\end{array}\right]\right]\right\rangle\right)\\ \text{FM}\ \langle ly\rangle\\ \text{SYN}\ \boxed{2}[\text{HEAD}\ adv]\\ \text{SEM}\ \boxed{3}\left[\begin{array}{l}\text{INDEX}\ \boxed{4}\\ \text{RELS}\left\langle\left[\begin{array}{l}\text{RELN}\ manner\_rel\\ \text{ARG}\ \boxed{4}\end{array}\right]\right\rangle\oplus\boxed{5}\end{array}\right]\end{array}\right]\right\rangle\end{array}\right]\\ \text{DTRS}\left\langle\left[\begin{array}{l}\textit{lexeme}\\ \text{MP}\ \boxed{1}\\ \text{SYN}\mid\text{HEAD}\ adj\\ \text{SEM}\left[\begin{array}{ll}\text{INDEX}&\boxed{4}\\ \text{RELS}&\boxed{5}\end{array}\right]\end{array}\right]\right\rangle\end{array}\right]$$

[12]The constructional rules that I adopt follow in general terms Sag et al. (2003, chp.16), and are very much in line with 'Construction Morphology' (Booij 2005). Note however that nothing in the present account hinges on a particular theoretical view on word formation, and is in principle compatible with both realizational or morpheme-based morphology, already explored elsewhere in the HPSG framework (Trost 1993; Krieger and Nerbonne 1993; Orgun 1996; Riehemann 1998; Koenig 1999; Crysmann 2002).

This general rule obtains adverbial lexemes from adjectival lexemes, and is responsible for both the phonological, morphological, semantic, and syntactic aspects of this process. With regard to linearization, the rule construes a domain element that extends the adjectival sign with regard to phonology and semantics. As before, the composition of MP in the mother node is determined by general and independent phonology alignment rules specified in F_A, which in this case adds an extra syllable to the root's phonological word.[13] The crucial aspect for the present account is that there is only one domain element in the linearization list DOM and therefore word-part LPE as in *quicker or ~~quick~~ly* is impossible.

A lexical rule account also allows us to capture other cases where LPE is not allowed, even though the word parts are prosodically independent and the word formation process is productive.

(84) a. *John outran (Bill) or -swam Patrick?
b. *Outdancing and -singing me this year won't be easy.

The prefixation rule that allows *out-* to derive a transitive verb from an adjective or intransitive verb, is also responsible for a number of peculiar properties. For example, it must apply before regular inflection (cf. confront $[out[smart]_A]_V$ and $[[out[smart]_A]_V ed]_V$ with **smarted*), the prefix attracts the main word accent, and there is a *better/more-than* interpretation, not found in any homophonous independent word *out*. Some of these aspects are more idiosyncratic than others, but the pattern involves several kinds of morphohological information that an account such as the one currently pursued can deal with because all the relevant levels of linguistic description are lexically available. Thus, although the preposition *in* has the same distribution as *out* in most contexts, it cannot be used as a prefix in this construction, as shown in **I indanced you = I danced less/worse than you*.

As far as the present approach is concerned, the lexical rule for *out-* prefixation is assumed to yield a word containing one domain element, similarly to other affixation rules like (83). The existence of a singleton linearization domain has the effect that word-part LPE is correctly ruled out, as in (84a).

On the other hand, compounding allows for LPE. This is accounted by assuming that compounds have a non-atomic lexical linearization domain. That is, a compounding lexical rule attributes to '*gold-mining*' a DOM list with two elements: [DOM ⟨[*gold*],[*mining*]⟩]. Note that one this assumption is made, one immediately obtains word-part LPE phenomena via the rule in (71) from §4.2, which can omit sub-lexical linearization domains.

The idea of allowing lexical items to contain non-atomic linearization domains has been proposed before the literature. For instance, Nunberg et al. (1994:513) make such an assumption when considering idiom parts, given that some idioms allow for some degree of discontinuity, and Kathol (1995) argues for this move when accounting for fronting of *separable* verbal prefixes in German:

[13] This lexical rule is simplified here for exposition purposes, as it must incorporate extra constraints over the classes of adjectives that can derive an adverb, and specify what categories this adverb is able to modify.

(85) daß Heike auf- hört
that Heike up- hears
'that Heike stops'

(86) hört Heike auf
hears Heike up
'does Heike stop?'

In Kathol's system, this is achieved by specifying lexically that the linearization domain of this word consists of two domain elements, one for the particle and another for the inflected verb, which can interleave and be realized in non-adjacent positions:

(87)
$$\begin{bmatrix} \textit{word} \\ \text{SYN} \begin{bmatrix} \text{VCOMPL} & \langle\rangle \\ \text{HEAD} & \boxed{1}\textit{verb} \end{bmatrix} \\ \text{DOM} \left\langle \begin{bmatrix} \text{FRM} & \langle \textit{hört} \rangle \\ \text{SYN} & \begin{bmatrix} \text{VCOMPL} & \langle \boxed{2} \rangle \\ \text{HEAD} & \boxed{1} \end{bmatrix} \end{bmatrix} \right\rangle \bigcirc \left\langle \begin{bmatrix} \text{FRM} & \langle \textit{auf} \rangle \\ \text{SYN} & \boxed{2} \end{bmatrix} \right\rangle \end{bmatrix}$$

In my proposal, lexical compounding rules and some instances of word formation with affixoids yield non-atomic lexical domains. In English the relative order of word-parts is not flexible, and thus the lexical rules can specify the order directly in the domain list. Consider the noun '*house-cleaning*' provided below (I simplify the phonological representation of the two phonological words for perspicuity).

(88)
$$\begin{bmatrix} \textit{word} \\ \text{MP} \left\langle \boxed{1}\begin{bmatrix} \text{PH} & [^{\omega}\ \text{haws}] \\ \text{FM} & \langle \textit{house} \rangle \end{bmatrix}, \boxed{2}\begin{bmatrix} \text{PH} & [^{\omega}\ \text{klinɪŋ}] \\ \text{FM} & \langle \textit{cleaning} \rangle \end{bmatrix} \right\rangle \\ \text{SYN} \mid \text{HEAD} \mid \textit{verb} \\ \text{SEM} \begin{bmatrix} \text{INDEX} & \boxed{e} \\ \text{RELS} & \left\langle \begin{bmatrix} \text{RELN} & \textit{house\_rel} \\ \text{ARG} & \boxed{y} \end{bmatrix}, \begin{bmatrix} \text{RELN} & \textit{clean\_rel} \\ \text{SIT} & \boxed{e} \\ \text{ARG} & \boxed{x} \end{bmatrix} \right\rangle \end{bmatrix} \\ \text{DOM} \left\langle \left[\text{MP}\ \langle \boxed{1} \rangle\right], \left[\text{MP}\ \langle \boxed{2} \rangle\right] \right\rangle \\ \text{ARG-ST}\ \langle\ \rangle \end{bmatrix}$$

This kind of lexical entry suffices to allow the coordination rule in (71) to license LPE in compound words in exactly the same way as phrasal LPE is obtained. This is illustrated in (89). In the coordination node the domains are not compacted, and so LPE car occur, informally: DOM ⟨[house], [cleaning], [and], ~~[house]~~, [repairing]⟩.

(89) House-cleaning and -repairing is an ongoing process for many people.

The structure that licences ellipsis in this example is shown in Figure 10.

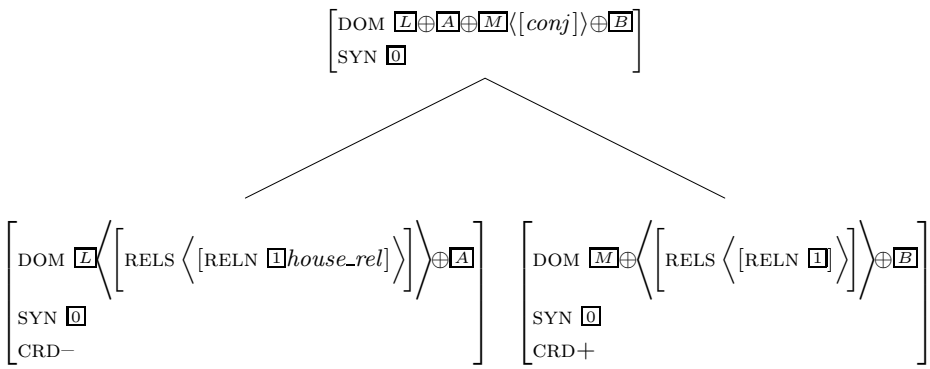

Figure 10: LPE in NP coordination

As discussed in §4.2.1, NP domains are compacted as they become an argument of a subcategorizing. This is done for linearization purposes, for example, so that adverbs are unable to occur discontinuously 'inside' compounds: **I forget about house-usually-cleaning.*[14] However, this compaction also predicts that long-distance LPE is not possible because it would require splitting compacted domain elements, as shown in the S coordination and VP coordination examples in (90).

(90) a.*[Anti-wrinkle cream] [is] [generally] [recommended] [and] [~~anti-~~aging lotion] [is] [too].
b.*[Half-brothers] [will] [inherit] [the gene], [and] [~~half-~~sisters] [will] [not].
c.*[I] [interviewed] [half-brothers] [today] [and] [~~half-~~sisters] [yesterday].

Compound words like the one in (88) can be obtained in a systematic way via compounding rule (which is a sub-type of post-inflectional construction) formalized as follows:

(91) Lexical Compounding Construction
compd-cx →

$$\begin{bmatrix} \text{MTR} & \begin{bmatrix} word \\ \text{SYN} \mid \text{VAL} \mid \text{COMPS} \ \langle\rangle \\ \text{DOM} \ \boxed{A}\oplus\boxed{B} \end{bmatrix} \\ \text{HEAD} & \boxed{3} \\ \text{DTRS} & \left\langle \begin{bmatrix} word \\ \text{SEM} \mid \text{INDEX} \ \boxed{5} \\ \text{DOM} \ \boxed{A} \end{bmatrix}, \boxed{3} \begin{bmatrix} word \\ \text{SYN} \mid \text{VAL} \mid \text{COMPS} \ \langle [\text{INDEX} \boxed{5}] \rangle \\ \text{DOM} \ \boxed{B} \end{bmatrix} \right\rangle \end{bmatrix}$$

In this compounding rule, the second daughter is a relational noun that subcategorizes for a PP complement via COMPS. Basically, the compounding rule is allowing this complement to be incorporated at the word level, binding the index variable 5 to the variable introduced by the non-head daughter.[15]

[14]Expletive insertions like *un-bloody-likely*, *cali-freaking-fornia*, and *abso-fucking-lutely* are a different phenomenon which patterns with phonologic boundaries.

[15]For more elaborate accounts of compounding, using morphological valence features to select lexical arguments, see Krieger and Nerbonne (1993) and Reinhard (2001).

Semantic inheritance is ensured by a more general principle which states that the semantics of the mother node corresponds to the append of the semantic contribution of each daughter. Again, the value of the mother's MP corresponds to the composition of the two phonological units introduced by each daughter, as specified above.I also assume that non-atomic linearization domains can be obtained in word formation with affixoids, most of which corresponding to Greek or Latin words, that only attach to independent words (e.g. *anti-*, *hyper-*, *inter-*, *macro-*, *micro-*, *multi-*, *neuro-*, *over-*, *poly-*, *socio-*, *under-*, as well as *-fold*, *-like*, and *-self*).

Some lexicalized compounds like *wiskunde* (viz. (48)) are specified in the lexicon as containing two domain elements, while other lexicalized words which are no longer perceived as compounds in any way like *orthography*, *neurology*, *periscope*, and *telescope*, are listed in the lexicon as containing a singleton domain element. Thus, only the latter cannot be partially elided.

5.2 Word-Part RPE

Affixes like *-ic*, *-al*, *-ate*, *-ion*, *-ity*, *-y*, *-ing*, *-ly*, *-er*, *-ful*, *de-*, *in-*, and many others are prosodically dependent of their hosts. Accordingly, the phonological composition function F_A should never attribute them an independent prosodic status. This has the desired consequence that the RPE rule in (81) cannot licence the following:

(92) a. *The company cannot afford to be im- nor overproductive.
b. *There was an increase of ex- and imports.
c. *Ann pressed a key accidental- and inadvertently.
d. *He was both a reaction- and a visionary.
e. *They were sing- and dancing.

On the other end of the spectrum we have compound words, which are formed with elements that do have phonological word status. In case RPE occurs in N coordination, one can expect that the amount of contrastive stress is fairly small, but in instances of word-part RPE in, for instance NP coordination or S coordination, the need for stress increases. This is as one would expect, since the 'RNRaised' units stand on their own. Given sufficient stress, a compound part can even project an independent intonational phrase for instance.

See for instance the word '*meat-eater*' represented below, containing two independent prosodic units:

(93)
$$\begin{bmatrix} \textit{word} \\ \text{MP} \left\langle \boxed{1}\begin{bmatrix}\text{PH} & [\omega\ \text{mit}] \\ \text{FM} & \langle \textit{meat} \rangle\end{bmatrix}, \boxed{2}\begin{bmatrix}\text{PH} & [\omega\ \text{itr}\rangle] \\ \text{FM} & \langle \textit{eater} \rangle\end{bmatrix} \right\rangle \\ \text{SYN} \mid \text{HEAD}\ \textit{noun} \\ \text{DOM} \left\langle \left[\text{MP}\ \langle \boxed{1} \rangle\right], \left[\text{MP}\ \langle \boxed{2} \rangle\right] \right\rangle \\ \text{ARG-ST}\ \langle\ \rangle \end{bmatrix}$$

This word does not trigger the creation of a more complex prosodic element because I am assuming that only phrasal signs project units higher in the prosodic hierarchy. If unstressed, these word parts will end up in the same phonological phrase. However, if *meat* were to be stressed, then this element can project an independent phonological phrase. In turn, RPE would be licensed according to the *rpe-cx* rule presented in (81). This case is illustrated below, which consists in an instance of RPE at the NP coordination level (phonological structure is abbreviated for exposition purposes):

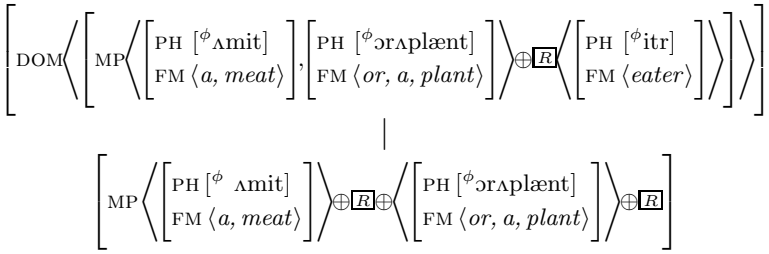

Figure 11: Word-part Right Periphery Ellipsis of '*eater*'

Since this deletion rule occurs locally, and syntax, semantics, and phonology are incrementally and locally construed, we can straightforwardly capture cases where ellipsis is peripheral only in the local domain in which it occurs. For instance, in (94) the ellipsis of *mining* occurs at the level of the AP coordination phrase, not at the S level.

(94) a. The last chapter of the book talks about [modern *copper-* and medieval *gold*-mining]$_{\text{AP}}$ techniques.

b. This disorder is [over- and mis-diagnosed]$_{\text{AP}}$ in many cases.

Mixed phrasal and word-part ellipsis is also accounted for because these units can likewise receive an independent prosodic status, even though they were introduced in structurally very different nodes:

(95) eine Vollzeit~~ausbildung~~ oder berufsintegrierte Ausbildung

Nothing in this account enforces the category of the internal non-shared items to be identical, which accounts for (19), repeated here as (96):

(96) [[zwanger]$_A$ [~~schap~~]$_N$]$_N$ en [[moeder]$_N$ [schap]$_N$]$_N$
pregnancy- and mother- hood

All the sublists in the *rpe-cx* rule are required to be non-empty, and thus the account does not allow for '~~*examples*~~ *and counterexamples*' or '*counter-*~~*examples*~~ *and examples*'. However, this stipulation can be dropped if we state that some element in the list $\boxed{A}$ is semantically contrasted with some element in $\boxed{B}$. This move allows to intuitively capture yet another fact about RPE in a straightforward way. See Kuhn (1996), Gundel (2003), Haji-Abdolhosseini (2003), and Wilcock (2005) for accounts of information structure in HPSG.[16]

[16]A reviewer points out that **Robin seems, and Leslie tried, to be a spy* is not acceptable. This infelicity may be due to pragmatic reasons rather than to ellipsis, such as the contrasting a verb

In the present account, simultaneous LPE and RPE can be obtained as a result of a sequence of *coord-cx* and *rpe-cx* rule applications. Consider the German example in (12), depicted in Figure 12 (for perspicuity, the values of MP and DOM are simplified). The prosodically contrasted word-parts *vor* ('pre-') and *nacht* ('post-') are stressed, and thus the supervening units can be elided from the right periphery. On the other hand, LPE is licensed because these compounds contain non-atomic linearization domains with identical elements in the left-periphery.

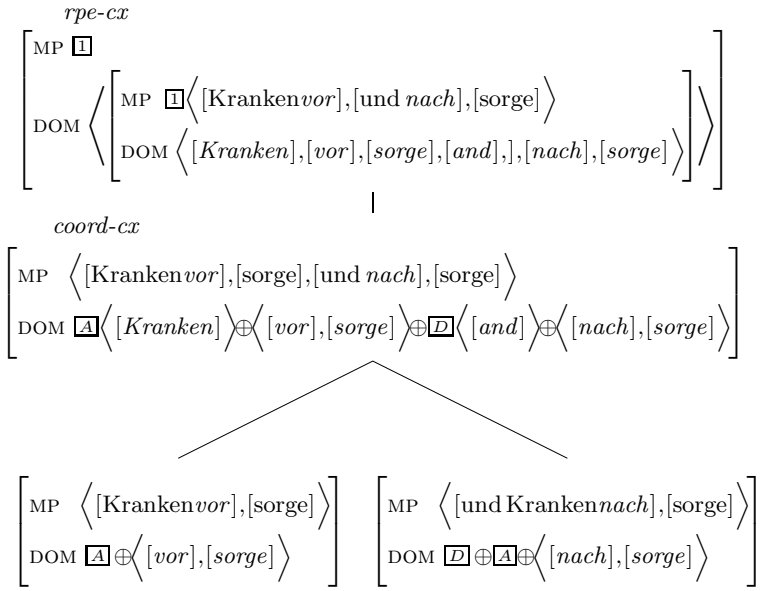

Figure 12: RPE & LPE: *Krankenvor~~sorge~~ und ~~Kranken~~nachsorge*

Note that in the coordination structure the mother node only contains one domain element for the word '*Kranken*', because of LPE. According to the Constituent Order Principle in (79), the phonological information found in the mother node is obtained from the domain elements. Thus the elided domain element is not considered as input to the F_A function, and so the mother's phonological representation only contains one occurrence od the word '*Kranken*'. The top node contains a compacted domain element, in which the MP value exhibits both LPE and RPE. The value of the mother's MP is, by virtue of the Constituent Order Principle, obtained from the values of MP in that domain list. In this case the domain list is singleton and therefore the phonology of the mother 1 is identical to the phonology of the unique domain element.

With regard to RPE, the case of affixes which have phonological word status is very similar to the case of compound words. These can be deletion targets as illustrated in data from various languages:[17]

that does not attribute a subject semantic role with a verb that does. I presently have no solution to resolve this matter, and limitations prevent further discussion.

[17]See Booij (1985) for Dutch and see Vigário (2003) for Portuguese.

(97) a. [[zicht]$_V$~~baar~~]$_{Adj}$ en [[tast]$_V$baar]$_{Adj}$ (Dutch)
visible and tangible

b. [[Hilf]$_N$~~los~~]$_{Adj}$ und [[Hoffnungs]$_N$los]$_{Adj}$ (German)
helpless and hopeless

c. [[subtil]$_{Adj}$~~mente~~]$_{Adv}$ e [[eficaz]$_{Adj}$mente]$_{Adv}$ (Portuguese)
subtly and effectively

Since there is evidence for attributing phonological word status to these suffixes, F_A must align the derived lexical items with multiple phonological words. This in turn means that the *rpe-cx* rule licences the above phenomena, exactly in the same way RPE in compounds is licensed.

For example, observe the contrast between a level 2 prefix '*un-*', and the level 1 prefix '*in-*'. The former does not fuse with the stem (strong boundary), while the latter does (weak boundary):[18]

(98) a. Allow for un- or over-employment of the capital stock.
b. It wasn't un- or anti-American to criticize Bill Clinton.
c. These measures will minimize both un- and over-employment.

(99) *The company cannot afford to be im- nor overproductive.

A stressed prefix like '*un-*' is sufficiently independent to stand alone, but it cannot be deleted as shown in (100):

(100) a. *Our dependence on unstable and -reliable suppliers.
b. *He is unable and -willing to provide a suitable environment.
c. *The food is still untouched and -spoiled.

The situation is not very different for prefixes like '*be-*' and '*ge-*' from Dutch. Booij (1985) shows that these are not good candidates for phonological words, and attributes them the status of syllables that attach to a phonological words (as *appendix to phonological words*). However, RPE can occur if these prefixes are stressed, which suggests that they can project (at least) phonological words if contrastively stressed:

(101) a. *be*~~laden~~ oder *ent*laden
loading or unloading

b. *befahren und ~~be~~laden
sailing and loading

In sum, the above affixation patterns always yield a singleton domain object. This move rules out LPE. On the other hand, if these affixes are contrastively stressed, then F_A can attribute them some prosodic independence, which in turn allows them to participate in a (limited) range of RPE phenomena. I say limited because from this analysis it follows that suffixes can only undergo local instances of RPE. This is because affixes cannot in general project *I*s or even ϕs. This is illustrated with RPE of the adverbial suffix *-mente*, which is possible in Ibero-Romance languages like Portuguese:

[18] Cf. well-known assimilation phenomena: [m] before a labial, e.g. *immature*; [ ] before a velar, e.g. *incorrect*; [r] before /r/, e.g. *irrelevant*; [l] before /l/, e.g. *illegal*.

(102) a. O advogado agiu rápida e eficientemente?
the$_{mas}$ lawyer$_{mas}$ acted rapid and efficiently

b. *O homem agiu rápida ou agiu lentamente?
the$_{mas}$ man$_{mas}$ acted rapid or acted slowly

The suffix cannot be elided in VP coordination (nor in S coordination) because the phonological structure [$^{\phi}$ *discutiu educada*] [$^{\phi}$ *mente*] is impossible. Affixes cannot project an independent phonological phrase, regardless of stress (see also §5.3).

Consider two possible phonological realizations licensed by F_A for stressed '*UNstable*' and destressed '*unstable*'. In (103a) the prefix is stressed and yields an independent ω. This realization allows for RNR of the stem. In contrast, in (103b) no special stress is attributed and the phonology consists in a single ω, and the main word stress is located in *stáble*.

(103) a.
$$\begin{bmatrix} \textit{word} \\ \text{MP} \left\langle \boxed{1}\begin{bmatrix}\text{PH} & [\omega\ \text{ʌn}] \\ \text{FM} & \langle \textit{un} \rangle\end{bmatrix}, \boxed{2}\begin{bmatrix}\text{PH} & [\omega\ \text{stejbl}\rangle] \\ \text{FM} & \langle \textit{stable} \rangle\end{bmatrix} \right\rangle \\ \text{SYN} \mid \text{HEAD} \ \textit{adj} \\ \text{DOM} \left\langle \left[\text{MP} \ \langle \boxed{1}, \boxed{2} \rangle \right] \right\rangle \\ \text{ARG-ST} \ \langle\ \rangle \end{bmatrix}$$

b.
$$\begin{bmatrix} \textit{word} \\ \text{MP} \left\langle \boxed{1}\begin{bmatrix}\text{PH} & [\omega\ \text{ʌnstejbl}] \\ \text{FM} & \langle \textit{un,stable} \rangle\end{bmatrix} \right\rangle \\ \text{SYN} \mid \text{HEAD} \ \textit{adj} \\ \text{DOM} \left\langle \left[\text{MP} \ \langle \boxed{1} \rangle \right] \right\rangle \\ \text{ARG-ST} \ \langle\ \rangle \end{bmatrix}$$

In both cases the lexical description contains a singleton domain element, which has the effect of ruling out word-part LPE. This is a systematic result of the lexical *un-* prefixation rule.[19]

5.3 Ibero-Romance Adverbial Reduction

The ellipsis of the adverbial suffix occurs in Portuguese, Catalan, and Spanish. While widespread in Portuguese, this phenomenon is marked as formal usage in Spanish, In modern Catalan it is not very frequent in corpora, but it is still considered part of the norm. Portuguese and Spanish are similar in this regard, since they exhibit the usual pattern of ellipsis:

(104) Yo estoy física, técnica y psicológicamente preparado.
I am physical, technical and psychologically prepared
(Spanish)

[19]Semantically, I assume this lexical rule basically takes a stem with a 'positive' meaning and negates it. Thus, one has *unhappy* and *unstable* but not **unsad* and **untragic*. See Horn (2002,2005) for more discussion on the semantics of this prefix.

(105) a. Eu estou física, técnica e psicologicamente preparado.
I am physical, technical and psychologically prepared

b. (...) foi adoptado tanto nacional como internacionalmente.
was adopted as national as internationally
'was adopted nationally as well as internationally'
(Portuguese)

Torner (2005) has recently argued that the Spanish *-mente* is a phrasal affix that can attach to adjectives as well as coordinate Adjectival Phrases. This would account for the fact that it is not possible to share the adverbial suffix across VP or S conjuncts, as noted in (102b). In my account, the adverbial suffix cannot be elided across VPs conjuncts because of independently motivated facts about prosodic phonology, namely that suffixes cannot project a phonological phrase by themselves. For example, [$^{\phi}$*o homem agiu gentil*] [$^{\phi}$*mente*] is not possible (e.g. no pauses or parenthetical clauses are admissible between the adjective and the adverbial suffix). On the other hand, both the adjective and the suffix are phonological words ($^{\omega}$*gentil*) ($^{\omega}$*mente*), and RPE is licensed, without requiring major stress assignment or a pause. The locality effect observed in RPE of *-mente* results from the fact that only independent prosodic units can undergo RPE, and from the fact that phonological structure is assembled incrementally, in parallel with syntactic and semantic structure.

Torner (2005) runs into at least two problems which a deletion approach does not have. First, this account requires the suffix to somehow look inside the structure of the AdjP to avoid cases where the head would not be adjacent to the suffix. Consider the data below, where *preocupadamente*, and *consternadamente* are adverbs:

(106) *Vivo [preocupada y consternada por las noticias] -mente
I-live preoccupied$_{fem}$ and shaken by the news -ly

A second problem is that the account is not general enough to capture the Catalan data. This is relevant because this language is closely related to Spanish and Portuguese. In Catalan adverbial reduction has the reverse pattern of ellipsis. According to the norm, the suffix *-ment* ('-ly') may only be elided in non-initial conjuncts:

(107) Yo estic físicament i tècnica preparat.
I am physically and technical prepared
'I am physically and technically prepared'

Further evidence for language-specific constraints is provided by the impossibility of adverbial reduction in other languages, including Italian and French where this suffix is etymologically the same:[20]

(108) a. *Il portiere é fisica e psicologicamente preparato.

b. *Le gardien de but est physique et psicologiquement préparé.
'the goalkeeper is physical and psychologically prepared'

[20]Originally, this item was an autonomous Latin word *mens* or *mentis* ('mind' or 'spirit') in ablative case (Hopper and Traugott 1993:100).

In fact, adverbial suffix ellipsis was possible in Old French (Grevisse 1936, 255) and in Old Italian (Ashby 1977, 44). So although the suffix *-mente* is an autonomous phonological word in Romance in general, it has lost some of its independence in Italian and French.[21] This is another example of a morpho-phonological idiosyncrasy which is best accounted for lexically, as a specification of the adverbial derivation rule for a given language. More specifically, the lexical rule for adverbial derivation in modern French and Italian should always fuse the adverbial suffix with the stem.

Not only the Catalan ellipsis pattern is (to my knowledge) unique in the languages that I considered, it is very restricted to the class of structures it applies. Catalan has the standard ellipsis ordering pattern for Peripheral Ellipsis and Gapping. Moreover, even other cases of word-part ellipsis show the usual pattern:[22]

(109) a. Inter o intraestatal
inter or intra-state

b. pre o postinstal·lació de l' arxiu
pre- or post-installation of the archive

c. afro i euroasiàtic
afro and euroasiatic

In sum, adverbial suffix ellipsis in Catalan seems to be only possible with adverbial coordination constructions. This idiosyncrasy suggests that Catalan has a special strategy adverbial reduction rule. This kind of adverbial reduction strategy for Catalan can be captured by the following ellipsis rule:

(110) *adv-redux-ctx* →

$$\left[\begin{array}{l}\text{MTR}\ \left[\text{DOM}\left\langle\left[\begin{array}{l}\text{MP}\ \ \boxed{A}\oplus\boxed{R}\oplus\boxed{B}\oplus\boxed{D}\\ \text{SYN}\ \ \boxed{1}\\ \text{SEM}\ \ \boxed{2}\\ \text{DOM}\ \ \boxed{3}\end{array}\right]\right\rangle\right]\\ \text{DTRS}\left\langle\left[\begin{array}{l}\text{MP}\ \ \boxed{A}_{ne-list}\oplus\boxed{R}\left\langle\left[\text{FM}\ \langle ment\rangle\right]\right\rangle\oplus\boxed{B}_{ne-list}\oplus\boxed{R}\oplus\boxed{D}\\ \text{SYN}\ \ \boxed{1}[\text{HEAD}\ \ adv]\\ \text{SEM}\ \ \boxed{2}\\ \text{DOM}\ \ \boxed{3}\end{array}\right]\right\rangle\end{array}\right]$$

Although there are two occurrences of *-ment* in the daughter, by virtue of the two lists $\boxed{R}$, only the suffix of the initial conjunct occurs in the mother node. The list $\boxed{D}$ is what allows the rule to apply recursively, in order to deal with coordinate structures that have more than two conjuncts. Below a simple example is provided for illustration.

(111) [[física] [ment] [i] [tècnica] ~~[ment]~~]$_{Adv}$

[21] For a brief discussion on Spanish see Suñer (1975), for instance. In the case of modern Romanian, there are no adverbial inflections.

[22] Example (109c) is from Vigário and Frota (2002).

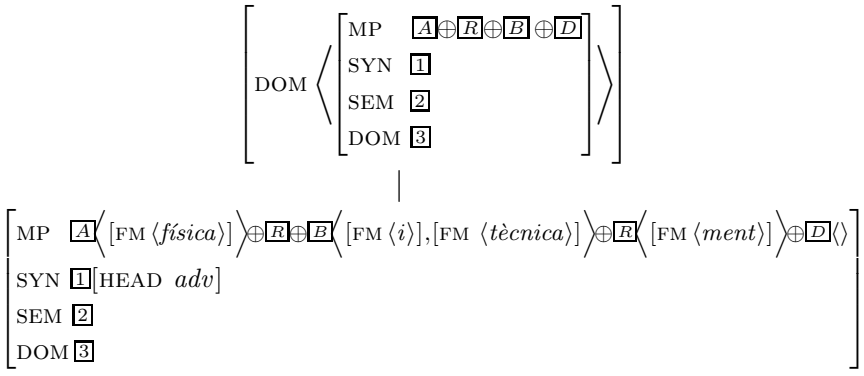

Figure 13: Analysis of the adverbial reduction in (111)

Finally, we must prevent the *-ment* suffix from being deleted by the *rpc-cx* rule in (81). This is only possible in Castilian and Portuguese. I shall therefore assume that in Catalan the RPE rule applies only to non-adverbial daughters. This can be done by adding the constraint [SYN [HD ¬*adv*]].

5.4 On Lexical Integrity

Toman (1985) points out that the possibility of word-complexes being transparent is not inconsistent with the old idea that words are islands. A similar view is held in Bresnan and Mchombo (1995), where prosodically conditioned ellipsis of sub-lexical items is seen as unproblematic for Lexical Integrity.

In my account, the rules of word structure formation are independent from those governing syntactic structure and syntactic operations do not affect the internal structure of words. In fact, syntax is unable to access the underlying word structure tree. The grammar rules cannot access DTRS recursively because the feature DTRS is not appropriate for descriptions of the type *sign*. On the other hand, my analysis does allow morpho-phonological strings to be visible for syntax in FRM and PHON. But there are cases in which this access is independently motivated, for instance the English indefinite determiner '*a*' (as opposed to '*an*') combines only with phrases which start with consonants, consonantal vowels (as in '*a unique animal*', or '*a European individual*'), and *h*- words with an unstressed syllable (like '*a HIStory book*', as opposed to '*an hisTORical moment*'). In fact, Booij (2005) has recently argued against the hypothesis of A-morphous morphology (Anderson 1992), based on evidence indicating that morpho-phonological rules in Dutch need to have some kind of internal access to compound and derived words alike.

Conclusion

This paper shows how peripheral ellipsis of word-parts and phrases can be uniformly accounted as essentially the same phenomenon: left periphery ellipsis deletes independent linearized items under sense identity in coordinate structures, regardless of these being phrasal or sub-lexical, and right periphery

ellipsis deletes prosodically independent items, under morph identity. Several cases involve mixed phrasal and lexical ellipsis which cannot easily be captured by sub-lexical or movement-based approaches. A uniform account emerges from taking into account a blend of factors, including key observations from morpho-phonology, and from a general theory of ellipsis that amounts to local constraints between daughter and mother nodes.

The account makes several correct predictions, including the fact that the size of the remnants and the elided material is correlated with the prosodic contrast that is necessary for right-periphery ellipsis. This is so because this ellipsis phenomenon applies locally to prosodically independent elements, and because of the independent fact that certain elements require pauses and stress in order to be prosodically independent. My approach captures a wide range of ellipsis patterns in both coordinate and non-coordinate constructions, while obtaining certain 'island' effects as the result of independently motivated linearization constraints. Some issues remain open, however, and further study of gramaticalization and productivity factors, as well as of morphophonology, are needed to advance the understanding of the phenomena.

References

Abbott, B. (1976). Right node raising as a test for constituenthood. *Linguistic Inquiry 7*, 639–642.

Alsina, A. (1990). *Predicate composition: a theory of syntactic funciton alternations*. Phd. thesis, Stanford University.

Anderson, S. (1992). *A-morphous Morphology*. Cambridge: Cambridge University Press.

Artstein, R. (2002). Coordination of word parts: a surface level account. In G. Katz, S. Reinhard, and P. Reuter (Eds.), *Proceedings of the Sixth Annual Meeting of the Gesellschaft für Semantik*, University of Osnabrück, pp. 1–15.

Artstein, R. (2005). Coordination of parts of words. *Lingua 115*(4), 359–393.

Ashby, W. (1977). *Clitic Inflection in French: An Historical Perspective*. Amsterdam: Rodopi.

Bauer, L. (1998). When is a sequence of two nouns a compound in English? In *English Language Linguistics 2*, pp. 65 – 86.

Beavers, J. and I. A. Sag (2004). Ellipsis and apparent non-constituent coordination. In S. Müller (Ed.), *Proceedings of the 11th International Conference on Head-Driven Phrase Structure Grammar, Katholieke Universiteit Leuven*, pp. 48–69. Stanford: CSLI Publications. `http://cslipublications.stanford.edu/HPSG/5/`.

Booij, G. (1985). Coordination reduction in complex words: A case for prosodic phonology. In H. van der Hulst and N. Smith (Eds.), *Advances in Nonlinear Phonology*, vol. 7 of *Linguistic Models*, pp. 143–160. Dordrecht: Foris.

Booij, G. E. (2005). Compounding and derivation: evidence for Construction Morphology. In W. U. Dressler, D. Kastovsky, O. E. Pfeiffer, and

F. Rainer (Eds.), *Morphology and its demarcations*, Number 264 in Current Issues in Linguistic Theory, pp. 109–132. Amsterdam / Philadelphia: John Benjamins.

Bresnan, J. (1974). On the position of certain clause-particles in phrase structure. *Linguistic Inquiry 5*, 614–619.

Bresnan, J. and S. A. Mchombo (1995). The Lexical Integrity Principle: Evidence from Bantu. *Natural Language & Linguistic Theory 13*, 181–252.

Chaves, R. P. (2007). *Coordinate Structures – Constraint-based Syntax-Semantics Processing*. Doctoral dissertation, University of Lisbon.

Chaves, R. P. and I. A. Sag (2007). Two kinds of ellipsis in English coordinate structures. *Under review for journal publication.*

Chomsky, N. (1970). Remarks on nominalization. In A. Jacobs and P. Rosenbaum (Eds.), *Readings in Transformational Grammar*, pp. 184–221. Ginn and co., Waltham (Mass).

Copestake, A., D. Flickinger, I. A. Sag, and C. Pollard (2006). Minimal recursion semantics: An introduction. *Journal Research on Language & Computation 3*(4), 281–332.

Crysmann, B. (2002). *Constraint-based Coanalysis - Portuguese Cliticisation and Morphology-Syntax Interaction in HPSG*. PhD. Thesis, Saarland University.

Crysmann, B. (2003). An asymmetric theory of peripheral sharing in HPSG. In G. Jäger, P. Monachesi, G. Penn, and S. Wintner (Eds.), *Proceedings of Formal Grammar 2003*, pp. 47–62. ESSLLI 2003, Vienna, Austria.

Di Sciullo, A. M. and E. Williams (1987). *On the definition of word*. Cambrige, MA: MIT Press.

Donohue, C. and I. A. Sag (1999). Domains in Warlpiri. In *Sixth International Conference on HPSG-Abstracts*, University of Edinburgh, pp. 101–106.

Dowty, D. R. (1988). Type-raising, functional composition, and nonconstituent coordination. In E. B. Richard Oehrle and D. Wheeler (Eds.), *Categorial Grammars and Natural Language Structures*, pp. 153–198. Dordrecht: Kluwer Academic Publishers.

Féry, C. and K. Hartmann (2005). The focus and prosodic structures of german gapping and right node raising. *The Linguistic Review 22*, 69–116.

Gleitman, L. R. (1965). Coordinating conjunctions in English. *Language 41*, 260–293.

Goodall, G. (1987). *Parallel Structures in Syntax: Coordination, Causatives, and Restructuring*. New York: Cambridge University Press.

Grevisse, M. (1986(1936)). *Le Bon Usage*. Gembloux: Duculot. Revised by André Goosse.

Gundel, J. (2003). Information structure and referential givenness/newness: How much belongs in the grammar? In S. Müller (Ed.), *Proceedings of the HPSG-2003 Conference, Michigan State University, East Lansing*, pp. 122–142. Stanford: CSLI Publications. `http://cslipublications.stanford.edu/HPSG/4/`.

Haji-Abdolhosseini, M. (2003). A constraint-based approach to information structure and prosody correspondence. In S. Müller (Ed.), *Proceedings of the HPSG-2003 Conference, Michigan State University, East Lansing*, pp. 143–162. Stanford: Stanford: CSLI Publications. `http://cslipublications.stanford.edu/HPSG/4/`.

Hankamer, J. (1973). Unacceptable ambiguity. *Linguistic Inquiry 4*, 17–28.

Hartmann, K. (2000). *Right Node Raising and Gapping: Interface conditions on prosodic deletion*. Philadelphia/Amsterdam: John Benjamins.

Hayes, B. (1989). The prosodic hierarchy in meter. In P. Kiparsky and G. Youmans (Eds.), *Rythm and Meter*, pp. 201–260. Orlando: Academic Press.

Höhle, T. (1991). On Reconstruction and Coordination. In H. Haider and K. Netter (Eds.), *Representation and Derivation in the Theory of Grammar*, Studies in Natural Language and Linguistic Theory, pp. 139–197. Dordrecht, Kluwer.

Hopper, P. J. and E. C. Traugott (1993). *Grammaticalization*. Cambridge University Press.

Horn, L. (2002). Ellipsis and discourse coherence. *Sophia Linguistica 49*, 1–64.

Horn, L. (2005). An un-paper for the unsyntactician. In S. M. et al. (Ed.), *Polymorphous Linguistics: Jim McCawleys Legacy*, pp. 329–365. Cambridge, MA: MIT Press.

Huddleston, R. D., J. Payne, and P. Peterson (2002). Coordination and supplementation. In R. D. Huddleston and G. K. Pullum (Eds.), *The Cambridge Grammar of the English Language*, Chapter 15, pp. 1273–1362. Cambridge University Press.

Hudson, R. (1976). Conjunction reduction, gapping, and right-node-raising. *Language 52*, 535–562.

Ingria, R. J. P. (1990). The limits of unification. In *Proceedings of the 28th annual meeting on Association for Computational Linguistics*, Morristown, NJ, USA, pp. 194–204. Association for Computational Linguistics.

Inkelas, S. and D. Zec (1990). Prosodically Constrained Syntax. In S. Inkelas and D. Zec (Eds.), *The phonology-syntax connection*, pp. 365–378. Stanford: CSLI & Chicago: University of Chicago Press.

Jackendoff, R. (1977). $\overline{X}$*-Syntax: A study of Phrase Structure*. the MIT Press.

Johannessen, J. (1998). *Coordination*. NY: Oxford University Press.

Kathol, A. (1995). *Linearization-Based German Syntax*. PhD. Thesis, Ohio State University.

Kathol, A. (2000). *Linear Syntax*. Oxford University Press.

Kayne, R. (1994). *The Antisymmetry of Syntax*. MIT Press, Cambridge, Mass.

Koenig, J.-P. (1999). *Lexical Relations*. CSLI Publications. Stanford.

Krieger, H.-U. and J. Nerbonne (1993). Feature-based inheritance networks for computational lexicons. In T. Briscoe, V. de Paiva, and A. Copestake (Eds.), *Inheritance, Defaults and the Lexicon*, pp. 90–136. Cambridge: Cambridge University Press.

Kuhn, J. (1996). An underspecified HPSG representation for information structure. In J. Tsuji (Ed.), *Proceedings of Coling-96. 16th International Conference on Computational Linguistics (COLING96). Copenhagen, Denmark, August 5–9, 1996*, Somerset, New Jersey, pp. 670–675. Association for Computational Linguistics.

Lapointe, S. (1997). A lexical analysis of the English auxiliary verb system. In *GLOT*, pp. 2,215–254.

Levine, R. (1985). Right node (non-)raising. *Linguistic Inquiry 16*, 492–497.

Levine, R. D. (2001). The extraction riddle: just what are we missing? *Journal of Linguistics 37*, 145–174.

McCawley, J. D. (1987). Some additional evidence for discontinuity. In G. J. Huck and A. E. Ojeda (Eds.), *Syntax and Semantics 20: Discontinuous Constituency*, pp. 185–200. Academic Press, Orlando, FL.

McCawley, J. D. (1988). *The Syntactic Phenomena of English* (second ed.). Chicago: University of Chicago Press.

Milward, D. (1990). Coordination in an axiomatic grammar. In *COLING*, pp. 207–212.

Müller, W. (1990). Die real existierenden grammatischen Ellipsen und die Norm. Eine Bestandsaufnahme. *Sprachwissenschaft 15*, 241–366.

Neijt, A. (1979). *Gapping*. Foris, Dordrecht.

Nespor, M. (1985). The phonological word in italian. In H. van der Hulst and N. Smith (Eds.), *Advances in Nonlinear Phonology*, pp. 193–204. Foris Publications, Dordrecht.

Nespor, M. and I. Vogel (1986). *Prosodic Phonology*. Dordrecht: Foris.

Nunberg, G., T. Wasow, and I. A. Sag. (1994). Idioms. *Language 70*(3), 491–538.

Orgun, C. O. (1996). *Sign-based morphology and phonology*. Phd. dissertation, University of California, Berkeley.

Pollard, C. and I. A. Sag (1987). *Information-Based Syntax and Semantics; Volume One – Fundamentals*. CSLI Lecture Notes No.13. Stanford: CSLI Publications.

Pollard, C. and I. A. Sag (1994). *Head-driven Phrase Structure Grammar*. Chicago: University of Chicago Press and Stanford: CSLI.

Pollard, C. J., R. T. Kasper, and R. D. Levine (1994). Studies in Constituent Ordering: Toward a Theory of Linearization in Head-Driven Phrase Structure Grammar. Research Proposal to the National Science Foundation.

Postal, P. M. (1974). *On Raising*. Cambridge, Mass.: MIT Press.

Postal, P. M. (1994). Parasitic and pseudoparasitic gaps. *Linguistic Inquiry 25*, 63–117.

Postal, P. M. (1998). *Three investigations of extraction*. MIT: Cambridge, Massachusetts.

Pullum, G. K. and A. M. Zwicky (1986). Phonological resolution of syntactic feature conflict. *Language 72*, 751–773.

Quirk, R., S. Greenbaum, G. Leech, and J. Svartvik (1985). *A Comprehensive Grammar of the English Language*. Longman, Harcourt.

Reape, M. (1994). Domain union and word order variation in German. In J. Nerbonne, K. Netter, and C. J. Pollard (Eds.), *German in Head-Driven Phrase Structure Grammar*, pp. 151–197. CSLI Lecture Notes, number 46. Stanford: CSLI Publications.

Reinhard, S. (2001). *Deverbale Komposita an der Morphologie-Syntax-Semantik-Schnittstelle: ein HPSG-Ansatz*. Philosophische dissertation, Universität Tübingen.

Riehemann, S. Z. (1998). Type-based derivational morphology. In *Journal of Comparative Germanic Linguistics*, Volume 2, pp. 49–77.

Ross, J. (1967). *Constraints on Variables in Syntax*. Doctoral dissertation, MIT, Cambridge, Massachusetts. [Published in 1986 as *Infinite Syntax!* Norwood, NJ: Ablex Publishing].

Ross, J. R. (1970). Gapping and the order of constituents. In M. Bierwisch and K. Heidolph (Eds.), *Progress in Linguistics*, Mouton, The Hague, pp. 249–259.

Sabbagh, J. (2007). Ordering and linearizing rightward movement. *Natural Language and Linguistic Theory 25*(2), 349–401.

Sag, I. A. (1976). *Deletion and Logical Form*. PhD. Dissertation, MIT. Published in 1980 by New York: Garland Press.

Sag, I. A., T. Wasow, and E. M. Bender (2003). *Syntactic Theory - A formal introduction. 2nd Edition*. Stanford: CSLI Publications.

Selkirk, E. (1986). On derived domains in sentence phonology. *Phonology Yearbook* 3: 371–405.

Selkirk, E. O. (1982). *The Syntax of Words*. Cambridge, Mass.: MIT Press.

Siegel, D. (1974). *Topics in English Morphology*. MIT Dissertation.

Simpson, J. (1983). *Aspects of Warlpiri Morphology and Syntax*. Phd. dissertation, MIT.

Simpson, J. (1991). *Warlpiri Morpho-Syntax: A Lexicalist Approach*. Kluwer, Dordrecht.

Smith, G. (2000). Word Remnants and Coordination. In R. Thieroff, M. Tamrat, N. Fuhrhop, and O. Teuber (Eds.), *Deutsche Grammatik in Theorie und Praxis*, pp. 57–68. Tübingen: Niemeyer.

Strauss, S. L. (1982). *Lexicalist Phonology of English and German*. Dordrecht: Foris.

Suñer, M. (1975). Spanish adverbs: Support for the phonological cycle? *Linguistic Inquiry 6*, 602–605.

Toman, J. (1985). A discussion of coordination and word-syntax. In T. Jindřich (Ed.), *Studies in German Grammar*, pp. 407–432. Dordrecht: Kluwer.

Torner, S. (2005). On the Morphological Nature of Spanish Adverbs Ending in *-mente*. *Probus 17*(1), 115–144.

Trost, H. (1993). Coping with derivation in a morphological component. In *Proceedings of the Sixth Conference of the European chapter of the Association for Computational Linguistics*, pp. 368 – 376. Utrecht.

Vergnaud, J.-R. (1974). *French Relative Clauses*. Doctoral dissertation, MIT, Cambridge Massassuchets.

Vigário, M. (2003). *The Prosodic Word in European Portuguese*. Interface Explorations 6. Mouton de Gruyter.

Vigário, M. and S. Frota (2002). Prosodic word deletion in coordinate structures. *Journal of Portuguese Linguistics 1*(2), 241–264.

Wesche, B. (1995). *Symmetric Coordination. An Alternative Theory of Phrase Structure*. Tüebingen: Niemeyer Verlag.

Wexler, K. and P. Culicover (1980). *Formal Principles of Language Acquisition*. Cambridge, MA: MIT Press.

Wiese, R. (1992). Prosodic phonology and its role in the processing of written language. In G. Görz (Ed.), *Computing Meaning*, Konvens 92: 1. Konferenz "Verarbeitung natürlicher Sprache", pp. 139–148. Berlin: Springer.

Wiese, R. (1996). *The Phonology of German*. Oxford: Oxford University Press.

Wilcock, G. (2005). Information structure and minimal recursion semantics. In A. A. et al. (Ed.), *Inquiries into Words, Constraints and Contexts: Festschrift for Kimmo Koskenniemi on his 60th Birthday*, CSLI Studies in Computational Linguistics ONLINE, pp. 268–277. Stanford, CA: CSLI Publications.

Wilder, C. (1997). Some properties of ellipsis in coordination. In A. Alexiadou and T. A. Hall (Eds.), *Studies on Universal Grammar and Typological Variation*, pp. 59–107. Amsterdam: John Benjamins.

Yatabe, S. (2001). The syntax and semantics of left-node raising in Japanese. In D. Flickinger and A. Kathol (Eds.), *Proceedings of the 7th International Conference on Head-Driven Phrase Structure Grammar*, pp. 325–344. Stanford, CA: CSLI Publications.
`http://cslipublications.stanford.edu/HPSG/1/`.

Zaenen, A. and L. Karttunen (1984). Morphological non-distinctness and coordination. In *ESCOL 83*, pp. 309–320.

Zwicky, A. M. (1986). The unaccented pronoun constraint in English. In A. M. Zwicky (Ed.), *Interfaces, volume 32 of Ohio State University Working Papers in Linguistics*, pp. 100–114. Ohio State University Department of Linguistics.