Abstract. Extraposition and right node raising (RNR) can interact in two ways: the result of each can be used as input for the other. Embedding of the former process in the latter explains apparent violations of the right periphery condition associated with RNR. The reverse application leads to right-peripheral material that is distributively linked to conjoined or insubordinated parts within the relevant clause. We argue for a multidominance approach to RNR, and a specifying coordination approach to extraposition, and we show that these theories can be combined in the way empirically required. Data are drawn from Dutch primarily, with some confirmation from English and German.

Keywords: coordination, ellipsis, extraposition, multidominance, right node raising

1 Introduction

A number of phenomena target the right periphery of a clause. We will discuss two of these: optional extraposition, and backward conjunction reduction, also known as right node raising (RNR). In (1a), the extraposed phrase with red hair modifies the subject a woman. In (1b), a house functions as the direct object of both sold and bought, but it is pronounced only in the rightmost position.

(1) a. A woman came into the room with red hair. (extraposition)
   b. John sold and Mary bought a house. (RNR)

In Dutch, extraposition across the so-called right sentence bracket is very productive. (The right bracket corresponds to the position of verbs, verbal particles and verb clusters; the left bracket is the verb second position [V2] of the finite verb in a main clause.) An example is (2), where the neutral position of over lepidopterologie ‘on lepidopterology’ is indicated with an underscore. The right sentence bracket is gekocht ‘bought’.

(2) Joop heeft een boek _ gekocht over lepidopterologie.
    Joop has a book bought about lepidopterology
    ‘Joop bought a book about lepidopterology.’

In (3), we illustrate right node raising of a participle in Dutch. Here, gelezen ‘read’ is interpreted in both coordinated clauses. Its normal surface position in the first clause is indicated with an underscore. Henceforth, we will also indicate the most prominent contrastive foci by capitalizing the stressed syllable.

(3) Joop heeft een BOEK _, en Jaap heeft een TIJDschrift gelezen.
    Joop has a book and Jaap has a magazine read
    ‘Joop read a book, and Jaap read a magazine.’
It is worth noting that backward reduction can be combined with forward reduction, more specifically, RNR with gapping. This is called *ambi-ellipsis* in Grootveld (1994), who is concerned with the challenges it raises for parsing. In (3), for instance, it is possible to elide the auxiliary *heeft* ‘has’ in the second clause in addition to the participle *gelezen* ‘read’ in the first clause; in fact, it sounds surprisingly natural to do so. However, in order not to unnecessarily complicate the discussion, we will avoid cases of ambi-ellipsis in this article.

Importantly, RNR constructions come with a particular intonation. On the first focus (here, *boek* ‘book’), which directly precedes the gap, the pitch rises but does not go down; this creates a sense of expectation. Then the conjunction and the second clause start out on a lower level, usually after a short pause or slowdown. This intonation contour can be depicted as / _. The contrastive focus in the second clause has a regular rise-fall contour, so *tijdschrift* ‘magazine’ in (3) is pronounced as /\.

RNR of a noun phrase is possible as well in Dutch; see (4). This is comparable to the situation in (1b).

(4) Joop KOCHT __ maar Jaap LEENde een boek.
Joop bought but Jaap borrowed a book
‘Joop bought a book, but Jaap borrowed a book.’

In fact, any word string can be input for RNR, provided that it is rightmost in each conjunct. Backward center gapping is prohibited, as is illustrated in (5b), which contrasts with forward gapping in (5a):

(5) a. Joop *kocht* een BOEK en Jaap __ een CD.
Joop bought a book and Jaap a CD
‘Joop bought a book and Jaap bought a CD.’

b. * Joop __ een BOEK en Jaap *kocht* een CD.
Joop a book and Jaap bought a CD
*Intended:* ‘Joop bought a book and Jaap bought a CD.’

Thus, right node raising is subject to a right periphery condition, hence the name.

In this article, we investigate the interaction of RNR and extraposition. We show that the result of each can be used as input for the other. The relevant data are presented in section 2. Section 3 discusses the theory of RNR and extraposition separately. Section 4 then shows that the proposed analyses can be combined to explain the effects of cumulative rightward processes. Section 5 is the conclusion.

## 2 Mutual feeding of rightward processes

### 2.1 Extraposition feeds right node raising

In English, a prosodically heavy noun phrase can optionally be extraposed; this is called Heavy NP Shift (HNPS). *Books* in (6a) does not count as heavy, but *the complete works of Charles Dickens* in (6b) does.

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     b. John bought (the complete works of Charles Dickens) yesterday (the complete
        works of Charles Dickens).

As has been noticed before in Wilder (1997), right node raising can be facilitated by HNPS. Consider the examples in (7).

(7)  a. * John bought _ YESterday, and Mary sold _ toDAY books.
     b. John bought _ YESterday _, and Mary sold _ toDAY the complete works of
        Charles Dickens.

Sentence (7a) is unacceptable because the right periphery condition on RNR is violated: the
shared string books is not rightmost in each conjunct, as it would normally precede time
adverbials like yesterday. By contrast, in (7b) the complete works of Charles Dickens could
have been shifted to the right within each conjunct before RNR takes place. The steps in the
derivation are as follows (pretheoretically):

(8)  a. John bought the complete works of Charles Dickens yesterday and Mary sold
     the complete works of Charles Dickens today. → HNPS →
     b. John bought _ yesterday the complete works of Charles Dickens and Mary sold _
     today the complete works of Charles Dickens. → RNR →
     c. John bought _ yesterday _ and Mary sold _ today the complete works of Charles
        Dickens.

We conclude that HNPS can feed right node raising in English. We will now shift our
attention to Dutch, and briefly return to other Germanic languages in section 2.3.

In Dutch, HNPS with regular noun phrases is very marginal. However, we can show
a similar pattern using free relative clauses, which constitute a special class of heavy NPs.
In (9a), the simple NP dat schilderij ‘that painting’ cannot be shifted rightwards; in (9b) wat Mieke maandag geschilderd had ‘what Mieke had painted on Monday’ can.

(9)  a. Joop heeft (dat schilderij) bewonderd (*dat schilderij).
     Joop has that painting admired that painting
     ‘Joop admired that painting.’
     b. Joop heeft (wat Mieke maandag geschilderd had) bewonderd (wat Joop has what
     Mieke Monday painted had admires what Mieke maandag geschilderd had).
     Mieke Monday painted had
     ‘Joop admired what Mieke had painted on Monday.’

We then observe that HNPS facilitates RNR, witness the contrast in (10):

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(10) a. *Joop heeft _ beWONderd, maar Jaap heeft _ verGUISD dat schilderij.
    Joop has admired but Jaap has maligned that painting
    Intended: ‘Joop admired that painting, but Jaap maligned that painting.’

b. Joop heeft _ beWONderd _, maar Jaap heeft _ verGUISD wat Mieke maandag geschilderd had.
    Joop has admired but Jaap has maligned what Mieke Monday painted had
    ‘Joop admired what Mieke had painted on Monday, but Jaap maligned what Mieke had painted on Monday.’

In (10a) the right periphery condition on RNR is violated, but in (10b) this can be circumvented by first applying HNPS. The process in deriving sentences like (10b) can be sketched as follows:

(11) a. [S₁ Aux₁ O V₁] Co [S₂ Aux₂ O V₂] → HNPS (in both clauses) →
    b. [S₁ Aux₁ _ V₁ O] Co [S₂ Aux₂ _ V₂ O] → RNR →
    c. [S₁ Aux₁ _ V₁ _] Co [S₂ Aux₂ _ V₂ O]

There is, however, a possible alternative explanation for (10b), more in line with an antisymmetric grammar (Kayne 1994). We may assume that Dutch is underlingly VO (Zwart 1994). Regular objects are obligatorily moved to the middle field (say, for Case licensing). Free relatives, like complement clauses, are exempt from this requirement. If they stay in situ, RNR could apply directly – without the necessity of extraposition –, since the objects are already right-peripheral in their clauses.

This alternative explanation of (10b), although it may be correct in itself, does not undermine the idea that extraposition can feed RNR. First note that it is of no help in explaining the English facts in (7). More importantly, it turns out that not only HNPS can feed RNR, but optional extraposition in general, including extraposition of modifiers. We illustrate this in Dutch.

Example (12) shows optional extraposition of a relative clause across the right sentence bracket (here, the participle bewonderd ‘admired’).

(12) a. Joop heeft iemand die meer dan twee ton verdiend had bewonderd.
    Joop has someone who more than 200,000 earned had admired
    ‘Joop admired someone who had earned more than 200,000.’

b. Joop heeft iemand _ bewonderd die meer dan twee ton verdiend had.

The extraposed order can then be used as input for RNR if we coordinate two such clauses:
(13) Joop heeft iemand _ beWONderd _, maar Jaap heeft iemand _ verGUISD die meer dan twee ton verdiend had.
Joop has someone admired but Jaap has someone maligned who earned more than 200,000.

‘Joop admired someone who had earned more than 200,000, but Jaap maligned someone who had earned more than 200,000.’

Similar examples can be construed with comparative clauses and PP modifiers; see (14) and (15), respectively:

(14) Joop heeft minder _ gekOCHT _, maar meer _ geHUURD dan hij aanvankelijk wilde.
Joop has less bought but more rented than he initially wanted.

‘Joop bought less than he initially wanted, but rented more than he initially wanted.’

(15) Joop heeft een ketting _ gekOCHT _, maar Jaap heeft een ketring _ geSTOlen met een dure edelsteen eraan.
Joop has a necklace bought but Jaap has a necklace stolen with an expensive gemstone there on.

‘Joop bought a necklace with an expensive gemstone, but Jaap stole a necklace with an expensive gemstone.’

In each case, the process is as sketched in (16), where $\beta$ is the relevant modifier, and $\alpha_1$ and $\alpha_2$ are the anchors it relates to.

(16) a. $[...[\alpha_1 \beta]...V_1] Co [...] [\alpha_2 \beta]...V_2]$ \quad \rightarrow \text{extraposition (2x) } \rightarrow
b. $[...[\alpha_1]...V_1 \beta] Co [...] [\alpha_2]...V_2 \beta]$ \quad \rightarrow \text{RNR } \rightarrow
c. $[...[\alpha_1]...V_1 ...] Co [...] [\alpha_2]...V_2 \beta]$

The coordination does not need to be clause-level. In (14) we already encountered an example of coordination below the auxiliary. Another illustration is (17):

(17) De manager heeft een jonge man _ AANgenomen _, en tegelijk
the manager has a young man hired and at the same time
een oude man _ ontSLAgen die heel goed is.
an old man fired who very good is.

‘The manager hired a young man who is very good, and at the same time fired an old man who is very good.’

Notice that the special RNR intonation is important here. Without that, the interpretation changes to one in which the relative clause relates only to the object in the second conjunct:

‘The manager hired a young man; and at the same time fired an old man who is very good’.
Furthermore, although extraposition from a direct object is the most common, this is not the only possibility. In (18) and (19) we illustrate extraposition plus RNR of a modifier from a subject, and in (20) from an indirect object.

(18) Er is zowel een man _ gearriVEERD _, als een vrouw _ verTROKken
there is both a man arrived and a woman left
die een rode hoed droeg.
who a red hat wore
‘Not only did a man arrive who wore a red hat, but also a woman left who wore a red hat.’

(19) Er heeft niet alleen een vrouw _ in de huiskamer geLACHen _, maar
there has not only a woman in the living room laughed but
ook een man _ in de slaapkamer geHUILd
also a man in the bedroom cried
die een hoed heeft verloren.
who a hat has lost
‘Not only did a woman who lost a hat laugh in the living room, but also a man who lost a hat cried in the bedroom.’

(20) Sinterklaas gaf meer kinderen _ een comPUterspel _, en minder ouders _
St. Nicholas gave more children a computer game and less parents een BOEK dan verwacht.
a book than expected
‘St. Nicholas gave more children than expected a computer game, and less parents than expected a book.’

Finally, it is worth pointing out that if extraposition is blocked in the two conjuncts that are input for RNR, the potential resulting configuration of backward conjunction reduction is unacceptable. This may seem obvious, but notice that RNR itself is an unbounded process:

(21) [Jaap zei [dat Mieke een HOND _ ]], maar [Joop beweerde [dat ze een KAT
Jaap said that Mieke a dog but Joop claimed that she a cat
had geaaid ]].
had petted
‘Jaap said that Mieke had petted a dog, but Joop claimed that she had petted a cat.’

By contrast, extraposition is subject to the right roof constraint (Ross’ 1967 upward boundedness constraint; see especially Koster 2000 for discussion), which means that rightward processes cannot cross clause boundaries. For instance, in (22b) extraposition to the right of the embedded clause is fine, but extraposition out of the embedded clause to the right of the matrix is unacceptable (22c).

(22) a. [Dat Joop een boer _ kent die alles over landbouw weet kent] is vreemd.
that Joop a farmer who all about agriculture knows is strange
‘It is strange that Joop knows a farmer who knows all about agriculture.’

b. [Dat Joop een boer _ kent die alles over landbouw weet] is vreemd.
c. * [Dat Joop een boer _ kent] is vreemd die alles over landbouw weet.

As expected, we can now coordinate two embedded clauses of the type in (22b) and apply RNR:

(23) [Dat Joop een boer _ ontVING _, maar Jaap een boerin _ WEGstuurde die alles over landbouw wist] is heel vreemd.
    ‘It is very strange that Joop received a farmer who knew all about agriculture but that Jaap sent away a woman farmer who knew all about agriculture.’

But what we cannot do is coordinate full sentences of the type in (22) and apply RNR:

(24) * Dat Joop een boer ontving is DUIDelijk, maar of Jaap een boerin wegstuurde het vraag die alles over landbouw wist.
    Intended: ‘It is clear that Joop knows a farmer who knows all about agriculture, but is the question if Jaap knows a woman farmer who knows all about agriculture.’

Such contrasts confirm the ideas expressed above. RNR is unbounded, but subject to a right edge constraint. Apparently, this constraint can be lifted, but only as the result of feeding by extrapolation. If extrapolation is blocked for whatever reason (for instance by the right root constraint, or by limitations on NP shift), RNR of non-peripheral material becomes impossible.

2.2 Right node raising feeds extrapolation

In the previous section we showed that extrapolation can feed RNR. Here, we argue that the reverse is also possible. In order to do so, we must first illustrate the fact that RNR is a process that can be applied to coordinate structures of categories other than clauses. In particular, noun phrases are of interest for our purposes. The sentences in (25) show that the righthand part of two coordinated NPs or DPs can be shared.

(25) a. Het lezen VAN _, en citeren UIT goede artikelen is belangrijk.
    ‘Reading good articles and citing from good articles are important.’

b. De immigratie vanUIT _, en het toerisme NAAR Marokko zijn gerelateerd.
    ‘The immigration from Marocco and the tourism to Marocco are related.’

Even in (26), the modifier van tien euro ‘of ten euros’ can be related to both boek ‘book’ and DVD, pending the correct RNR intonation.
The required intonation for this reading is facilitated by the use of a distributive focus marker as in both... and, either... or, not only... but also. An example sentence is (27):

(27) Ik kocht niet alleen een BOEK _, maar ook een DVD van tien euro.
    I bought not only a book but also a DVD of ten euro
    ‘I bought not only a book of €10, but also a DVD of €10.’

Now consider (28), where again the relevant modifier is related to both coordinated object DPs. What is relevant is that it is no longer adjacent to the second noun, but instead surfaces in an extraposed position to the right of the participle.

(28) Ik heb zowel een BOEK _ als een DVD _ gekocht van tien euro.
    I have both a book and a DVD bought of ten euro
    ‘I bought both a book of €10 and a DVD of €10.’

It seems, then, that the PP van tien euro ‘of ten euros’ has first been right node raised within the coordinated object, and then extraposed across the verb gekocht ‘bought’. In other words, RNR feeds extraposition. Schematically, this is indicated in (29):

(29) a. S Aux [[N₁ PP] Co [N₂ PP]] V → RNR (constituent level) →
    b. S Aux [[N₁ _] Co [N₂ PP]] V → extraposition →
    c. S Aux [[N₁ _] Co [N₂ _]] V PP

Normally, the coordinate structure constraint would prohibit extraction, but notice that (29) can be subsumed under the well-known across-the-board (ATB) exception, because the relevant modifier leaves a gap in each conjunct.

Of course one could call (29c) rightward ATB, at least descriptively, but note that this term has also been used for simple cases of RNR like (1b) in Ross (1967) and Sabbagh (2007), for instance. What is important is that ‘rightward ATB’ as in (29) can be decomposed into two steps: RNR at the constituent level, which explains that only one of the two modifiers is pronounced (see further section 3.1), and extraposition, which explains that the remaining modifier does not surface at the right edge of the coordination phrase – as in (25) or (27) –, but to the right of the participle (see further section 3.2).

It is worth noting that the gap must be right-peripheral in each conjunct. If we try to extract a medial modifier, the result is bad, as is shown in (30):
(30) * Ik heb niet alleen een VRIEND _ die aardig is maar ook een VIJAND _
   I have not only a man who kind is but also an enemy
   die aardig is ontmoet van Obama.
who kind is met of Obama

   Intended: ‘I met not only a friend of Obama who is kind, but also an enemy of
   Obama who is kind.’

This restriction follows from the right periphery condition on RNR (but, as it happens, it
can also be explained by independent restrictions on extraposition). Another restriction is
caused by the right roof constraint, which we already encountered before; consider (31):

(31) [Dat Joop zowel een BOEK _ als een DVD gekocht heeft (van tien euro)]
   that Joop both a book and a DVD bought has of ten euro
   is vreemd (*van tien euro).
   is strange of ten euro
   ‘It is strange that Joop bought both a book of €10 and a DVD of €10.’

Here, the modifier can be right node raised and extraposed within the subject clause,
comparable to (28), but it cannot be extraposed across the embedded clause boundary to the
right edge of the main clause.

Let us turn to some positive possibilities. The pattern in (29) is not restricted to
extraction from objects. In (32) and (33) the PP modifier relates to the coordinated subject
NPs.

(32) Er werd niet alleen een BOEK _ maar ook een DVD _ verkocht van
tien euro.
   there was not only a book but also a DVD sold of
   ten euro
   ‘Not only a book of €10 was sold, but also a DVD of €10 was sold.’

(33) Zowel een MAN _ als een VROUW _ werd gesignaleerd met een paarse hoed.
   both a man anda woman was observed with a purple hat
   ‘Both a man with a purple hat and a woman with a purple hat were spotted.’

Furthermore, example (34) illustrates extraction of a relative clause instead of a PP:

(34) Het verbaast me dat Mieke niet alleen de lelijke MAN _, maar ook de
   it surprises me that Mieke not only the ugly man but also the
   knappe JONGen _ verafschuwt die nog geen vriendin heeft/*hebben
   handsome boy detests who yet no girlfriend has/*have
   ‘It surprises me that Mieke detests not only the ugly man who does not have a
   girlfriend, but also the handsome boy who does not have a girlfriend.’

Notice that the embedded finite verb is obligatorily singular. This implies that there are
originally two similar relative clauses related to each of the two contrasted nominals, as is
indicated by the underscores. The RNR intonation and the distributive character of (34) rule out an analysis in terms of a complex antecedent, since this would lead to plural agreement, as is shown in (35):

(35) [[de man], en [de jongen],] die en *[heeft*

the man and the boy who no girlfriend have/*has
‘the man and the boy who do not have a girlfriend’

In this example, there is only one relative clause that is associated to the collective of coordinated noun phrases.

There is another potential alternative analysis, however, that we cannot immediately rule out for examples such as (28) and (32) through (34). This analysis involves the possibility of non-constituent RNR. A sound example of non-constituent RNR is (36), for instance.


‘Joop has read three books and Jaap has read four books.’

We could now reanalyze (34) and the other examples in the following way. First, we assume that there are two coordinated clauses (or at least extended predicates) that contain a noun-modifier combination each, as in (37a). Then, extraposition of the modifier takes place within each clause separately (37b). Finally, the right-peripheral sequence verb-modifier (which is not a constituent) is right node raised, resulting in the surface-structure (37c).

(37) a. [... N₁ Mod ... V] Co [... N₂ Mod ... V] → extraposition (2x) →

b. [... N₁ _ ... V Mod] Co [... N₂ _ ... V Mod] → non-constituent RNR →

c. [... N₁ _ ... _ _ ] Co [... N₂ _ ... V Mod]

But this is a variant of what we already discussed in section 2.1, namely extraposition feeding RNR (and not the reverse). Given that the examples under discussion are indeed interpreted distributively, there is nothing wrong in principle with the alternative analysis in (37). It is fair to note, though, that the original proposal in (29) is less complicated. Thereby, we are presupposing that non-constituent RNR is more complex than simple RNR: we believe that the former is obtained by applying simple RNR iteratively (see also De Vries 2005a). Thus, the alternative analysis involves double extraposition followed by double RNR, whereas our initial proposal involves single RNR followed by single extraposition, with the same end result.

Are there examples for which (37) is excluded? This would be the case if RNR can be combined with collective predicates, which are incompatible with a biclausal analysis. Normally, we do not expect this to be possible, since the RNR intonation triggers a distributive interpretation. Therefore, examples such as (38a), like (38b), are unacceptable, contrary to (38c). Similarly, (39) is unacceptable. Evidently, the results can be fortified by the use of a distributed focus marker in the coordinated phrase (as in both...and).
(38) a. * The MAN _, and the WOMan from Germany were married to each other.
    b. * The man from Germany was married to each other, and the woman from
       Germany was married to each other.
    c. The man and the woman were married to each other.

(39) * De uitgever heeft een kort PAper _ en een lang esSAY gebundeld dat
    the publisher has a short paper and a long essay bundled which
    over right node raising gaat.
    about right node raising goes

Intended: ‘The publisher bundled a short paper that is about RNR and a long essay
that is about RNR.’

We can, however, circumvent this restriction by looking at instances of RNR outside of
syntactic coordination contexts (for more discussion of coordination-like reduction
processes in phrasal comparatives, and, more generally, ‘insubordination’ constructions, we
refer to Van der Heijden 1999 and Lechner 2001). In (40a), NP₁ and NP₂ are semantically
on a par, but NP₂ is not coordinated to NP₁: it is in a prepositional phrase subordinated to
some projection of the predicate. In (40b) we observe that RNR with respect to the two NPs
is possible.

(40) a. It can be hard to distinguish NP₁ from NP₂.
    b. It can be hard to distinguish synTACtic _ from seMANtic factors.

The same can be done with a modifier of NP. We illustrate this in Dutch:

(41) Mieke wil een artikel van JOOP _ met een artikel van JAAP (over
    Mieke wants a paper of Joop with a paper of Jaap about
    right node raising) vergelijken (over right node raising).
    right node raising compare about right node raising

    ‘Mieke want to compare a paper by Joop about RNR with a paper by Jaap about
    RNR.’

Crucially, the modifier can also surface to the right of the final verb, which means that it is
extraposed. Thus, (41) can only be explained if RNR can feed extraposition. A biclausal
analysis is out of the question, since compare X to Y is a collective predicate. A similar
example is (42):

(42) Joop heeft het ENE (boek) _ na het ANdere (boek) _ gekocht dat slechts tien
    Joop has the one book after the other book bought that only ten
    euro kostte.
    euro cost

    ‘Joop bought one book after the other that only cost €10.’

Here, what is relevant is that the relative clause is both right node raised and extraposed.
In brief, we presented data giving rise to the conclusion that constituent RNR can be used as input for extraposition, which is the reverse of what we found in the previous section.

2.3 Additional evidence from English and German

Although the data that are central to this article are primarily drawn from Dutch, the mutual feeding of extraposition and RNR can be witnessed in other Germanic languages as well. In this section we briefly discuss some English and German examples.

As was shown in (6) above, prosodically heavy NPs can shift to the right in English. Furthermore, English allows for relative clauses and PPs to be extraposed; see (43), for example:

(43) John saw a man (who was wearing a red hat) in the pub (who was wearing a red hat).

We have seen in (7) that heavy NP shift in English can feed RNR that would otherwise violate the right periphery condition (see section 3.1 for more discussion concerning this condition). Similarly, example (44) shows that RNR can target a relative clause, provided that it can be extraposed within both conjoined clauses:

(44) John saw a girl _ in TOWN _, and Joey saw a boy _ in the LIBRARY who was playing cello.

Thus, as we would expect, extraposition can generally feed RNR in English. Example (45) suggests that the reverse also holds:

(45) a. John gave not only a BOOK _, but also a DVD about the life of whales to Joey.
   b. John gave not only a BOOK _, but also a DVD _ to Joey about the life of whales.

Here, the PP about the life of whales is the target of RNR within the coordinated object in (45a), prior to being (optionally) extraposed across the indirect object in (45b). Note that the RNR intonation is crucial: in the absence of contrastive focus on book and DVD, (45) allows for an alternative reading in which the relevant PP is associated with DVD only. According to our informants, the correct RNR intonation is relevant for (44) as well. Without the pitch accent on town that is followed by a break, the extraposed relative clause is likely to be associated with a boy in the second conjunct only, but not simultaneously with a girl in the first conjunct.

We conclude that in both Dutch and English, RNR and extraposition may interact. Let us see if German behaves similarly in this respect. The following is an example of RNR targeting a comparative clause (in italics), comparable to (14) for Dutch:
Der Hans hat weniger _ geKAUFT _, aber mehr _ geMIEtet als er ursprünglich behauptet hat. ‘Hans bought less than he initially stated, but rented more than he initially stated.’

Here, the comparative clause is extraposed across the participle within each conjunct. Consequently, it is right-peripheral, and can be subject to RNR, resulting in (46). In addition to this example, the majority of the German speakers we consulted accepted sentences in which relative clauses are extraposed and then right node raised.1

Finally, let us see if there are examples in German in which RNR presumably takes place prior to extraposition. This is indeed the case; see (47):

Es überrascht mich, dass die Michi nicht nur einen hässlichen MANN _, sondern auch einen hübschen JUNGen _ hasst der noch keine Freundin hat. ‘It surprises me that Michi not only hates an ugly man who doesn’t have a girlfriend yet, but also a handsome boy who doesn’t have a girlfriend yet.’

Here, a relative clause, associated with both conjuncts of the conjoined object, has been extraposed across the main verb hasst ‘hates’ after right node raising. Again, it must be emphasized that the RNR intonation is crucial for the intended distributive reading. Let us briefly expand on this by a comparison with a collective reading. Consider the contrast in (48), without extraposition.

Michi hasst [einen hässlichen Mann_i, und einen hübschen Jungen_j] die_i+j ‘Michi hates an ugly man and a handsome boy who don’t have a girlfriend yet.’

Michi hasst einen hässlichen Mann_i, und einen hübschen Jungen_i die_i+j ‘Michi hates an ugly MAN, and a handsome BOY who don’t have a girlfriend yet.’

As (48a) shows, it is possible for a relative clause to take a coordinated object as a whole as its antecedent. (Such a relative clause could also be extraposed.) In (48b), however, a collective interpretation is impossible because of the RNR intonation (which includes contrastive focus on Mann and Jungen). Thus, RNR forces distribution. For this reason, (48b), which contains a plural relative pronoun and plural agreement on the verb, is ungrammatical. The judgments are the same for Dutch relative clauses in such configurations.
In sum, the bidirectional interaction between RNR and extraposition originally found in Dutch, can be confirmed by similar data from English and German. The remainder of this article is an attempt to explain these findings from a formal syntactic perspective.

3 How to analyze right node raising and extraposition in isolation

Since there is no generally accepted theory for either RNR or extraposition, we first discuss them independently in the next two subsections, and return to the combination of both in section 4.

3.1 Right node raising as multidominance

As is clear from the data discussed so far, RNR constructions are subject to the right periphery condition. Along with this condition, this section discusses the properties of RNR constructions. Based on those, we argue in favor of a multidominance approach to RNR.

The data in (49) demonstrate that RNR is not sensitive to island conditions. Example (49a) shows RNR out of a complex NP, and (49b) out of an adverbial phrase.

(49) a. John admired a girl who BAKED _, and offended a boy who ATE chocolate chip cookies.
    b. John kissed a girl on a RAIny _, and Joanna a boy on a SUNny day in October.
    c. John thinks that his brother LOves _, and Joanna thinks that her sister HAtes chocolate chip cookies.

Importantly, (49c) shows that RNR does not obey the right roof constraint, as it crosses clause boundaries (in this example, the target of reduction is embedded in each conjunct). This differs from the situation in extraposition constructions; recall (22) and (31) above.

Looking carefully at example (49b), we note that it is possible for RNR to apply to non-constituents. Namely, rainy and sunny are contrasted, and RNR applies to the noun day and the adjunct that modifies the noun phrase in each conjunct. The Dutch example in (50) provides a more pregnant case of non-constituent RNR. Here, the string een baard gegroet ‘a beard greeted’ is evidently not a constituent.

(50) Joop heeft eerst een man MET _, en later een man ZONder een baard gegroet.
    Joop has first a man with and later a man without a beard greeted.
    ‘Joop first greeted a man with a beard and later greeted a man without a beard.’

Furthermore, the examples in (51) show that RNR can also apply below the word level (see also Hartmann 2000 and Ha 2008):

(51) a. Deze theorie heeft voor- en nadelen.
    this theory has for- and disadvantages
‘This theory has pros and cons.’

b. Joop bedacht een theorie met veel VOOR-, en Mieke een theorie met veel NAdeelen.

‘Joop came up with a theory with many advantages and Mieke came up with a theory with many disadvantages.’

The more complicated example in (51b) is marked for some speakers.

The insensitivity to island constraints (including the right roof constraint), together with the possibility to target non-constituents constitute a problem for theories that analyze RNR in terms of rightward across-the-board movement (see Ross 1967, and more recently Sabbagh 2007). Notably, leftward ATB movement is sensitive to islands, witness (52):

(52) * Which movie, did a girl that loves t, laugh and a boy who hates t, cry?

Sabbagh (2007) attempts to circumvent the issue of islandhood, proposing that rightward movement is in principle unbounded as long as it does not cross overt material in the same cyclic node. This leaves open the issue of moving non-constituents – by some iterative process –, which would then require tuck-in operations at the adjunction site in order to derive the correct word order. The movement approach is also complicated in simple cases of RNR, in the sense that two constituents are moved out of two conjuncts, whereas only one of them surfaces (in the one available landing site?). But this is a more general problem for the derivation of ATB movement.

It seems more plausible that the target of RNR is not moved, but stays in situ. This idea can be worked out in different ways. It has been suggested in the literature that RNR is backward deletion (Hartmann 2000 and Ha 2008, among others). However, such an analysis is not without problems. For instance, forward deletion phenomena are known to be sensitive to the so-called head condition (Fiengo 1974). This condition prohibits the deletion of material that is c-commanded by an overt head (see also Wilder 1994). This means that we cannot delete arguments if their selecting head is not deleted as well, which is illustrated by the contrast in (53):

(53) a. John ate a chocolate chip cookie and Joanna ate an ice cream.

b. John ate a chocolate chip cookie and Joanna did eat a chocolate chip cookie too.

c. * John loves chocolate chip cookies and Joanna hates chocolate chip cookies.

That this condition does not hold for RNR is shown in (54), where the arguments of the overt finite verb are missing:

(54) John LOVes _, and Joanna HAtes chocolate chip cookies.

Furthermore, contrary to forward deletion, RNR is sensitive to some condition on identity. Whereas forward deletion is acceptable regardless of the morpho-phonological form of what is deleted, RNR that targets material that is not identical in the respective conjuncts is
marginal to bad. The following examples of gapping (55a) and RNR (55b) show this asymmetry in Dutch:

(55) a. Mieke gaat naar India, en haar ouders gaan naar Griekenland.  
    Mieke goes to India, and her parents go to Greece  
    ‘Mieke is going to India, and her parents are going to Greece.’

b. * Ik denk dat MIEke op vakantie is, maar jij denk dat haar OUders op vakantie zijn.  
    I think that Mieke on holiday is but you that her parents on holiday are  
    ‘I think that Mieke is on holiday, but you think that her parents are on holiday.’

Finally, RNR shows condition C effects (56a) that are unexpected if RNR would be backward ellipsis or, for that matter, rightward movement – considering that comparable instances of forward deletion (56b) and leftward movement (56c) are unproblematic; see also Johnson (2007).

(56) a. * He, aDMIRed _, and she offENded the woman John, loved  
    b. She offended the woman John, loved, and he, did offend the woman John, loved, too.  
    c. Which woman that he, loved did John, offend?

We conclude that RNR is fundamentally different from both leftward ATB movement and forward ellipsis, and is therefore not be analyzed as the mirror image of these. The data suggest that the target of RNR is in situ; even more so, it behaves as if it is syntactically present in both conjuncts. In the spirit of earlier proposals by McCawley (1982, 1987), Wilder (1999, 2008), Bachrach & Katzir (to appear) and Johnson (2007)³, we propose that RNR is a multidominance configuration. Under this assumption, the target of RNR is shared between the respective conjuncts, that is, the ‘reduced’ material is simultaneously part of the first and the second conjunct. Crucially, this approach abandons the single mother condition, allowing nodes to have more than one mother. Recently, there have been several proposals to analyze movement of α as remerging α with some β that is part of the same root (see in particular Starke 2001 and Zhang 2004). Multidominance in RNR is then the result of remerging a given α with some β that is not part of the same root, that is, external remerge (see De Vries 2007 for more discussion, also concerning the linearization of such constructions).

More concretely, in a RNR configuration where a given α is reduced in a coordination of XP₁ and XP₂, α is initially merged with one sister (say, A in XP₁), and then remerged with the other sister (B in XP₂) – or the other way around. After this, both conjuncts can be completed and united at the top. A schematic structure is given in (57):
From the multidominance approach to RNR constructions it does not independently follow why the target of RNR must be right-peripheral in the respective conjuncts. Wilder (1999, 2008), Bachrach & Katzir (to appear), and Johnson (2007) try to derive this restriction syntactically. Wilder (1999, 2008) alters the linear correspondence axiom (LCA, see Kayne 1994) in order to make it compatible with multidominance structures, and argues that violations of the right periphery condition are symmetry violations: in a configuration where A and B share $\alpha$, and where $\alpha$ is followed by $x$ in A, the proposed ordering mechanism will produce both $\alpha < x$ and $x < \alpha$, which is impossible to spell out. Bachrach & Katzir (to appear) argue for a linearization mapping condition, from which it follows that RNR leads to a violation of their edge alignment condition if it targets an $\alpha$ that is multidominated by A and B, and followed by some $x$ in A. Crucially, both Wilder (1999, 2008) and Bachrach & Katzir (2006) predict that the shared $\alpha$ only has to be right-peripheral in the first conjunct in RNR constructions. Wilder (2008:244) considers this a welcome consequence, as cases like (58) are acceptable in English:

(58) John should fetch _ and give the book to Mary.

We believe, however, that there are reasons to assume that the example in (58) does not involve RNR at all. First, (58) becomes rather odd when we assign it a true RNR intonation, that is, if we add an intonation break after the first conjunct, and put contrastive focus on fetch and give, as indicated in (59).

(59) * John should FETCH _, and GIVE the book to Mary.

If the (contrasted) verbs have different subjects, the example is similarly unacceptable; see (60b). Finally, the possibility of (58) is restricted to fetch and... and a small set of comparable phrases; other combinations of a transitive with a ditransitive verb are ruled out, as is illustrated in (60b):

(60) a. * John should FETCH _, and Joey should GIVE the book to Mary.
    b. * John BOUGHT _, and Joey GAVE the book to Mary.

Bachrach & Katzir (2006), following Fox & Pesetsky’s 2005 theory of cyclic spell-out, argue that such cases are ungrammatical because they require the reordering of material that has already been spelled out in a previous phase. An undesirable consequence of this approach, it seems to us, is that violations of the right periphery condition in the first
conjunct are ruled out by a different mechanism than those in the second conjunct. Finally, we should mention that the above examples are straightforwardly ruled out in the approach by Johnson (2007), according to which the book in (58) through (60) would not c-command anything, and consequently violate the proposed alignment constraints. However, as is pointed out by Johnson himself, cases in which RNR targets material that is embedded in non-final material of the right conjunct are not excluded, contrary to fact.

It can be concluded that it is extremely hard to derive the right periphery condition syntactically, and all of the cited attempts make use of certain theoretical stipulations. This suggests that the condition is perhaps not syntactic at all. We have come to believe that it is an interface phenomenon. What is not considered in any of the syntactic accounts is the obligatory presence of contrastive focus in both conjuncts in RNR constructions, and the demand that the shared material immediately follows the foci. In line with observations by Hartmann (2000), Selkirk (2002), and Ha (2008), we think that the right periphery condition is closely related to the alignment of contrastive focus. First, it can be observed that in a RNR construction, it is not possible to have material that is not the target of RNR follow the contrastively focused elements in the respective conjuncts:

(61) a. * John BOUGHT yesterday _, and Joanne SOLD yesterday the complete works of Charles Dickens.
    b. * John BOUGHT the book _, and Joanne SOLD the book that was required for algebra.

When we modify (61a) and shift the contrastive focus to the constituent directly preceding the shared material, the sentence becomes acceptable:

(62) John bóught YESterday _, and Joanne sóld toDAY the complete works of Charles Dickens.

Notice that there are two contrasted pairs in (62), but the rightmost pair (yesterday–today) gets the most prominent accent. Here, the distinction is indicated with capitals for prominent pitch accent, and accents (') for secondary stress.

Example (63) shows that contrastive focus cannot be applied to just any pair. We will follow Rooth (1992) in that a contrastively focused X triggers a set of alternatives. For a contrastively focused pair X and Y, X and Y must have identical sets of alternatives. This explains the unacceptability of examples such as (63): there is no possible world in which yesterday and on the market have identical sets of alternatives:

(63) * John bóught YESterday _ and Joanne sóld on the MARket the complete works of Charles Dickens.

We can now formulate the right periphery condition as an interface constraint on what can be shared in a RNR configuration. It is based on the prosodic rule saying that focused constituents must align to the (right or left) edge of their prosodic domain (see also Hartmann 2000), and the semantic requirement concerning contrastively focused elements:
(64) **Right periphery condition**
In a structure \([\{\text{XP}_1 (\ldots F_1) \alpha \} \text{Co} \{\text{XP}_2 (\ldots F_2) \alpha \}]\), where \(\alpha\) is shared
(i) a primary focus element \(F\) must be aligned to the right of its prosodic domain \(\phi\);
(ii) the foci in the respective conjuncts must have identical sets of alternatives;
(iii) a shared element \(\alpha\) must immediately follow \(F\) in both \(\text{XP}_1\) and \(\text{XP}_2\).

In sum, we propose that RNR involves syntactic sharing (multidominance), which – in this configuration – is restricted to material that directly follows the contrasted material in the respective conjuncts.

### 3.2 Extraposition as specifying coordination plus ellipsis

This section briefly argues for a ‘specifying coordination’ approach to extraposition, which is discussed in more detail in De Vries (2002, 2009).

A common example of extraposition of a relative clause in Dutch is (65). A more complicated case is (66), where the relative clause is extracted from an embedded position:

(65) Ik heb de man _ gezien die een zwarte koffer droeg.
    I have the man seen who a black suitcase carried
    ‘I saw the man who carried a black suitcase.’

(66) De politieagent heeft [de papieren van [de man _]] gecontroleerd die een zwarte koffer droeg.
    the police officer has the papers of the man checked who a black suitcase carried
    ‘The police officer checked the papers of the man who carried a black suitcase.’

Such examples constitute stark evidence against both a stranding analysis of extraposition (Kayne 1994) and a rightward movement analysis (Reinhart 1980, Baltin 1983, Büring & Hartmann 1997, among others). The latter requires movement from a strong island, which is otherwise ungrammatical.\(^6\) The former requires (leftward) movement of a non-constituent – in (66), the underlined part of V [D[N[P[D[N modifier]]]]] – which is fundamentally impossible.

Unfortunately, a simple base-generation analysis in terms of right-hand adjunction (see Culicover & Rochemont 1990, for instance) is also problematic. One serious difficulty concerns topicalization of remnant VPs. In (67), the indirect object is scrambled out of the verb phrase, which is consequently preposed, dragging along the direct object:

(67) [t\text{ij} Een hand gegeven] heb ik hem, niet t\text{ij}.
    a hand given have I him not
    ‘I did not shake hands with him.’ (**lit. ‘Given a hand, I have him not.’**)

In the light of this possibility, consider (68):
Example (68a) shows extraposition of a relative clause, which, supposedly, is right-adjoined to the verb phrase. In (68b), the complete phrase containing the antecedent, the participle, and the extraposed relative clause is topicalized; this is fine. However, (68c) shows that topicalization of the verb phrase without the antecedent is unacceptable. Given that (67) is fine, this is entirely unexpected. Importantly, the pattern in (68) can be replicated with modifiers other than relative clauses, such as prepositional phrases, result clauses, and complement clauses of nouns and adjectives. Therefore, a construction-specific rule such as “a relative clause must be preceded by its antecedent” is of no use. The general pattern is that remnant VPs containing extraposed material are inert (see Kaan 1993). Neither of the theories of extraposition mentioned so far is able to explain this pattern.

Therefore, let us turn to Koster’s (2000) proposal, which states that extraposed constituents are coordinated to the spine of the clause (at the lowest possible level). For instance, (68a) would be analyzed roughly as (69):

(69) Ik heb [\[de man gezien\] [\[die een zwarte koffer droeg\]]].

Here, the \[\] is a so-called ‘colon phrase’, whose head – the colon – is described as a specifying coordinator.

It is immediately clear that Kaan’s generalization illustrated in (68) follows from this theory. Starting from (69), we could prepose the entire \[\], resulting in (68b), but we cannot move de man gezien ‘the man seen’ stranding the relative clause as in (68c), since movement of a first conjunct would be a violation of the well-known coordinate structure constraint. Similarly, we explain that the extraposed material itself, being a second conjunct, is an island for extraction (the so-called freezing effect), as is illustrated in (70):

(70) a. Hij is altijd gek (op kaas) geweest (op kaas).
    he is always fond on cheese been on cheese
    ‘He has always been fond of cheese.’

b. Waar is hij altijd gek (op _) geweest (* op _)?
    where is he always fond on been on
    ‘What has he always been fond of?’

Another advantage is that we can easily represent the possibility of extraposition from embedded positions and positions higher in the clause than the regular direct object position. An example of extraposition from a (preposed) \(wh\)-phrase is (71):
(71) \[\:P [Hoeveel boeken heb je weggegeven] [ : [die je nog niet hebt gelezen]]? \]
read
‘How many books did you give away that you haven’t read yet?’

Since coordination is a general phenomenon, independent of the category of the conjuncts, we expect the ‘size’ of the first conjunct of the :P to be variable.

There is also a clear disadvantage of Koster’s coordination approach to extraposition. Namely, the modifier in the second conjunct is not functionally equivalent to the part of the spine that is in the first conjunct, whereas functional equivalence of conjuncts is a general demand for regular coordination. However, this problem can be resolved. Suppose that the second conjunct involves more than what can be overtly detected, and in fact repeats the first conjunct, but with one addition: the relevant modifier in its canonical position. Phonologically repeated material is then deleted. See (72):

(72) Ik heb \[&:P [de man gezien] [ &: [de man die een zwarte koffer droeg gezien]]. \]

Note that we changed the notation of the colon phrase to &:P, a specifying coordination phrase, in order to distinguish between the present analysis and Koster’s original one. Both conjuncts are now (extended) verb phrases. The second conjunct contains more information than the first, so it can be interpreted as a specification. The deletion involved can be compared to gapping; this will be discussed below. First, we would like to point out that the representation in (72) has a number of additional advantages over (69), and in fact over any other analysis of extraposition in terms of base-generation. The basic reason is that (72) incorporates some traits of the rightward movement analysis without taking over its drawbacks. Most importantly, the extraposed modifier is generated in its canonical position next to its anchor (here, man). Therefore, the required (restrictive) interpretation is directly represented in the structure. No additional mechanism is necessary that links the extraposed constituent to its associated position in the matrix.

Furthermore, consider the example in (73a) and the analyses in (73b/c), slightly more detailed than hitherto. Here, (73b) would be Koster’s original analysis, and (73c) is the present view.

(73) a. Ik heb alleen die man beleefd gegroet die een zwarte koffer droeg.
   I have only that man politely greeted who a black suitcase carried
   ‘I politely greeted only that man that carried a black suitcase.’

b. \[CP S Aux \[P [XP DO (X) [\:P V t s V tno]] [ : RC ]] \]
c. \[CP S Aux \[&:P [XP1 [only that man]DO \ (X) [\:P V t s V tno]] \] \]
   \[ &: [XP2 DO only that man RC \ (X) [\:P V t s V tno]] \]

There is a relative clause (RC) related to the direct object (DO) of the matrix clause. This object has been scrambled to some middle field projection XP across an adverb (Adv), which we take to be adjoined to the vP for ease of representation. Crucially, the vP contains a trace of the subject (S) as well. In the :P analysis (73b), the subject must be moved from
the vP inside the first conjunct to the first sentence position. However, this would constitute a clear violation of the coordinate structure constraint. In the &;P analysis, this problem does not arise, since there is a representation of the thematic subject position inside the second conjunct as well. Therefore, the subject is moved in an across-the-board fashion, which is generally fine (as was first noticed in Ross 1967).

Finally, let us mention briefly that the scope of an extraposed constituent is determined by the associated position in the matrix, as is stressed by Büring & Hartmann (1997), and which we confirmed with Dutch data in earlier work. Such empirical findings are consistent with the specifying coordination approach, where the extraposed constituent is in situ in a way.

Before we end this section, let us add some comments on the required deletion in representations such as (72). It seems to us that what is happening here can be compared to the situation in gapping constructions. Gapping involves forward deletion of repeated material in a second conjunct. Crucially, this type of deletion may involve non-constituents and discontinuous material. An example that shows it all at once is (74):

(74) HIJ heeft Marie een BOEK gegeven en ZIJ heeft Marie een CD gegeven.
    he has Marie a book given and she has Marie a CD given
    ‘He gave Marie a book, and she has given Marie a CD.’

The most important rule is that remnants must provide new information. In other words, everything that is repeated must be deleted. This is shown in (75):

(75) Joop heeft Mieke vanochtend een boek gegeven en Jaap/*Joop heeft
    Joop has Mieke this.morning a book given and Jaap/Joop has
    Monique/*Mieke gisteren/*vanochtend een CD/*boek gegeven.
    Monique/Mieke yesterday/this.morning a CD/book given
    ‘Joop gave Mieke a book this morning, and Jaap/Joop (gave) Monique/*Mieke a
    CD/book yesterday/*this morning.’

What is also remarkable is that gapping is clause-bound, as is shown in English in (76):

(76) a. Joop bought a book and Jaap bought a CD.
    b. * Joop said [CP that Mieke bought a book], and Jaap said [CP that Monique bought a CD].

It is likely that deletion across sentence boundaries leads to recoverability problems (see also G. de Vries 1992 for discussion). This has an interesting consequence. From the present perspective, it means that we can reduce the right roof constraint for extraposition to a more general constraint on deletion in coordination constructions. Consider (77a), which illustrates a violation of the right roof constraint (see also (22) and (31)), and the analysis sketched in (77b).

b. \[ \&: \text{([CP that John bought a book] is strange)} \]
\[ \&: \text{([CP that John bought a book of €10] is strange)]} \]

In (77b), what needs to be deleted in the specifying conjunct involves material from the higher clause (is strange) as well as from the lower clause (that John bought a book). This is comparable to the situation in (76b). Therefore, we can now generalize over two seemingly unrelated phenomena: a constraint on gapping and a constraint on extraposition.

To sum up, we argued that extraposition involves coordination as well as deletion. In this way, we combine some positive properties of the more traditional rightward movement accounts and certain base-generation accounts, whilst avoiding the problems associated with each. The deletion involved, although it perhaps looks strange at first sight, turns out to reflect important characteristics of the gapping construction.

4 A syntax of cumulative rightward processes

We now show that the analyses independently developed for RNR and extraposition separately, can be combined to yield the empirical results from section 2. Abstractly, the two structural configurations are represented in (78), which contains the respective tree structure (T), bracketed structure (B), and the output of linearization (L):

(78) Right node raising: \hspace{1cm} Extraposition:

\[ T: \]
\[ B: \text{[CoP \{UP \ldots F_1 (\delta)\} Co \{WP \ldots F_2 \delta\}]} \]
\[ L: \text{[\ldots F_1 Co \ldots F_2 \delta]} \]

In the first configuration (RNR), there is (usually) coordination of some UP and WP (which can be clauses, verb phrases, noun phrases, and so on). Within these, there is a shared right node \( \delta \) (of any size and category) following the foci \( F_1 \) and \( F_2 \). In the second configuration (extraposition), some node of the main projection line (XP), normally the sister of \( \alpha \), is repeated by means of an abstract specifying coordination phrase, such that the second instance is more specific than the first in that it contains the phrase EX (a modifier, for instance) in situ. All repeated material (here, \( \beta \) and \( \gamma \) surrounding EX) is elided; in effect, then, EX appears to be extraposed across \( \gamma \).
The two structures can be combined as follows. First, let us discuss extraposition as input for RNR. This means that the configuration for extraposition is embedded in a larger RNR configuration. In order to do so, extraposition must take place in both coordinated phrases (here, UP and WP) separately; see (79):

(79) Extraposition → RNR

\[
\begin{array}{c}
\text{Linearization: } \left[\ldots \alpha \beta \gamma^\theta_1 \&: \beta (\text{EX}) \gamma^\theta_2 \text{ Co} \ldots \alpha \beta \gamma^\theta_1 \&: \beta \text{ EX} \right] \\
= \left[\ldots \alpha \beta \gamma^\theta_1 \text{ Co} \ldots \alpha \beta \gamma^\theta_2 \text{ EX} \right]
\end{array}
\]

Here, EX (possibly a modifier relating to both \(\beta\) and \(b\)) is extraposed across \(\gamma\) in UP, and across \(c\) in WP. As a result it is phonologically rightmost in both conjuncts, and RNR of EX can be licensed, provided that \(\gamma\) and \(c\) are the relevant contrasted foci. A concrete example (13) is repeated in (80), where RC stands for a relative clause:

(80) Joop heeft iemand _ beWONderd _, maar Jaap heeft iemand _ verGUISd [RC die...].
Joop has someone admired _ but Jaap has someone maligned who...
‘Joop admired someone who..., but Jaap maligned someone who...’

If we perform the correct sequence of mergers, we arrive at a structure as in (79), such that ...
\(\alpha = \text{Joop heeft}, \beta = \text{iemand}, \gamma = \text{bewonderd}, \text{Co} = \text{maar}, ...a = \text{Jaap heeft}, \beta = \text{iemand}, c = \text{vergusd}, \text{and EX} = [\text{RC die...}].\) A relevant illustration in English is repeated in (81):

(81) John saw a girl _ in TOWN _, and Joey saw a boy _ in the LIBRARY who was playing cello.

In this case, \(\alpha = \text{John}, ...\beta = \text{saw a girl}, \gamma = \text{in town}, \text{Co} = \text{and}, a = \text{Joey}, ...b = \text{saw a boy}, c = \text{in the library, and EX = who was playing cello.}\) Notice that EX is merged right-peripherally within the complex [... \(\beta/b\)]. In some more detail, we have \([\text{XP2=VP [saw [DP a [girl [EX=RC who was playing cello]]]] [PP in town]]}, for instance. See (82), where CP is a clause and vP an (extended) predicate:
Next, consider how RNR within a complex major constituent can be used as input for extraposition. This configuration is sketched in (83), where the structure proposed for RNR – see (78) – is part of a larger structure for extraposition. Again, XP₂ specifies XP₁ because of the presence of the additional modifier in EX.

(83) \[ RNR \rightarrow \text{extraposition} \]

Linearization: 
\[ \ldots [\alpha \beta \ldots F_1 \text{Co} \ldots F_2 \gamma &:] \ldots F_1(\text{EX}) \text{Co} \ldots F_2 \text{EX} \gamma] \]
\[ = [\ldots \alpha \beta \ldots F_1 \text{Co} \ldots F_2 \gamma \text{EX}] \]

A relevant example is repeated in (84):
(84) Ik heb zowel een BOEK _ als een DVD _ gekocht van tien euro.
   I have both a book and a DVD bought of ten euro
   ‘I bought both a book of €10 and a DVD of €10.’

Here, ...α = ik heb, ...f₁ = een boek, Co = als, ...f₂ = een dvd, γ = gekocht, and EX = van tien euro. There happens to be no β in this case. The focus particle zowel ‘both’ is related to the CoP level (see De Vries 2005b for details). The structure for (45b) is sketched in (85):

(85) John gave not only a BOOK _, but also a DVD _ to Joey about the life of whales.

It is perhaps insightful to spell out what the alternative analysis mentioned in section 2.2 amounts to. Recall that it involves a double predicational (or clausal) structure. Apart from the foci, the predicates or clauses are the same. There is extraposition within both predicate phrases. On a larger scale, there is non-constituent RNR of the modifier plus the preceding participle. The resulting structure is (86), where we make use of the same ingredients in (78) for a fair comparison.

(86) Alternative analysis
The reader will notice that this is a complex variant of (79). More concretely, (85) then becomes (87):

(87) Alternative analysis

We do not regard (86)/(87) as more attractive than (83)/(85).

Moreover, as we noticed in section 2.2, there are examples of RNR outside of syntactic coordination contexts that cannot be explained along such lines. Thus, using the ideas behind (83), the structure of the repeated example in (88) must be like (89):

(88) Joop heeft het ENE (boek) _ na het ANDere (boek) _ gekocht dat slechts tien euro kostte.

‘Joop bought one book after the other that only cost €10.’
As in (83), the modifier is right node raised at the constituent level, and then surfaces in an extraposed position. We abstract away from the details of Dutch clause structure. In this example, DP₁ has probably been scrambled to a high position within the middle field.

We conclude that the analyses independently proposed for both RNR and extraposition can straightforwardly be combined to produce the data discussed in section 2. The resulting structures are rather complex; we take it that this corresponds to the fact that the examples under discussion are hard to process.

5 Conclusion

We discussed data indicating that there can be interaction between two phenomena known as extraposition and right node raising (RNR). Both relate to the right periphery of some relevant domain (a clause or a coordinated phrase). It turns out that optional extraposition can be used as input for RNR. This is the case for extraposable modifiers, and for heavy NPs, including free relatives. We showed this on the basis of Dutch examples primarily, with some confirmation from English and German. The reverse pattern also seems to be possible: if there is RNR of a modifier at the (major) constituent level, it can be extraposed as well. Even though some of these data can also be explained differently with reference to either complex antecedent phenomena or non-constituent RNR, this is certainly not the case for all of them. Therefore, we conclude that there is a mutual syntactic feeding relationship between RNR and extraposition.

Both processes are subject to a number of constraints. Extraposition from embedded positions is possible (which is an argument against a rightward movement account), but a clause boundary functions as a barrier (the right roof constraint). For RNR there are phonological and semantic requirements. First, the reduction must take place at the right edge of both conjuncts (or insubordinated phrases). This is the right periphery condition, which is active at the phonological interface, and pertains to the audible surface structure.
Second, the material immediately preceding the RNR site must be assigned a contrastive focus accent. Semantically, they must have identical sets of alternatives. It can be shown that all these constraints are operating in sentences involving cumulative rightward processes.

Following a strong current in the literature, we analyze RNR in terms of multidominance. This means that the relevant phrase is simultaneously part of both conjoined phrases or clauses. We argue that neither RNR nor extraposition involves rightward movement. For the latter, we want to avoid the problems of a simple base-generation account as well. Therefore, we use a theory based on specifying coordination in combination with forward deletion (gapping), proposed in earlier work by one of the authors. Thereby, the last part of the predicate is repeated as the second conjunct of a CoP which specifies the first in that it contains the relevant ‘extraposed’ phrase in situ. All repeated material is elliptical.

We showed that these independently developed analyses can be combined to explain the cumulative rightward processes discussed in section 2. It is not entirely clear to which extent the data presented actually support these particular approaches to RNR and extraposition, but we conclude they are compatible with them. We illustrated this by analyzing a number of examples in detail.

Notes

1 We should note that first attempts with PPs in German were less successful, so we cannot claim full generality at this point.

2 Interestingly, Bachrach & Katzir (to appear) observe that RNR can feed wh-ATB movement, allowing constituents to move out of islands as long as they are right-peripheral in the respective conjuncts:

(i) Which book, did [John meet the man who wrote _ ] and [Mary the man who published _ ]

These data in particular complicate the proposal of Sabbagh (2007), because the target of RNR cannot move leftward if the first cycle is over. However, the relevant Dutch examples in which extraposed material is ATB-moved out of a relative clause are reported to be ungrammatical:

(ii) * Over welke oorlog ontmoette Joop een vrouw die een boek SCHREEF en Mieke een man die een boek LAS?

‘About which war did Joop meet a woman who wrote a book, and Mieke meet a man who read an article?’

3 Similar proposals can be found in the literature for ATB wh-movement (Citko 2003, 2005), multiple wh-questions (Gracanin-Yuksek 2006), (transparent) free relatives (Van Riemsdijk 1998, 2002). Note that the multidominance approach to ATB solves the problem of multiple constituents moving to a single position, which we briefly touched upon in the discussion concerning the possibility of rightward ATB movement.

4 Notice that any multidominance structure creates a direct problem for the LCA as originally proposed by Kayne (1994). Namely, an α that is shared by A and B will give rise to the ordering α < α, constituting a reflexivity violation. Wilder (1999, 2008) circumvents this by proposing that the image of X consists of those terminals that are fully dominated by X. A shared α in X is by definition not fully dominated by X, since α also has at least one other mother.

5 Examples in which the secondary pair is not properly contrasted are a little less bad, but still very marginal:
(i) ?* ... dat Joop in het bós een hele marathon gelopen heeft. en dat Mieke gisteren een halve marathon geforceerd heeft.

‘... that Joop has run a complete marathon in the forest and that Mieke has run half a marathon yesterday.’

6 Another asymmetry between leftward and rightward movement would be that leftward movement is unbounded (that is, can be applied successive-cyclically), whereas extraposition to the right is subject to the right roof constraint, as was illustrated in section 2.1, example (22).

7 Preposing of a relative clause alone is also unacceptable: * [Die een zwarte koffer] droeg heb ik de man gezien ‘who a black suitcase carried have I the man seen’. This can be attributed to other factors, such as the island status of (complex) noun phrases.

References


Johnson, K. 2007. LCA+alignment=RNR. Manuscript, University of Massachusetts Amherst.


