ON THE DISUNITY OF RIGHT-NODE RAISING PHENOMENA: EXTRAPOSITION, ELLIPSIS, AND DELETION

Rui P. Chaves

University at Buffalo, The State University of New York

The empirical facts about right-node raising (RNR) lead to fundamentally conflicting analytical conclusions. There is strong evidence that RNR does not obey syntactic constraints of any kind, which in turn suggests that RNR is not a syntactic operation, but there is also evidence that strongly favors a syntactic analysis. The idiosyncratic and almost paradoxical nature of the phenomena indicates that no simple unified analysis of RNR can be formulated. In order to resolve this empirical and theoretical impasse, I propose that what is usually called RNR is best seen as the conflation of three completely unrelated kinds of phenomena: VP/N′-ellipsis, extraposition, and (backward) periphery deletion. Although they are fundamentally different, these phenomena can yield structures that are superficially similar and, in some cases, apply to the same strings. The latter is one of the major factors that has misled previous accounts. Once this three-way confound between ellipsis, extraposition, and deletion is taken into account, the contradictory idiosyncrasies about RNR vanish, and a wide range of cases are obtained as predictions of independently motivated accounts of VP/N′-ellipsis and ATB extraposition phenomena. This article offers an explicit formalization of the phenomena under discussion in sign-based construction grammar (Sag 2012), a framework that combines insights from head-driven phrase structure grammar (HPSG; Pollard & Sag 1994) and Berkeley construction grammar (Fillmore & Kay 1996).*

Keywords: extraposition, ellipsis, deletion, scope, cumulation, conjunction

1. Introduction. The phenomenon usually called right-node raising (RNR) involves a right-peripheral element that is shared by two or more phrases, as illustrated in 1.† Although it is not always the case, certain elements flanking the RNRAised material are usually contrasted and convey new information. Thus, 1 is a felicitous answer to How do John and Mary feel about spinach?. In this work I signal contrastive focus with small caps, and square brackets identify the RNRAised string. This contrast is reflected prosodically as contrastive focus, with an L+H* tone, possibly followed by a pause and an L-tone (Selkirk 2002, Kentner et al. 2008).

(1) a. John detests and Mary likes [spinach].
   (= ‘John detests spinach and Mary likes spinach.’)
b. *John detests [spinach] and Mary likes.

One particularly challenging kind of RNR is illustrated in 2, which I refer to as additive RNR. Let us consider 2a, adapted from Abbott 1976. In one reading, Fred spent $10,000 and Mia lost $10,000 (the nonadditive reading). In the second reading, however, Fred spent some amount of money and Mia lost some amount of money such that

† The term ‘right-node raising’ (Postal 1974:127) is used in a neutral way, without assuming that any kind of raising takes place. RNR has been referred to in a number of ways, such as ‘backward conjunction reduction’ (Ross 1967) and ‘shared constituent coordination’ (Radford 1988). None of these is ideal because it has been known since Hudson 1976 that RNR is not restricted to coordination. The attested examples in this article were retrieved from the Brown treebank (BRN), Switchboard (SWB), and Wall Street Journal (WSJ) corpora, and were validated by native speakers.
the two amounts total $10,000 (the additive reading). The same ambiguity arises if a total of is omitted, although the nonadditive reading is preferred. Similarly, 2b can be interpreted as meaning that the tunes that John hummed are different from the tunes that Mary sang (the additive reading) or are the same ones (the nonadditive reading). Finally, in 2c the context makes the additive reading the felicitous one.

(2) a. Fred spent and Mia lost [(a total of) $10,000].
   b. John hummed and Mary sang [several tunes].
   c. Sue spent her summer in Paris and Ted is relocating to London. I can’t imagine why she would vacation in and he would move to [two of the most expensive cities in Europe].

Symmetric expressions like the same, different, in equal amounts, and so forth can also give rise to additive readings, as in 3. As argued by Carlson (1987), such symmetric expressions have an internal reading, in which they are interpreted without appeal to an extrasentential referent, and an external reading, in which there is no appeal to an extrasentential referent. It is the former that is relevant here. For example, in the internal reading of 3a, John defeated an opponent $x$ and Mary lost to an opponent $y$ such that $x \neq y$. Crucially, such interpretations cannot be reduced to the non-RNR counterpart John defeated different opponents and Mary lost to different opponents. See also Jackendoff 1977, McCawley 1982, and Postal 1998.

(3) a. John defeated and Mary lost to [very different opponents].
   b. John hummed and Mary sang [similar tunes].
   c. Tom shouted and Mary cried [each other’s names].

What is special about additive readings in general is that each verb predicates a different subset of the denotation of the plural RNRaised NP. For example, 2b means that John hummed a certain tune $x$, Mary sang a certain tune $y$, and $x$ and $y$ are similar. Hence, independently predicated referents are summed in the same plural phrase. Crucially, data like 2 show that additive RNR is independent from symmetric predicates like different and the same, and that it can arise in any plural NP RNR structure.

In this work I argue that additive readings can arise from various types of construction, including ellipsis, extraposition, and deletion. In fact, there is evidence that the additive readings can apply to any kind of syntactic dependent, beyond RNR constructions (Chaves 2012). For example, additive readings arise in leftward extraction, as is shown in the examples in 4, from Chaves 2012.2

(4) a. What $\{x, y\}$ did [Kim [eat __ $x$ and drink __ $y$]]?
   b. The leftovers $\{x, y\}$ that the dog ate __ $x$ and drank __ $y$ were beginning to turn.
   c. Setting aside illegal poaching for a moment, how many sharks $\{x, y\}$ do you estimate [[__ $x$ died naturally] and [__ $y$ were killed recreationally]]?
   d. The [ships $\{x, y\}$ that [a U-boat destroyed __ $x$] and [a Kamikaze plane blew up __ $y$]] were the Laconia and the Callaghan.

Additive readings also arise in modification structures, as in 5. For example, the relevant reading of 5a can be paraphrased as John tapped his left leg and his right leg, and 5b as The average lifespan was between zero years and one year. Here, the conjunction of two adnominal modifiers that select a singular nominal head yields an adnominal

modifier that selects a plural nominal head. Crucially, each conjoined adjective predicates a different nominal entity.  

(5) a. John tapped his [[left and right] legs].  
    b. The average lifespan was between [[zero and one] [years]].  
    c. Kowal discovered the [[thirteenth and fourteenth] [moons of Jupiter]].  
    d. The production will peak on [days [six and seven]].  
    e. Bart and Lisa are [players [three and four]].

Drawing from Krifka 1990:173 and Chaves 2012, I model all kinds of additive readings via the generalization in 6, which is formalized in the non-Boolean conjunction rule formulated in §3.2 below.

(6) SHARED DEPENDENT CONDITION FOR CONJUNCTION (informal version):
    Predication dependencies shared by conjuncts are combined via ‘⊕’.

This condition requires that the indices of dependents that are shared by conjuncts must be combined with a Linkean i-sum. The ‘⊕’ operator is the join operation in a mereological domain (Link 1983): \( x \oplus y = x \cup y \). Because ‘\( \cup \)’ is idempotent (i.e. \( \forall x [x \cup x = x] \)), \( x \oplus y \) means that the two indices are either identical or cumulate into a plurality. In the former case we allow the shared dependent to be predicated by both verbs (e.g. John HUMMED and Mary SANG the same tune(s)), whereas in the latter the shared dependents are cumulated into a plurality (e.g. John HUMMED and Mary SANG similar/different tunes).

A related type of RNR phenomenon is SUMMATIVE AGREEMENT RNR, shown in 7; see also Postal 1998:173 and Yatabe 2002. What is remarkable is that the RN-Raised VP is plural even though the respective subjects are singular and are located in different clauses. The prosodic contrast must be minimal, and the context must allow for the speaker to have a privileged perspective of the two conjoined propositions.

(7) [Context: In a faculty meeting, two instructors each express their views about their students. One instructor praises John and the other praises Mary. Days later, the former instructor recalls the statements made at the meeting.]
    I said that John—and you said that Mary—[were wonderful students].

1.1. PROPOSAL. The main analytical alternatives for RNR that have emerged are across-the-board (ATB) rightward extraction (e.g. Hankamer 1971, Postal 1974, Gazdar 1981, Sabbagh 2007, and related accounts like Steedman 1996), deletion (e.g. Wexler & Culicover 1980, Napoli 1983, Kayne 1994, Wilder 1997, Hartmann 2000, and Ha 2006, among others), and multidominance (e.g. McCawley 1982, Radford 1988, Moltmann 1992, Wilder 1999, Bachrach & Katzir 2008, and Gračanin-Yuksek 2013). The survey of RNR phenomena conducted in this work indicates that no single account can explain the full range of phenomena: there is solid empirical evidence both in favor of and against syntactic accounts of RNR, however defined. These empirical facts lead to conflicting analytical conclusions and therefore hamper the formulation of a simple unitary generalization for RNR. A somewhat similar conclusion is reached by Barros and Vicente (2011), who conjecture that some cases of RNR are best seen as ELLIPSIS, whereas others are best seen as the result of MULTIDOMINANCE. Larson (2012) has offered a refutation of

3 Other examples are I loved the [[Australian and New Zealand] beaches] and We photographed the [[Brooklyn and Peace] Bridges]. In the relevant readings, these do not mean that a set of beaches is located both in Australia and in New Zealand or that there is a set of bridges both called Brooklyn and Peace. It is clear that such cases do not involve RNR and are instead base-generated because they do not operate at longer distances (e.g. *We photographed the Brooklyn and the Peace beaches). See §2.1 for evidence that RNR is not bounded in this way.
Barros and Vicente (2011), however, showing that the ellipsis-multidominance split is not consistent with the facts. In this work I discard the multidominance account because it faces a number of technical difficulties, discussed throughout this article. I propose to resolve the analytical impasse created by RNR by assuming that what is usually called RNR falls into three distinct categories. Some data are best seen as cases of VP/N′-ellipsis rather than RNR proper. In other words, the proper account of VP/N′-ellipsis and coordination should predict the relevant instances of apparent RNR. Other apparent cases of RNR are best seen as resulting from the interaction between coordination and extraposition. Any suitable account of rightward extraction and coordination will predict these apparent instances of RNR as ATB extraposition. The remaining instances of RNR are what I view as true RNR, and are modeled via a nonsyntactic backward deletion operation. Interestingly, all instances of RNR allow some additive readings. The proposed analysis is summarized below.

(i) VP/N′-ELLIPSIS: VP/N′-ellipsis is a phenomenon that allows the omission of VPs and N′s in certain conditions (Sag 1976, Sag & Hankamer 1984, Merchant 2001, Miller & Pullum 2013). As is well known, VP/N′-ellipsis can occur cataphorically or anaphorically, and is restricted to VP and N′ phrases that are controlled by certain heads. When it applies cataphorically, the elision site cannot c-command the antecedent. Cataphoric ellipsis can have the appearance of an RNR construction, especially if there is prosodic contrast. The present article claims that some apparent instances of RNR are nothing but VP/N′-ellipsis, and therefore are predicted by any sufficiently robust theory of VP/N′-ellipsis that allows for cataphora, however defined. True RNR has none of the VP/N′-ellipsis properties: it cannot be reversed, it can apply to a much wider range of phrases beyond VP and N′, it cannot occur without an overt linguistic antecedent, and it imposes stricter identity conditions than ellipsis (e.g. ellipsis allows tense and gender mismatch but true RNR does not).

(ii) ACROSS-THE-BOARD EXTRAPPOSITION: Extraposition is a syntactic phenomenon that allows a restricted set of syntactic constituents (NP, PP, and RelC) to be displaced to the right of their canonical location. Any reasonably robust theories of extraposition and of coordination will necessarily interact and predict the existence of ATB extraposition. Such cases have the superficial appearance of RNR, but are obtained by extraposition and coordination for free, without further assumptions. Crucially, ATB extraposition and true RNR differ in several fundamental ways. First, ATB extraposition can only apply to extraposable syntactic constituents, whereas true RNR can apply to

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4 Some of the major problems with multidominance accounts are the following. In multidominance, ATB leftward extraction is viewed as the leftward movement of a multidominated structure. But this is directly challenged by languages like Hausa, which have leftward extraction but lack RNR altogether (Davies 1992, Beavers & Sag 2004). The second major shortcoming of multidominance is the fact that it has been unable since its inception to offer an explicit account of the directionality of RNR, illustrated in 1. For example, de Vries (2009) simply conjectures that the directionality of RNR is due to some kind of interface effect related to contrastive focus. But as shown in §2.2, there are instances of RNR that do not require contrastive focus. Gračanin-Yuksek (2013:278, n. 7) offers no explicit account either, and simply stipulates that ‘a condition that shared material must be linearized in the (second) final conjunct would be specific to sharing in coordinate structures’. This stipulation is problematic because it is well known that RNR is not restricted to coordination (see §2.1). Finally, Bachrach & Katzir 2008 has a number of technical problems, as Yatabe (2012) notes. For example, it allows the right edge of a phrase and the left edge of the immediately following phrase to be fused (e.g. *John met Mary, Mary laughed, and Bill was surprised is incorrectly predicted to be a legal RNR). See below for more criticism.
a much wider range of strings (e.g. immobile elements such as idiom parts, nonconstituent sequences, word-parts, and combinations thereof). Second, only ATB-extraposed phrases can obtain wide quantificational scope over the coordination. This follows from the fact that ATB extraposition allows the displaced phrase to reside in a higher structural position, above the extraction sites. In contrast, true RNR does not allow this possibility. In fact, true RNR can be discontinuous, in which case the RNRaised string is nonperipherally embedded inside the rightmost conjunct. ATB-extraposed phrases have wide scope over the coordination.

(iii) **Backward periphery deletion**: True RNR can apply in virtually any construction, and can target any pair of peripheral strings as long as they have the same morph forms and are prosodically independent (this includes stressed pronouns, word-parts, nonconstituents, and even discontinuous strings). Because virtually anything can be deleted in this way, the evidence suggests that this phenomenon is not syntactic in nature but, rather, linearization-based. I argue that true RNR is best modeled as an optional surface-based deletion operation. This form of deletion allows summative agreement.

Although VP/N′-ellipsis, extraposition, and backward periphery deletion are different phenomena, the set of strings and constructions that they can apply to is not disjoint. For example, since extraposition and ellipsis can target VPs, then certain VP RNRAising structures can be parsed either way. Moreover, since deletion can apply to a much wider range of strings than ellipsis or extraposition, it follows that some RNR cases can be parsed in three different ways. For example, 8a can be derived by cataphoric N′-ellipsis as well as by backward periphery deletion. The cataphoric N′-ellipsis parse is motivated by the existence of an anaphoric parse. This datum contrasts with 8b, which is an unambiguous case of deletion, since adjectives like *interesting* do not license N′-ellipsis.

(8) a. The relevant passage is in the third or in the fifth [line]?
   (cf. The relevant passage is in the third line or in the fifth?)
   b. This is the difference between an interesting and a boring [book].
   (cf. *This is the difference between an interesting book and a boring.*)

Similarly, 9a can be derived by ATB extraposition or backward periphery deletion. Since this kind of PP complement is extraposable (e.g. *I bought a book yesterday about quantum physics*), it follows that it should be extraposable ATB. The example in 9b, however, involves an idiomatic phrase *X does not play with a full deck* (= ‘X is crazy’). The PP complement cannot be extraposed or fronted in any way, and therefore there is no available ATB extraposition parse. Only the backward periphery deletion analysis is possible.

(9) a. I bought a book and you got a magazine [about quantum physics].
   (PP complement is movable.)
   b. Robin does not play—or pretends not to play—with a full deck.
   (PP in the idiom phrase is not movable.)

1.2. **Structure of the article.** This article is structured as follows. Section 2 offers an overview of certain key properties of RNR that are usually not recognized in recent literature. First, it argues that RNR data are not restricted to coordinate structures and can target a wide range of other environments. The degree of flexibility suggests that RNR is not a syntactic operation. Second, it shows that the typical RNR-like

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5 The same is true for French, as shown by Abeillé and Mouret (2008).
prosody is neither obligatory nor a grammatical requirement. Hence, prosody can be used neither as a criterion for identifying RNR, nor as a factor for explaining RNR phenomena. I argue that the typical RNR prosody has a functional motivation.

Section 3 argues that the reason for the lack of a simple analytical generalization for RNR is that three fundamentally different kinds of phenomena have been confounded: VP/N'-ellipsis, ATB extrapolation, and backward periphery deletion. Once this three-way confound is removed, a simpler interpretation of the conflicting empirical evidence emerges where true RNR boils down to deletion of morphophonological units. All other apparent instances of RNR are obtained for free, as predictions of ellipsis and extrapolation. The shared dependent condition for conjunction is argued to permeate all three types of phenomena, and to account for summative agreement and additive RNR.

2. Preliminary observations.

2.1. On the lack of syntactic constraints on RNR. There have been many claims that RNR is restricted by various kinds of syntactic conditions. However, none of them are convincing. For example, Hartmann (2000:119) claims that argument structure parallelism is required by RNR. This is refuted by cases like 10, where the argument structures of the matrix verbs are not parallel in any way.

(10) a. Sue gave me—but I don’t think I will ever read—[a book about relativity].
b. Dale sells—and Dana knows a man who repairs—[washing machines].
c. Never let me—or insist that I—[pick the seats].

Another example of a syntactic RNR condition is from Postal 1998:126, where it is claimed that *Sandra MAY HAVE exerted and PROBABLY DID exert [herself] is odd because of the reflexive. But the sentence is odd because the semantically contrasted verbs are almost synonymous, and therefore do not easily contrast. Note the ameliorative effect that replacing may with might has on Postal’s datum. More recently, te Velde (2005: 496) and others have assumed that RNR is restricted to clausal coordinations. This is not accurate, as originally noted as far back as McCawley 1987:187. The majority of RNR found in the three corpora considered in this study is subclausal RNR. The examples in 11 are typical.

(11) a. Will he try to gain a seat or control of [the board] … (WSJ)
b. The FBI is very supportive of and an active participant in [Mr. Bennett’s initiative]. (WSJ)
c. … it was a sweet and an intelligent [dog]. (SWB)
d. Holmes rebels against the social conventions of his day not on moral but rather on aesthetic [grounds]. (BRN)
e. The break-in on Monday was a rare but not unheard-of [breach of royal security].

Notably, there are even attested cases of recursive nonclausal RNR—that is, structures where the RNRAised phrase contains yet another embedded RNRAised phrase, as in 12.

(12) Then suddenly we found ourselves in the middle of another fight, an irrational, an indecent, an undeclared and immoral [war with our strongest—and some had thought noblest—[ally]]. (BRN)

Furthermore, Wilder 1997, Chaves 2008, and others note that RNR can apply to word-parts in phrasal coordinations, as shown in 13. Crucially, the bracketed strings are not syntactically mobile constituents. To my knowledge, there is no independent evidence for allowing word-parts such as these to be accessible to syntax, as would be required by a movement or multidominance account of RNR.

(13) a. Your theory under-and my theory over[generates].
   b. We ordered the hard- but they got us the soft-[cover edition].
   c. These events took place in pre- or in post-[war Germany]?

Another crucial fact about RNR is that it is not circumscribed to coordination structures in any way. This was originally noted by Hudson (1976, 1984), with data like 14a,b, and has been noted by various other authors since then, although it is often not taken into consideration.7

(14) a. I’d have said he was sitting on the edge of rather than in the middle of [the puddle].
   b. It’s interesting to compare the people who like with the people who dislike [the power of the big unions]. (Hudson 1976:550)
   c. Anyone who meets really comes to like [our sales people]. (adapted from Williams 1990)
   d. Spies who learn when can be more valuable than those able to learn where [major troop movements are going to occur].
   e. Politicians who fought for may well snub those who have fought against [chimpanzee rights]. (Postal 1994)
   f. Those who voted against far outnumbered those who voted for [my father’s motion]. (Huddleston et al. 2002:1344)
   g. If there are people who oppose then maybe there are also some people who actually support [the hiring of unqualified workers].

In 15 are given various examples of noncoordinate RNR involving adjunction structures. Examples 15e,f are my own and 15g,h are attested. For more examples see Phillips 1996:56, and for arguments against the parasitic gap analysis of such data see Levine 2001:165.

(15) a. It seemed likely to me though it seemed unlikely to everyone else [that he would be impeached]. (Bresnan 1974)
   b. John offended by not recognizing [his favorite uncle from Cleveland]. (Engdahl 1983:12)
   c. John throws out whereas Mary eats [anything that happens to be in the refrigerator]. (Goodall 1987:97)
   d. We suggest to our employees—without actually requiring of them—that they wear a tie. (Authier 1989)
   e. The volcano is glaciated, making for an interesting while not very technically challenging [climb].
   f. If you keep avoiding then you’ll never get to meet [your real father].

7 Many recent RNR studies ignore Hudson’s finding and simply assume that RNR always targets coordinate structures (e.g. Hartmann 2000:55, 141, te Velde 2005:496, and Sabbagh 2007, to cite only a few). Goodall (1987:98) noted that RNR could not be treated in terms of his account of union of reduced phrase markers precisely because of such noncoordinate instances. Williams (1990) took the opposite approach, by arguing that 14c is evidence that Subject + VP structures have a ‘coordinate character’ and consequently that the concept of coordination, and hence ‘across-the-board’ extraction, should be extended to these structures as well. This move is problematic, however, as shown by Postal (1993) and McCawley (1998:Ch. 9).
g. Oncogenes must be present for a cell to become malignant, but researchers have found them in normal as well as in cancerous cells, suggesting that oncogenes do not cause cancer by themselves. (WSJ)

h. … the President’s decision will finally clarify itself as a moral, rather than a medical problem. (WSJ)

As expected, word-part RNR also arises in noncoordinate structures, as illustrated in 16.

(16)  a. Explain how signals move from a pre- to a post-synaptic neuron.
   b. I’m more interested in four-star than in five-star hotels.
   c. You must learn to distinguish neuro- from psycho-linguistic claims.
   d. Alison majored in neuro- while Alexis majored in socio-linguistics.

The data above show that RNR can in principle occur in virtually any kind of construction. RNR is also fairly unrestricted with regard to the kinds of syntactic nodes that it can cross. In particular, it can cross clausal boundaries, as 17 shows.

(17)  a. Sally might be and everyone believes Sheila definitely is pregnant.
       (Ross 1967:§4.2.4)
   b. I know that you said and I happen to agree that I need a new car, but I just don’t have the money for it right now. (adapted from McCawley 1987:188)
   c. I think that I would and I know that John will buy a portrait of Elvis.
       (McCawley 1998)
   d. One police officer said that he liked and another even boasted that he defended vigilante justice.

A well-known property of RNR is that it is not constrained by islands, as noted by Wexler and Culicover (1980), Grosu (1981:45), and McCawley (1982). Consider the evidence in 18.8

(18)  a. I know a man who sells and you know a person who buys pictures of Elvis Presley.
   b. John wonders when Bob Dylan wrote and Mary wants to know when he recorded his great song about the death of Emmet Till.
       (Wexler & Culicover 1980:299)
   c. Politicians win when they defend and lose when they attack the right of a woman to an abortion.
       (Sabbagh 2007:382, n. 30)
   d. Lucy claimed that—but couldn’t say exactly when—the strike would take place.
   e. I found a box in which and Andrea found a blanket under which a cat could sleep peacefully for hours without being noticed.
       (Bresnan 1974)

But the flexibility of RNR goes beyond that. Levine (1985:493) showed that RNR is not generally limited by recursion. In other words, phrases with different levels of recursive embedding can all share the same RNRaised element. This possibility is illustrated by 19, in which completely different coordinate structures RNRaise the same string.

8 Steedman (1985, 1990, 2001) and Dowty (1988:183) claim that RNR is bounded, nonetheless, as predicted by their accounts. For example, Dowty argues that an idea that, and a robot which can solve this problem is evidence for islands in RNR. But as Phillips (1996:95) points out, this oddness is explained by semantic factors: it is impossible to semantically contrast that (which is semantically vacuous) with which. This is supported by the acceptability of Bresnan’s 18d, e, where the verbs are contrasted, rather than the complementizers. Steedman (2001:17) argues that RNR exhibits islands effects by claiming that I hope that I will meet the woman who wrote and you expect to interview the consortium that published that novel about the secret life of legumes is ungrammatical. Many of my informants do not share that judgment.
(19) [[John gave silver _ 1 and Harry gave gold _ 1], [but nobody gave platinum _ 1] [to the father of the famous quintuplets]]. (Sabbagh 2007:383, n. 31)

Furthermore, Levine (1985) and Postal (1998:155) also argue that a string can be RN-Raised out of an RN-Raised string. Postal refers to this as autorecursive RNR. In 20 the first clausal coordination RN-Raises the CP that Tony could, which is itself missing a VP complement hire more workers. The latter is RN-Raised out of that Tony could, and out of the I believe that he should, into a different and higher coordinate clause.

(20) Frank reported to Louise _ 1 and Mike admitted to Marion _ 1 [that Tony could _ 2]—and I believe that he should _ 2—[hire more workers].

Although 20 is fairly artificial, the attested example in 21 is acceptable to all of the native speakers that I consulted. This sentence, and various others like it, are found in the Employment Based Permanent Resident Questionnaire (I-485 application) that United States green card applicants must fill out.

(21) Have you ever engaged in, conspired to engage in, or do you intend to engage in, or have you ever solicited membership or funds for, or have you through any means ever assisted any type of material support to any person or organization that has ever engaged or conspired to engage in [sabotage, kidnapping, political assassination, hijacking, or any other form of terrorist activity]?9

In 21, the preposition stranding in the three first conjuncts shows that the RN-Raised structure is the bracketed NP at the end of the sentence. However, some of the conjuncts actually RN-Raise a PP, not an NP. For example, in the relative clause that has ever engaged or conspired to engage, both occurrences of engage share the same PP headed by in. Here, RN becomes autorecursive: the NP embedded in this RN-Raised PP itself undergoes RN. It is this NP that the first four conjuncts of 21 share.

The empirical evidence indicates that RN is not syntactically restricted, contra Dowty 1988, Postal 1998, Hartmann 2000, Steedman 2001, te Velde 2005, Sabbagh 2007, Gračanin-Yuksek 2013, and many others. In particular, the data suggest that RN cannot be seen as involving the same syntactic mechanism that is responsible for leftward extraction. For further evidence that certain RN cases are not syntactic phenomena see §3.3.

2.2. On the phonology of RN. Prosody is a criterion frequently used to detect RN. Selkirk (2002) and Kentner and colleagues (2008) experimentally established that standard RN cases (i.e. where an NP is RN-Raised from a clausal coordination) typically involve an L-H* pitch accent on the contrasted elements in both conjuncts, followed by a low boundary tone, and sometimes a pause.10 Contrastive focus, if present, must coincide with semantic contrast, as 22 and 23 show.

(22) a. *John gave but Bill didn’t give [a present to Mary].
   b. *John gave a present to Mary but Bill didn’t give a present to Mary.

(23) a. John gave but Bill didn’t give [a present to Mary].
   b. John gave a present to Mary but Bill didn’t give a present to Mary.

It is obvious that contrastive prosody by itself does not trigger RN. After all, 23a is as acceptable as 23b, and both are felicitous answers to the question What did John and

10 Selkirk found that in 10% of the cases there was no pause or break, and another 10% contained H* or !H* pitch accents rather than the typical L+H*. Kentner and colleagues (2008:212) replicated these results.
Bill decide to do about Mary’s birthday gifts? Still, Hartmann (2000:20) proposes that focus triggers a deletion operation called deletion by focus, which in turn yields RNR. This position is problematic for two reasons. First, it requires that the elements preceding the RNRaised string must be contrastively interpretable narrow foci (Hartmann 2000:141). This proposal is at odds with 24, where the focused elements are not adjacent to the putative ellipsis site.

(24) a. My mother blushed at this small lie because she knew and we knew [that the roosters had already been paid for].
   b. They refused to mention and we failed to notice [that they are not there].
   c. I find it easy to believe, but Joan finds it hard to believe [that Tom is dishonest].
   (Postal 1974:127)
   d. The Fed is responsive to, and cannot help being responsive to [the more overtly political part of the government].

Second, there are instances of RNR that do not require significant contrastive prosody. In 25a the RNRaised unit can be realized with neutral intonation. The rightmost unit can be integrated into the preceding structures without major difficulty. Other examples of RNR that do not require special intonation at a normal speech rate are 25b,c. This is consistent with Kentner and colleagues (2008:212), who experimentally show that the phonological boundary between conjuncts is typically weaker than the boundary between non-RNR counterparts of the same sentence.

(25) a. Tom took many photographs and Sue painted some portraits [of famous people].
   b. These first magnitude wines ranged in price from $40 to $125 [a bottle].
   (WSJ)
   c. … said Lonnie Thompson, a research scientist at Ohio State who dug for and analyzed [the ice samples].
   (WSJ)
   d. And because of the time difference, the Japanese and the U.S. [markets’ trading hours] do not overlap.
   (BRN)

Cases like 26a,b are also instances of RNR where the contrastive prosody can be minimal. McCawley (1987:187) argued that these are not simply cases of adjectival conjunction because, although the nominal heads knowledge and food are singular, there is plural subject-verb agreement.

(26) a. [Historical and scientific [knowledge]] are different in nature.
   b. [Thai and Burmese [food]] are quite similar.

There are also cases like 27, however, in which only the second daughter seems to require prosodic focus. The stranded word in the first daughter can be realized without prosodic contrast.

(27) a. … ridiculous may be the only way to describe how the U.S. decides to take—or rather, not to take—[covert action].
   (WSJ)
   b. … 17 other attorneys representing 18,136 claimants in the U.S. and abroad argue that the appeal would delay—and perhaps even destroy—[a $2.38 billion settlement fund that is the centerpiece of the reorganization plan].
   (WSJ)
   c. To kill an error is as good a service as, and sometimes even better than, [the establishing of a new truth or fact].

11 Charles Darwin, March 5, 1879 (More letters of Charles Darwin, vol. 2: Darwin to Wilson, p. 422)
Finally, in other cases the first conjunct is prosodically contrasted but the second need not be. As noted by Wagner (2010:223, n. 32), in 28 the RNRaised element can be unaccented and grouped prosodically with the second conjunct.

(28) Thatcher’s legacy and image loom large over British psyche for both those who loved and those who hated [her].

These data indicate that focus accent and rising intonation are not grammatical requirements of RNR. Instead, they suggest that the peculiar prosody that often accompanies RNR is functionally motivated. The RNR parse for a given sentence often must compete with a non-RNR parse. Sometimes the ambiguity is only temporary, as in Tom promised me and Mary offered me [100]. In this example Tom promised me and Mary is temporarily a plausible parse. Sometimes the ambiguity is permanent, however, as in Robin is singing and Kim is playing [a song]. Prosody can aid the planning, production, and comprehension of such structures, by signaling not only that such structures involve incomplete phrases, but also where the extra computational steps must be taken in order to allow a peripheral string to be shared by multiple phrases. The guiding and preemptive role of prosody in parsing has been noted before, in a variety of constructions (Fodor 2002a,b, Kitagawa & Fodor 2006). See also Frazier et al. 2006 for arguments that prosodic representations are central in permitting an utterance to be retained in memory while it is processed.

I therefore conjecture that the typical RNR prosody emerges from the interaction of ambiguity-avoidance processing strategies and the semantic contrast that such constructions (as well as their non-RNR counterparts) exhibit. This would explain why the VP RNR parse of 29a—paraphrasable as Tom is happy and Fred is happy—is impossible to accept. There is no way to cue the RNR parse, and therefore it is preempted by the NP coordination parse. It is independently known that the more committed the parser becomes to a syntactic parse, the harder it is to reanalyze the string (Ferreira & Henderson 1991, 1993, Tabor & Hutchins 2004). Now compare 29a with the acceptable VP RNR parse of 29b. Here, a NP coordination parse is not grammatical, and thus it is unable to preempt the RNR parse.

(29) a. *Tom and Fred [is happy].
   b. Today a man and tomorrow a woman [is coming to interview for my position].

A similar pattern arguably arises in sentences like The police arrived to taser, pepper-spray, and arrest me. If the verbs are not prosodically contrasted, and the pronoun is un-stressed, then speakers are more likely to assume that taser and pepper-spray are being used as intransitive verbs. But if the verbs are contrasted and the pronoun is stressed, then it is more likely that each VP shares the same complement.

Kentner et al. 2008 reports several perceptual studies where the lack of contrastive prosody in RNR caused processing difficulties in the presence of parsing conflicts. In one experiment, spoken sentences like Nina is riding and Ian is fixing a bike were given to subjects. Such items were preceded by a context that biased the RNR reading or the non-RNR reading. The results show that items were judged to be more acceptable faster when the correct prosodic contours were employed. Kentner and colleagues conclude that processing obstacles created by syntactic complexity can be neutralized with optimal prosodic phrasing, since comprehenders can use prosodic cues during on-line sentence processing in order to assign the appropriate reading to an otherwise ambiguous string. This makes sense if the prosodic contour of RNR is functionally motivated rather than a grammatical constraint.
Further evidence consistent with the idea that the extra processing difficulty incurred by RNR can be reduced with prosodic cues comes from the fact that RNR is approximately twice as frequent in written corpora as in spoken corpora (Meyer 1995, Greenbaum & Nelson 1999, Harbusch & Kempen 2009). This is to be expected. In an RNR construction, comprehenders and producers alike must maintain in working memory incomplete structures that must later be linked to the RNREntered string. This adds a significant processing load to speech production and comprehension, in which cognitive resources are already strained by real-time communicative pressure. In written text, however, speakers have more time to plan and comprehend more complex and exotic sentence types. Thus, writers are less pressured to avoid complex sentences than oral speakers are.

Finally, it seems that the presence of a prosodic phrase boundary after the contrasted element depends on the length of the structure (Kentner et al. 2008:210). Thus, as long as this is allowed by the independently motivated phonological rules of the grammar, short RNREntered elements tend to be integrated into the current intonational phrase and longer ones must be able to make up their own. I illustrate this point with the data in 30, in increasing order of minimally required prosodic contrast. For example, 30a can get by with minimal focus contrast but 30c,d cannot, under penalty of causing the language processor to garden-path and go awry. In other words, I claim that utterances like 30d are easier to plan, produce, and comprehend with strong prosodic cues that signal the presence of a nonstandard structure. Crucially, this cline in required focus contrast is not present in the non-RNR counterparts of 30. This is expected in a functional account of RNR prosody, but not in a syntactic account.

(30) a. I specialized in pre- and in post-[Columbian cultures].
   b. Fred studies and Sue specializes in [pre-Columbian cultures].
   c. I met someone who studies and Sue mentioned someone who specializes in [pre-Columbian cultures].
   d. Wait a minute … ! You met someone interested in PRE- or someone interested in POST-[Columbian cultures]?

This is not to say that there are no phonological constraints at work in RNR. Swingle (1995) and McCawley (1998) argue that the RNREntered elements must always be phonological phrases or at least sequences of intonational phrases. However, they hasten to point out that such a proposal is problematic for instances of RNR involving word-parts. A simpler and more general approach is to assume that RNREntered units must adhere to the general prosodic phrasing rules of the grammar. In some cases this means that the RNREntered element can be an intonational or phonological phrase, and in other cases it cannot. In some cases, the RNREntered element must be able to fuse with the preceding string, but not in others. Let us consider some evidence for this. Ross (1967:221), Hankamer (1973), Bresnan (1974), Carpenter (1992:196), and Swingle (1995) claim that certain expressions block RNR.

(31) a. He tried to persuade but he couldn’t convince [them]/*[them].
   b. I think that I’d and I know that Pat’ll [buy those portraits of Elvis].
   c. They’ve always wanted a—and so I’ve given them a—[coffee grinder].
   d. I bought every red and Jo liked some blue [t-shirt].

Swingle (1995) notes that the oddness of the examples in 31 follows from general prosodic phrasing principles that have nothing to do with RNR. Pronominal RNR like 31a is acceptable only in one of two scenarios: either if the second verb has low con-
trastive stress and the pronoun can prosodically fuse with it as already seen in 26, or if the pronoun is stressed and thus can create an independent phonological phrase. In general, unstressed pronouns must form a prosodic unit with their governing head. However, in 31a the head that the unstressed pronoun would lean on bears strong contrastive stress, which forces a prosodic phrase boundary. As Zwicky (1986) argues, unstressed pronouns must lean on the governing head, since they cannot form prosodic phrases in their own right if they do not bear accent. There are at least three sources of evidence for this. First, we have the oddness caused by unstressed pronouns not adjacent to their verbal head, as in *We took in [*him][the mutt] yesterday. Crucially, Zwicky notes that the oddness vanishes if the pronouns are stressed, or if the pronominal phrase is made heavier, as in *We took in (both) him and her. Second, unstressed pronouns cannot be stranded in ‘nonconstituent coordination’ structures like Robin gave the book to my brother, or *[it][the magazine] to my sister?. Third, unstressed pronouns cannot be stranded by parenthetical insertion, as in *They gave my father, who had just turned 60, it (Ross 1967:60). Similarly, conjunction markers must prosodify with their hosts. This explains the oddness of 32. The prosodic phrasing that RNR would require is *(a monograph on Mesmer and) [(Freud)], which is not well formed because of independent prosodic facts.

(32) *Sandy is writing an article on Aristotle and Freud, and Sal has just published a monograph on Mesmer and [Freud].

Similarly, the prosodic phrasings needed for 31b,c are equally ruled out on independent grounds, having nothing to do with RNR. Stressed pronouns, affixes that correspond to independent prosodic words, and compound parts can be RNRaised because they are independent prosodic units in their local domains. Conversely, certain determiners, cliticized verbs, and unstressed pronouns must fuse with their respective prosodic hosts, and therefore block RNR. This prosodic account sheds light on various puzzles, such as 33.

(33) *The brother of—and John believes that—Pete slept.

The oddness of 33 arguably follows from conflicting syntax-prosody requirements. The string Pete slept does not form a constituent in the first conjunct, and therefore cannot form an intonational unit according to the sense unit condition (Selkirk 1984:291). Basically, two constituents \( C_x \) and \( C_y \) can form a prosodic unit iff \( C_x \) modifies or is an argument of \( C_y \). The sense unit condition provides an explanation for, among other things, why the prosodic phrasing in 34a is grammatical, but not the phrasing in 34b. Note that 34c, attributed to Mark Liberman in Pierrehumbert 1980, would have a pronunciation virtually identical to that of 34a. For a more sophisticated alternative to the sense unit condition, cast in head-driven phrase structure grammar (HPSG), see Taglicht 1998.

(34) a. *[Three mathematicians in ten] [derive a lemma].
   b. *[Three mathematicians] [in ten derive a lemma].
   c. *[Three mathematicians] [intend to rival Emma].

In 33 the string Pete slept is forced to have a rather awkward prosodic constituency (e.g. ?*[the brother of] [Pete] [slept]). The opposite occurs in the second conjunct, where

12 Féry and Hartmann (2005) study German RNR, and offer evidence that when the shared constituent, or part of it, can form its own phonological phrase, it is accented. But if it is integrated into an independently existing phonological phrase, it is unaccented.
Petesleptisaconstituentandasingleintonationalphrase,inaccordancewiththesense unitcondition.

Further evidence for RNR targeting prosodically independent units in their local do-
main comes from a phenomenon observed in Castilian and Portuguese, where the ad-
verbialsuffix-mente(requiredtoderiveadverbsfromadjectives)canbeRNRAised (Chaves 2008). This is seen in the Portuguese data in 35. In phrasal coordination, the suffix can be RNRAised, as in 35a, but not in clausal coordination, as in 35d. The latter is out because such suffixes cannot form an intonational phrase by themselves.

(35) a. Oadvogadoagiu rapida(mente)eeficientemente?
   thelawyer acted rapid(ly) and efficiently
b. O advogado agiu rapidamente e eficiente*(mente)?
   thelawyer acted rapidly and efficient(ly)
c. *O advogadoagiu rapida/eficiente?
   thelawyer acted rapid/efficient
d. *O advogado agiu rapida(mente)e o magistradoagiu eficientemente?
   thelawyer acted rapid(ly) and the magistrate acted efficiently

Chaves 2008 notes that although Italian and French also have the same suffix-mente, the omission pattern in 35a is not allowed in those languages. The reason for this is that although the suffix-menteisanautonomousphonologicalworkinRomanceingen-
eral,ithaslostsomeofitsindependenceinItalianandFrench. In fact, the pattern in 35a,b was possible in Old French (Grevisse 1986 [1936]:255) and in Old Italian (Ashby 1977:44).

Insum, RNR does not impose any prosodic constraints. Rather, RNR must obey the independentlymotivatedprosodicphrasingrulesofthegrammar. Theprosodiccontour typically observed in RNR depends on the size of theremnants and may be functionally motivatedby theneedtoreduceambiguity. Without it, sentences that appear to bemissingacomplementwouldbeassumedbytheparsertoBeincomplete, andtherefore ill-formed. With prosodic cues, however, it becomes clearer that the sentenceisnot complete and that there remainder is expected downstream. Hence, the longer the RNR, the stronger the prosodic cues, as in 30.

3. RNR AS THE CONFLATION OF THREE DISTINCT PHENOMENA.

3.1. VP/N’-ELLIPTIS. Barros and Vicente (2011) argue that some cases of RNR are bestviewedasesinstancesofVP/N’-ellipsisratherthanRNRproper,basedoninfection mismatches and vehicle-change effects, originally noted by Höhle (1991). As such, theseputativet RNR cases areobtainedforfree, aspredictionsofany sufficientlyrobust theory of VP/N’-ellipsis. Any cataphoric ellipsis has the potential to resemble RNR, especially if there is contrastive prosody. In what follows I add various empirical arguments in favor of this view.

Bošković (2004) argues that examples like 36 show that RNR is transparent with re-
gard to tense, and concludes that RNR is similar to VP-ellipsis.

(36) a. John will (sleep in her house) and Peter already has slept in her house.
   b. John won’t (negotiate his salary) but Susan already has negotiated her salary.

But this conclusion seems problematic. RNR environments that cannot be derived via VP-ellipsis impose stricter identity conditions. This is shown in 37, where the RN-
Raised VP must be compatible with both conjuncts.
(37) a. Tom let Mia and Mary let Bill [play outside].
   b. Tom allowed Mia and Mary allowed Bill [to play outside].
   c. Tom let Mia and Mary allowed Bill to [play outside].
   d. *Tom let Mia and Mary allowed Bill [to play outside].

If the examples in 36 involve cataphoric VP-ellipsis, then the oddness of 37d is explained. Of course, 36 can have RNR-like prosody, but so can non-RNR constructions (moreover, I show in §2.2 above that prosody is not a reliable criterion for identifying RNR). Further support for the cataphoric VP-ellipsis view comes from the fact that the sentences in 36 have anaphoric counterparts, as 38 illustrates.

(38) a. John will sleep in my house, and Peter already has.
   b. I certainly would clarify the situation but you already have.

This point is important because true RNR phenomena cannot be reversed, as shown in 39.

(39) a. *Chris likes [his bike] and Bill loves.
   (cf. Chris LIKES and Bill LOVES [his bike].)
   b. *Fred sent Mary [a love poem] and Tim handed Sue.
   (cf. Fred sent Mary and Tim HANDED Sue [a love poem].)
   c. *Did Kim become a periodontist or an ortho-?
   (cf. Did Kim become a PERIO- or an ORTHO[dentist]?)

Vehicle-change phenomena are also to be expected if some cases of RNR are VP-ellipsis, as Barros and Vicente (2011) argue. This is borne out in 40, adapted from Larson 2012.

(40) a. Tom didn’t pass his math exam but I’m sure Alice will [pass her math exam].
   b. John will make his bed and Sue already has [made her bed].

But this argument is not a strong one, since sloppy readings can also arise in RNR structures that do not allow a VP-ellipsis analysis, as illustrated in 41a. In §3.3 I argue that such cases are an instance of BACKWARD PERIPHERY DELETION, not ellipsis. This is supported by the fact that GENDER mismatches block sloppy readings in NP RNR, as in 41b, but not in VP-ellipsis, as 40 shows. In sum, the contrast between 40 and 41 indicates that 40 is due to ellipsis but that 41a is not.

(41) a. Chrisx LIKES hisx bike and Billy LOVES [hisy bike].
   (Höhle 1991, Jacobson 1999)
   b. #Chrisx LIKES hisx bike and Suey LOVES [hery bike].

As a referee notes, a clearer prediction emerges from the well-known fact that cataphoric VP-ellipsis requires that the elided material not be c-commanded by the constituent containing the antecedent (cf. *You never do __ when you say you will help me with You never help me when you say you will __ ). As predicted, cases like 42 are not licensed by VP-ellipsis because the c-command condition is violated. Moreover, 42 is not licensed by backward periphery deletion either, because gender morph form mismatches are not tolerated in general. Moreover, note that replacing Tom with Ann causes 42 to become acceptable, as expected, as an unambiguous instance of backward periphery deletion.

(42) *Tom couldn’t even though Sue could save herself.

Other examples that are arguably also instances of ellipsis are shown 43. Their reversal indicates that these cases can be parsed as backward sluices (Giannakidou & Merchant 1998).
(43) a. Why and how [do scientists study climate change]?
    (cf. Why do scientists study climate change, and how?)
b. It’s not clear if or when [Mary bought the book].
    (cf. It’s not clear if Mary bought the book, or when.)

Examples like 44, by contrast, are not reverse sluices, and therefore are probably not instances of ellipsis. Rather, these cases are unambiguous cases of backward periphery deletion. Thus, it is plausible that 43 can be parsed either as ellipsis or as backward periphery deletion.

(44) a. Where and who [is the cheapest cosmetic dentist in Manchester]?
    (cf. *Where is the cheapest cosmetic dentist in Manchester, and who?)
b. The people of whom and to whom [George speaks] are specially selected.
    (cf. *The people of whom George speaks and to whom are specially selected.)
c. … that is to say, the protection of a woman’s right to choose, whether, when, and with whom [to have sexual intercourse].
    (cf. *When/with whom to have sexual intercourse and whether.)

As expected, examples like 45 are impossible because they cannot be parsed as sluices or as deletion. The clausal coordination counterparts that would feed the sluice or the deletion operations are not grammatical to begin with, since the verbs are missing complements.

(45) a. *Who and what found?
    (cf. *Who found and what found?)
b. *Who and whom saw?
    (cf. *Who saw and whom saw?)

Ellipsis can also explain other puzzling cases of apparent N′RNR. Cases like 46–49 are best seen as N′-ellipsis (Jackendoff 1971). This is motivated by the fact that such cases can be reversible and have extrasentential antecedents.

(46) a. I’ve never owned any, but I’ve always wanted diamonds.
    (cf. I’ve always wanted diamonds but I’ve never owned any.)
b. Speaker A: I need to buy some diamonds.
    Speaker B: I don’t have any.
(47) a. Fred got most—but not all—of Sue’s letters.
    (cf. Fred got most of Sue’s letters—but not all.)
b. Speaker A: I read most of Sue’s letters.
    Speaker B: I read all of them. And I still read them now.
(48) a. One or more boys may continue to live at the boarding home.
    (cf. One boy or more may continue to live at the boarding home.)
b. Speaker A: I invited a boy to our party.
    Speaker B: You should invite more.
(49) The annual lease payment increases in the third or in the fifth [year]?
    (cf. The annual lease payment increases in the third year or in the fifth?)

But not all nominal RNR is due to N′-ellipsis. Consider the contrast in 50. None of these cases can be reversed or have extrasentential antecedents. Hence, these must be analyzed as the by-product of a different mechanism from N′-ellipsis. In §3.3 below I analyze such cases as instances of backward periphery deletion.
In sum, there is evidence that some apparent cases of VP/N' RNR are best viewed as VP/N'-ellipsis rather than RNR proper. Whereas VP-ellipsis is a semantic dependency that (anaphorically or cataphorically) targets exclusively VP and N' phrases, RNR is not. RNR phenomena also allow internal readings for symmetric predications, like 51, as noted by Larson (2012:147). In these data there is a verb form mismatch that is characteristic of VP-ellipsis, contra the predictions of Barros and Vicente (2011) that internal readings cannot occur in VP-ellipsis.

(52) A: Alice and Iris were asked to [work on different topics].
B: Alice is happy to, but I don’t think Iris is.

Finally, certain readings also arise in N'-ellipsis, as shown in 53a,b. In the relevant interpretations, the RN-Raised nominal is plural even though its adjectives are singular. This is arguably cataphoric N'-ellipsis because third and fifth allow anaphoric dependencies (e.g. The second year was hard but the third was even harder). Additive N' readings are not allowed by any other type of RNR. This is illustrated by 53c,d. Adjectives like real and interesting cannot license N'-ellipsis (e.g. *The tedious book was expensive, and the interesting was cheap), and therefore the additive readings are unavailable.

(53) a. The relevant passage is between the third and the fifth [lines].
   (= ‘The relevant passage is between the third (line) and the fifth line.’)

b. This increases the annual lease payment in the third and in the fifth [years].
   (= ‘This increases the annual lease payment in the third (year) and in the fifth year.’)

c. *This is the difference between the real and the fictional [worlds].
   (= ‘This is the difference between the real (world) and the fictional world.’)

d. *This is the difference between an interesting and a tedious [teachers].
   (= ‘This is the difference between an interesting (teacher) and a tedious teacher.’)

Furthermore, as expected from N'-ellipsis, the plural antecedent of such readings can reside in a different sentence, as in 54 and 55.

(54) A: I know the relevant passage is somewhere in the first [lines of the paper].
B: I think it is between the third line and the fifth line.

(55) A: Most people [have gall bladders].
B: Well, I don’t have a gall bladder and Robin doesn’t have a gall bladder either.
There are several approaches to the analysis of ellipsis: deletion (Sag 1976, Merchant 2001), LF-copying (Williams 1977), or direct interpretation (Ginzburg & Sag 2000, Culicover & Jackendoff 2005, Jacobson 2008). In the latter, the remnant phrase is generated ‘as is’ and assigned an interpretation based on the surrounding context. For example, in Ginzburg & Sag 2000 and Sag & Nykiel 2011, a VP containing an elliptical object is licensed by a rule along the lines of 56. The feature val(ence) lists the subcategorized phrases of a given head, sem(antics) contains semantic content (i.e. set of semantic restrictions), and c(on)t(e)xt contains information structure.

\[
(56) \quad \text{VP-ellipsis construction}
\]

\[
\begin{array}{c}
\begin{array}{c}
\text{SEM} \\
\text{RESTR} \{Q(P)\} \\
\text{MAX-QUD} \\
\text{P}
\end{array} \\
\text{CTXT} \\
\text{sAL-UTT} \\
\langle \text{VP} \rangle
\end{array} \rightarrow \text{Aux} \begin{array}{c}
\begin{array}{c}
\text{SEM} \\
\text{RESTR} \{Q\}
\end{array}
\end{array}
\]

More specifically, max(imal)-q(uestion) u(nder) d(iscussion) records objective facts of the dialogue and is constantly being updated as discourse progresses, whereas sal(ient)-utt(erance) contains categorial information about the (sub)utterance that receives the widest scope in max-qud. Crucially, such information need not correspond to overt discourse, which accounts for remnants that do not have sources (e.g. sluices like *What floor?* or *What else?*, and VP-ellipses like *Don’t!* , *Do I have to?*, and *I can’t*). Since the MAX-QUD is part of the DIALOGUE GAME BOARD, where the objective facts of the dialogue are recorded, the denotation of any given referring expression is grounded objectively, rather than from the perspective of any single dialogue participant. This accounts for the constraints on indexical resolution in ellipsis noted by Sag and Hankamer (1984). In this base-generation account, elliptical constructions are taken to be a subset of a larger class of constructions, including those of sentence fragments, short answers to WH-questions, and reprise structures.

Basically, 56 allows an auxiliary to project a VP, combining the semantics \( Q \) of the auxiliary with the semantics of the missing VP complement \( P \). I refer the reader to Sag & Nykiel 2011 and Culicover & Jackendoff 2005 for an overview of the various empirical facts supporting the direct interpretation analysis: (i) ellipsis need not have overt antecedents; (ii) ellipsis is immune to island constraints; and (iii) the category of the remnant must match that of the antecedent (which includes case-matching effects like those observed in Hungarian). All of these properties follow straightforwardly from the direct interpretation analysis, without any need for further modifications to the theory.

Due to space limitations, I cannot discuss ellipsis phenomena in detail, but a sketch of cases like 51 and 52 is illustrated in Figure 1. In a nutshell, such cases arise when both auxiliaries undergo the complement ellipsis rule in 56.

Note that I am assuming a binary branching rule of the form \( S \rightarrow S[sal-utt (X)]\ X \). This allows an utterance \( S \) with a \( [sal-utt (X)] \) specification to be juxtaposed with a phrase that instantiates \( X \). In the case of the structure in Fig. 1, \( X \) corresponds to the VP working on different topics. Such a rule is independently motivated, as 57 shows. The complement of the auxiliary do is the VP in sal-utt, which is resolved by the continuation try to quit.

\[
(57) \quad \text{A: Tom is trying to quit smoking.} \\
\text{B: I did [too]. (I mean,) try to quit.}
\]

This account predicts that cataphoric cases like 58 are impossible, since the VP work on different topics is combining with the first conjunct rather than with the entire coordination.
Whatever the best formal analysis of ellipsis may be, the evidence above indicates that at least some instances of RNR are best seen as instances of ellipsis. Below I discuss symmetric predicates, additive readings, and extraposition in more detail.

3.2. ATB EXTRAPOSITION. Various authors have argued that RNR is a rightward syntactic dependency (Ross 1967, Hankamer 1971, Postal 1974, 1998, Gazdar 1981, Sabbagh 2007). Although these accounts are technically very different from each other, they all rely on the assumption that RNR involves a structurally distinct syntactic constituent linked to multiple daughters. In a sense, this is the mirror image of ATB leftward extraction, like *It is [chocolate bagels], that Kim likes *x and Mia hates *x*, in which one filler is linked to two gaps.13

In this section I discuss evidence that some apparent instances of RNR are predictions of rightward extraction and coordination. The first such type of evidence comes from the different extraction patterns induced by symmetric and asymmetric coordination, in the terminology of Levin & Prince 1986. As is well known, coordinations with an asymmetric interpretation do not require ATB leftward extraction (Ross 1967, Schmerling 1972, Goldsmith 1985, Lakoff 1986, Levin & Prince 1986). Similarly, asymmetric coordination does not impose ATB rightward extraction either, as Lakoff (1986:153) shows with 59. In this example the conjunction has an asymmetric interpretation, and therefore RNR need not be ATB. This is expected if 59 involves extraposition.

(59) I went to the toy store, bought, came home, wrapped up, and put under the Christmas tree [one of the nicest little laser death-ray kits I’ve ever seen].

A second source of evidence in favor of viewing some apparent cases of RNR as simply predictions of ATB extraposition is semantic scope attributable to the RN.

13 It is unlikely that the two phenomena are due to one and the same mechanism, however. First, RNR allows preposition stranding in languages that usually do not allow preposition stranding via leftward extraction, such as Irish and Romance languages (McCloskey 1986). Second, as Davies (1992) and Beavers and Sag (2004) note, languages like Hausa clearly have leftward extraction but lack RNR altogether. If leftward and rightward extraction are due to one and the same mechanism, then these asymmetries are unexpected.

14 For detailed discussion about extraction in symmetric/asymmetric coordination see Kehler 2002:Ch. 5.
phrase being in a higher structural position than its in-situ counterparts. The simplest cases are as in 60. The relevant interpretation is one where the RNRaised phrase outscopes material embedded in the coordination.

(60) a. John tells a joke and Mary tells a funny story [to every person they meet].
   \((\forall\ person > (\exists\ joke \land \exists\ funny-story))\)

   b. They either captured or shot [every escaped inmate].
   \((\forall\ escaped-inmate > (\text{captured} \lor \text{shot}))\)

More complex cases were originally noted by Geach (1972) and McCawley (1982:104, n. 12). Although 61b is not ambiguous, 61a can either mean that ‘there are many famous persons such that Kim took photographs of them and Sam painted portraits of them’ or that ‘there are many famous persons such that Kim took photographs of them, and there is a possibly different set of many famous persons such that Sam painted portraits of them’.

(61) a. Kim took photographs and Sam painted portraits [of many famous persons].
   b. Kim took photographs of many famous persons and Sam painted portraits of many famous persons.

Sabbagh (2007:365–71) makes a similar observation for cases like 62a. In one reading the nurse will determine on a patient-by-patient basis how each patient will be treated (some may be given flu shots, others may be administered blood tests, for example). In another reading all patients will be treated the same. However, the non-RNR counterpart in 62b only seems to have the second reading.

(62) a. The nurse will either give a flu shot or administer a blood test [to every patient admitted last night].
   b. The nurse will either give a flu shot to every patient admitted last night, or administer a blood test to every patient admitted last night.

These scope asymmetries are readily explained in an extraction account: the RN-Raised phrase is structurally higher than the coordination and therefore it can take wide scope. An ATB extraposition also predicts cases with strict identity readings, such as 63.

(63) Tom loves and Robin adores a girl from school.
   (= ‘Tom and Robin respectively love and adore the same girl from school.’)

As Sabbagh (2007:367) shows, the wide-scope reading is available even when RNR crosses clausal boundaries, as in 64. Like the data above, this example is scopally ambiguous: (i) \(\exists\ someone > \forall\ \text{Germanic language}\) and (ii) \(\forall\ \text{Germanic language} > \exists\ someone\).

\footnote{Sabbagh (2007:367) claims that there are scopal differences between sentences with and without RNR. For example, \textit{John knows someone who speaks every Germanic language} is claimed to have only the ‘\(\exists\ > \forall\)’ scoping, where the quantifier does not scope outside the relative clause. The robustness of this empirical claim is doubtful. My informants report that \textit{John knows someone who speaks every Germanic language} can have the ‘\(\forall\ > \exists\)’ reading, as do the informants of Abels (2004) and even some of Sabbagh’s own informants (Sabbagh 2007:367, n. 15). Further counterevidence to the claim that quantifier scope is clause-bounded as claimed by Sabbagh (2007:367) and assumed by the multidominance account of Bachrach and Katzir (2008) is (i) and (ii).

(i) We were able to find someone who was an expert on each of the castles we planned to visit.
   \((\exists\ > \forall; \forall\ > \exists)\)
   (due to Copestake et al. 2005:304)

(ii) John was able to find someone who is willing to learn every Germanic language that we intend to study.
   \((\exists\ > \forall; \forall\ > \exists)\)}
(64) John knows someone who speaks and Bill knows someone who wants to learn [every Germanic language].

As Gazdar (1981) and Sabbagh (2007) observe, ATB extraposition is fully compatible with cases like 65 because the RN-Raised phrase is in a higher structural position than the conjuncts, and therefore outscopes the conjunction.¹⁶

(65) a. Robin spent and Mia lost [(a total of) $10,000 (between them)].
  b. Tom shouted and Mary cried [each other’s names].
  c. My colleague failed and I passed [our respective examinations].
  d. Robin sent a letter and Kim wrote a postcard [to a girl in the same class as theirs].
  e. Fred bought a book and Mary got a magazine [about exactly the same topic].
  f. Fred spoke to a man and Mary spoke to a woman [who are interested in similar activities].
  g. The Red Sox beat and the Giants were beaten by [different teams].

Other RNR cases that are consistent with the ATB extraposition analysis are seen in 66. Again, these are expected if the RN-Raised phrase obtains wider scope over the coordination.

(66) a. Ernest sold cocaine and George sold heroin [to the first nurse and to the second dental assistant] (respectively). (Postal 1998:136, 178)
  b. I bought travel guides for Paris and London yesterday. Mary vacationed and Bill decided to live [in these two cities] (respectively). (Gawron & Kehler 2003)

Further support comes from the existence of similar readings in extraposed relatives like 67. This suggests that at least some instances of additive RNR are ATB extraposition.

(67) a. I met the only man and Sue spoke with the only woman [who saw exactly what happened].
  b. Tom bought a can opener and Alice bought a dictionary [that were once owned by Leonard Bloomfield]. (McCawley 1982:100)

In sum, the evidence suggests that many apparent RNR sentences can be obtained for free, as the consequence of extraposition and coordination. In what follows I show how an account of extraposition and coordination can obtain the ATB extraposition phenomena discussed above, including additive RNR. To be clear, this is not intended to be a comprehensive account of extraposition. Rather, the goal is to illustrate the workings of an account that obtains the relevant set of data.

A formalization of extraposition, coordination, and dependent cumulation. Additive and nonadditive extraposition will be modeled in a uniform way, as sketched in Figure 2. Basically, if two dependents are extracted ATB out of the coordinate structure, then their indices are combined as ‘x ⊕ y’. As a consequence, either both conjuncts predicate the same referent (x = y), or each conjunct predicates a different referent (in which case x ⊕ y forms a plurality).

¹⁶ Hartmann (2000:79) claims that data like 65 are in fact ungrammatical, and therefore pose no problem for a phonological deletion account of RNR. This is untenable, in my view. All of my informants accept 65.
I adopt the account of English extraposition proposed in Kim & Sag 2005 and Kay & Sag 2012, cast in SIGN-BASED CONSTRUCTION GRAMMAR, a formally well-defined construction-based variant of HPSG (Pollard & Sag 1994). The present formalization follows Sag 2012, with minimal simplifications. Let us start by considering an example of a verbal lexical entry, given in 68. The feature M(ORPHO)P(HONOLOGY) contains linearized phonological and morphemic information. Mixed morphophonological representations of this kind are motivated by morphologically conditioned phonological alternations.\(^{17}\) The feature PHON(OLOgy) records phonological units such as prosodic words (ω), phonological phrases, syllable structure, metrical information (the latter are omitted for perspicuity), and so on, along the lines of Höhle 1999. The feature FORM lists morph forms and is used to distinguish between homophonous forms with different morphological paradigms. For example, homophonous words like lie ‘speak falsely’ and lie ‘recline, rest’ involve distinct morph forms \([\text{FORM} \langle \text{lie}\rangle]\) and \([\text{FORM} \langle \text{lie}\rangle]\). Because lie\(_1\) and lie\(_2\) are different morphs, the grammar can determine how they inflect (lie/lay/lain vs. lie/lied/laid). This FORM feature will play a crucial role later on in backward periphery deletion.

\[
\text{(68)} \quad \begin{array}{l}
\text{word} \\
\text{MP} \left[ \begin{array}{c}
\omega \\
\text{PHON} /\text{sing}/ \\
\text{FORM} \langle \text{sing}\rangle
\end{array} \right] \\
\text{SYN} \left[ \begin{array}{c}
\text{CAT} \quad \text{verb} \\
\text{XARG} \quad X \\
\text{VAL} \quad \langle X: \text{NP}_{\text{nom}}, \text{NP}_{\text{acc}} \rangle \\
\text{EXTRA} \quad \langle \rangle \\
\text{SEM} \left[ \begin{array}{c}
\text{INDEX} \quad e \\
\text{RELS} \quad \{\text{sing}(e, x, y)\}
\end{array} \right]
\end{array} \right]
\end{array}
\]

The syntactic feature VAL(ENCE) lists the valents that are subcategorized by the verb. The notation ‘NP\(_x\)’ is merely a shorthand for any nominal sign with an empty valence list \([\text{VAL} \langle \rangle]\) and with an index \(x\) that is quantificationally bound. The least oblique va-

---

\(^{17}\) For instance, the phoneme /\text{A}/ corresponding to the English indefinite article becomes /\text{æ}/ if it precedes a voiced segment. This is not a phonological rule of English because it applies only to the indefinite article (Pullum & Zwicky 1988). See Asudeh & Klein 2002 for a crosslinguistic overview of other morpheme-specific phonological processes in various other languages, including Welsh, French, and Hausa.
lent is the nominative subject, which is singled out as an ‘external argument’ by the feature \textit{xarg}. The two occurrences of the variable \textit{X} basically state that the first member of \textit{val} is also the value of \textit{xarg}. The \textit{xarg} feature allows a head to impose morphosyntactic and semantic constraints on the subject of a sister clause. The feature \textit{extra} records any dependents that are extraposed rather than realized in situ. I follow van Noord & Bouma 1996 and Keller 1994 in assuming that the value of the feature \textit{extra} in noncoordinate phrases is the concatenation of \textit{extra} values of the local daughters. The coordination case is discussed in detail below.

Finally, the \textit{rel(ation)s} feature contains semantic relations described by the sign. Following Copestake et al. 2005 and Sag 2012, I take such semantic representations to be sets of scopally underspecified predications, very much like the underspecified discourse representation structures proposed in Reyle 1993 and Frank & Reyle 1995.

Phrasal rules determine how (nonextraposed) valents are discharged from \textit{val}. The phrase structure rule that allows a word of any given category \textit{X} to combine with its subcategorized complements \textit{X}_1 \ldots \textit{X}_n is shown in 69, in a familiar phrase-structure grammatical for perspicuity. The variables \textit{X} and \textit{Y} range over feature structure descriptions. In this work, I assume the linearization theory of Kathol 2000, although nothing truly hinges on this.

(69) HEAD-COMPLEMENT CONSTRUCTION

\[
\text{phrase} \quad \begin{bmatrix} \text{CAT} \quad \text{X} \tikz[baseline=3pt,scale=0.825]{\draw (-3pt,0) -- (3pt,0);}; \text{XARG} \quad \text{Y} \tikz[baseline=3pt,scale=0.825]{\draw (-3pt,0) -- (3pt,0);}; \text{VAL} \quad \langle \text{Y} \rangle \end{bmatrix} \rightarrow \text{word} \quad \begin{bmatrix} \text{CAT} \quad \text{X} \tikz[baseline=3pt,scale=0.825]{\draw (-3pt,0) -- (3pt,0);}; \text{XARG} \quad \text{Y} \tikz[baseline=3pt,scale=0.825]{\draw (-3pt,0) -- (3pt,0);}; \text{VAL} \quad \langle \text{Y}, \text{X}_1, \ldots, \text{X}_n \rangle \end{bmatrix} \]

In a nutshell, 69 states that a head-complement phrase is licensed if the complements \textit{X}_1, \ldots, \textit{X}_n recorded in the valence of the lexical daughter are rightmost sisters. The category of the head daughter is required to be the same as the category of the head daughter via the constraint \textit{cat\text{X}}. Hence, a verb will project a phrase with the same part of speech. Analogously, 70 allows a predicate to combine with its subject, the sign that instantiates \textit{Y}.

(70) HEAD-SUBJECT CONSTRUCTION

\[
\text{phrase} \quad \begin{bmatrix} \text{CAT} \quad \text{X} \tikz[baseline=3pt,scale=0.825]{\draw (-3pt,0) -- (3pt,0);}; \text{XARG} \quad \text{Y} \tikz[baseline=3pt,scale=0.825]{\draw (-3pt,0) -- (3pt,0);}; \text{VAL} \quad \langle \rangle \end{bmatrix} \rightarrow \text{Y} \quad \begin{bmatrix} \text{CAT} \quad \text{X} \tikz[baseline=3pt,scale=0.825]{\draw (-3pt,0) -- (3pt,0);}; \text{XARG} \quad \text{Y} \tikz[baseline=3pt,scale=0.825]{\draw (-3pt,0) -- (3pt,0);}; \text{VAL} \quad \langle \text{Y} \rangle \end{bmatrix}
\]

These two constructional rules license structures like the one in Figure 3. The top branching node is licensed by 70 and the lower branching node is licensed by 69. The symbol ‘VP’ is nothing but shorthand for any verbal sign with a singleton \textit{val} list, and ‘S’ is shorthand for any verbal sign with an empty list value for \textit{val}. For further discussion of how this grammar handles various other phenomena see Sag 2012.

Following Kim & Sag 2005, several rules handle different types of extraposition, each with syntactic and semantic idiosyncrasies. The extraposition of complements is

\[18\] For example, tag questions (compare Sarah, read the book, didn't she, *it,? with The book, was read by Sarah, wasn't it, *she,) and dangling modifiers (compare Furious, Kim, threw the TV out the window with *Furious, the TV was thrown out the window by Kim). For more on \textit{xarg} see Sag & Pollard 1991, Bender & Flickinger 1999, Meurers 1999, and Sag 2012.
modeled by the lexical rule in 71, which takes a complement from the valence list and places it in EXTRA instead. That valent will be realized to the right of its canonical location, not in situ.

(71) **Complement extraposition lexical construction**

\[
\begin{array}{c}
\text{word} \\
\text{SYN} \\
\end{array} \quad \begin{bmatrix}
\text{XARG} \\
\text{VAL} \\
\text{EXTRA}
\end{bmatrix} \begin{bmatrix}
Y \\
L_1 \circ L_2 \\
L_3 \circ \langle X \rangle
\end{bmatrix} \rightarrow
\begin{array}{c}
\text{word} \\
\text{SYN} \\
\end{array} \quad \begin{bmatrix}
\text{XARG} \\
\text{VAL} \\
\text{EXTRA}
\end{bmatrix} \begin{bmatrix}
Y \\
L_1 \circ \langle X \rangle \circ L_2 \\
\end{bmatrix}
\]

\( \land X \neq Y \)

The complement extraposition lexical construction takes as input a lexical sign like 68 and yields a variant of that lexical sign where one complement \(X\) is now in EXTRA instead of VAL. The symbol ‘\(\circ\)’ corresponds to list concatenation. For example, if we apply 68 to this rule, then \([\text{VAL} L_1 \circ \langle X \rangle \circ L_2]\) is unified with \([\text{VAL} \langle X;\text{NP}_{nom}^x, \text{NP}_{acc}^y \rangle]\). The unification resolves as \(L_1 = \langle Y \rangle\) and \(X = \text{NP}_{acc}^y\), and \(L_2 = \langle \rangle\). If the verb had two complements instead, then there would be two possible resolutions, and so on. Figure 4 illustrates the effect of applying 68 to 71.

A third phrasal construction discharges signs recorded in EXTRA. Whereas the head-complement construction rule requires the head to be lexical, the rule in 72 requires the head daughter to be phrasal. Hence, any extraposed dependents \(X\) in EXTRA will necessarily occur to the right of their canonical location.

(72) **Head-extraposition construction**

\[
\begin{array}{c}
\text{phrase} \\
\text{SYN} \\
\end{array} \quad \begin{bmatrix}
\text{XARG} \\
\text{VAL} \\
\text{EXTRA}
\end{bmatrix} \begin{bmatrix}
Y \\
L_2 \\
L_1
\end{bmatrix} \rightarrow
\begin{array}{c}
\text{phrase} \\
\text{SYN} \\
\end{array} \quad \begin{bmatrix}
\text{XARG} \\
\text{VAL} \\
\text{EXTRA}
\end{bmatrix} \begin{bmatrix}
Y \\
L_2 \\
\langle X \rangle \circ L_1
\end{bmatrix}
\]

Figure 3. Derivation licensed by the head-complement and head-subject constructions.
This grammar fragment licenses extraposition structures like the one in Figure 5. The sign recorded in the `extra` feature of the first daughter is unified with the second daughter.

![Figure 4. Application of the complement extraposition lexical construction.](image)

This grammar fragment licenses extraposition structures like the one in Figure 5. The sign recorded in the `extra` feature of the first daughter is unified with the second daughter.

![Figure 5. Application of the head-extraposition construction.](image)

This grammar fragment licenses extraposition structures like the one in Figure 5. The sign recorded in the `extra` feature of the first daughter is unified with the second daughter.

![Figure 4. Application of the complement extraposition lexical construction.](image)

This grammar fragment licenses extraposition structures like the one in Figure 5. The sign recorded in the `extra` feature of the first daughter is unified with the second daughter.

![Figure 5. Application of the head-extraposition construction.](image)

This grammar fragment licenses extraposition structures like the one in Figure 5. The sign recorded in the `extra` feature of the first daughter is unified with the second daughter.

![Figure 4. Application of the complement extraposition lexical construction.](image)

This grammar fragment licenses extraposition structures like the one in Figure 5. The sign recorded in the `extra` feature of the first daughter is unified with the second daughter.

![Figure 5. Application of the head-extraposition construction.](image)

This grammar fragment licenses extraposition structures like the one in Figure 5. The sign recorded in the `extra` feature of the first daughter is unified with the second daughter.
each with different syntactic, prosodic, semantic, or pragmatic characteristics. For our purposes we need only consider the construction that handles non-Boolean conjunction, shown in 73. The conjunction creates a plurality $\alpha$ with the conjuncts’ indices ($i$ and $j$) and conjoins the semantics of each conjunct ($P$ and $Q$). This is crucial for the account of additive readings in general, since this rule combines the indices of any $n \geq 0$ dependents in an $i$-sum, for all $\text{SYN}$ features $\Gamma$ that record syntactic dependencies (extra, $\text{VAL}$, slash, and sel).

(73) Non-Boolean conjunction (and the shared dependent condition)

\[
\begin{align*}
\text{phrase} & \quad \text{SYN} \left[ \Gamma \langle \text{XP}^{x_0}_0, \ldots, \text{XP}^{x_n}_n \rangle \right] \\
\text{SEM} & \quad \text{INDEX } k \\
\text{RELS} & \quad \{ k = i \oplus j, z_0 = x_0 \oplus y_0, \ldots, z_n = x_n \oplus y_n \} \cup P \cup Q \\
\end{align*}
\]

The current grammar fragment allows sentences like that in Figure 6, which can be interpreted additively (in which case the tune(s) that Fred hummed are different from the tune(s) that Mia sang), or nonadditively (Fred and Mia hummed and sang the same tunes).

In this case the only dependents that are shared by the conjuncts are extraposed NPs in extra, since there are no other dependents in other $\text{SYN}$ features. Thus, the $\Gamma$ in 73 is instantiated with extra. Because the index $z$ of the NP in extra must be unified with the index of the overtly realized NP, this means that the ATB extraposition of singular NPs like each song or the song are felicitous only if the index $z$ in extra corresponds to an atomic individual as well, via the $z = x = y$ resolution for the $i$-sum $z = x \oplus y$. For example, the ATB extraposition parse of John knows someone who speaks—and Bill knows someone who wants to learn—[every Germanic language] necessarily yields the $z = x = y$ resolution because the index of the ATB-extraposed NP is singular. This obtains the wide-scope reading. The narrow-scope and sloppy readings follow from backward periphery deletion, as in §3.3.

On symmetric predicates. There are several possible accounts of the internal readings of different and same (e.g. Barker 2007 and references therein). In what follows I sketch a rather straightforward model-theoretic analysis that will suffice for the purposes of this article. As is well known, one of the possible readings for a sentence like

\[\text{John knows someone who speaks—and Bill knows someone who wants to learn—[every Germanic language]}\]

For example, packaging conjunction (e.g. Eggs, cheese, and bacon was all I needed), numeral conjunction (e.g. I counted five hundred and twenty-two cats), arithmetical conjunction (e.g. Two and two is four), conditional conjunction (e.g. Take one more step and I’ll shoot you where you stand), intensification conjunction (e.g. The sound became louder and louder), violated-expectation conjunction (e.g. I can drink two bottles of wine and not get drunk), asymmetric scope conjunction (e.g. You can’t get a new car and Kim get just a postcard), Boolean conjunction (e.g. The owner and the editor is a member of the club), non-Boolean conjunction (e.g. You can’t simultaneously drive a car and talk on the phone), ‘good-and-bad’ coordination (e.g. There are teachers and there are teachers ... ), ‘regardless’ coordination (e.g. War or no war, we’re going to Iraq), and so forth.
Robin and Sam read several books is the cumulative reading, in the sense of Kroch 1974, Scha 1981:497, Kriifka 1989, Schein 1993, Schwarzschild 1996, and Sternefeld 1998. In such a reading, the set of books read by Robin may or may not intersect with the set of books read by Sam. This includes the case in which the relation between books and readers is ‘a special cumulative reading where, in addition, the relation is a bijective function’ (Link 1991). In the present account, the purpose of the expression different is precisely to force such a bijective interpretation. See Chaves 2012 for an analysis of respectively that involves essentially the same kind of intuition and can model ‘respectively’ readings that do not involve pluralities, such as 74.

(74) For every document, she had to translate it to Russian or Bielo-Russian, respectively.

I tentatively assume that the adjective different has the truth-satisfaction conditions in 75. The \( \theta_i(i, R) \) function is true iff there is some tuple \( t = \langle \ldots, i_k, \ldots \rangle \) in the denotation of a relation \( R \), in which the individual \( i \) is the \( k \)-th member of \( t \). Basically, 75 requires that every value of \( x \) participate in some relation \( R \) only once, and that every value of some \( y \) participate in the \( n \)-th and \( m \)-th arguments, respectively.

(75) \([\text{different}(x)] = 1 \text{ iff there is a bijective function } f \text{ such that} \quad f = \{(a, b) : a \subseteq I(x) \land b \subseteq I(y) \land \exists_{n \neq m} \exists R(\theta_n(a, R) \land \theta_m(b, R))\}\]

The account is illustrated in 76, in which I revert to standard first-order logic notation for exposition purposes. For example, if \( I(\text{read}) = \{e_1, \text{robin}', b_1\}, \langle e_2, \text{sam}', b_2\} \), then 75 yields \( f = \{(r, b_1), (s, b_2)\} \), which is a bijection.

(76) Robin and Sam read different books.

\[ \exists y \, \text{book}'(y) \land \text{different}(y) \land x = \text{robin} \oplus \text{sam} \land \text{read} (e, x, y) \]
In sentences like *Every student read a different book*, the *b* entities correspond to the individuals in the denotation of *every student*. A narrow-scope reading of the complement *a different book* will allow the *a* entities to correspond to each of the different books. In this kind of example, there is no need for a cumulative reading in the sense of Scha 1981:497.

Finally, examples like 77 follow from the grammar of coordination and extraposition. As seen in Figure 6, the i-sum that 73 introduces combines the indices of the NPs that each of the conjuncts contains in EXTRA. As a consequence, each verb can predicate a different member of the set of opponents. This allows the conditions in 75 to be satisfied since there are two different R relations: *defeat* and *lose to*, respectively. Again, we arrive at the bijection \( f = \{ (\text{robin}', o_1), (\text{sam}', o_2) \} \).

(77) Robin defeated and Sam lost to different opponents.

\[\exists z \text{ opponent}'(z) \land \text{different}(z) \land e = e_1 \oplus e_2 \land z = x \oplus y \land \text{defeat}(e_1, \text{robin}, x) \land \text{lose-to}(e_2, \text{sam}, y)\]

A very similar analysis is adopted for the *same*, as seen in 78. The main difference is that a constant function is imposed rather than a bijective function. Hence, all of the *a* entities must be paired with exactly the same *b*. A sentence like *Robin and Sam read the same books* means that there is a set of books such that Robin and Sam read it, and a sentence like *Each student liked the same movie* means that there is one movie such that every student saw it, and so on.

(78) \([\text{same}(x)] = 1 \text{ iff there is a constant function } f'\) such that

\[f' = \{(a, b) : a \subseteq I(x) \land b \subseteq I(y) \land \exists_{n \neq m} 3R(\theta_n(a, R) \land \theta_m(b, R))\}\]

**ON THE LIMITS OF EXTRAPPOSITION.** Extraposition is standardly assumed to be a bounded syntactic dependency, unable to cross clausal nodes (Ross 1967, Akmajian 1975, Baltin 1978, 1982, Stowell 1981), as seen in 79. This is usually given as an argument against ATB extraposition accounts of RNR, given that RNR is immune to island effects (see §2.1).

(79) a. *[[I [met a man [who knows ___] yesterday] [all of your songs]].

b. *[[That a review ___ came out yesterday] is catastrophic] [of this article]].

c. *[[That someone ___ exists] is a foregone conclusion] [who can beat you up]].

d. *[[[That it is impossible ___] is clear] [for pigs to fly]].

The acceptability of the extrapositions in 80 suggests, however, that the role of purely configurational factors has been overstated. According to my informants, the adverbial interveners in 80 do not require parenthetical prosody. Conversely, even strong parenthetical prosody on the adverbs in 79 fails to improve those data.

(80) a. I’ve been requesting [that you pay back ___] ever since May [the money I lent to you a year ago]. *(Kayne 2000:251)*

b. I’ve been wanting to meet someone who knows ___ ever since I was little [exactly what happened to Amelia Earhart].

c. I’ve been wondering [if it is possible ___] for many years now [for anyone to memorize the Bible word for word].

Crucially, note that the durative semantics of *I’ve been wanting/requesting/wondering* in 80 raises an expectation about the realization of a durative adverbial expression like *ever since* or *for many years* that provides information about the durative semantics of the main predicate. Hence, the adverb is cued by the main predication, and coheres much better with the high attachment than with the lower attachment.
In (81) we see extrapositions from embedded clauses, which should be flat out impossible if extraposition is not an unbounded phenomenon. To be sure, my informants report that the adverbial interveners in (81) do not require any special prosody, which means that these data cannot be easily discarded as parenthetical insertions.

(81) a. I have [wanted [to know __] for many years] [exactly what happened to Rosa Luxemburg].  
    (attributed to Witten 1972 in Postal 1974:92)

b. I have [wanted [to meet __] for many years] [the man who spent so much money planning the assassination of Kennedy].  
    (attributed to Janet Fodor in Gazdar 1981:177)

c. Sue [kept [regretting __] for years] [that she had not turned him down].  
    (Van Eynde 1996)

d. She has been [requesting that he [return __] [ever since last Tuesday]] [the book that John borrowed from her last year].  
    (Kayne 2000:251)

e. Mary [wanted [to go __] until yesterday] [to the public lecture].  
    (Howard Lasnik 2007 course handout)

It is well known that extraposition causes some processing difficulty. For example, there is a general and measurable tendency for the language processor to prefer attaching new material to the more recent constituents (Frazier & Clifton 1996, Gibson et al. 1996, Traxler et al. 1998, Fodor 2002, Fernández 2003). In particular, eye-tracking studies like Staub et al. 2006 indicate that the parser is reluctant to adopt extraposition parses. This explains why extraposition in written texts is less common in proportion to the length of the intervening material (Uszkoreit et al. 1998): the longer the structure, the bigger the processing burden. Crucially, however, the preference for the closest attachment can be weakened by many factors (Carreiras 1992, De Vicenzi & Job 1993, Fernández 2003, Desmet et al. 2006). In a recent study about the on-line processing of English relative clause extraposition, Levy and colleagues (2012) show that extraposition creates significant processing difficulty when compared with nonextraposed counterparts of the same sentences, but that a preceding context that sets up a strong expectation for a relative clause modifying a given noun can actually facilitate comprehension of an extraposed relative clause modifying that noun. In other words, in spite of a larger processing burden, some extrapositions can be made easier to process by parsing expectations. This finding is consistent with the relative acceptability of (80), and consistent with the immunity of RNR to islands, since RNR sentences typically cue the presence of incomplete structures via prosody. Interestingly, Stucky (1987:401–2) had already expressed this intuition by noting that extrapoosed relatives tend to be linked to the closest preceding head as long as they can combine with it in a semantically coherent way. Stucky also noted that when an attachment fails due to grammatical violations, it can be very difficult for the parser to recover and attempt to attach the extrapoosed phrase to a more distant element. This is illustrated in (82), in which the degree of oddness caused by linking the relative to the closest NP interferes with the ability to link it to the correct NP, the subject.

(82) a. ??A friend of mine wanted to talk to the administrators who feels wronged.

b. ?A friend of mine wanted to leave town who feels wronged.

Nongrammatical factors of this kind have been argued by Hawkins (2004) to be responsible for major typological trends in the languages of the world. I suspect that they play an important role in explaining extraposition islands as well, and that Grosu (1973),

20 http://ling.umd.edu/~lasnik/LING819%202007/Multiple%20Sluicing%20819%20.pdf, retrieved 2009
Gazdar (1981), and Stucky (1987) are right in claiming that extraposition is not as syntactically restricted as usually held but, rather, is constrained by performance factors such as syntactic and semantic parsing expectations and memory-resource limitations. There are various sources of empirical and experimental evidence in support of this view. Recent corpora and experimental findings by Strunk and Snider (2008, 2013) show that extraposition does not always obey subjacency, contra Baltin (2006), Sabbagh (2007), and many others. The counterexamples in 83a–c are adapted from Strunk & Snider 2008, 2013, and 83d–f are inspired by the latter.

(83) a. [In [what noble capacity __ ]] can I serve him [that would glorify him and magnify his name]?
   b. We drafted [a list of basic demands __ ] last night [that have to be unconditionally met or we will go on strike].
   c. For example, we understand that Ariva buses have won [a number of contracts for routes in London __ ] recently, [which will not be run by low floor accessible buses].
   d. Robin bought [a copy of a book __ ] yesterday [about ancient Egyptian culture].
   e. I’m reading [a book written by a famous physicist __ ] right now, [who was involved in the Manhattan Project].
   f. I saw [your ad in a magazine __ ] yesterday [on the table at the dentist office].

In 84, I provide further evidence that extraposition is not as severely restricted by syntax as usually held. In these examples two extrapositions are entangled. First, it-extraposition displaces a CP to object position and then a PP complement of the matrix verb is extraposed into the extraposed CP. Thus, one extraposed phrase moves into another’s clausal domain.

(84) a. I’ve been asked __ , if it is possible __ , [[by every reporter in the state], [for Morrison to return to the lineup by the end of the season]].
   b. I said __ , that [[it was in our interest] __ , [to everyone in that room], [to see Mr. Gorbachev succeed]].
   c. I’m going to inquire __ , if [[it’s likely] __ , [to each of the programmers], [for a project to be completed in eight months]].

These data contrast with the oddness of 85, suggesting that the phenomena are due to the complex interaction of various factors rather than a general configurational condition.

(85) *It was believed __ , that [there walked into the room] __ , [by everyone], [a man with long blond hair].
    (Rochemont 1992)

It is also traditionally assumed that prepositions cannot be stranded in English extraposition, which contrasts with the well-known fact that RNR does allow preposition stranding. However, Wasow (2002) found attested preposition-stranding extrapositions such as the one in 86a. I supplement this with the constructed example in 86b. Crucially, the material intervening between the preposition and its object does not require parenthetical prosody.

(86) a. I’ll go over in my mind all the things I did wrong. (Wasow 2002:128–29)
   b. I ran into just yesterday one of my favorite writers of all time.

There is no shortage of other counterexamples to extraposition islands. For example, Baltin (1982) attributes the oddness of cases like 87a to (generalized) subjacency. This view is refuted by Culicover and Rochemont (1990:28, n. 11), who note that the data
improve if the relative clause is focused. Stucky (1987:398) also points out counterexamples like 87b, and argues that the oddness of 87a results from the extraposed relative being uninformative, which makes it pragmatically odd. The speakers that I have consulted find my example in 87c to be fully acceptable, even without focus.

(87) a. *John said he would meet a man at the party who was from Philadelphia, and meet a man at the party he did who was from Philadelphia.
   b. John said that he would call up his friends and call up his friends he did, for all of whom that must have been a great surprise.
   c. Simon said he wanted to meet someone today who can actually sing, and meet someone today he did who sang his socks off.

Subject phrases are not absolute extraposition islands either, as in my examples in 88, which are significantly more acceptable than *[Pictures __] frighten people [of John] (Drummond 2009). One may argue that the acceptability of the sentences in 88 is due to the subjects being passivized or unaccusative, but this is unlikely given the oddness of examples involving similarly derived subjects like *[A photograph of a book __] was published last year [about French cooking] (Akmajian 1975).

(88) a. [The circulation of a rumor __] has started [that Obama will not seek re-election].
   b. [A copy of a new book __] arrived yesterday [about ancient Egyptian culture].
   c. [Concerns about the deaths __] were raised [of two diplomatic envoys recently abducted in Somalia].

Finally, Hofmeister and colleagues (2015) offer experimental evidence suggesting that freezing effects in extraposition can be seen as the result of processing complexity. In sum, there are good reasons to believe that extraposition is not as severely restricted by syntax as is usually assumed. Rather, the evidence suggests that Grosu (1973), Gazdar (1981), and Stucky (1987) are correct in claiming that extraposition limitations are due to pragmatic and performance factors, like those experimentally manipulated by Levy and colleagues (2012), Strunk and Snider (2013), and Hofmeister and colleagues (2015).

3.3. Backward periphery deletion. I now turn to RNR cases that cannot be seen as predictions of ellipsis or of extraposition. These are what I consider to be RNR proper. Unlike ellipsis and extraposition, true RNR (i) can target any peripheral string of words that can form an independent prosodic unit, and (ii) imposes morph form identity. Let us start by considering cases where the RNRaised element is not an extractable or elidable unit. In 89 we see a nominal head being RNRaised, stranding an NP-internal modifier. For example, 89a cannot be attributed to extraposition (*Elvis wrote a truly brilliant last year thesis) or to N′-ellipsis (*Elvis wrote a truly brilliant).
(89) a. John wrote a mildly interesting but Elvis wrote a truly brilliant
[thesis on nightingales].  
(Swingle 1995)
b. The first experiment involved a positively while the second involved a
negatively [charged particle].  
(adapted from Wilder 1997)
c. I thought it was going to be a good but it ended up being a very bad
[reception].
d. Is deforestation a major or is it the only [factor for primate extinction]?  
e. Not only is deforestation a major—it is also probably the main [factor
for primate extinction].
f. A conspicuous and it is hoped not unpleasant [feature of the book] is
its abundant illustrative quotations from eminent poets …

Finite VPs can also be RNRaised, as shown in 90. For instance, in 90a both conjuncts share the same VP, and the subject the captain is left stranded inside the first conjunct, and is the conjunct-final constituent. Such VPs cannot be omitted via VP-ellipsis, as shown by the oddness of *He suspects that the captain, nor leftward extracted, as in
*Detests goat cheese, he suspects that the captain.

(90) a. He suspects that the captain but knows that the major [detests
goat cheese].  
(McCawley 1998)
b. The waiter forced the customers and the manager persuaded the staff
[to leave quietly].  
(Beavers & Sag 2004)
c. One witness said that a ghost and another claimed that an angel [had
been sighted in the bell tower].
d. Tonight a group of men, tomorrow night he himself, [would go out
there somewhere and wait].
(e. As far as I was concerned, she had already and had dandily [shown
what she could do].  
(BRN)
f. … Democrats privately and Republicans publicly [say that this is one
subject on which Clinton does not have the moral high ground].

Other cases of nonextractable and nonelidable RNR strings in English are TPs like 91 and comparative phrases as in 92. The simplest interpretation of these facts is that RNR does not involve any form of syntactic displacement.

(91) a. I've been wondering whether but wouldn't want to positively state
that [your theory is correct].  
(Bresnan 1974)
b. *[Your theory is correct], I've been wondering whether.
c. *I wondered whether yesterday [your theory is correct].

(92) a. An argument with Orville Torrence Killpath was as frustrating and
as futile [as a cap pistol on a firing range].
(bRN)
b. *As a cap pistol on a firing range, an argument with Orville Torrence Kill-
path was as frustrating/futile.
c. They were also as liberal or more liberal [than any other age group in
the 1986 through 1989 surveys].
(WSJ)
d. *Than any other age group in the 1986 through 1989 surveys, they were
also as liberal.

Neijt (1979) and Hartmann (2000:66, n. 5) note that [and XP] conjuncts can undergo
RNR in Dutch. This is an important observation because conjunct phrases are not ex-

22 *The devil’s dictionary*, by Ambrose Bierce, 1911 (http://www.gutenberg.org/ebooks/972)
tractable.²⁴ I am inclined to accept this view—contra McCawley (1982:101, n. 11), Postal (1998:121), and others—given passable examples like 93. There is a strong tendency to parse ordered ham as a complete VP, but with strong continuation prosody at ham it is possible to parse this sentence as I ordered ham and eggs but got bacon and eggs instead.

(93) (?)I ordered ham—but got bacon—and eggs.

There are more extreme cases of RNR, discussed in §2.1, which cast further doubts on syntactic accounts of RNR, however defined. The first comes from idioms like 9, repeated here as 94. The prepositional phrase with a full deck has no syntactic mobility, and yet can be RNRaised. This is exactly as expected in a nonsyntactic deletion account.

(94) Robin does not play—or pretends not to play—with a full deck.

(*It is with a full deck that Robin does not play ___.)

Second, examples like 95a,b would require a word-part dontist that is clearly not a well-formed syntactic unit to behave as if it were a full-fledged unit. In fact, Sabbagh (2007:390, n. 33) assumes just this, by claiming that word-part RNR cases involve movement of stems into syntax, in violation of lexical integrity (Chomsky 1970, Selkirk 1982, Booij 1985, Toman 1985, Lapointe 1997). But there is no evidence that a word-part is a syntactic unit, or that stems can move from morphology to syntax.²⁵

(95) a. Do you want to become an ortho- or a perio[dontist]?
   b. Do you primarily work with ortho- or with perio[dontists]?
   c. *Dontists, I don’t think I could work with ortho-.
   d. *Did you work with ortho- yesterday dontists?

Grosu (1976), Abbott (1976), and others note that data like 96 indicate that RN-Raised elements need not be constituents. It is possible, however, that these cases are obtained by extraposing sequences of constituents or by assuming some form of non-standard constituency (Steedman 1996, Sabbagh 2007).

(96) a. Mary baked and George frosted [20 cakes] [in less than an hour].
   (Grosu 1976)
   b. Bob offered and Stacey actually gave [a gold Cadillac] [to the Schwartz family].
   c. I borrowed and my colleagues stole [large sums of money] [from the Chase Manhattan Bank].
   (Abbott 1976:639)
   d. John tried to persuade but failed to convince [his skeptical examiners] [that he knew the right answer].
   (Neijt 1979:41)
   e. Robin plans to mail and DHL had better be ready to carry [a package of books] [this coming Thursday] [to the King of Norway].
   (Levine 2001:164)

But there are cases of nonconstituent RNR that require assumptions about constituency that have no independent motivation. The first case is illustrated in 97.²⁶

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²⁴ The phenomenon of stripping (Ross 1967, Hankamer & Sag 1976, Chao 1988) can give the appearance that a conjunct phrase can be moved, as illustrated by John bought a book yesterday, and a newspaper. The oddness of *John bought both a book yesterday, and a newspaper indicates that this is an instance of elliptical clausal coordination, rather than an instance of NP coordination followed by conjunct movement.

²⁵ These data are problematic for any syntactic account, including multidominance, since there is no independent evidence that syntax can access word-parts, as required by 95 as well as by 98 below. For further discussion about problems arising in movement accounts, see Sabbagh 2007:382, 391 and Yatabe 2007.

²⁶ These data are inspired by German data from Wesche 1995:55 and Wilder 1999.
(97) a. It is possible that someone with a good—and assumed that someone with an excellent—[set of golf irons] [would make this hole in one].
   b. I think that someone with four—and firmly believe that someone with five—[kids in diapers] must be insane.

Two constituents are RN(Raised) in 97: [set of golf irons], and [would make this hole in one]. The RN(Raised) N’ and VP. The RN(Raised) N’ belongs to an embedded PP in the rightmost NP on each conjunct (i.e. [someone [with [a good/excellent __]]]), whereas the RN(Raised) VP takes the entire NP headed by someone as subject. I know of no independent syntactic, semantic, or prosodic reason for viewing such an N’ VP sequence as a unit, even in theories where traditional constituency is rejected, like Steedman 1985, 1996, Larson 1990:626–27, and Sabbagh 2007:395–97. And if there is no independent reason to assume that such units form constituents, then this stipulation should be avoided.

A second challenge to the notion that only constituents can be RN(Raised) comes from data like 13c, repeated below in 98a. There is no independent justification for viewing the strings war Germany, star hotels, or synaptic neuron as constituents. In all of these cases the first unit in the RN(Raised) string is a stem, not a syntactic entity, and there is no evidence that it can combine with the phrase that follows it.

(98) a. These events took place in pre- or in post-[war Germany]?
   b. Explain how signals move from a pre- to a post-[synaptic neuron].
   c. I’m more interested in four- than in five-[star hotels].

The cases in 99 are particularly revealing because the RN(Raised) element is supposed to be a bound morpheme in one conjunct but a syntactic phrase in the other. The idea that a syntactic element can move into morphology and vice versa has no independent motivation. See Booij 1985:147 for similar phenomena in Dutch.

(99) a. Please list all publications of which you were the sole or co-[author].
   b. It is neither un- nor overly [patriotic] to tread that path.
   c. The ex- or current [smokers] had a higher blood pressure. (Chaves 2008)
   d. The neuro- and cognitive [sciences] are presently in a state of rapid development ... 27
   e. Are you talking about a new or about an ex-[boyfriend]?

Booij (1985) and Nespor (1985) note some direct evidence for the deletion analysis. In the Dutch data in 100, when wesp ‘wasp’ combines with steek ‘sting’ an additional schwa appears in between: wespe-steeek. This linking morpheme survives the deletion in German and Dutch, a fact that is hard to explain in a syntactic analysis.

(100) wespe-en bije [steken]
    wasp- and bee stings

Further difficulties for movement-based accounts come from discontinuous RN(R), first noted by Wilder (1999) with data like 101. The first verb is not compatible with to Mary, but the second verb is. Schematically, we have a sequence of elements ‘A & B C D’, which is interpreted as ‘[A C] & [B C D]’, not as ‘[A C D] & [B C D]’. In such cases, the RN(Raised) NP is not in a higher structural position than the conjuncts.

(101) John should fetch and give [the book] to Mary.

The same point is further illustrated by the attested data in 102, from Whitman 2009:238–40. Each verb shares the same rightmost complement NP, but that complement im-

mediately precedes another phrase (underlined) that belongs to the last (underlined) conjunct.

(102) a. A Monroe County man, convicted yesterday of RAPING, BEATING, and STUFFING [a 7-year-old girl] into an abandoned well, could be executed by lethal injection.

b. The blast UPENDED and NEARLY SLICED [an armored Chevrolet Suburban] in half.

c. During the War of 1982, American troops OCCUPIED and BURNED [the town] to the ground.

d. Members of the platoon testified that they PUNCHED, KICKED, and STRUCK [the detainee] with their rifles.

There are even more complex cases of discontinuous RNR. As Whitman (2009) notes, sometimes the D part is neither a complement of B nor a modifier of it. For example, in 103 the string to perform the necessary actions without injury is a constituent, in contrast with the data above. Whitman admits being unable to model such cases.

(103) a. Please move from the exit rows if you are unwilling or UNABLE [to perform the necessary actions] without injury.

b. In the player’s box was Tony Nadal, the UNCLE and COACH [of Rafael Nadal] since he started playing as a youngster.

Bachrach and Katzir (2008) argue that discontinuous RNR involving clausal coordination is not possible. In their account, each conjunct is a clause and therefore undergoes SPELL-OUT before the conjunction takes place. The multidominated material is not spelled out because it is not completely dominated within each conjunct. It is completely dominated once conjunction occurs, but since spell-out has already taken place, linearization cannot be interfered with. Discontinuous clausal RNR does exist, however, as illustrated by 104. Bachrach and Katzir incorrectly predict that such cases are impossible.

(104) a. The first platoon OCCUPIED and the second BURNED [the town] to the ground.

b. Tom SPENT and Mary DONATED [over one hundred dollars] to charity.

Discontinuous RNR is best seen as deletion because of examples like 105. The former involves sublexical units, and the latter involves a noncoordination structure. Both of these cases are expected in the present approach if they are deletion-based RNR.

(105) a. Are you talking about a new or that ex-[boyfriend] you used to date? (cf. ?*Are you talking about a new?)

b. The troops that OCCUPIED ended up BURNING [the town] to the ground.

The evidence suggests that true RNR is not a syntactic operation: it can apply to virtually any strings, including nonconstituent units that cannot be displaced in any way, or discontinuous strings located within a noninitial conjunct. We also have cases where two strings with different sublexical and phrasal status can trigger RNR, and cases where a stem is apparently moved to the syntactic domain, as if it were a phrase, and cases where a syntactic phrase is apparently moved into morphology, as if it were a stem. There is no independent evidence to assume that these kinds of syntactic operations are possible. However, if these kinds of RNR are due to a backward deletion operation that targets only linearized strings, not syntax, then such phenomena are expected.

Identity conditions. Following Booij 1985, Beavers & Sag 2004, and Chaves 2008, I assume that backward periphery deletion imposes morph form identity conditions. There is much evidence in favor of this view. First, note that phonological iden-
tity is not sufficient, as shown in 106. In 106a,b the RNRaised units are morphemes that belong to different parts of speech, and in 106c–f the two RNRaised nominals are required to have two different senses at the same time. For example, lamb must describe both an animal and its meat, bat must describe both an animal and a sports instrument, and armed must describe a body and a weapon. Oddness arises because in general the same phrase cannot simultaneously have two meanings, except in puns (Zaenen & Karttunen 1984:316).

(106) a. *Randy saw and Rene has been [flying planes].
   b. *Jo will and Sandy built the [drive].
   c. *Mary fed and Tom enjoyed [the lamb].
   d. *Robin swung and Leslie tamed [an unusual bat].
   e. *I am and I speak [Japanese].
   f. *There stood a one- and well-[armed man].

Similarly, the cases in 107 are odd because there is no morpheme to delete: blackboard, butterfly, and so on are grammaticized monomorphic words, not productive compounds. Blackboards need not be black or made of board, and butterflies are not flies, nor buttery. And as Müller (1990) and Smith (2000) point out, for a morpheme to be deleted it must not be grammaticized.

(107) a. *I am interested in dialect- and epistem[ology].
   b. *We caught butter- and fire[flies].
   c. *We need new black- and floor[boards].

The oddness of the sentences in 107 contrasts with the acceptability of the data in 108.

(108) a. We saw a landscape dotted with wind- and water-[mills].
   b. We caught house and horse [flies].

There are also reasons to believe that semantic identity is not required, given that examples like those in 109 allow sloppy readings, as noted by Höhle (1991).

(109) a. Chris likes and Bill loves [his bike].
   b. Tom loves and Jeff adores [every girl from his school].
   c. Fred sent Mary and Tim handed Sue [a love poem].

Moreover, RNR differs from bona fide extraction in that only the former allows semantic duplication of a quantifier. For example, in 110a the phrase very few accounts of the local situation can be construed distributively (Pat wrote few accounts and Birch emailed few accounts), as predicted by a backward periphery deletion, whereas in 110b a single quantifier must bind into both conjuncts, resulting in a complex conjunctive restriction on the quantifier (the accounts that were both written by Pat and emailed by Birch), as predicted by ATB extraposition. The interrogative wh-expression in 110c similarly lacks a distributed interpretation (the question is asking for only one number, not two).

(110) a. (During the long campaign,) Pat wrote his mother and Birch emailed her father [very few accounts of the local situation].
   b. (During the long campaign,) there were [very few accounts of the local situation] that Pat wrote to his mother and Birch emailed to her father.
   c. [How many accounts of the local situation] did Pat write to his mother and Birch email to her father?

Notably, RNR does not seem to impose strict constraints on grammatical properties. For example, in 111 the RNRaised NP Frauen is required to be accusative by the verb findet and dative by the verb hilft. The same pattern arises in the word-part RNR in 112.
Crucially, such sentences are possible only because the accusative and dative plural realizations of *Frau* involve the same morphological form. This pattern is to be expected if the identity conditions imposed by backward periphery deletion pertain to morph stems, as assumed above.

(111) Er findet Frauen und hilft [Frauen]
he finds women.Acc and helps women.Dat

(112) Weil Leituns(wasser) von Mineral[wasser] unterscheiden ist
because flat.water.NOM from mineral.water.DAT differentiated is

The same phenomenon can be seen in languages like Finnish, as 113 shows. This sentence is possible only because the possessive suffix added to the noun obliterates case distinctions. If the different case markings were overt, RNR would be impossible. Similar data have been noted in a variety of other languages (Bayer 1996).

(113) He lukivat hänen uusimman (kirjansa) ja me hänen parhaat
they read his newest book.sg.gen and we his best

books.pl.nom

(114) a. I certainly will and you already have [set_{NFIN/INF} the record straight].
    b. Either they or you [are_{2sg/3pl} going to have to go].
    c. Would you like to meet or to be [a movie star_{PRED+/−}]?

English RNR exhibits the same disregard for grammatical features. In 114a *will* requires a nonfinite VP, while *have* requires a finite VP. In 114c the NP *a movie star* is required to be predicative by the first conjunct but nonpredicative by the second.

(115) a. #Chris$_{1}$ likes his$_{2}$ bike and Bill$_{1}$ loves [his$_{2}$ bike].
    b. #Chris$_{1}$ likes his$_{2}$ bike and Sue$_{2}$ loves [her$_{3}$ bike].
    c. *Chris$_{1}$ likes his bike and Bill$_{1}$ loves his$_{2}$ bike.

There are other data suggesting that RNR imposes some form of morphophonological identity, as originally discussed in Pullum & Zwicky 1986. Consider the evidence in 116, which shows that tense differences block RNR.

(116) a. *Tom let Mia$_{1}$ play outside and Mary allowed BILL$_{2}$ to [play outside].
    b. *Kim succeeded in helping us and Sam tried to [help us].
    c. *I like playing guitar and I WILL [play guitar].

But when it comes to number inflection it seems that RNR is somewhat more flexible, as shown in 117a,b. It is possible that number inflection is less relevant for RNR because it makes a weaker semantic contribution than tense inflection. Whereas tense is referential (since it indicates an associated time interval via intersentential or extrasentential dependencies), agreement is a local phenomenon between elements in the sentence, meaningless outside of the grammatical system.28

28 Alternatively, the acceptability of 117a may be due to a performance error. See Solomon & Pearlmutter 2004, Eberhad et al. 2005, Bock et al. 2006, and Bock & Middleton 2011 for recent discussion of the psycholinguistic evidence for so-called agreement attraction errors.
(117) a. Tom thinks that the shoes but Mary thinks that the coat [is too expensive].
   b. ??Tom thinks that the coat but Mary thinks that the shoes [are too expensive].
   c. *Tom thinks that the coat but Mary thinks that the shoes [is too expensive].
   d. *Tom thinks that the shoes but Mary thinks that the coat [are too expensive].

Matters are further complicated by the fact that the pattern in 117d is sometimes passable for some speakers, in restricted contexts. This ‘summative agreement’ RNR has been noticed before, by Postal (1998:173) and Yatabe (2002). I illustrate this point with the paradigm in 118. Judgments appear to be somewhat idiosyncratic, but the acceptability of summative agreement improves if John and Mary are not contrasted.

(118) a. Tom said that John—and Mia said that Mary—[were wonderful students].
   b. *Tom said that John—and Mia said that Mary—[were wonderful students].
   c. Tom said that John—and Mia said that Mary—[was a wonderful student].

Summative agreement also seems to arise in RNR of matrix VPs.

(119) a. Today a man—and tomorrow a woman—[is coming for an interview].
   b. Today a man—and tomorrow a woman—[are coming for an interview].
The above patterns are contrary to Grosz 2012, where summative agreement is assumed to be the only option for these types of RNR, and to arise due to configurational conditions.

I propose that summative agreement arises when the speaker has a privileged perspective on the situation under discussion and opts to summarize it in his/her own words, by repackaging the sentence on the fly. For example, suppose that Fred (the speaker) knows that (i) Mia thinks Mary is a wonderful student and that (ii) Tom thinks John is a wonderful student. Then, Fred might opt to say that Mia and Tom think that Mary and John are wonderful students, respectively. This can be paraphrased in various ways, including 118a. But when it is less likely for the speaker to have a privileged perspective, the two propositions should be kept separate. The latter case is illustrated in 120. Without a proper contextualization, it is harder to construe a situation where the speaker of 120a,b is privy to Sue’s and Kim’s thoughts or to Bob’s guesses. The access to this kind of information is less immediate than in 118a, where the speaker is simply reporting what Tom and Mia have said.

(120) a. Sue thought that Bill—and Kim thought that Tom—[was/?*were lost].
   b. ??*Bob guessed that John—and Mia warned that Mary—[were bad students].

Beavers and Sag (2004) note that summative agreement is at least in part a semantic process, since it does not occur in disjunction. I illustrate this point with 121. This shows that summative agreement is contingent on the semantics of the coordinator.

(121) a. Did you say that John or did you say that Mary [was a wonderful student]?
   b. *Did you say that John or did you say that Mary [were wonderful students]?
Symmetric predicates can occur in summative agreement RNR as well, as illustrated in 122, in spite of claims to the contrary by Grosz (2012).

(122) a. We used to think that Tom’s problems and Bill’s problems were different, but after discussing them with you, we’ve come to the realization they’re not so different: I think that Tom—and you think that Bill—have very similar problems.
   (= ‘There is a set of problems that I think Tom has and you think Bill has.’)
b. I suspect that there’s no winner in this case, it’s pretty much a tie. To put it in perspective: I think that Robert—and you think that Bill—are equally annoying.
   (= ‘There is an equal degree of annoyance that Robert and Bill cause.’)

I propose that summative agreement arises when the speaker repackages two independent propositions into a third proposition by adding additional contextual information. The idea that such sentences involve an extra ‘repackaging’ step that combines with independent propositions is consistent with the speaker variation that Yatabe (2002) observes. In my view, such RNR raisings do not truly have a semantic effect. They simply mirror the fact that the speaker has additional information that can be integrated into the utterance during the deletion. In other words, deletion offers the speaker the chance to fuse the two statements into a richer one. Evidence that this process does not have a semantic effect comes from the fact that true plural predication is not allowed, as noted by Moltmann (1992) with 123.

(123) a. *I said that Bill—and Mary said that Bob—[have finally met].
   b. *Tom is happy that Bill—and Fred is glad that Mary—[love each other].
   c. *Today a man and tomorrow a woman [are talking about each other].

The oddness of such cases contrasts with the acceptability of 124, discussed by Ross and Perlmutter (1970), Hintikka (1974), and McCawley (1982, 1998). In my account, 124 is obtained via ATB extraposition, as in Chaves 2009.

(124) A man entered and a woman left [who had met in Vienna].

A formalization of backward periphery deletion. Backward periphery deletion allows peripheral and prosodically independent units to be deleted under morph form identity. Recall that the feature M(ORPHO)P(HONODY) contains both phonological and morph form information, as illustrated in 125. The phrase these big books consists of a phonological phrase (φ) with three prosodic words (ω). In what follows I assume that the elements in FORM are restricted to morphs with semantic contribution: stems, derivational affixes, and tense affixes. For ease of exposition, morphophonological representations like 125a are abbreviated as shown in 125b.

(125) a. $$\text{phrase}$$
   $$\begin{bmatrix}
   \phi \\
   \omega /\text{ph} o n /b i g /
   \omega /\text{ph} o n /b o k s /
   \end{bmatrix}
   \begin{bmatrix}
   \text{PHON} /d i z /
   \text{PHON} /b i g /
   \text{PHON} /b o k s /
   \end{bmatrix}
   \begin{bmatrix}
   \text{FORM} /t h i s /
   \text{FORM} /b i g /
   \text{FORM} /b o k s /
   \end{bmatrix}
   $$

b. $$\phi /d i z b i g b o k s /
   \text{this big book}$$

Following Inkelas & Zec 1990, Kratzer & Selkirk 2007, and many others, I assume that prosodic structure is built locally and incrementally. The morphophonology of a
phrase is computed as the linear combination of the phonologies of the daughters, which allows the grammar to straightforwardly access properties that have been argued to be important for prosodic phrasing (syntactic boundaries, category membership, headship, (directionality of) branching, and grammatical relations), and it also allows deletion to apply locally, as sketched in 126. Here, \( \alpha_n \) is a morphophonologic constituent, \(^*\) is a Kleene plus, and \(*\) is a Kleene star.

(126) **Backward periphery deletion construction** (informal version):
Given a sequence of morphophonologic constituents \( \alpha^+_1 \alpha^+_2 \alpha^+_3 \alpha^+_4 \alpha^+_5 \), then output \( \alpha^+_1 \alpha^+_3 \alpha^+_4 \alpha^*_5 \) iff \( \alpha^+_2 \) and \( \alpha^+_4 \) are identical up to morph forms.

The account is informally illustrated below. Square brackets correspond to intonational phrases and parentheses to smaller prosodic units of different strengths, such as prosodic words or phonological phrases. The latter roughly correspond to a maximal syntactic projection of a lexical category or a syntactic branching phrase. Although there is experimental evidence showing that a finer-grained hierarchy of intonational boundaries is probably needed, the precise nature of this hierarchy remains to be established. In 127a–d the contrastive stress creates prosodic boundaries that would otherwise not exist, thus allowing 126 to apply. The deletion pattern in 127a is obtained if \( \alpha_1^- = [(Alice LOVES)] \), \( \alpha_2^- = [(bagels)] \), \( \alpha_3^- = [(and Tim HATES)] \), \( \alpha_4^- = [(bagels)] \), and \( \alpha_5^- \) is the empty string. If \( \alpha^-_2 \) is nonempty, then discontinuous RNR occurs, as in 127b. The latter corresponds to \( \alpha_1^- = [(John should FETCH)] \), \( \alpha_2^- = [(the book)] \), \( \alpha_3^- = [(and GIVE)] \), \( \alpha^-_4 = [(the book)] \), and \( \alpha^-_5 = (to Mary) \). In the NP in 127e no contrast is needed since there is a natural prosodic boundary between the prosodic words.

(127) a. \([(Alice LOVES)] [(bagels)] [(and Tim HATES)] [(bagels)].
b. \([(John should FETCH)] [(the book)] [(and GIVE)] [(the book)] [(to Mary)].
c. (in pre) (war Germany) (or in post) (war Germany)
d. (distinguish NEURO) (linguistics) (from PSYCHO) (linguistics)
e. (Thai) (food) (and Burmese) (food)

The fact that 126 can apply only to well-formed prosodic phrasings that are licensed by the independent prosodic rules of English typically means that deletion targets units that are peripheral in the first daughter and noninitial in the second. And since deletion applies to only certain parts of a phrase, comprehenders can more easily determine that the sentence is incomplete and that the missing material will be realized downstream. This functional explanation for the directionality of RNR is consistent with the fact that prosodic cues are known to help the production and comprehension of a variety of different constructions (Fodor 2002a,b, Kitagawa & Fodor 2006) and is also consistent with the functional explanation offered in §2.2 for the fact that the prosodic contrast observed in RNR is correlated with the distance between the RNRaising site and the overt RNRaised unit.

In order to formalize 126, I draw from Yatabe 2002, Beavers & Sag 2004, and Chaves 2008 and propose the rule in 128. This construction splits the \( mp \) list of a phrase into five sublists, using the list concatenation ‘◦’ operation. The \( F_1…n \) variables range over lists of morph stem forms, and \( L_1…4 \) over lists of morphophonological units. With the exception of \( L_4 \), all lists are required to be nonempty (otherwise, the rule could apply with no effect). The elided material is the sublist containing morph forms \( \text{[form }\ F_1] \ldots , \text{[form }\ F_n]\) that occur again later, in different morphophonological units. The notation \( L: \{\text{[form }\ F_1], \ldots , \text{[form }\ F_n]\} \) means that \( L = \{\text{[form }\ F_1], \ldots , \text{[form }\ F_n]\} \).
(128) Backward periphery deletion construction (formal version)

\[
\text{phrase} \quad \text{MP} L_1 \circ \left( \text{ne-list} \circ L_2 \circ \text{ne-list} \circ L_3 \circ L_4 \right) \rightarrow \\
\text{phrase} \quad \text{MP} L_1 \circ \left( [\text{FORM } F_1] \cdots [\text{FORM } F_n] \right) \circ L_2 \circ L_3 \circ \left( [\text{FORM } F_1] \cdots [\text{FORM } F_n] \right) \circ L_4
\]

Crucially, only the second of the \([\text{FORM } F_1], \ldots, [\text{FORM } F_n] \) sequences appears in the mother. The effect of 128 is illustrated in Figure 7. The peripheral units are highlighted.

![Figure 7. Backward periphery deletion of linearized morphophonological units.](image)

Here the \(L_1\) variable corresponds to a singleton list containing the phonology \((\text{Kim LIKES})\), \(L_2\) corresponds to a singleton list containing the phonology \((\text{and Mia HATES})\), and \(L_3\) corresponds to a singleton list with \((\text{bagels})\). In this case, \(L_4\) is the empty list, and therefore the RNR is not discontinuous. The nature of the prosodic constituents in \(\text{MP}\) is not specified by the rule in 128; this is left to independently motivated prosodic phrasing. Thus, if 128 applies to a clause, then the prosodic constituents are intonational phrases \((I)\); if the phrase is subclausal, then the constituents are phonological phrases \((\phi)\); and so on.\(^\text{29}\)

The deletion rule in 128 can omit any sequence of independent morphophonological units, in any phrasal node, coordinate or not, under morph form identity, as long as the syntax-phonology rules of the grammar are respected. Consequently, part of speech and

\(^\text{29}\) See Wagner 2010 for arguments that coordination can yield recursive prosodic structure.
syntactic constituency are irrelevant. Furthermore, the account correctly predicts that RNR is not possible in word-parts that have similar phonology but that do not have a corresponding morpheme, due to grammaticization, as discussed in 106 above. For example, the compounding process that created the words butterfly and firefly is no longer productive. Hence, although these lexemes have two prosodic words each (/bətəflɛ/ and /faɪəflɛ/), they consist of one morph root each, butterfly and firefly. Because the two words correspond to completely different morph forms, the identity requirement imposed by 128 cannot be satisfied, and the deletion in 129 is correctly blocked.

(129) Did you catch a butterfly or a firefly?

Backward periphery deletion targets independent prosodic units, and therefore makes various correct predictions, as discussed in §2.2. For example, Milward (1994) claims that 130 is odd because RNR requires each conjunct to have the same syntactic bracketing. But such a radical stipulation is unnecessary, as the oddness follows in the present account from the sense unit condition (Selkirk 1984:291). More specifically, the syntactic bracketing of the first conjunct [[a friend of Terry's handbag] cannot be realized with the required prosodic bracketing [a friend of] [Terry's handbag].

(130) *I saw a friend of—and the manufacturer of—Terry's handbag.

Note that the rule in 128 is simplified in that the RN-Raised unit should be allowed to be unaccented and to be grouped prosodically with the preceding prosodic constituent. I assume that independent morphophonological rules can apply to the output of the deletion in 128 and obtain this effect. This phenomenon is worth mentioning because it offers a simple explanation for a number of puzzling RNR phenomena. Consider 131, first noted by Kayne (1994). This example is challenging to most theories of RNR because the negative polarity item (NPI) any must somehow still be in the scope of negation in order to be licensed.

(131) John has read but he hasn't understood any of my books.

However, there is evidence that what is RN-Raised here is my books, not any of my books. In other words, the complement of read is the plural NP my books, and understood takes as complement the singular partitive NP between square brackets (see below). The example in 132 offers independent support for this view.

(132) John may very well have read but he ended up mentioning none of my books.

The complement of read is my books rather than none of my books. Hence, in spite of the fact that the partitive NP forms an intonational unit, the RN-Raised string is actually my books. The words none/any of belong to the second conjunct but end up being phonologically integrated into the same prosodic unit after the nominal phrase is RN-Raised. Hence, 131 poses no challenge for NPI licensing since any of is not part of the RN-Raised string: [(John has read) [my books] [(but he hasn't understood) (any of)] [(my books)]. The present analysis also predicts the contrast below. In 133a the string books (NP) is deleted under morph identity with the string books (N') in the second conjunct. Conversely, in 133b there is no suitable coordination that can feed backward periphery deletion.

(133) a. Robin read books but Mary didn't read any books.
   b. *Robin didn't read (any) books but Mary read any books.

30 A referee suggests that this may be a case of null complement ellipsis. I think this is implausible because of the oddness of ?*John has read in the relevant interpretation.
Cases like 134 are also correctly predicted to be odd. Since the only NP that both conjuncts can share is *any books*, the oddness stems from the fact that the first conjunct cannot license the presence of the NPI. If the string *any of my books* were truly being RNRaised in 131, then the oddness of 134 and the acceptability of 131 would be a mystery.

(134) *John has seen (any) book but he hasn’t bought [any book].

The account predicts the examples in 135, in which the first daughter RNRaises an NP, but the second seems to RNRaise a different phrase. In my account, *with* and *than* are not part of the RNRaised NP in 135a,b, and merely prosodify with it after deletion takes place.

(135) a. We either give the marines or supply the paratroopers [with extra guns].

b. They were also as liberal or more liberal [than any other age group in the 1986 through 1989 surveys].

Let us turn to summative agreement RNR, in 118a and 122, repeated here as 136.

(136) a. I said that John and you said that Mary [were wonderful students].

b. I think that Bob and you think that Bill [have very similar problems].

In §3.3 I argued that these cases involve subtle judgments and require a particular type of context in which the speaker can employ a perspective shift. In this account, deletion offers the speaker an opportunity to integrate a limited amount of contextual information into the construction. The fact that this process involves access to the signs that correspond to the elided units makes it a reconstruction operation, which is consistent with the fact that speaker judgments are difficult, and sometimes unstable. This is depicted in Figure 8.

The speaker’s knowledge that the $x$ and $y$ dependents are referentially different leads to a repackaging of the remainder of the sentence, via the coordination of the two VPs. Given that implicit coordination, the shared dependent condition for conjunction can apply and cumulate the shared dependents $x$ and $y$. Finally, the morphophonology of the reconstructed coordinate VP is integrated into the mother node, rather than the morphophonology of the original VPs: *has problems*.

Figure 8 is somewhat misleading since RNR only enforces morph stem identity, but the point is that the phrase *have similar problems* reflects the speaker’s knowledge about the values of $x$ and $y$. In that sense, the additive reading has no semantic effect on the logical form of the sentence. A more formal version of this analysis is fleshed out in Figure 9.

This analysis can be obtained by revising 128, as shown in 137. The function $\Upsilon()$ takes as an argument the list of $mp$ material that is shared in the daughters. In the simplest case, the speaker is faithful to the sentence and does not tamper with the morphophonology: $\Upsilon(L) = L$. In that case, everything works as in 128.
(137) **BACKWARD PERIPHERY DELETION CONSTRUCTION (extended version)**

\[
\frac{\text{phrase}}{\text{phrase}}
\]

\[
\frac{\text{MP} L_1 \circ \text{ne-list} \circ L_2 \circ \text{ne-list} \circ \Gamma (L_3) \circ L_4}{\text{MP} L_1 \circ \left( \text{FORM F}_1 \right) \circ \cdots \circ \left( \text{FORM F}_n \right) \circ L_2 \circ L_3 \circ \left( \text{FORM F}_1 \right) \circ \cdots \circ \left( \text{FORM F}_n \right) \circ L_4}
\]

In the nontrivial case, \( \Lambda (L) \) allows the speaker’s privileged contextual perspective to interfere with the realization of \( L \) during the processing of deletion. In that case, \( \Lambda (L) \) outputs \( L' \), the morphophonology of a phrase that corresponds to the conjunction of two eventuality-denoting signs \( X_1 \) and \( X_2 \) that have the same morphophonology \( L \). The signs \( X_1 \) and \( X_2 \) can be found by inspecting the working-memory workspace, as in 138.\(^{31} \)

(138) **SHARED DEPENDENT CUMULATION IN BACKWARD PERIPHERY DELETION:**

\( \Lambda (L) = L' \) iff

(i) there are two eventuality-denoting signs \( X_1 \) and \( X_2 \) with the same morphophonology. More formally:

\[
\exists X_1 \exists X_2 \:
\begin{align*}
\text{MP} & L_{1}^{L_1} \left( \text{INDEX } e_1 \right) \land \text{MP} & L \left( \text{INDEX } e_2 \right) \\
\text{SEM} & \left( \text{RELS } \Gamma_1 \right) & \text{SEM} & \left( \text{RELS } \Gamma_2 \right)
\end{align*}
\]

(ii) \( L' \) is the morphophonology of the conjunction of \( X_1 \) and \( X_2 \):

\[
\begin{align*}
\text{MP} & L' \left( \text{INDEX } e = e_1 \oplus e_2 \right) \\
\text{SEM} & \left( \text{RELS } \Gamma_3 \right)
\end{align*}
\]

\( \Lambda \) \( \Rightarrow (\Gamma_1 \land \Gamma_2 \land C) \)

\(^{31}\)Alternatively, it might be possible to access \( X_1 \) and \( X_2 \) via the sal(ient)-utt(eration) discussed in §3.1. Lack of space prevents me from exploring this possibility in more detail.
Condition (i) requires that two signs $X_1$ and $X_2$ with the same morphophonology $L$ be accessible in the working-memory parsing workspace. Both signs describe eventualities ($e_1$ and $e_2$) and have as semantic representations $\Gamma_1$ and $\Gamma_2$, respectively. These signs are required to describe eventualities because perspectives are attitudinal stances that speakers entertain about eventualities. The output of $\Upsilon(L)$ is the morphophonology $L'$ of a phrase that denotes the conjunction of $\Gamma_1$ and $\Gamma_2$, as per condition (ii). I assume that if $X_1$ and $X_2$ have shared dependents $x$ and $y$ then they are cumulated in the usual way, via the shared dependent condition for conjunction. The result is a phrase that is equivalent to $\Gamma_1 \land \Gamma_2 \land C$. The term $C$ consists of contextual information, and as such it can contain information about the dependents $x$ and $y$ shared by the conjuncts $X_1$ and $X_2$. Thus, if $C$ establishes that $x = y$, then $L'$ can be something like the same problem; if $C$ establishes that $x \neq y$, then $L'$ can be different problems; if $C$ establishes that similar($x, y$), then $L'$ is similar problems; and so forth.

Because the perspective combination process implemented by $\Upsilon()$ focuses on phrases that describe eventualities, we predict that unambiguous instances of backward periphery deletion are unacceptable if the RNRaised unit is nominal, as seen in 139.32

(139) a. *This is the difference between an interesting and a tedious [teachers].
   (cf. This is the difference between an interesting and a tedious [teacher].)
   b. *We relied on a neuro- and on a psycho[linguistic claims of equal value].
    (cf. We relied on neuro- and on psycho[linguistic claims of great value].)
   c. *Do you usually collaborate with an ortho- and a perio[dentists]?
    (cf. Do you usually collaborate with an ortho- and a perio[dentist]?)

The same goes for discontinuous NP RNR in 140. Since this type of RNR can only be derived via backward periphery deletion, we predict that 140 cannot have internal readings. Again, this follows because $\Upsilon()$ is restricted to combining eventuality-denoting expressions.

(140) a. *Between them, Tom spent and Mary donated [a total of $3,000] to charity.
   b. *They helped to evacuate and burn [a total of four villages] to the ground.

4. Conclusion. This work argues that no previous account of RNR can explain the full range of empirical facts because no parsimonious unitary analysis of RNR can be formulated: different subsets of RNR data lead to conflicting analytical interpretations. This impasse can be resolved if what is usually called RNR is seen as the conflation of three (partially overlapping) independent phenomena: (cataphoric) VP/N'-ellipsis, ATB extraposition, and backward periphery deletion. All three phenomena are superficially similar in that they delay the overt realization of a shared string. Any sufficiently robust

32 Additive readings like (i) and (ii) are unproblematic. The conjoined adnominal phrases full-time and part-time undergo deletion of a peripheral morphophonological unit (e.g. full-time and part-time). As predicted, an additive reading is not allowed: *full- and part-times. The conjoined adnominals full-time and part-time adjoin to the same nominal head, however, and therefore they can be cumulated in exactly the same way as in 5 above.

(i) Both [[full- and part-time] employees] will get raises this year.
(ii) We don’t see many [[three-, four-, and five-year-old] children] around here.
account of ellipsis and extraposition can predict various instances of putative RNR phenomena. True RNR boils down to a deletion operation that targets linearized strings and deletes independent morphophonological units under morph form identity. The proposed analysis draws from previous work on deletion (Booij 1985, Swingle 1995, Yatabe 2002, Beavers & Sag 2004, Chaves 2008). Extraposition accounts of RNR are traditionally problematic because extraposition has been assumed to be severely restricted by syntax. However, Grosu (1973), Gazdar (1981), Stucky (1987), and others have noted counterexamples that suggest that the role of syntax in extraposition islands has been overstated, and recent psycholinguistic research supports that conclusion (Staub et al. 2006, Levy et al. 2012, Strunk & Snider 2013, Hofmeister et al. 2015). In this work I complement this evidence with new data that further indicate that extraposition is not a syntactically bound phenomenon.

This article also argues that the typical prosodic correlates of RNR are not grammatical requirements of RNR, since they are not obligatory in various cases. On the contrary, the usual prosody is motivated by functional factors having to do with ambiguity avoidance. This is supported by Kentner et al. 2008, which shows that the longer the remnants, the stronger the contrastive stress. Finally, I have argued that additive RNR is an instance of a much more general conjunction-based phenomenon that allows dependents shared by conjuncts to be semantically combined. This process occurs independently of symmetric predicates and in a wide range of other constructions, including leftward extraction and adjunction.

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