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Adjectival hydras: Restrictive modifiers above DP?*

Jonathan David Bobaljik

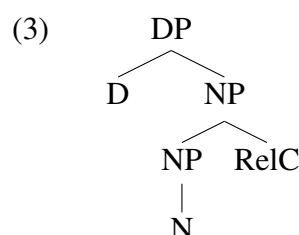
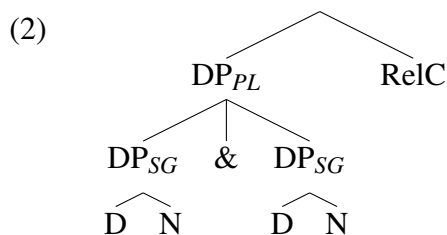
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1. Introduction: Hydras and similar beasts

The example in (1) illustrates what Link (1984) dubbed a “hydra”—the relative clause appears to have two heads:¹

(1) [The Austrian_a and the Canadian_c who_{a+c} married each other] met in Cambridge.

Since it contains the reciprocal predicate *married each other*, the relative clause must restrict a plural nominal.² And since each of the conjoined DPs is singular, the interpretation suggests that the relative clause must be outside the conjoined DPs, as in (2). However, this presents a *prima facie* challenge to the notion that restrictive modifiers must attach to a projection of N below the determiner, as in (3).



*Thanks first to Susi Wurmbrand, who has been instrumental in getting this squib off the ground in more ways than one. I also thank Danny Fox, Patrick Grosz, Zheng Shen (who also provided code for multidorinance trees), and an anonymous reviewer for useful comments and suggestions. For their assistance in constructing and judging examples, I’m grateful to Valentine Hacquard, Gabriel Martínez Vera, Philippe Schlenker, and Julio Villa-Garcia. I acknowledge financial support from the J.S. Guggenheim foundation for my research on agreement.

¹Such examples were first noted for extraposed relatives with split antecedents in Perlmutter & Ross (1970). See also Vergnaud (1974) and Jackendoff (1977) for early discussions.

²Examples such as (1) clearly may involve restrictive relative clauses, as in: *The Austrian and the Canadian who married each other left early, but the other Austrians and Canadians stayed late.*

As has been widely noted, this is not just a matter of a surface configuration that can be undone by reconstruction, for example. The plural-seeking predicate in the relative clause is uninterpretable if reconstructed into each conjunct:

- (4) *the Austrian_a who_{a+c} married each other . . .

While the classic RelC hydras are widely discussed in the literature, hydraesque modification also arises with post-nominal adjectives, at least in Romance.³ In examples like (5), the adjective takes scope over both nouns: its agreement is feminine plural, suggesting that it occurs outside of the conjoined, singular DPs (each of which has its own determiner).

- (5) a. la pianista y la artista austríacas [Sp.]
 the.FSG pianist.SG and the.FSG artist.SG austrian.FPL
 ‘the Austrian pianist and [the Austrian] artist’
- b. la femme et la fille intelligentes [Fr.]
 the.FSG woman.SG and the.FSG girl.SG intelligent.FPL
 ‘the intelligent woman and girl’

As with RC hydras, one can show that these can be restrictive modifiers, taking scope over both conjuncts:

- (6) Solo se invitó a la pianista y a la artista austríacas, no
 only SE invited DOM the.FSG pianist and DOM the.FSG artist austrian.FPL not
 a las otras pianistas y artistas [Sp.]
 DOM the.FPL other.FPL pianist.PL and artist.PL
 ‘Only the Austrian pianist and artist were invited, and not the other pianists and artists.’

Examples like (6) provide a challenge for theories of postnominal adjectives which place those adjectives somewhere below D. This includes theories that involve N-movement above an underlyingly prenominal adjective, as well as those that invoke phrasal remnant movement, as in Cinque (2010).⁴ The morphological form suggests that the adjective is higher than the determiner, modifying the coordination as a whole.

In the following pages, I consider three directions one might head in in capturing adjectival hydras. Facts considered here suggest that adjectival hydras are indeed more similar to RelC hydras than they are to RNR and other constructions with shared material. Yet extending existing accounts of traditional hydras to the adjectival construction is not without

³Jackendoff (1977, 191-2) also presents examples with PP modifiers: *the boy and the girl [with the same birthday]*.

⁴Examples like (5) are noted briefly in Cinque (2010, 88-90), but only with indefinite determiners, which he takes to be lower than D in (3). His account does not seem to generalize to examples with definite determiners, as in the examples here.

its challenges. In this squib, I call attention to some of these, but leave the ultimate analysis still open.

2. Multidominance I: RNR and shared agreement

One approach might try to relate the postnominal adjectives to Right-Node-Raising constructions. In some constructions (and subject to some speaker variability), RNR constructions can show *summative agreement*: shared elements in RNR can be plural, when the agreement controllers in the unshared conjuncts are singular (see Moltmann 1992, Otaki 2010, Grosz 2015, Shen 2017, in progress, among others):

- (7) a. [Sue's proud that *Bill* ___] and [Mary's glad that *John* ___] **have** travelled to Cameroon. (Grosz 2015, 6)
- b. Der Gustav ist stolz, dass die *Tina*, und der Otto ist froh, dass der *Tom*,
the Gustav is proud, that the Tina, and the Otto is happy, that the Tom,
nach Nigeria reisen **werden**.
to Nigeria travel **will.PL**
'Gustav is proud that Tina, and Otto is happy that Tom, will[PL] travel to Nigeria.' (Grosz 2015, 9)
- (8) John's and Mary's students are a couple.⁵ (Shen in progress)

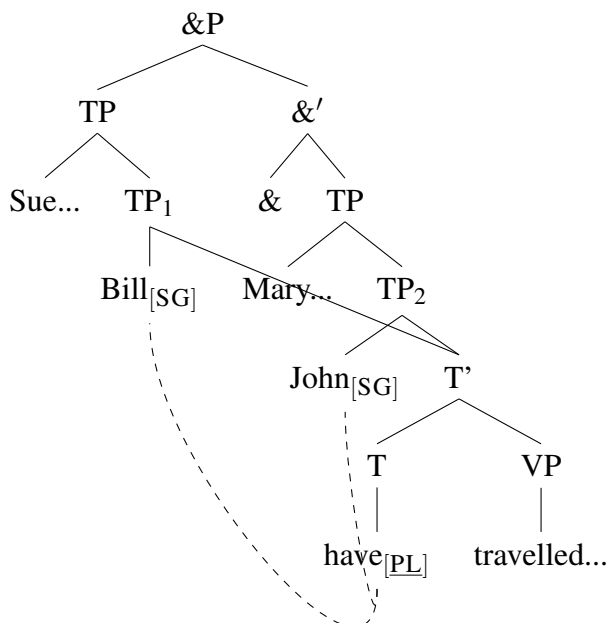
Grosz's account capitalizes on the agreement relations that hold between the agreeing element that is shared and the multiple, singular controllers of agreement.⁶ A simplified version of Grosz's account of (7a) is given in (9):

⁵The predicate 'are a couple' is intended to ensure this refers to one student each of John and Mary.

⁶Shen (2017, in progress) investigates the varied patterns of agreement that arise in NP-internal sharing constructions cross-linguistically, and contrasts these with the clausal examples, including (8), but also the more widespread pattern in (i), where a plural shared noun is excluded:

- (i) This tall and that short student(*s) are a couple.

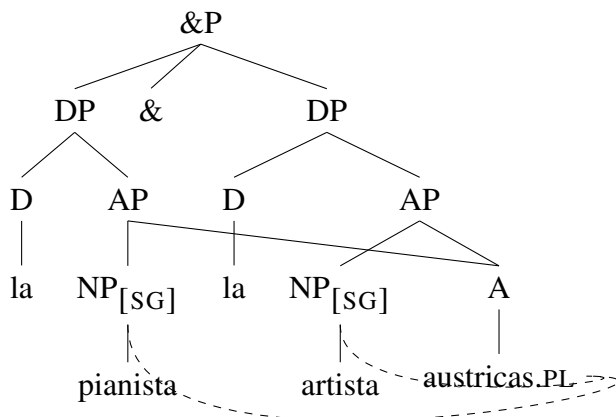
Shen argues that multidominance/shared agreement within NP yields singular agreement, as in (i), where the demonstratives agree in number with the head noun, while in clausal sharing, such as Grosz's RNR constructions, summative agreement (may) obtain. Shen attributes this to the different ways in which number is represented on N and T.

(9) *Grosz (Simplification)*

The key point in this analysis is that the shared auxiliary *have* enters into agreement dependencies (dashed lines) with two singular controllers. In the morphology, this is realized in the same manner as if the controller of agreement were a coordination of two singulars [*Bill and John*], as in (10). Importantly, though, *there is no coordinated NP at any point in the syntactic representation in (9)*.

(10) [*Bill and John*] **have** travelled to Cameroon.

That the postnominal adjectival examples involve agreement might be an initial reason to pursue an agreement-sharing direction, for example, as in (11).

(11) *Sharing*

Nevertheless, Grosz provides an argument that RNR and hydras have distinct behaviour and should not be assimilated to one another. Specifically, Grosz argues that the RNR cases

which he analyzes as multiple agreement apparently fail to admit the kinds of predicate that require a syntactically represented plural subject. He offers (p.31) the following contrast—licensing of *each other* is possible in relative clause hydras' split antecedents (as we have seen, see also (12a)), but (apparently) not in the RNR construction (12b):⁷

- (12) a. I saw the linguist yesterday, and I'll meet the philosopher tomorrow, [_{RC} who hate each other]
 b. *[The dean is sad that this linguist_I], and [the head of the department is disappointed that this philosopher_p] hate each other_{I+p}.

Grosz's observation provides us with a diagnostic we may now apply to the adjectival hydras. Under Grosz's approach, a simple multi-dominance structure with a shared adjective as in (11) should show plurality only in the morphology, but, like Grosz's RNR case, should fail to be licit if the shared material requires a syntactically or semantically plural antecedent. As we have just seen, such configurations distinguish RNR from real hydras. In French and Spanish, as in English, there are complex adjectival expressions, such as *mutually exclusive, dependent on one another* that meet this criterion: they may not occur as a modifier or predicate of a singular noun:

- (13) a. #That assumption is mutually exclusive.
 b. *el teorema mutuamente excluyente [Sp.]
 the.MSG theorem.MSG mutually exclusive
 c. *[Cette propriété mutuellement exclusive] doit être testée. [Fr.]
 this.FSG property.FSG mutually exclusive.FSG should be tested.

Yet these adjectives do participate in the adjectival hydra construction, as in (14):

- (14) a. el teorema y el axioma mutuamente excluyentes [Sp.]
 the theory and the axiom mutually exclusive
 'the mutually exclusive theory and axiom'
 b. el teorema y el axioma dependientes uno del otro [Sp.]
 the theorem and the axiom dependent one of.the other'
 'the theory and axiom dependent on one another.'
 c. (?) Cette propriété et cette caractéristique mutuellement exclusives ... [Fr.]
 this property and this characteristic mutually exclusive
 ... doivent être testées simultanément.
 should be tested simultaneously

⁷I admit to not fully sharing the judgment here, although I agree with the direction of contrast: the collective predicate with RNR seems much less accessible than with hydras, where it is unobjectionable. But see Moltmann (1992) and Otaki (2010) for examples where syntactic plurality does appear to be licensed in RNR.

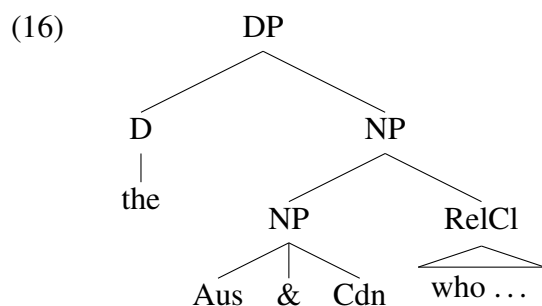
For completeness, (15) shows that these examples can involve clearly restrictive modification:

- (15) Hay muchos teoremas y axiomas en el artículo, pero [[solo el teorema y
have many theorems and axioms in the article but only the theory and
el axioma] mutuamente excluyentes] son problemáticos. [Sp.]
the axiom mutually exclusive are problematic
'There are many theorems and axioms in the article, but only the mutually exclu-
sive theorem and axiom are problematic.'

These examples thus seem to show that the postnominal plural adjectives, modifying conjoined singular DPs, pattern with relative clause hydras in permitting semantically plural-seeking modifiers, and not with RNR-type summative agreement.

3. Extending RelC hydras

An alternative approach would generalize any of various recent approaches to hydras (see, e.g., Zhang 2007, Fox & Johnson 2016), treating the adjectives as reduced relative clauses. Unlike Grosz's RNR cases, and Shen's nominal-internal number mismatches, the approach to hydras and extraposed RCs in Zhang (2007) and Fox & Johnson (2016) does involve a constituent that is a coordination of two nouns (to the exclusion of the determiner), providing a host for modification. That is, their approach to (1) involves a derived constituent with a single, shared determiner, as in (16) (along with a semantics for coordination that yields the correct interpretation, i.e., not a self-marrying dual-citizen):



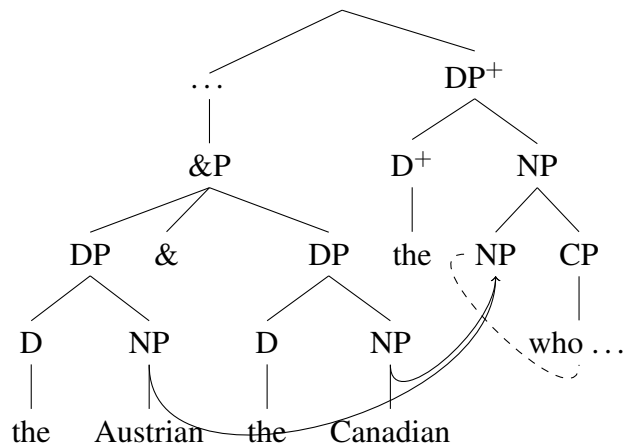
The question is how to derive this constituent, and to account for the apparently 'extra' determiner in the second conjunct. We start by reviewing a rather intricate account of hydras, noting some potential issues, and then turn to a simpler account, which appears to work empirically, but which may undermine other established generalizations in the literature.

3.1 Multidominance II: Covert coordination and ATB QR

Fox & Johnson (2016), adapting a proposal in Zhang (2007), propose an analysis of hydras in which the constituent in (16) is derived via an application of across-the-board QR, building on earlier ideas about QR and about the derivation of extraposed relative clauses.

Their analysis is intricate, and I will not do justice to it here, but a brief summary of the derivation is sketched in (17). First, they assume that the pronounced determiners in each conjunct are uninterpreted. After the conjunction is created, the two NPs (one from each conjunct) undergo across-the-board QR, to the position where their combination merges with the relative clause, and to which the semantically interpreted determiner (D^+) is then added. Although I have not prevented their motivations here, note that QR of the restriction, but without the determiner/quantifier, is an independent component of their approach to QR (see also Johnson 2012). With the assumption that *the* is the kind of determiner that triggers QR (and with a proposed semantics for *and*), they end up with an interpreted (but unpronounced) constituent (DP^+), in which the modifier is beneath the interpreted D, but outside the coordinated NPs, yielding the right semantics.

(17) *ATB movement of N*



Adjectival hydras could be readily assimilated to this structure if the post-nominal adjectives in Romance could be simply reduced relative clauses. If this were the case, as various readers of an earlier draft observed, then those post-nominal adjectives that cannot appear in predicate positions should be excluded from the hydra construction. Zheng Shen and Gabriel Martínez Vera note that this seems incorrect at first blush for Spanish. The plural adjective *previos* ‘former’ enters into the hydra construction in (18a), but a (reduced) relative clause source is implausible, since *previo* cannot occur in predicate position (18b):

- (18) a. El presidente y el vicepresidente previ-o-s son amigos.
the.M.SG president and the.M.SG vice.president former.-M-PL are friends
‘The former president and (former) vice-president are friends.’
b. *El presidente es previo.
the.M.SG president is former.M.SG
‘The president is former.’

By contrast, though, an anonymous reviewer suggests that corresponding examples are degraded in Italian. When the adjective cannot be predicative (and thus cannot be the basis of a reduced relative clause), it cannot participate in the adjectival hydra construction:

- (19) a. l' occhio e l' orecchio sinistri
 the.SG eye and the.SG ear left-M.PL
 'the left eye and ear'
 b. *L' occhio è sinistr-o.
 the.SG eye is left-M.SG
 'The eye is left.'

At this stage of inquiry, then, the facts are unclear, but (18) remains as an apparent challenge to reducing all post-nominal adjectival hydras to reduced relative clauses.

3.2 Empty determiners

A final direction to consider is one that posits a different kind of mismatch between the pronounced structure and the structure in (16) needed for interpretation. Note that even setting aside QR, a component of the Fox & Johnson (2016) analysis just cited was the assumption that the pronounced determiners (including quantifiers) in hydras are not in fact the semantically contentful determiners, but are lower, morphological copies of the determiner. On the model of *determiner doubling* in languages like Swedish (as in (20)), they suggest a structure like (21), where μ is a semantically vacuous copy of the higher determiner.⁸

- (20) den gamla mus-en
 the old mouse-DEF
 'the old mouse'

- (21)
-
- ```

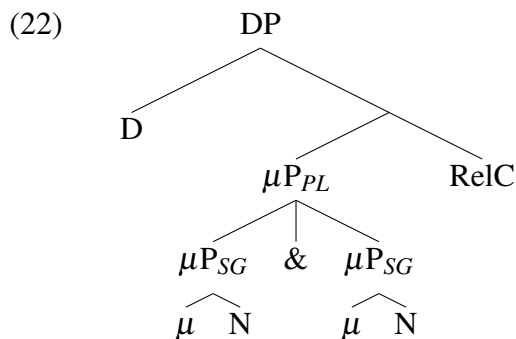
graph TD
 DP --> D
 DP --> muP[μP]
 D --- the[the]
 muP --> mu[μ]
 muP --> NP
 mu --- DEF[DEF]
 NP --- N[N]

```

If the pronounced definite determiners in Romance are instances of  $\mu$ , rather than D, then the structure of adjectival hydras could involve coordination of  $\mu$ P. The plural restrictive modifier can be attached outside the coordination of two singular  $\mu$ s (matching the surface string) but still beneath (unpronounced, but interpreted) D, as required, restricting the complement of the semantically contentful determiner:<sup>9</sup>

<sup>8</sup>Their  $\mu$  is similar to Cinque's *d*, although Cinque proposes that only indefinite determiners are in the lower projection.

<sup>9</sup>A reviewer notes that an analysis of RelC hydras along these lines is suggested in Cecchetto & Donati (2015). Danny Fox raises the question of whether the determiners must be identical in the adjectival hydra construction, as is held to be the case for RelC hydras (Moltmann 1992). This is clearly an important ingredient in choosing among analyses, but I do not have the data to hand to answer this.



A reviewer notes the Romanian example in (23), from Cinque (2004, 134) (attributed to Carmen Dobrovie-Sorin), illustrating that the adjectival hydra construction also occurs with the suffixal definite article in Romanian, which could be seen as spelling out  $\mu$  rather than D:

- (23) [ soț-ul                      și soți-a                      ] precauți nu fac mai mult de un  
 husband-the.M.SG and wife-the.F.SG careful-PL not make more than one  
 copil  
 child

Positing that the position in which determiners are pronounced does not align with their interpreted position resolves (albeit somewhat by brute force) the semantic issue with the structure in (2), without the complexities of QR. However, I suspect that pushing this line will have the eventual cost of being forced to the position that the overtly pronounced determiners are *never* in D, but are always lower exponents.<sup>10</sup> This then raises the question of why hydras can only be formed with post-nominal adjectives, and why pre-nominal adjectives should not be allowed to precede the pronounced determiners which are, by hypothesis in the low  $\mu$  projection: *\*austríacas la pianista y la artista*. To the extent that extraposition, but not fronting, of relative clauses is independently attested, the approach in (17) could provide an independently motivated account of this restriction. Without an account of the pre-/post-nominal asymmetry, the  $\mu$  approach also appears to overgenerate in undesirable ways.

#### 4. Conclusion

In sum, we are left with a puzzle. Postnominal adjectives in Romance belong to the hydra family. Analyses incorporating multidominance open up a rich landscape of analytic possibilities for taming these exotic beasts. Within this landscape, postnominal adjectives appear to pattern with relative clauses, semantically restricting pluralities, and thus not exhibiting the kind of purely morphological plurality shown in RNR constructions. The analytic tools are available to characterize these, while still maintaining that restrictive modifiers of nouns are lower than the (semantically interpreted determiner), although these approaches require

<sup>10</sup>I would hazard a guess that Swedish hydras can be formed where even the higher element in (23) is doubled: *the old mouse and the young cat which chased each other...*

non-trivial departures from the surface order. Neither of the directions considered, however, seems fully satisfactory. While we may attempt to reduce the adjectival hydras to the regular kind, there is still work to be done in coming to grips with their semantics and syntax: for each challenge resolved by extending one of the current approach to hydras, a new one emerges to take its place.

### References

- Cecchetto, Carlo, & Caterina Donati. 2015. *(Re)labeling*. Cambridge, MA: MIT Press.
- Cinque, Guglielmo. 2004. A phrasal movement analysis of the Romanian DP. In *Studia linguistica et philologica in honorem D. Irimia*, ed. A. Minuț & E. Munteanu, 129–142. Iași: Editura Universității “A. I. Cuza”.
- Cinque, Guglielmo. 2010. *The syntax of adjectives*. Cambridge, MA: MIT Press.
- Fox, Danny, & Kyle Johnson. 2016. QR is restrictor sharing. In *Proceedings of the 33rd West Coast Conference on Formal Linguistics*, ed. Kyeong min Kim, Pocholo Umbal, Trevor Block, Queenie Chan, Tanie Cheng, Kelli Finney, Mara Katz, Sophie Nickel-Thompson, & Lisa Shorten, 1–16. Somerville: Cascadilla Proceedings Project.
- Grosz, Patrick. 2015. Movement and agreement in right-node-raising constructions. *Syntax* 1–38.
- Jackendoff, Ray. 1977.  *$\bar{X}$  syntax: A study of phrase structure*. Cambridge, MA: MIT Press.
- Johnson, Kyle. 2012. Toward deriving differences in how *Wh* movement and QR are pronounced. *Lingua* 122:529–553.
- Link, Godehard. 1984. Hydras: on the logic of relative constructions with multiple heads. In *Varieties of formal semantics*, ed. Fred Landman & Frank Veltman, 245–257. Dordrecht: Foris.
- Moltmann, Friederike. 1992. Coordination and comparatives. Doctoral dissertation, MIT, Cambridge, MA.
- Otaki, Koichi. 2010. Right node raising and plurality. Ms. University of Connecticut.
- Perlmutter, David M., & John R. Ross. 1970. Relative clauses with split antecedents. *Linguistic Inquiry* 1:350.
- Shen, Zheng. 2017. On multi-valued Ns and Ts in number concord and agreement. In *Proceedings of CLS 52*.
- Shen, Zheng. in progress. Feature arithmetics in the nominal domain. Doctoral dissertation, University of Connecticut, Storrs, CT.
- Vergnaud, Jean-Roger. 1974. French relative clauses. Doctoral dissertation, MIT, Cambridge, MA.
- Zhang, Niina Ning. 2007. The syntactic derivations of split antecedent relative clause constructions. *Taiwan Journal of Linguistics* 5:19–48.

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