Movement of Degree/Degree of Movement
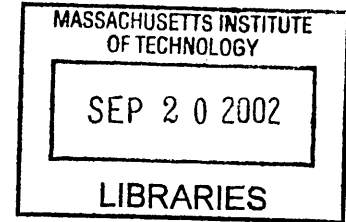
by

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ABSTRACT

In this project we examine the DP-internal behavior of degree operators contained in attributive extended APs, specifically degree fronting (*so sunny a day*) and degree right extraposition (*a day sunny enough*). We argue that both processes have to do with the scope of the degree operator, namely, that degree fronting is a diagnostic of clausal scope of the degree operator, while right extraposition is overt QR to the DP-internal landing site where a quantifier can be interpreted.

We first show that pre-determiner APs in Germanic languages (*so sunny a day*) are moved to [Spec, NumP] only if they contain a degree operator, i.e. an element that cannot be interpreted in situ. We will then show that the appearance of the adjectival projection in that position is due to pied-piping, and that different degree operators behave differently with respect to how much material is moved overtly (pied-piping).

We then turn to right extraposition. We will show that it can be differentiated from other cases traditionally denoted by the same term (e.g. *a professor proud of her children*). On the other hand, it has certain properties permitting to assimilate it to DP-extraposition to the right periphery of the vP (Heavy NP Shift) – it has new information status and permits stranding of the argument of the degree operator (*a more interesting problem than this*). These and similar factors suggest that right extraposition of degree-containing extended APs is overt QR of the degree operator accompanied by more or less pied-piping.

The overall picture seems to be that QR an overt movement processes examined for clausal projections exist in nominal projections as well and have similar properties.

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Unlike gestation, dissertation can take varying amounts of time. However, a similarity between the two processes is that it is the preceding stage that we tend to enjoy for as long as it remains humanely possible. In my case, most of the time I spent on my thesis was dedicated to what eventually became its appendices. I can only hope that my thesis is not born prematurely. It certainly had a lot of midwives, whom I'm listing below in a more or less random order.

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Finally, interaction with my most beloved professor has been to me a source of great joy and intellectual stimulation, both in life and linguistics. It is in small tribute to his enormous influence that I dedicate this work to Morris Halle.

CHAPTER 1

INTRODUCTION

In this project we will be mostly concerned with two cases in English and some other Germanic languages where an attributive adjective (and an item it semantically combines with) appear in a position different from its usual pre-nominal one:

(1) a.   **way too interesting** an issue (to investigate)   degree fronting

       b.   a case **unusual enough** (to investigate)   right extraposition

In order to avoid the question of the internal structure of the constituents that appear to the left of the article in (1a) and on the right periphery in (1b), we will assume that (a) both are DP-internal (which is elementary to show, given that such DPs can appear in any argument position and that adjectives cannot be separated from them) and (b) both are extended AP projections, where *extended AP projection* means a constituent whose lexical head is an adjective. We will assume that an extended AP definitely contains at least the basic AP, it is less clear whether the external argument introducer aP is always projected. Depending on how non-degree adverbs are merged, other functional projections may be contained in the extended AP (henceforth, *xAP*. We will adopt a convention whereby extended projections will be referred to as xAP (extended AP), xNP (extended NP, which is usually DP but sometimes NumP), xPP, etc.).

We will argue that it is the presence of a degree operator (*too* in (1a), *enough* in (1b)) that triggers the dislocation of the xAP. The thrust of the argument centers around the proposal that degree operators must raise for interpretability, and the landing sites in (1) reflect this. We will argue that degree fronting in (1a) corresponds to QR of the degree operator to a clausal level, with the first step of the successive-cyclic movement (movement to the escape hatch on the left DP-periphery) being overt, while right extraposition in (1b) is overt QR to a DP-internal landing site.

1.1.   The framework

Our assumptions concerning the internal structure of xAP, xNP, etc., and the semantics of various basic pieces will be spelled out in Chapter 2. We will be constructing our analysis in the Minimalist framework (Chomsky 1995-2001), i.e. assuming a single-component grammar where merge and move operations are interspersed, and can be interrupted by the operation of Spell-Out, transferring a chunk of the structure built to the interfaces.

We will be assuming the Copy Theory of Movement, where each trace is a full copy of the moved element, though only one link of a chain is spelled out at PF and LF (not necessarily the same link). This means that a degree operator moving through a series of positions (e.g. raising to the xNP-periphery first, then to some $\langle t \rangle$-type node in the clause) can be pronounced in one position (the fronted one or the base-generation one) and interpreted in the other position (at the highest scope one).

A piece of theoretical machinery that will ultimately become important is *late* or *counter-cyclic merge*, originally proposed by Lebeaux (1988) for wh-movement and other Ā-movement, and extended by Chomsky (1995). Counter-cyclic merge means that an argument of a scope-bearing lexical item may be merged not at the base-generation site of the item, but at its QR position (Fox & Nissenbaum 1999, Bhatt & Pancheva 2002). Counter-cyclic merge comes into play in cases where an XP that is semantically combined with a phrase YP or a head Y^0 surfaces discontinuously from it, in a position c-commanding YP/Y^0. For example, a degree clause may surface separately from the degree operators it combines with, as in (2a), and a relative clause may appear sentence-finally while its head remains in its base-position, as in (2b).

(2)   a.   a **more** difficult problem **than you might have thought**

        b.   We found **a stray cat** yesterday **that seems to have been abandoned**.

Analyzing such cases as counter-cyclic merge rather than extraposition explains why the surface position of the discontinuously merged argument (the *than*-clause in (2a) and the relative clause in (2b)) marks the lowest scope that the scope-bearing element (the degree operator and the indefinite xNP, respectively) might have.

The picture of the grammar that arises from our analysis is that QR is probably not feature-triggered, since its occurrence is dependent on the semantic properties of the moved item (and we will show that some degree operators require phrasal scope, while others can be interpreted DP-internally). We would assume that QR occurs freely and other factors (phonology, the mysterious EPP feature, focus) may influence in which position the QRed operator is spelled-out.

1.2.   Thesis plan

In Chapter 2 we will present the set of fairly conservative assumptions that we will be relying on concerning the argument structure of an xAP and its external syntax within an xNP, for which we will also be assuming a standard D^0-Num^0-NP structure. We will then do the same for the

semantic side of our project. We will present the semantics of degree operators under the assumption that scalar adjectives are monotone. We will present the argument structure that we will be presupposing and show that as a result, the internal syntax of a dependent clause (such as a *than*-clause for a comparative) can have an effect on its scope. We will conclude this chapter by presenting the main puzzle that we will be concerned with: the construction in (3), which we will refer to as *degree fronting*:

(3)   a.   **such** a fascinating construction (that you'll love it)

        b.   **as bizarre** an order (as you could wish for)

In Chapter 3 we will defend the view that the essence of life is movement. To put the same thought less flamboyantly, we will present two possible analyses of the degree fronting construction: the movement analysis that we will be arguing for and a base-generation analysis (proposed by Delsing 1993, among others). We will first present the major generalizations about degree fronting, i.e. the class of xAPs that front (those containing degree operators as opposed to the rest). We will then discuss how the two possible analyses, movement vs. base-generation, deal with the syntactic properties of cases like (3) and their interpretation. We will show that the analyses of (3a) and (3b) are essentially the same, and assimilate (3) to cases where the xAP has not moved. We will show that this unification is only possible in a movement analysis.

In Chapter 4 we will discuss what determines whether a degree operator moves at PF. Under the analysis we propose, at least some operator movement is obligatory at LF, because a degree operator is not interpretable in situ, but the actual Spell-Out site of the degree operator is not without consequences. Importantly, overt fronting of an operator entails clausal scope, but the reverse is not true: a degree operator can have wide scope but still be pronounced in its base position. In this respect, degree operators behave just like regular quantifiers in being able to QR at LF.

We will then show that some degree operators must be fronted, while others have a default position (either in situ or DP-peripherally), but can be made to appear in the non-default one. In the same chapter we will show that degree fronting is constrained to occur in non-specific (i.e. [-referential]) indefinites only, and that when the xAP appears next to the operator, as in (3b), the article has to be overt.

In Chapter 5 we will present evidence for a scope position inside the DP. We will suggest that the reason why non-indefinite xNPs disallow degree fronting is because the degree operator cannot escape from a non-indefinite xNP to the clausal level. We will present evidence for a DP-internal scope position, and show that the unavailability of clausal scope for a degree operator

trapped in an xNP other than a non-specific indefinite can be shown independently of degree fronting. The reason is that the scope of degree operators is constrained by their interaction with other quantifiers (cf. Beck 2000, Kennedy 1997). Also in this chapter we will examine the interaction of the scope of a degree operator with its surface position. Our conclusion here is that the PF position of a given degree operator cannot be easily explained by its semantics or its phonological shape.

In Chapter 6 we will examine the previously unnoticed phenomenon that we call *degree right extraposition*. We will show that right-extraposed xAPs containing degree operators, such as (4a), have different syntactic properties from the usual right-branching xAPs forced to the right periphery by the impossibility of a right-branching pre-nominal modifier in (4b):

(4)   a.   a concept **even more fascinating**/structures **this complicated**

       b.   a professor **proud of her children**/talent **surpassing anything**

We will base our argument on the fact that factors apparently licensing the appearance of degree-containing xAPs on the right periphery do not permit other kinds of xAPs to appear there. We will argue that degree right extraposition is the QR of an xAP-internal degree operator to its lowest landing site inside the DP. We will motivate this by showing that non-scope-bearing modifiers cannot right extrapose, while such scope-bearing adjectives as *different* (Beck 2000) can. This assumption will permit us to explain why degree operators and other scope-bearing adjectives can be separated from their argument (*a taller man than my father*). To conclude this chapter, we will examine the similarities between degree right extraposition and another type of movement to the right periphery, also argued to be overt QR: Heavy NP Shift. Just as with right extraposition, an element semantically combined with an NP (its modifier) can appear separated from it, as in (2b) (Fox & Nissenbaum 2001, Nissenbaum 2000). We will show that assuming certain basic similarities between the two makes an interesting and correct theoretical prediction in what concerns an AP-internal landing site for degree QR.

The final chapter will conclude by recapitulating the major empirical and theoretical results of this project, and the appendices will present reasons why we chose the theoretical assumptions made in Chapter 2 over others available.

CHAPTER 2

THEORETICAL ASSUMPTIONS

In this section we will detail the set of axioms that we will be assuming for this project. The vast majority of them are uncontroversial and have to do with the internal structure of the extended NP and AP (xNP and xAP, respectively). We will also describe the semantic model that we will be using, in essence built upon Heim & Kratzer (1994), and Heim (1985, 2000 & 2001).

We will first describe our assumptions about the internal and external syntax of the xAP, i.e. the order in which its arguments are projected and how this ordering influences how the xAP is combined with the NP in its attributive (modifying) function.

We will then present the argument structures for degree operators: a degree operator is a relation between a degree variable and a predicate over degrees. As a result, the semantics of degree operators is such that they cannot be interpreted in situ. We will show that the scope of a degree operator (e.g. an equative *as*) can depend on the internal syntax of its dependent degree clause (as *as*-clause).

Finally, we will present the puzzle that this project is trying to unravel: the construction in which the xAP appears above the indefinite article (*so small a matter*) instead of its usual NP-adjoined position.

2.1.   Genesis of the xAP

This subsection is concerned with the syntax of the attributive xAP, both external (how the xAP is combined with the NP it modifies) and internal (its argument structure). Argument ordering will be determined from the interaction between the two rules of semantic interpretation that we are assuming: Functional Application and Predicate Modification.

2.1.1.   Attributive xAPs

We will assume that xAPs are merged as sisters to the NP in the following way:

(5)

```
              NP
        ┌──────┴────────┐
       xAP             NP
        △         ┌─────┴──────┐
      large      xAP          NP
                  △      ┌──────┴────────┐
                 red    xAP             NP
                         △               │
                      Chinese            N'
                                         │
                                         N⁰
                                         │
                                      dragons
```
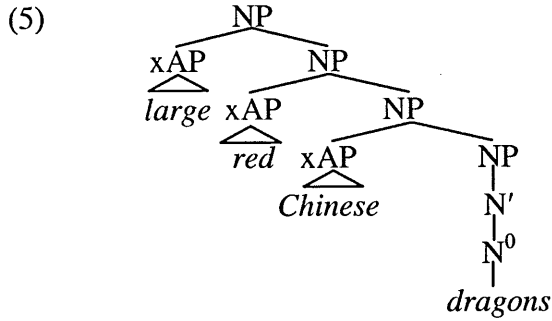
Unlike most researchers that assume this tree geometry, we do not assume that an xAP and an NP are merged by the special kind of merge (called *pair-merge* by Chomsky 2001) resulting in a special adjunction structure. For our purposes, there is only one kind of merge and xAPs are merged where they would be interpretable, i.e. as long as the NP has a compatible semantic type (see appendix 1 for the discussion).

There exist two alternative theories of adjectival modification. One, due to Berman (1973) and Abney (1987), proposes that pre-nominal adjectives are heads; the other, by Cinque (1994), proposes that xAPs are merged as specifiers of functional heads in the xNP. The two analyses are represented in (6a) and (6b), respectively:

(6)   a.   AP   Abney's and Berman's approach
```
         ┌────────┴────────┐
        Spec              A'
         △    ┌────────────┴──────┐
   naturally A⁰                   AP
             │                    │
            ugly                  A'
                          ┌───────┴──────┐
                         A⁰             NP
                          │              △
                      dangerous       dragons
```

b.   FP   Cinque's approach
```
     ┌──────┴────────┐
    xAP             F₂'
     △       ┌───────┴──────┐
naturally ugly F₂⁰          F₁P
                     ┌───────┴──────┐
                    xAP            F₁'
                     △       ┌──────┴──────┐
                 dangerous  F₁⁰           NP
                                           △
                                        dragons
```
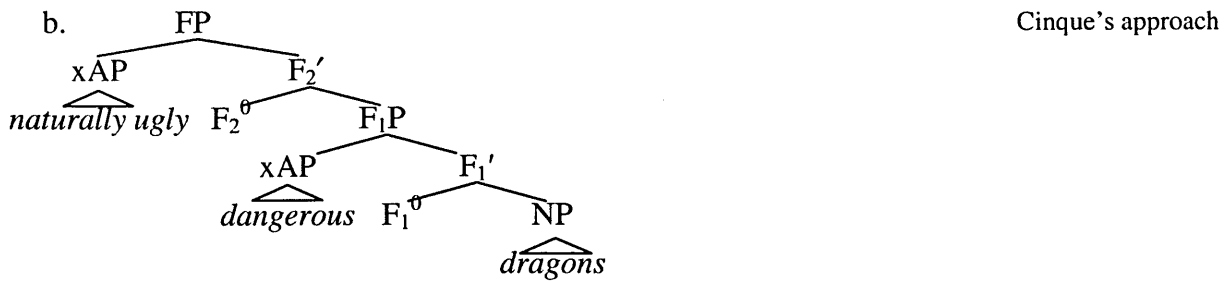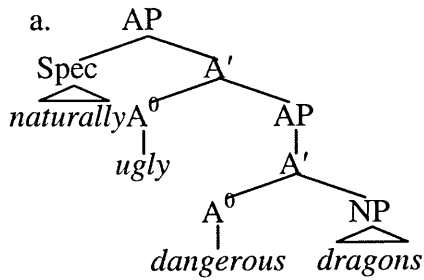
Arguments against (6a) can be found in Appendix 2, and (6b) is analyzed in Appendix 3.

2.1.2. Asyndetic coordination

Before we continue, we should add that all three analyses appear to not be able to deal with (7), due to David Pesetsky, p.c. Under the constituent structure we are assuming, the meaning in (7b) should not have been available:

(7)   a less/very cold rainy day
  a.   a rainy day which is less/very cold
  b.   a day which is less/very cold and less/very rainy

The degree operator in (7) can be interpreted as having scope over both adjectives. How is this possible, if xAPs are merged independently of each and never form a constituent? Moreover, under our assumptions, the degree variables of *cold* and *rainy* must be saturated before the two xAPs are merged with the NP, so *less* has to be part of one of them only (as in (7a)). However, as David Pesetsky, p.c., notes, the two xAPs have to be evaluated either as both being positive or as both being negative, which suggests a common evaluation scale.

We propose that the interpretation in (7b) is that associated with asyndetic coordination, i.e. coordination without an overt conjunction. In other words, (7b) is identical to (8):

(8)   a less cold and rainy day

A degree operator combines with the two adjectives in (7b) in the same way it does in other coordination structures. That our proposal is on the right track can be seen from the fact that the phenomenon is not restricted to degree modification. Other types of modification can also spread over two xAPs, as long as the modifier is evaluative:

(9)   a.   a disgustingly cold rainy day
  b.   a (*structurally) contrived dangerous building

In other words, asyndetic coordination is not conditioned by degree quantification and must be evaluative. If *cold* in (7b) is viewed as positive and *rainy* as negative, the evaluation becomes internally inconsistent:

(10)   such a cold rainy day
  a.   = a rainy day that is so cold
  b.   = a day that is so [positively/negatively evaluated] cold and rainy
  c.   ≠ a day that is so [positively evaluated] cold and [negatively evaluated] rainy

If one of the two modifiers is evaluated as positive and the other as negative (e.g. a day that is pleasantly cold but unpleasantly rainy), asyndetic coordination is impossible.

Evaluation necessarily implies scalarity. We do not know why asyndetic coordination must be evaluative, but this assumption allows us to explain both what happens in (7b) and (10b), and the pragmatic constraints on it.

2.1.3. Argument structure

The absolute minimum on the number of arguments that an adjective can have would seem to be the same as that for verbs – one. Unlike verbs, for which it was argued (Hale & Keyser 1993, 1998) that they must have an internal argument, it does not seem to be necessary for an adjective to have an internal argument. Just like verbs, adjectives can have weather and non-thematic subjects:

(11) a.   It's rainy today.

     b.   It is likely that another terrorist attack will happen in the US.

Inner arguments of adjectives, just like inner arguments of verbs, can be propositional or not. Unlike verbs, adjectives do not assign Accusative case, so all non-propositional arguments are introduced by prepositions:

(12) a.   proud of her children

     b.   sure that the analysis will work

     c.   same as before

     d.   likely to win

An adjective combines with its argument by the standard rule of Functional Application:

I.   **Functional Application** (Heim & Kratzer 1994)   For $\alpha \in D_\sigma$, $\beta \in D_{\langle \sigma, \tau \rangle}$ and γ s.t. γ immediately dominates both α and β $[\![\gamma]\!] = [\![\beta]\!]([\![\alpha]\!])$

Functional Application (I) says that when the meaning of one sister (β) is a function with an empty argument slot of the type σ and the meaning of the other sister (α) is of this type σ, the meaning of the mother is the result of applying the meaning of β to the meaning of α.

If we take an adjective such as *left*, which takes a locative argument of the semantic type $\langle e \rangle$, and combine it with a PP like *of the intersection* (assuming, for the sake of simplicity that *of* is semantically vacuous), the result will be interpreted by the rule of Functional Application:

(13)

$$AP_{\langle e, t \rangle}$$

$$A^0_{\langle e, \langle e, t \rangle \rangle} \qquad PP_{\langle e \rangle}$$

left   *of the intersection*

$= \lambda y \in D_e$. y is located to the left of the intersection

[left] $= \lambda x \in D_e$. $\lambda y \in D_e$. y is located to the left of x

The adjective *left* takes two arguments, the first one being a location. When we combine it with the appropriate location, one argument slot is saturated and the result is an AP of the type $\langle e, t \rangle$. This AP has an empty variable slot, which will be saturated by the subject.

Apart from arguments denoting individuals in the world (semantic type $\langle e \rangle$) or propositions (type $\langle t \rangle$),[1] adjectives can also take arguments of the type $\langle d \rangle$ (degree). Consider examples like (14):

(14) a.   The Solar system is very large.

      b.   Thumbelina is 1″ tall.

Both examples involve adjectives that are somewhat vague. The size of 1000 astronomical units (1 AU = the distance between the Sun and the Earth) is very large if we are talking about our everyday experiences, but in terms of the Milky Way it's nothing. The standard assumption is that adjectives such as *tall* and *large* contain an additional variable slot usually saturated by an implicit contextual argument (see Bierwisch 1989 for the argumentation). In other words, there is an implicit argument in (14a), and (14b) shows that this implicit argument can be saturated by an overt measure phrase. An adjective is defined as *scalar* if it has an argument of type $\langle d \rangle$.

We will now show that the degree argument of an adjective is merged before the subject but after the object. In other words, the semantic type of a scalar transitive adjective such as *proud* is $\langle e, \langle d, \langle e, t \rangle \rangle \rangle$:

(15)   [proud] $= \lambda x \in D_e$. $\lambda d \in D_d$. $\lambda y \in D_e$. y is d-proud of x

---

[1]   We simplify the picture considerably here by assuming non-intensional semantics, since the only types relevant for our purposes are e, d, and t. In reality, adjectives such as *likely* take functions from worlds to truth-values (semantic type $\langle s, t \rangle$), and so our analysis would have to be reformulated to take this into account. The same is true regarding intervals, which also can be involved in the semantics of adjectives such as *former*. We will ignore these subtleties here.

The reason why we assume this argument ordering has to do with the other interpretational rule we will be using: Predicate Modification:

> **II.   Predicate modification** (Heim & Kratzer 1994)
>
> For $\alpha \in D_{\langle e, \sigma \rangle}$, $\beta \in D_{\langle e, \sigma \rangle}$ and γ s.t. γ immediately dominates both α and β
>
> $[\![\gamma]\!] = \lambda x \, . \, [\![\alpha]\!](x)$ and $[\![\beta]\!](x)$

Predicate Modification (II) deals with situations where two sisters have the same semantic type. In this case the mother node is interpreted as a conjunction of its two daughters. Consider a case like (16), where the adjective and the noun have the same semantic type:

(16)   NP $_{\langle e, t \rangle}$ $= \lambda x \in D_e \, . \, x$ is a movie and x is Italian

    AP $_{\langle e, t \rangle}$ NP $_{\langle e, t \rangle}$

   Italian   *movie*

(16) is very simple – what happens when we take an adjective such as *large*, which takes a degree argument, in addition to the subject? We will argue that the degree argument of adjectives that have an external argument (subject) is syntactically internal (i.e. most scalar adjectives have the type $\langle d, \langle e, t \rangle \rangle$):

(17)   a. $[\![tall]\!] = \lambda d \in D_d \, . \, \lambda x \in D_e \, . \, x$ is tall to the degree d

      b. $[\![sick]\!] = \lambda d \in D_d \, . \, \lambda x \in D_e \, . \, x$ is sick to the degree d

The reason why the degree argument of a scalar adjective is saturated before the subject is because of how Predicate Modification (II) works – it can only interpret nodes whose daughters have the same semantic type. If adjectives had the semantic type $\langle e, \langle d, t \rangle \rangle$, they wouldn't be able to combine with an element of the type $\langle e, t \rangle$. On the other hand, suppose scalar adjectives have the semantic type $\langle d, \langle e, t \rangle \rangle$. In a modificational structure, the adjective first merged with its degree argument and becomes $\langle e, t \rangle$. Now the modifier and the noun have the same type $\langle e, t \rangle$ and can be easily combined by Predicate Modification (see Appendix 4 for the discussion of why an alternative to Predicate Modification which could have handled a modifier of the semantic type $\langle e, \langle d, t \rangle \rangle$ cannot work).

What about adjectives such as *proud*, which take an inner argument in addition to a degree argument and the subject? We know that the degree argument is merged below the subject and so is the inner argument. What is the relation between the degree argument and the inner argument in (18)?

(18) proud of her children

Since inner ⟨e⟩-type arguments of adjectives will not concern us here, we will assume that (15) correctly represents the argument ordering.

There exists a class of the so-called non-intersective adjectives, such as *alleged* or *former*, which combine with the NP by the rule of Functional Application (I). Since such adjectives are not as a rule scalar, they need not concern us here. Some discussion can be found in Appendix 1, but the adjectives that will concern us the most are intersective, i.e. interpreted by the rule of Predicate Modification (II). What is important for our purposes is the fact that when an xAP is combined with the NP it has the semantic type ⟨e, t⟩

2.1.4.   Summary

We will assume that attributive adjectives are merged as sisters to the NP node and combine with it by the semantic rule of Predicate Modification (II). We will assume that the inner ⟨e⟩-argument of the adjective merges before the degree argument (semantic type ⟨d⟩), which in turn precedes the external argument.

(19) a.

b.
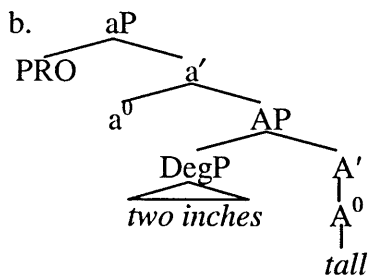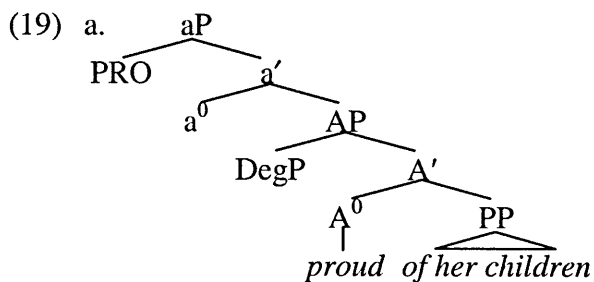
In attributive xAPs, the internal subject position (if projected at all) can only be filled by PRO.[2] If it were filled by a argument of the semantic type ⟨e⟩, the result would have had the

---

[2]   PRO here is a semantically vacuous element, which does not saturate the subject position of the adjective. However, it can move, leaving behind a trace of the type ⟨e⟩. This property of PRO will become useful in Chapter 5.

semantic type $\langle t \rangle$ and the xAP would not have been able to combine with the noun (semantic type $\langle e, t \rangle$) by the rule of Predicate Modification.[3]

On the other hand, if the degree variable slot of a scalar adjective is not filled by an overt or covert degree argument in [Spec, AP], the xAP would have the semantic type $\langle d, \langle e, t \rangle \rangle$ and would not be able to combine with the noun (semantic type $\langle e, t \rangle$) by the rule of Predicate Modification. For this and other reasons we will make the fairly standard assumption that even when we do not see an overt measure phrase such as *2 inches* in [Spec, AP], it is still filled by a free variable POS, which behaves like an unbound pronoun and receives its value by free variable assignment. The same analysis applies to scalar nouns:

(20) a.   Frank Sandow is POS-tall.   free degree variable assignment

           g: POS = 5'10"

    b.   He is an POS-idiot

           g: POS = 3 on the idiocy scale

(21)   She $_i$ was a beautiful woman.   free $\langle e \rangle$-type variable assignment

           g: she $_i$ = Lady Karle

What is crucial for our purposes is that the degree variable of the adjective is filled before the xAP merges with the noun. This factor will be crucial in our subsequent examination of the semantics of degree operators and how it interacts with adjectival syntax.

2.2.   NumP

We will assume throughout that adjectives are phrasal and that the only functional heads present in the xNP are Num^0 (which can be spelled out as the indefinite article *a* or be null) and the higher D^0 (which hosts the definite article *the*, quantifiers such as *every* and numerals such as *two*).[4]

What is important for our purposes, however, is the differentiation between NumP and DP. Evidence that these two projections are different comes from the identifier *such*:

(22) a.   every such person

---

[3]   So is the subject position in [Spec, aP] ever filled by an overt subject? Such an analysis would not be impossible for a small clause structure (cf. Stowell 1981, 1983).

[4]   The fact that quantifiers and numerals can co-occur (cf. *every two steps*), although suggesting more DP-internal functional projections, is irrelevant for our purposes and will be disregarded.

> b.   such a person

The identifier *such* appears below the quantifier in (22a) and above the article in (22b). Another piece of evidence in the same direction comes from the fact that the quantifier *no* can sometimes co-occur with the indefinite article:

(23) a.   There can be **no** more charming **a** bouquet than lilies of the valley gripped in a 4-year-old's fist.[5]

       b.   There is **no** more charming **a** scene of married love in all Shakespeare than this little vignette on a street in Padua...[6]

Furthermore, the idea that all DPs contain a number projection is motivated semantically. Additional syntactic evidence for the existence of NumP as independent projection below the DP can be found in Ritter (1991).

We will assume for now that the fronted constituent in degree fronting constructions moves to [Spec, NumP]. Evidence for such an analysis, showing that degree fronting is constrained by the overtness of Num^0, will be presented in section 4.3.

2.3.   Semantics of degree operators

In this section we will examine the semantics of the degree operator in predicative adjectives. We will show that degree operators are quantifiers over degrees and thus, like other quantifiers, cannot be interpreted in their base positions.

2.3.1.   Monotonicity

Before we can turn to the semantics of degree operators, we need to consider what happens when the degree argument slot is saturated by an overt measure phrase such as 2″. What exactly does *2″tall* mean? To see that the issue is less banal than it seems consider examples like (24):

(24) The bartender: You can't drink here unless you're 21 years old.

        The customer: But I am 21 years old. In fact, I'm thirty.

The dialogue in (24) shows that scalar predicates are monotone: if a scalar predicate holds to a degree (i + j) it also holds to any lower degree *i*:

---

[5]   *http://www.vvdailypress.com/home/beauty/.*

[6]   *http://www.nytimes.com/books/first/b/bloom-shakespeare.html.*

III.   Monotonicity (Heim 2000):

A function f of type $\langle d, \langle e, t \rangle \rangle$ is *monotone* iff $\forall x \; \forall d \; \forall d' \; [f(d)(x) = 1 \; \& \; d' < d \rightarrow f(d')(x) = 1)$

An additional argument in the same direction comes from Seuren (1984). Consider a negative sentence like (25) below, his (27):

(25)   Jim is not that tall.

Suppose *that* means 5′ in the context of the utterance. Then (25) cannot mean that Jim is either shorter than 5′ or taller than 5′ (but not exactly 5′). What (25) means is that Jim's height is lower than *that* (= 5′). In other words, it negates that Jim's height is equal to or exceeds 5′. Thus the positive form of the same sentence only specifies the lower limit on Jim's height (5′) – he could be taller, and the negative sentence in (25) denies Jim any height exceeding *that* (= 5′).

So if a person is tall to a degree *d′*, they are also tall to any lower degree (i.e. if Thumbelina is 1″ tall, she is also ¾″ tall, ½″ tall, ¼″ tall, etc.). This fact needs to be reflected in the semantics of degree operators.

2.3.2.   Argument structure

The comparative morpheme *-er* (or its standalone variant *more*) regularly occurs with three other items, exemplified in (26): the scalar predicate whose degree variable it binds, a degree clause or degree phrase introduced by *than*, and a differential (26a) or a multiple.[7] The equative morpheme *as* also appears with a predicate, a degree clause/phrase introduced by *as* and a multiple. In the schema below, the comparative and the equative are designated by the cover term *operator*:

---

[7]   The syntax and semantics of multiples (a.k.a. factor phrases) and differentials is a fascinating topic, which I cannot delve into here. Both, although interacting with the meaning of the comparative and equative operators, will be ignored throughout. See Hellan (1981) and von Stechow (1984) for the discussion.

(26) **Definitions:**
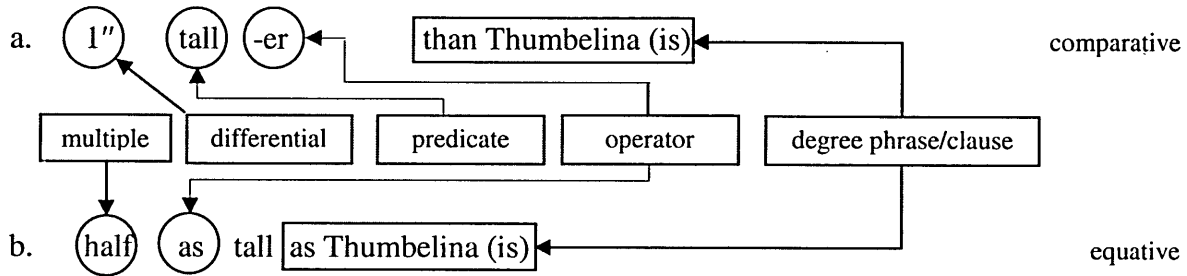
Degree operators are not a very well-defined class, though we will provide something of a list in section 3.1.1. Most of the conclusions drawn about their semantics and syntax are based on the syntax and semantics of equatives and comparatives. Taking *more* as an example, we see that it denotes a relation between two degrees:

(27)   a.   Mt. Everest is taller than this.

         b.   The maximal degree d such that Mt. Everest is tall to d is higher than this.

The semantics of *more* as proposed by Heim (1985) defines the relation between the degree expressed by the degree clause (*than*-clause) and the maximal degree at which a predicate over degrees is true:[8]

(28)   a. $[\![more]\!] = \lambda d \in D_e . \lambda f \in D_{\langle d, t \rangle} . max\ (f) > d$

             where max $(P) = \iota d \in D_d . P(d) = 1$ and $\forall d' \in D_d [P(d') = 1 \rightarrow d' \leq d]$

The first argument of *more* in (28) is a degree, expressed by a degree clause. The second one is a (necessarily monotone) predicate over degrees (semantic type $\langle d, t \rangle$), whose maximum *more* compares to the degree denoted by the degree clause. The equative *as* and d the *less*-comparative are defined in the same way:

(29)   a. $[\![less]\!] = \lambda d \in D_e . \lambda f \in D_{\langle d, t \rangle} . max\ (f) < d$

         b. $[\![as]\!] = \lambda d \in D_e . \lambda f \in D_{\langle d, t \rangle} . max\ (f) \geq d$

We will assume that this analysis extends to other degree operators, i.e. that other degree operators also relate a degree and a predicate over degrees. This means that all degree operators have the same semantic type $\langle \langle d, \langle d, t \rangle, t \rangle \rangle$.

---

[8]   We will leave aside the differential argument of the comparative quantifier (von Stechow 1984):

      (i)   2″/a lot/a fair amount taller

2.3.3. Dependent clauses

If all degree operators relate a degree to a predicate over degrees, then one of the arguments of a degree operator is a degree. We will assume, along with Heim (1985) and subsequent analyses, that this degree is the first (inner) argument of a degree operator. In some cases, it is expressed or constrained by a dependent clause, as in (30a), or by some other sort of a dependent, as in (30b), but there are also cases like (30c), where it is merely inferred from the context:

(30) a.   Mt. Everest is **so** tall **that you cannot see the top**.   ·
      b.   This is way **too** cool **for me**.
      c.   **How** fascinating!

As before, degree clauses provide the most insight into the nature of degree dependents. Starting with Chomsky (1965), degree clauses have been analyzed as involving movement of a degree operator to the left periphery. The operator is either null (the analysis we will assume) or spelled out as *than*. The end result is a definite description of a degree, such as (31). To make the example more readable, we have placed the maximality operator below *than*:

(31) ...than max $\{d \in D_d$. Thumbelina is d-tall$\}$

Irrespectively of whether *than* is the maximality operator or merely shows agreement with the maximality operator in the degree clause, its presence/phonological form clearly indicates the presence of the maximality operator on the left periphery of the degree clause. In other words, in degree clauses the maximality operator is always on the left periphery, which is also necessary to obtain the right semantics for the degree clause (a degree).

2.3.4. The scope of degree operators

As the semantics in (28) indicates, the first argument of a degree operator is the degree denoted by the degree clause. Following Bresnan (1973), Heim (1985), etc., we will assume for now that *more* first combines with a degree clause (which is then extraposed, to obtain the correct surface order) and only then with the predicate:[9]

(32)

$$\text{Deg}^0 \qquad\qquad\qquad \text{CP}$$

more [than max $\{\lambda d' \in D_d$. Thumbelina is d'-tall$\}$]   *tall*

---
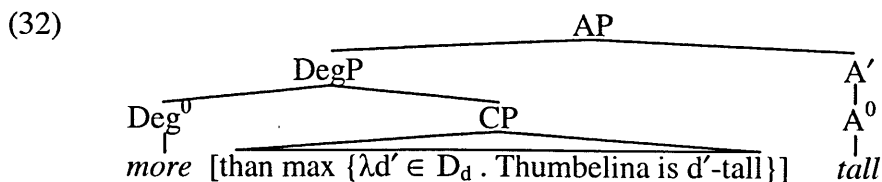
[9]   We will later adopt a late merge approach to the base-generation of dependent clauses (cf. Lebeaux 1988).

From the semantic point of view, DegP in (32) is perfectly interpretable and has the type $\langle\langle d, t\rangle, t\rangle$ (a quantifier over degrees). However, it cannot be interpreted in [Spec, AP] , because its sister has the wrong semantic type $\langle d, \langle e, t\rangle\rangle$.

To solve this problem, we can raise the DegP to some type $\langle t\rangle$ node. The trace that is left behind by this movement is of the semantic type $\langle d\rangle$, which means that it can now combine with A$'$. Disregarding all non-essential projections such aP and vP, we obtain the following structure:

(33) $\langle t\rangle$ = Tom Thumb is taller than Thumbelina

        $\langle d, t\rangle$ DegP

$\lambda d \in D_d$ IP   Deg^0 CP

     Tom Thumb   I$'$ *more* [than max $\{\lambda d' \in D_d$. Thumbelina is d'-tall$\}$]

              I^0

              is   AP

                 t$_d$ A$'$

                       A^0

                      tall
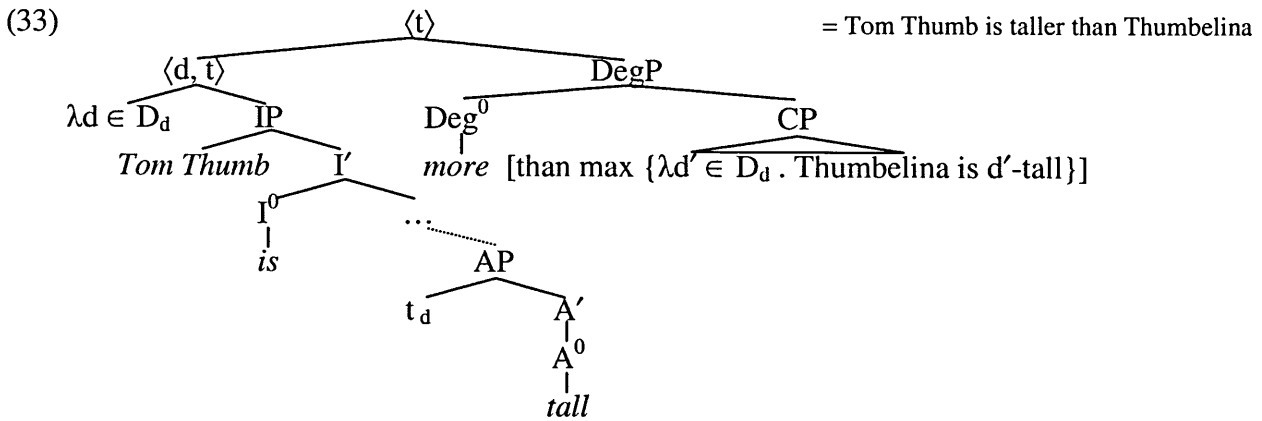
(33) solves our problems. A degree operator (even with its dependent) is not interpretable in situ, but its trace is. On the other hand, since movement necessarily creates the λ-abstract of the appropriate type, to obtain a type $\langle d, t\rangle$ predicate as a sister to the degree operator, we merely need to adjoin this degree operator to a type $\langle t\rangle$ node.

Bresnan (1973) and Sag (1976), among others, have shown that ellipsis resolution provides a strong argument for the movement of the degree operator to a clausal level. Consider the degree clause in (33). At PF, all we have is *than Thumbelina (was)*. Since ellipsis resolution is based on parallelism, in order to obtain *than max {$\lambda d' \in D_d$. Thumbelina is d'-tall}*, we need to have an appropriate antecedent in the prior context. This means that we need to have an antecedent where the sister of *tall* is a trace and the degree operator has raised at least as high as the vP (the ellipsis site).

A degree clause with an ellipsis in it forces QR of the degree operator to a position at least as high as the ellipsis site. We will be using this mechanism to force a clausal scope for degree operators inside DPs.

2.4. Exodus from the DP: degree fronting (bird's eye)

If degree operators cannot be interpreted in their base position, how are they interpreted inside a DP in examples (34)?

(34) a.   This is a more interesting question (than this one).

b.   Loki failed a more difficult task than Thor (did).

From the semantic point of view, nothing changes. As before, we need to raise the degree operator to a type $\langle t \rangle$ node. In a case like (34b), where the degree clause requires resolution of VP-ellipsis, degree operator movement has to be to a clausal level.

Let us consider the derivation of (34b) (possible tree structures in (35)) step by step. The comparative operator *more* is merged as [Spec, AP]. The AP *more difficult* is merged as a sister to NP, which is encased in a NumP. Because a degree operator cannot be interpreted in situ, *more* raises to a $\langle t \rangle$ type node, along with its dependent clause.

Because of ellipsis resolution in the degree clause, the comparative operator needs to raise to a position at least as high in the main clause as the ellipsis site in the degree clause (cf. Fiengo & May 1994, on QR required for ellipsis resolution in ACD constructions). This means that the degree operator can be adjoined to CP, as in (35a), to vP, as in (35b):

(35) a.

b.   CP

A tree diagram:

- CP
  - C^0
  - IP
    - DP
      - *Loki*
    - I'
      - I^0
      - $\langle t \rangle$
        - $\langle d, t \rangle$
          - $\lambda d \in D_d$
          - vP
            - t_i
            - v'
              - v^0 — *failed*
              - VP
                - V^0
                - NumP
                  - Num^0 — *a*
                  - NP
                    - AP
                      - t_d
                      - A'
                        - A^0 — *difficult*
                    - NP — *task*
        - $DegP_{\langle\langle d, t\rangle, t\rangle}$
          - Deg^0 — *more* [than max {$\lambda d' \in D_d$. Thor failed a d-difficult task}]
          - CP
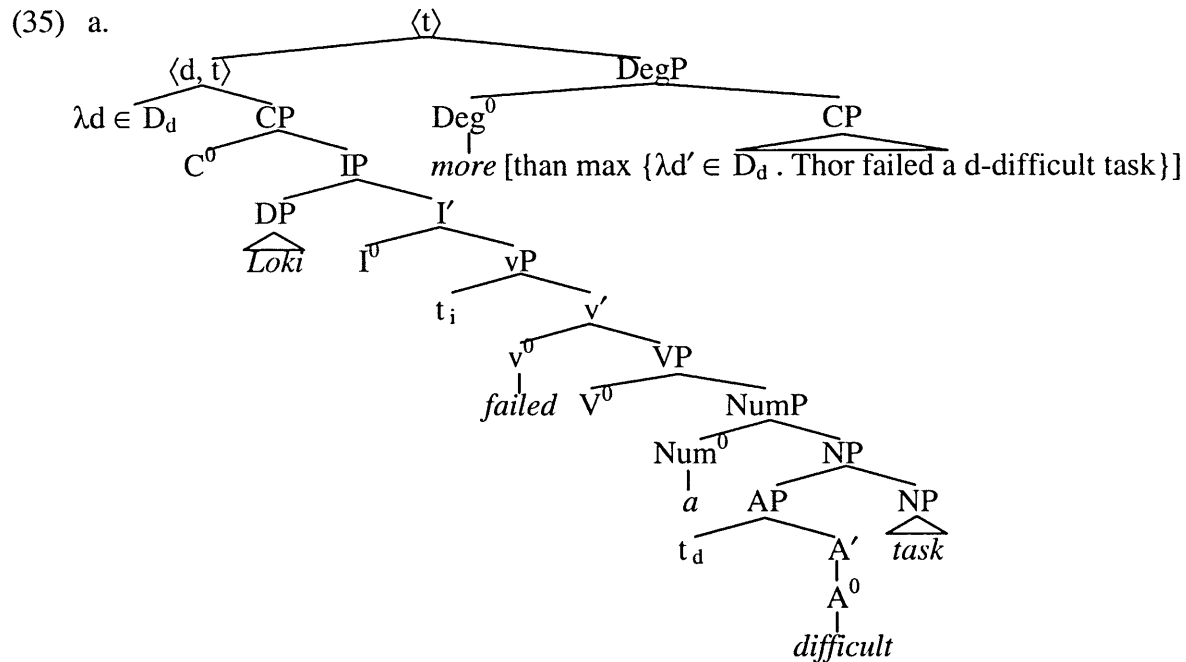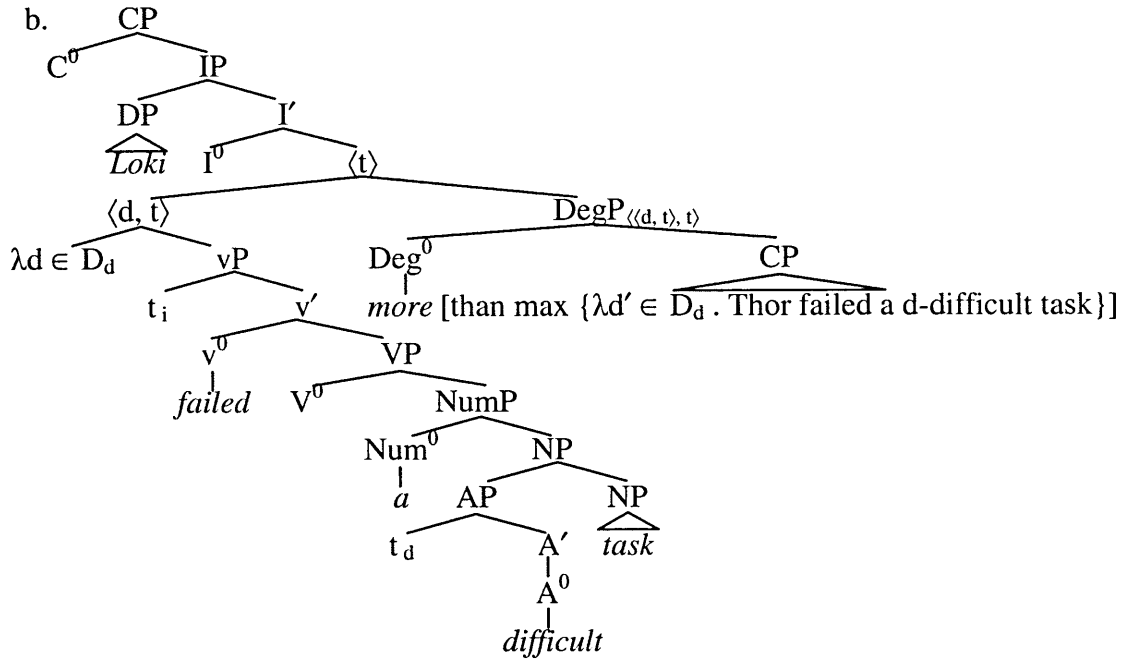
However, a crucial detail is missing from the picture. So far, nothing we have said differs from the more or less standard assumptions used in the syntax of degree operators. Now we can turn to the question that this research project is centered around: the question of degree fronting. As discussed above, we make the standard assumptions that (1) the degree operator is merged as a sister to the adjective it semantically combines with and (2) that the xAP is merged as a sister to the NP it modifies. Both these assumptions appear to be violated in (36):

(36)   a.   **such** a fascinating construction (that you'll love it)

      b.   **as bizarre** an order (as you could wish for)

In (36a), the degree operator is separated from the adjective it semantically combines with, and in (36b) the xAP is not adjacent to the NP it modifies. Both constructions appear in several Germanic languages (German, Dutch and Scandinavian, at least).

We will argue that (36a) and (36b) are variations on the same theme. We suggest that both are due to the fact that a degree operator QRing from an xNP must pass through the escape hatch on the left periphery of the xNP, in our case [Spec, NumP]. Movement to this position (what we call *degree fronting*) may or may not be accompanied by pied-piping:

(37)   NumP   the LF of a degree fronting construction

```
(37)        NumP
        _____
      DegP        Num′
      ____      _____
     such   Num⁰      NP
            |      _____
            a    AP        NP
                ____      _____
              t_d    A′  construction
                     |
                     A⁰
                     |
                 fascinating
```
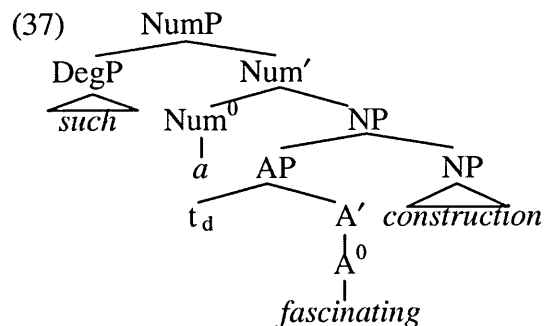
We will show that the structure in (37), along with the assumption that it arises as a result of degree QR to a scope position outside the xNP accounts both for the fact that degree fronting only occurs with xAPs containing degree operators (as opposed to degree modifiers or any other modifiers), the distribution of degree fronting (only happens in non-specific indefinites) and the correlation between degree fronting and the clausal scope of such degree operators as the exclamative *what* or the interrogative *how*. In the next chapter, we will examine the distribution of degree fronting and show how our analysis accounts for it. We will also show that alternative analyses require additional assumptions to handle some of the data we will present.

CHAPTER 3

EPPUR SI MUOVE

In this chapter we will describe the class of xAPs that appear before the article in *so interesting a problem* and compare this construction to *such a complicated issue*. We will show that an xAP appears in the DP-peripheral position only in presence of a degree operator that is semantically combined with this xAP, though such presence is not a sufficient condition.

We will argue that the DP-peripheral position of an xAP is due to movement (as opposed to base-generation), and show that items that trigger this movement are all degree operators. We will show that besides such fronting operators as *so* and *as*, which pied-pipe the rest of the xAP with them, there are also fronting operators such as *such* and *what*, which appear on the left DP-periphery alone. We will argue that the difference between the two classes can be reduced to the question of xAP pied-piping.

3.1.   DP-peripheral xAPs

From a purely descriptive point of view, certain additions to an attributive xAP can change its syntax. While unmodified attributive adjectives or attributive adjectives modified by a *-ly* adverb uniformly appear DP-internally, as in (38a), the presence of certain degree operators can force the entire attributive xAP to appear before the article, as in (39a):

(38) a.   a (potentially/particularly/terribly) simple/horrible/Italian/scientific book

      b.   *(potentially/particularly/terribly) simple/horrible/Italian/scientific a book

(39) a.   as/so/too simple/horrible/?Italian/(?)scientific a book

      b.   *a(n) as/so/too simple/horrible/Italian/scientific book

All xAP-fronting elements belong to the same semantic class – they refer in some way to the degree variable of the adjective. On the other hand, not all degree-modifying xAP-internal elements are compatible with the (optional or obligatory) appearance of the xAP on the DP-periphery. Degree-modifying adverbs such as *utterly* or *sufficiently* (unlike its near-synonym *enough*) in (40), and PP degree modifiers, such as *to a high degree* in (41), disallow xAP-fronting:

(40) a.   a(n) (sufficiently/utterly) simple/horrible/Italian/scientific book

      b.   *sufficiently/utterly simple/horrible/Italian/scientific a(n) book

(41)   a.   a simple/horrible/Italian/scientific (*to a high degree) book

        b.   *simple/horrible/Italian/scientific (to a high degree) a book

The fact that PPs cannot appear on the left periphery of the DP is unsurprising, given that right-branching structures are not possible modifiers in general. The interesting generalization is that open-class adverbs (i.e. adverbs formed with *-ly*) do not appear before the article, with or without the xAP they combine with, unless another element, e.g. *so*, is present:

(42)   *(so) terribly stubborn a mule

This generalization is independent of the semantics of the adverb: all adverbs behave the same, be they degree (*considerably*), manner (*structurally*), modal (*possibly*), etc. Given that the meanings expressed by those closed-class items that do appear before the article, such as *enough*, can be expressed by adverbs such as *sufficiently*, the constraint seems to be syntactic. However, we will show that open/closed-class is not the relevant distinction we should be concerned with – what matters is modification vs. quantification.

3.1.1.   English degree words

Bolinger (1972) notes that almost any adverb can function as a degree adverb, as long as it can be understood evaluatively:

(43)   a.   Your bracelet is hideously/incredibly/damned well/breath-takingly expensive.

        b.   *Brave New World* is an offensively/?blindingly/??politically pessimistic book.

The less standard examples (43b) show that any adverb *X-ly* can function as a degree adverb as long as we can imagine saying "to a degree that is X". This (43b) can be interpreted as (44):

(44)   *Brave New World* is a book pessimistic to a(n) offensive/?blinding/??political degree.

Because most adverbs can be interpreted figuratively, the class of items that can function as degree modifiers in English is open. On the other hand, there exists a class of degree words whose meaning gives the impression of being more "functional":

Table 1: English degree words

	meaning	dependents
almost	at the threshold of being X	
altogether	completely X	
how(ever)	degree interrogative or exclamative	
least	superlative operator	
most	superlative or intensive operator	
not at all	intensified negation	
quite	sufficiency operator	
rather	expectancy reverser (?)	
somewhat	X to some degree	
that	degree demonstrative (distant)	
this	degree demonstrative (proximate)	
very	high degree modifier	
what	degree exclamative	
as	equative operator	*as*-clause/phrase; multiple
enough	sufficiency operator	result infinitive
too	excess operator (opposite of *enough*)	result infinitive
less	comparative operator	*than*-clause/phrase; differential
more	comparative operator	*than*-clause/phrase; differential, multiple
so	relational operator	*that* result clause, *as*-clause
such	same as *so*, surfaces as sister to xNP	*that* result clause, *as*-clause

The table above attempts to provide some minimal descriptions of the semantics of various degree words. However, some clarifications are in order.

3.1.2.   Homonyms and dependents

Some degree operators have slightly different meanings in different contexts, and these meaning changes can be accompanied by the change in argument structure. For example, *so/such* can be used as a substitute for *as* in NPI contexts, in which case it will take an *as*-clause as opposed to a *that*-clause that it takes in its relational meaning (see Meier 2001, 2002 for the semantics of this latter *so*, which should extend to *such*). The only difference between the NPI equative *so* and the non-NPI equative *as* is that the former does not take multiples:

(45) a.   I don't think that Mt. Everest is (many times) as tall as Bunker Hill.

      b.   I don't think that Mt. Everest is (*many times) so tall as Bunker Hill.

On the other hand, the contrast between the relational *so/such* and the exclamative one is less likely to be a matter of different lexical entries, because the two meanings are often if not always collapsed in the same lexical entry cross-linguistically.

According to the semantic model we are assuming, degree words fall into two major categories: operators, which cannot be interpreted in-situ and must raise to a $\langle t \rangle$-type node, and modifiers, which have the semantic type $\langle \langle d, \langle e, t \rangle \rangle, \langle d, \langle e, t \rangle \rangle \rangle$ and thus are interpretable in situ by the rule of Functional Application (p. 14).[10]

Sometimes it is not at all clear to which of these two categories a particular degree word belongs. Taking as an example *very* and the exclamative *so*, both place restrictions on the degree variable of the adjective they modify. Thus, (46a) can be paraphrased as (46b), though some nuances of meaning will be lost:

(46) a.   Linder is so/very/amazingly/hauntingly beautiful.

      b.   Linder is beautiful to a high degree.

However, *so* but not any other degree word in (46a) defines a relation between two degrees, just like *more*: the degree to which Linder is beautiful and another degree, which can be overtly introduced by a *that*-result clause, but here is understood from the context. As a rule of thumb, all degree words that have clausal dependents are operators, but lack of a clausal dependent does not mean that a degree word is not an operator: for example, *how* is obviously not a modifier.

Relational semantics and/or the presence of a clausal dependent are good indications that a given degree word is an operator. We will argue that another diagnostic for degree operators is whether a degree word can appear on the left periphery of the xNP projection, as in (47a, b):

(47) a.   **[How large]$_j$ a t$_j$ dragon** did St. George slay t$_i$?   degree fronting + xAP pied-piping

      b.   **[What]$_i$ a t$_i$ large dragon** (St. George slew)!   degree fronting, no xAP pied-piping

---

[10]   The formulation we have given to the rule of Predicate Modification ensures that modifiers of adjectives cannot be of the semantic type $\langle d, \langle e, t \rangle \rangle$, because Predicate Modification only applies to nodes of the type $\langle e, t \rangle$. This still leaves possible the option where adjectival modifiers have the same semantic type as non-scalar adjectives (i.e. $\langle e, t \rangle$). If *structurally unsafe* had such a structure, it would have been interpreted as 'structural and unsafe'. We have no explanation for the fact that this option is not available, unless, of course, this is in fact the structure of asyndetic coordination (p. 13).

c.   Archangel Michael slew **a more dangerous dragon**.   no fronting

It should be noted that although the DP-internal position of *more* in (47c) is the default one, degree fronting is not impossible. The only degree operators that never allow degree fronting are superlatives, but this is due to the independently known fact that degree fronting is only possible with non-specific (i.e. [-referential]) indefinite xNPs (Bolinger 1972, Delsing 1993, etc., see section 4.3 for the full discussion). In an intensifier use, where *most* means *very* (as in *a most interesting problem*), *-st* forms allow degree fronting, at least in some dialects:

(48) a.   *most/least interesting the problem

      b.   ?most friendly an answer   Bresnan (1973), ex. (226b)

The fact that a given degree word can never be found DP-externally, as is the case with the superlative *most*, does not mean that this degree word is not an operator (since the semantics of a superlative is that of an operator). The same argument goes through for such open-class (formed with the *-ly* suffix) adverbs as *sufficiently*, which can never front, but they have relational semantics (similar if not identical to *enough*) and can have a clausal dependent (a result   ·
infinitive). In other words, a DP-internal degree word may or may not be an operator, but we will argue that if a degree word can be found at the left periphery of the DP, this degree word *is* an operator.

So which degree words trigger degree fronting?

3.1.3.   Lexicon of degree fronting

When we examine the functional-looking elements in Table 1, we see that by far not all of them trigger the fronting of the xAP. As (49) shows, even though *very* and *almost* look like function words and semantically combine with the degree variable of the adjective, they disallow xAP-fronting:[11]

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[11] Degree modifiers *nearly, by far, almost*, etc., can appear before the article in superlatives (David Pesetsky and Irene Heim, p.c.):

      (i)   By far the most interesting discovery was made by Eleanor Arroway.

      (ii)   Almost the first thing he said was an insult.

      There are several reasons to believe that the phenomenon might be different from degree fronting.

      First of all, it should be noted that in these cases the degree modifiers appear before the *definite* article, which usually disallows degree fronting (even though the definite article in superlatives does not have all the properties that definite articles have elsewhere – e.g. it does not impose discourse-old interpretation).

(49) a.   a(n) (almost/very/altogether) simple/horrible/Italian/scientific book

   b.   *almost/very/altogether a(n) simple/horrible/Italian/scientific book

Degree words such as *very* and *altogether* are semantically degree modifiers, while those like *so* and *as* are degree operators. We will argue that it is this semantic difference that determines whether a degree word can trigger xAP-fronting. The behavior of functional degree elements in English with respect to fronting is described below (see Chapter 6 for the discussion of rightward movement of degree modifiers).

Second, items that appear before the article in such examples are not degree operators, as in other cases of degree fronting. Semantically they are differentials: they say something about the difference between the value that the degree variable has in a real superlative and some other degree variable. In (i) this means the difference between the level of interest of the discovery made by Eleanor Arroway and the level of interest of other discoveries, and in (ii), it is the difference between the position of the insult in the list of things he said and his first utterance.

Third, although *nearly* and *almost* are semantically compatible with other degree operators (as (iii) shows), (iv) shows that they cannot appear on the left periphery by themselves:

   (iii) ? An almost more interesting discovery was made by Eleanor Arroway.

   (iv) * Almost a more interesting discovery was made by Eleanor Arroway.

We leave the topic as subject for further research.

Table 2: English degree fronting

	in situ	degree operator fronting	xAP pied-piping
enough	default	optional, marked	obligatory
less	default	optional, marked	obligatory
more	default	optional, marked	obligatory
least	default (intensifier)	optional, marked	obligatory
most	default (intensifier)	optional, marked	obligatory
such	no	obligatory	no
what	no	obligatory	no
how(ever)	no	obligatory	obligatory
that	no	obligatory	obligatory
this	no	obligatory	obligatory
rather	optional	optional	optional
quite	optional	optional	optional, marked
not at all	optional	optional	no
as	optional, marked	default	obligatory
so	optional, marked	default	obligatory
too	optional, marked	default	obligatory
almost	obligatory	no	
altogether	obligatory	no	
somewhat	obligatory	no	
very	obligatory	no	

As the table shows, several patterns of behavior are available for a degree word. For a few degree words (*such*, *what*, *how(ever)*, *this* and *that*), the in-situ position is unavailable. Some of them (the last three) trigger xAP pied-piping, the rest do not:

(50) a. such a complicated pattern   degree operator fronting

b. *such complicated a pattern   degree operator fronting + xAP-pied-piping

c. *a such complicated pattern   in situ

(51) a. *how a complicated pattern   degree operator fronting

b. how complicated a pattern   degree operator fronting + xAP-pied-piping

c. *a how complicated pattern   in situ

A different example is the class of degree operators, such as *more* or *enough*, for which the default position is in situ, but the DP-peripheral one is also available:[12]

(52)   a.   *more a complicated pattern   degree operator fronting

    b.   more complicated a pattern   degree operator fronting + xAP-pied-piping

    c.   a more complicated pattern   in situ

Conversely, the degree operators *so*, *as* and *too* are by default DP-peripheral, but they can also be found DP-internally when combined with e.g. *no* or *far*:

(53)   a.   a **not so/as interesting** claim

    b.   a **far too interesting** proposal

As noted above, *-ly* adverbs never trigger xAP fronting or move to the DP-periphery alone (like *such*). It is not clear at this point whether the pattern is significant, given that (a) many closed-class items (*altogether*, *very*, etc.) do not appear before the article either, and (b) a closed-class item can have an open-class (*-ly*) semantic equivalent (as in the case of *enough* vs. *sufficiently*).

Any analysis of the degree fronting construction should answer the following questions: is there a principled way to distinguish those xAPs that can appear before the article from those that cannot; and have DP-peripheral xAPs moved to their surface position or are they base-generated there? In our approach, degree fronting is movement of a degree operator to the clausal level. In the next section we will see what answers the base-generation approach gives.

3.2.   An emigrant or an autochthon?

In this subsection we will introduce the two possible analyses of why the xAP is DP-peripheral in degree fronting constructions discussed above: the movement analysis that we are defending and the base-generation analysis. We will show that the cases that served as evidence for a base-generation analysis can be handled by our movement analysis.

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[12]   (52b) is ungrammatical in some dialects, unless we add *no* and use a synthetic comparative:

    (i)   No lesser person than Gandhi said so!

3.2.1. Movement

Various movement analyses of adjective fronting have been tacitly adopted by Bolinger (1972), Bresnan (1973), Siegel (1994), and Bennis, Corver & den Dikken (1998), among others, but the details such as the landing site and the trigger have never been spelled out (except by Bolinger (1972), who suggests that degree fronting is prosodically motivated).

We will also argue for a movement analysis (degree fronting). In this chapter we will show that the xAP in (47a) is base-generated as a sister to an NP and that the degree operator in (47b) is base-generated as a sister of the xAP. The trigger and the landing site will be discussed in the next chapter.

(47) a.   **[How large]$_j$ a t$_j$ dragon** did St. George slay t$_i$?   degree fronting + xAP pied-piping

     b.   **[What]$_i$ a t$_i$ large dragon** (St. George slew)!   degree fronting, no xAP pied-piping

     c.   Archangel Michael slew **a more dangerous dragon.**   no fronting

Importantly, we will assume that from the semantic point of view what moves to the left periphery of the DP is only the degree operator, raising to escape from the DP and be interpreted at a higher clausal level. The appearance of the xAP there is due to the ill-understood syntactic phenomenon of pied-piping. In other words, the LF and the PF of a degree fronting construction are different: at LF the degree operator has moved to the left periphery leaving behind a trace of the type $\langle d \rangle$, and at PF, depending on the extent of pied-piping, the entire xAP has moved (as in (54b), only the degree operator has (as is the case with *such*), or nothing has (with e.g. *more*).

(54) a.   NumP   the LF of a degree fronting construction
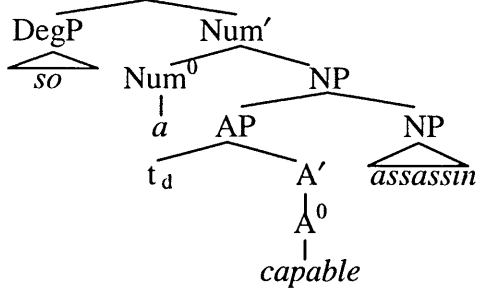
     b.   NumP   a PF of a degree fronting construction
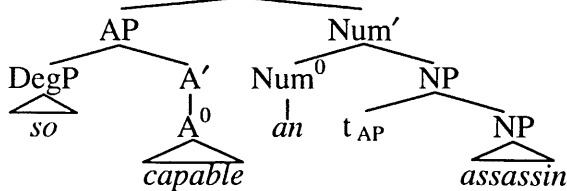
We will argue that the degree operator on the left periphery of the DP in (47) is always base-generated as a sister to the xAP it modifies and moves to the left periphery, as in (54) (the label of the entire structure, NumP, will be argued for in section 4.3.5). This movement can be overt or covert and, in the former case, be accompanied by the pied-piping of the xAP.

The next question to ask is when the movement happens: before or after the Spell-Out. At first glance, given that the LF and the PF may be different, as in (54), post-Spell-Out movement seems to be a better option. The problem with it is that we have a suspicious situation where independent movement operations at LF and at PF are triggered by the same semantic property – that of being a degree operator. While at LF, movement is clearly due to interpretive necessity, at PF, we can provide no immediately obvious trigger for it. Moreover, the correlation between overt degree fronting and obligatory clausal scope (see section 5.3 below) now appears totally accidental.

We will thus assume that the movement of a degree operator and the xAP it is contained in takes place before the Spell-Out and different copies are interpreted at LF and PF:

(55)   NumP   Spell-Out
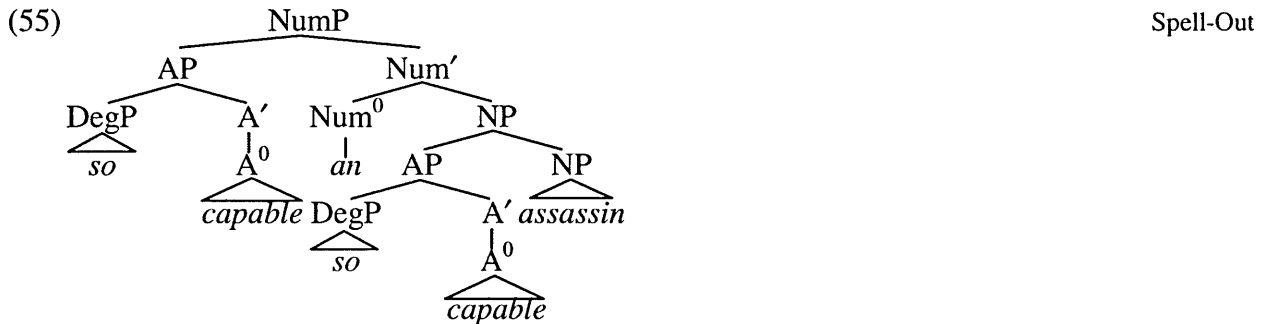
At the Spell-Out there are (at least) two identical copies of the xAP containing the degree operator. At the LF branch, only the degree operator is interpreted in the DP-peripheral position, its lower trace is interpreted as a variable of the type $\langle d \rangle$:

(56)   NumP   LF
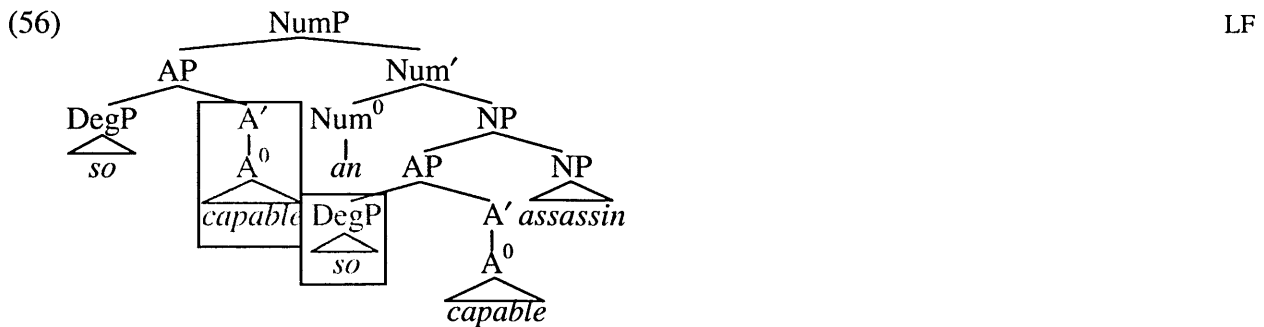
At PF, depending on a particular degree operator, either the entire xAP or only the degree operator or nothing will be interpreted (pronounced) in the higher position. With *such*, only the

degree operator is pronounced in the peripheral position; with *so*, the entire xAP is; and with *more*, the entire xAP is pronounced in the lower position. In other words, the extent of pied-piping is determined by a particular degree operator:

(57)   NumP   PF (*so*)
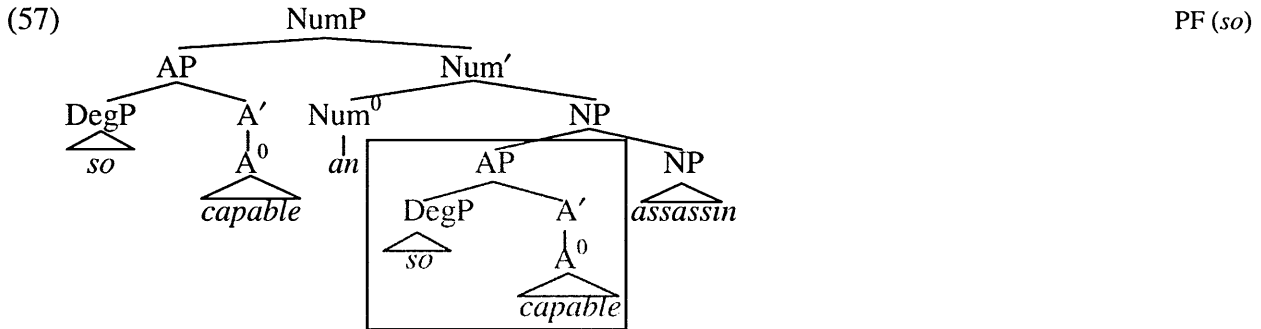
It should be noted that a major problem with the Copy Theory of Movement, also relevant here, is that it provides no particular reason for why pied-piping should work the way it does (i.e. the trigger for the movement, the degree operator, is never pronounced in a position lower than that where the constituent it has pied-piped (the xAP in our case) does).

3.2.2.   Base-generation

A movement analysis of degree fronting is not the only option. Abney (1987) (and following him Delsing 1993, Zwicky 1995 and Lilley 2002) argue for a base-generation approach to degree fronting cases. There are two main arguments for this approach: the dialectal *of*-insertion in English and article iteration in Scandinavian. We will show that both these cases can be handled by a movement analysis as well.

Both Abney (1987) and Delsing (1993) assume that pre-nominal adjectives are heads, as in (58):

(58)   DegP   Abney's ex. (376)

Even disregarding Abney's adjectives-as-heads hypothesis (see Appendix 2 for arguments against it), can we argue against the constituent structure like (58), where the adjective is first combined with the noun and then with the degree operator?

(59) [too [big [of [a house]]]]

We will first present the specific structures that the base-generation hypothesis (but not the movement hypothesis) is assumed to be able to handle, and then show that they can be analyzed in the movement approach as well

One reason for a base-generation analysis is the unexpected appearance of the preposition *of* in degree fronting cases, as in the following examples from Bolinger (1972:136):[13]

(60) a.   that large **of** a house

       b.   considerable **of** a fool

Under the assumption that *of* is semantically vacuous, its appearance could be motivated by the necessity of assigning Case to the DP *a house* in (58). No comparable explanation can be given if (60) are derived by movement.

An objection to this proposal is that if the DP in the fronting examples needs Case, why is *of*-insertion dialectal? Furthermore, even though a movement analysis does have to explain *of*-insertion, a base-generation analysis must explain lack thereof, and so nothing is gained from the point of view of explanatory adequacy.

Another argument for base-generating the extended AP in the position before the indefinite article comes from Delsing (1993:138). Example (61a), his (60), shows that Scandinavian also allows an xAP combined with a degree operator to appear before the indefinite article. (61b), his (61), shows that in a dialect of Scandinavian this can happen even in absence of a visible degree operator, though the article is then duplicated:

(61) a.   så stort et hus   Danish/Norwegian

           so big a house

           so big a house

       b.   e stort e hus   Northern Swedish

           a big a house

           a big house

Constructions like (61b) are limited to Northern Swedish and possible when the adjective is emphasized, in a way not made precise by Delsing. Taken by themselves, they do not argue for

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[13]   Example (i) shows that *of*-insertion occurs only if the xAP is pied-piped (David Pesetsky, p.c.):
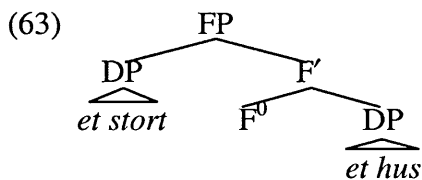
      (i)   She is such (*of) an engineer!

   This constraint does not seem to follow straightforwardly either from a movement analysis of *of*-insertion or from a base-generation one.

a base-generation analysis of the xAP on the left periphery. The origin of the second indefinite article is no less obscure whether we assume that the xAP *stort* is merged in its surface position or moved there. What makes a movement analysis less likely is the fact that the adjective and the accompanying indefinite article in (61b) can be iterated (Delsing's ex. (84)):

(62) en   stor   en   ful   en   kar
      a   big   a   ugly   a   man

      a big ugly man

If (61b) and (62) are derived by base-generating the adjectives in their surface positions, then the only question to be answered is why English disallows multiple xAPs before the indefinite article, while Northern Swedish has no such restriction. This question is probably related to the question of why some (probably most) languages do not allow any xAPs before the indefinite article. Both movement and base-generation analyses have to resolve this question.

The disadvantage of a movement analysis is that it needs to explain where the additional articles in structures like (61b) and (62) come from. In a base-generation analysis different from Delsing's, one could argue that (61b) contains two DPs, and hence two indefinite articles. An analysis as in (63) also provides the insertion site for *of*, as F^0:

(63)

```
              FP
         _____|_____
        |             |
        DP            F'
        △         ____|____
     et stort     |        |
                 F^0       DP
                           △
                          et hus
```

No such alternative is available for our movement analysis, since we crucially assume that the fronted xAP is part of the same DP as the noun. Where does the additional indefinite article come from?

Since we argue for the movement analysis, we need to propose an explanation for the extra indefinite articles in (61b) and (62). We propose that the additional articles (all but the last one) are not articles at all, but rather re-analyzed as emphatic markers of some sort. The last article is Num^0 to whose Spec the rest of the xAPs raise. The empirical generalization is that emphasis (exclamatives, evaluatives (the *N of an N* construction), etc.) brings into play a degree variable (frequently as a result of coercion). We hypothesize that emphasis necessarily relies on the presence of a degree operator.

This analysis will also allow us to explain why the movement happens at all. Indeed, since we are assuming that xAP fronting is triggered by a degree operator (e.g. (61a) is derived by

attracting *so* to a position above the indefinite article, while raising the xAP is merely pied-piping), re-interpreting *et* as a degree operator explains why do the adjectives in (61b) and (62) raise.

To make the issue clearer, we will consider multiple articles in colloquial German degree fronting:[14]

(64) a. ein so ein Idiot

          a so a idiot

          such an idiot

    b. ein solch ein grosses Haus

          a so a large house

          such a large house

As in Northern Swedish, in the Upper Austrian dialect of German more than one adjective can be fronted:

(65) ein so ein grosses ein graessliches Haus

      a so a large a ugly house

      such a large ugly house

Ein-insertion in colloquial German is contingent on degree fronting. Given the contrasts in (66) and (67), we conclude that it is the external article that has to be explained.

(66) a. *ein so Idiot

          a so idiot

    b. so ein Idiot

          so a idiot

          such an idiot

(67) a. ?ein solch grosses Haus   perceived as antiquated

          a such large-Msg house

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[14] Thanks to Martin Hackl for bringing these examples to my attention. Similar English examples ([??]*a far too interesting a book*) are probably best analyzed as performance errors (also suggested by Delsing 1993), though they may be an indication of a similar language change.

German judgments in this section are courtesy of Patricia Cabredo-Hofherr, Martin Hackl, Irene Heim, and Michael Wagner, unless specified otherwise.

b.	solch ein	grosses	Haus
	such a	large-Msg	house

such a large house

Suppose that the function of the pre-adjectival *ein* is indeed that of emphasis, similar to the function of *et* in Northern Swedish, and that this emphasis involves the degree variable of the adjective, similarly to the exclamative *what*, epithets, insults and the *N of an N* construction (see Matushansky 2002). If *ein/et* is semantically combined with the fronted xAP, the most natural assumption is that it is also syntactically combined with it,[15] i.e. that *ein/et* forms a constituent with the fronted xAP. Then the main syntactic difference between Northern Swedish/German and English is whether Num^0 can attract only one (English) or more than one degree operator (Northern Swedish and German).

In other words, with respect to degree fronting English behaves like it does with respect to wh-movement: only the highest degree operator can be fronted.[16] Northern Swedish and German degree fronting is like the Slavic wh-movement: all eligible degree operators must front. Finally, languages like French treat degree operators like wh-in-situ languages treat wh-words: all degree operators remain in situ.

As we mentioned before, two questions must be answered with respect to degree fronting if a movement analysis is assumed: the provenance of extra "articles" and cross-linguistic variation as to the number of xAPs containing a degree operator that can appear before the indefinite article. Our answer to the first question, i.e. the proposal that *ein/et* is reanalyzed as an emphatic operator of some sort, is neutral with respect to whether the xAP(s) before the indefinite article is/are base-generated in their surface position or moved there.

However, our movement analysis reduces the cross-linguistic difference with respect to the extent of degree fronting to a similar difference established for overt wh-movement: multiple wh-movement (xAP fronting in Northern Swedish behaves like wh-movement in Slavic), single

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[15] An alternative analysis is of course possible. In section 3.4.1 we will show what assumptions need to be made in order to interpret a structure where the degree operator and the xAP it modifies do not form a constituent at merge.

[16] For unclear reasons, two degree operators are usually not possible in the same DP (e.g. **so interesting a more fascinating book*), independently of degree fronting (cf. **a more interesting more fascinating book*, **a fastest best car*, except as asyndetic coordination). However, it is not completely ruled out (example due to David Pesetsky, p.c.):

(i)　It's rare that a bog contains such dirty water this cold.

wh-movement (xAP fronting and wh-movement in English behave in the same way) or wh-in-situ (the lack of xAP fronting in French is like lack of wh-movement in Chinese). Delsing's base-generation analysis, on the other hand, still has to explain the differences between English, French and German/Northern Swedish with respect to xAP fronting.

We conclude that both *of*-insertion and *ein/et*-insertion can be handled by a movement analysis and thus provide no argument for preferring a base-generation analysis.

3.2.3. Summary

In this section we have suggested that the semantics of degree words (operators vs. modifiers) is correlated with their syntax: degree operators can appear DP-externally. We have shown that the ability of a degree word to appear on the left periphery of the DP correlates with whether it has a "relational" meaning and can have a clausal dependent.

Some degree operators can appear on the left periphery alone (*such* and *quite*), while others appear with the xAPs they semantically combine with (*quite* and *so*). There are degree operators that can only be found at the periphery (*what* or *how*), and those that appear both DP-internally and DP-peripherally (*quite* and *more*). Finally, some degree operators must appear adjacent to the xAP they semantically combine with (*more* or *so*), while others are under no such restriction (*rather* or *quite*).

To handle these facts we propose that degree fronting is derived by attracting the degree operator to the left periphery of the DP. For some degree operators, this fronting is accompanied by xAP pied-piping. Both overt fronting and xAP pied-piping are optional.

An alternative analysis would be to base-generate the degree operator (along with the xAP it semantically combines with) on the left periphery. We have examined the arguments for this analysis given by Delsing (1993) and concluded that all the facts handled by a base-generation analysis can be dealt with by the movement analysis. However, we can also show that a base-generation analysis is untenable due to both semantic and syntactic reasons.

3.3. Adjective base-generation site

In order to show that the fronted xAPs in examples like (68) have indeed moved to their surface position, we need to compare them to examples like (69), where they appear in situ.

(68) a.　　Sherlock Holmes has never encountered **so mysterious** a crime.

　　　b.　　This is **as neat** a little problem as anything you could wish for...

　　　c.　　...and not **too dangerous** a proposition.

    d.   No matter **how talented** a criminal Professor Moriarti was…

    e.   … his henchman wasn't **that clever** a man.

(69) a.   This is **such** an **interesting** case.

       b.   And **what** a **fascinating** account!

Surface strings like (68) can arise in three possible ways. One possibility is to base-generate the adjective and the degree operator as a constituent merged as a sister to the head NP and then raise the entire xAP to its surface position at PF (as in (54b)). This analysis is the one we will adopt:

(54) b.
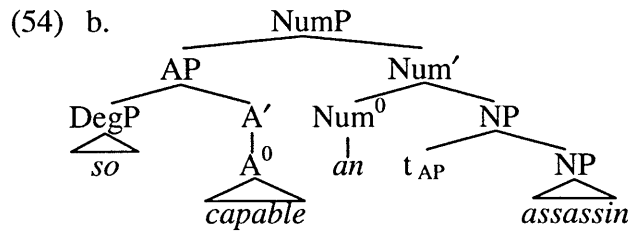
One alternative is to base-generate the entire xAP constituent on the left DP-periphery and combine it with the rest of the xNP:

(70)
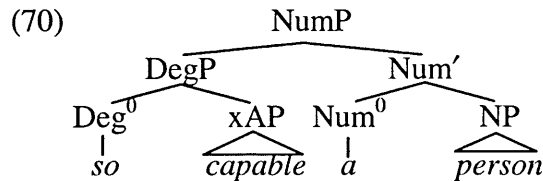
The only difference between the proposal in (70) and the original base-generation proposal by Abney (1987) and Delsing (1993) is that the degree operator and the xAP on the left DP-periphery form a constituent (see Appendix 2 for arguments against analyzing pre-nominal adjectives as heads (Abney 1987 and Berman 1973)).

The third and last option is to only base-generate the degree operator on the left periphery and then raise the adjective to adjoin to it (counter-cyclically):

(71)
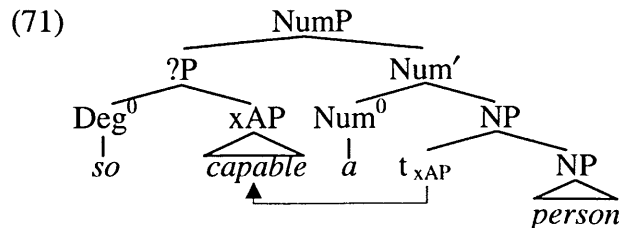
Since the last option is easier to rule out, we will start with it.

3.3.1. Optional fronting

The degree operators *such* and *what* always appear on the left DP-periphery alone. Theoretically this could mean that they are always base-generated there. What would this mean for the analysis of such degree operators as *so* and *as*, which also appear on the left periphery of the DP, but with the adjectives they modify?

Syntactically, (71) cannot be maintained. First of all, it requires merging the xAP to a non-root position, i.e. movement to a non-c-commanding position. First of all, such movement is a violation of the extension condition (Chomsky 1995). Such a violation by itself is not necessarily a problem, given that merger at positions other than the root (counter-cyclic merge) has been proposed by Lebeaux (1988), Chomsky (1995), Fox & Nissenbaum (1999), Nissenbaum (2000), and Bhatt & Pancheva (2002), among others. The real problem is that movement to a non-c-commanding position cannot be interpreted in the semantic model we are assuming.

(72)
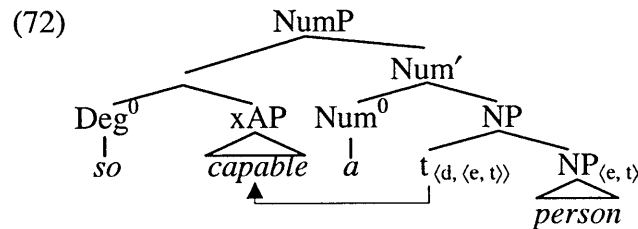
Indeed, the standard assumption is that movement of a constituent leaves behind a variable. This variable has either the same semantic type as the moved constituent or a simplex type ($\langle d \rangle$, $\langle e \rangle$, etc.). In the case of a predicate, the only possible type is the same as that of the predicate – in our case, $\langle d, \langle e, t \rangle \rangle$. Such a trace cannot be combined with the NP of the semantic type $\langle e, t \rangle$. For the same reason (type incompatibility), the xAP cannot be interpreted in-situ or reconstructed.

The analysis in (71) also has serious problems with cases like (73), where the same degree operator can appear in the high or in the low position:

(73) a. Quake 3 has a great gothic look, and when need be has **a just as great technical look**.[17]

b. Although Case was **just as interesting a character** as Buz, Corbett lacked Maharis' range and fiery intensity.[18]

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[17] *http://www.denken.com/dzone/q3article002.htm.*

[18] *http://www.jumptheshark.com/r/route66.htm.*

Obligatorily fronting degree operators like *as* or *so* can appear below the indefinite article if they are modified by *just*, *not*, etc. In definite DPs, this is in fact the only option:

(74) a.   The tutors at the Writing Center have been trained to help you meet the writing demands of professors at the Universty of Maine, and **the just as strict demands** of writing in the Twenty First Century.[19]

    b.   I could invent **this very long and not so interesting story** about the ancient meanings of those words but how about I tell you the truth.[20]

    c.   ... i was sitting on the floor recounting **my ever so interesting story** about how i don't know what to do with myself...[21]

A similar observation is made by Delsing (1993:141) for *too*:

(75) a.   a far too big house   Delsing's ex. (74)

    b.   *a too big house/✓too big a house

Examples (73a), (74) and (75a) show that modification allows the degree operators *as*, *so* and *too* to appear below the indefinite article. This strongly suggests that these degree operators have been base-generated in the DP-internal position (the dispreferred alternative being that they appear there as a result of lowering). If the same degree operator is sometimes base-generated above the indefinite article, as in (71), and sometimes below it, as in (76), then (73a) and (73b) (among others) have totally unrelated derivational histories, despite the fact that they have the same meaning and semantically combine with the same element (the xAP; note though that *such* can appear without any xAP and *so* cannot). In other words we would have to say that fronted degree operators such as *so* and *as* can be base-generated in either (71) or (76):

(76)   NumP
       ┌──────┴──────┐
     Num^0 NP
       │   ┌────┴────┐
       a   QP   NP
           ┌───┴───┐   ┌─┴─┐
         far too big *house*
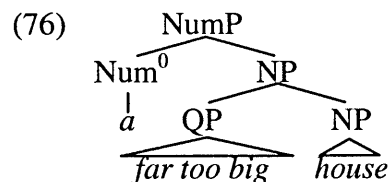
It should be emphasized that there is no problem with proposing two structures instead of one; but our analysis allows a higher level of generalization: for us, the same degree operator is

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[19] *http://www.ume.maine.edu/~wcenter/about.html*. This is the writing center of the University of Maine, so hopefully this example should not be viewed as a production error.

[20] *http://www.nwitpahex.com/archives/2000_07_01_archive.html*.

[21] *http://www.netspace.org/~jcn/another/99/02/28.html*.

spelled out as *such* if it appears as a sister to xNP (an extended NP projection) and *so* otherwise. The same is true for the exclamative *what* and *how*. The surface similarity between *so/such* and *how/what* is less surprising with our analysis, as is their complementary distribution.

Furthermore, even degree operators that normally appear DP-internally (i.e. base-generated in a structure like (71)) can also appear DP-peripherally:

(77) a.   I am now older, and wiser, and hopefully **more careful a cruising sailor.**[22]

b.   What could be **more annoying a name** than the contrived teen lingo Xtreme.[23]

While *more* is usually found below the indefinite article, it can also appear above, which means that a base-generation analysis must employ both (71) and (76) for *more* as well. Worse, there are cases where the high position is the only option for *more*, and then a base-generation analysis would need an additional reason to rule out the DP-internal position in (71), as we will see in the next subsection.

3.3.2.   Obligatory fronting

In certain cases all dialects of English require the comparative to appear on the left periphery. As Bresnan (1973, fn. 10) shows, the position of a degree operator and the xAP it semantically combines with can be influenced by negation:

(78) a.   [$_{DegP}$ *(no) taller] a man

b.   a [$_{DegP}$ (*no) taller] man

When the synthetic comparative is preceded by *no*, the entire xAP must appear above the indefinite article. Another such case is that of comparative correlatives (Culicover & Jackendoff 1999, first noted by Ross 1967):

(79) a.   **The more interesting a word** you come up with for the blank, the better.[24]

b.   The more people get involved, **the more interesting a site** it is, and it can soon be a great site.[25]

c.   **The less interesting a piece**, the more imaginative and convincing you must play it.[26]

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[22]   *http://i.m.y.c.tripod.com/atease1.htm.*

[23]   *http://www.jammag.com/computers/zenith/xtreme.htm.*

[24]   *http://www.english.vt.edu/~siegle/Comp/What_is_/what_is_.html.*

[25]   *http://www.breakfasttacos.com/about.htm.*

Descriptively speaking, the position of a degree operator is influenced by some functional elements. Different elements have different effects, and thus *quite* facilitates the in-situ position for *so*, while *no* forces the fronted position for *-er*:

(80) a.   I hadn't expected **a quite so** interesting reaction.[27]

     b.   That it happened 50 years ago makes it **no smaller a** sacrifice or any less important.[28]

A priori, the effect may be due to prosody (cf. Bolinger 1972), semantics (e.g. the degree operator may be uninterpretable in its base position) or syntax (there is a functional projection attracting degree operators to the DP-periphery). An approach postulating that (at least some) degree operators are base-generated above the article cannot easily explain why the very same operators can appear below the article as well. From the syntactic point of view, this analysis requires additional stipulations.

Interestingly, most arguments levied against the analysis in (71) can also be raised against (70). Indeed, what (70) proposes is that only the degree operator is base-generated on the left DP-periphery in degree fronting constructions, with the xAP raising to it. The default case is that of *such*, while *so* or *as* differ from it in attracting the xAP. However, all cases of optional degree fronting, as in (73), or cases where a degree operator is forced to assume a non-default position, as in (78) and (79), argue that for each degree operator two positions (and their corresponding interpretations) should be available: DP-internally and DP-externally.

There are also semantic problems with both (70) and (71), having to do with the fact that the DP-peripheral degree operator has to semantically combine with the xAP. These problems become apparent when we consider the possibility that only *such* and *what* are base-generated on the left DP-periphery. In the next section we will compare our movement analysis in (54) to the partial movement analysis in (70) with respect to *such* and *what*.

3.4.   Degree operator base-generation site

We can now turn to those operators that never cause the adjective to appear on the left periphery of the DP, namely *what* and *such*. In our theory, they receive an analysis identical to that of *so*, *how* and other degree operators that appear on the left periphery of the DP. The only difference is

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[26]   *http://www.trumpetguild.org/itgyouth/scott.html.*

[27]   *http://raddial.com/fiction/plays/rugrat/scene_6.html.*

[28]   *http://www.ancestry.com/library/view/news/articles/3832.asp.*

that *what* and *such* do not pied-pipe the xAP they are semantically combined with, while *how* and *so* do.

One could imagine an alternative analysis, where the degree operators *such* and *what* are base-generated on the left periphery of the DP. We will show that such an analysis results in a semantic problem. To solve this problem, we need to postulate movement of a null operator – a stipulation that would also work for an "adjectives as heads"-type analysis. We will first show why this stipulation is required and then, how it would apply to any approach separating a DP-peripheral degree operator and the xAP it modifies. In other words, we will demonstrate that in any theory where the degree operator and the adjective it semantically combines with do not start out as a single constituent, at least one additional stipulation is required, and thus such a theory is inherently less economical.

3.4.1. Such and what

Both *such* and *what* can only appear on the left periphery and are separated from the adjectives they semantically combine with. But do they in fact combine with these adjectives, or is it just an illusion? Examples (81) show that *such* and *what* can appear without any adjective at all:

(81) a.   What a fool!

b.   He is such an idiot!

(82) a.   ?What a South-African!

b.   ?She is such a lobster nutritionist!

The contrast between (81) and (82) shows that *what* and *such* are degree modifiers, since they are infelicitous with non-scalar predicates. While the nouns in (82) cannot be easily coerced into a scalar interpretation, other nouns can (especially for people like the readers and the author, who know the prototypical qualities of a linguist):

(83) a.   What a linguist!

b.   He is such a linguist!

In both cases in (83) what is subject to evaluation is not the property *linguist*. While in (83a) the most likely property to be evaluated is the quality as a linguist, (83a) can also express surprise as to the degree of correspondence to the stereotype of a linguist (*What a linguist! She would ask a plane hijacker for judgments*). The latter interpretation is the most salient in (83b), if not the only one.

Evaluation of prototypical properties is what usually happens when non-scalar predicates are coerced into a scalar interpretation (see Appendix 5). In examples like *more French than Napoleon*, the property with respect to which two entities are evaluated is 'having (many of) the properties prototypically associated with being French'. The relative infelicity of (82) is caused by the absence of readily available stereotypes for *South African* and *lobster nutritionist* (compare to *New Yorker/high school principal*, where such stereotypes are readily available).

If *such* and *what* appear to be sensitive to the presence of a degree variable, the most likely reason is that their semantics involves this degree variable. Indeed, (81a) expresses the speaker's amazement as to the high degree to which the referent of the xNP is foolish, and (81b) means that the subject of the clause (*he*) is an idiot to a degree equal to or exceeding some contextually specified degree, similar to *enough* and *too* (see Meier 2002). Because (81b) is an exclamative, this contextually specified degree is presupposed to be high.

From the syntactic point of view, *what* and *such* can only appear as part of an xNP. This is clear from their inability to appear with non-attributive adjectives:

(84) a.   *What/✓how foolish she is!

b.   He is *such/✓so foolish!

So far nothing we have said excludes the possibility that *such* is base-generated in its surface position. In the standard Heim & Kratzer (1998) approach, in the predicate position, the indefinite article is semantically vacuous and present only for syntactic reasons. So *such an idiot* in predicate positions should be interpretable irrespectively of whether the degree operator *such* is merged together with a scalar predicate *idiot*, as in (85a), or with the xNP *an idiot* in (85b):

(85) a.   NumP

b.   NumP
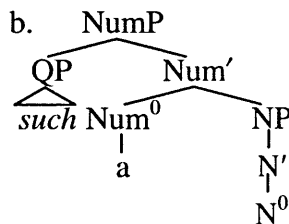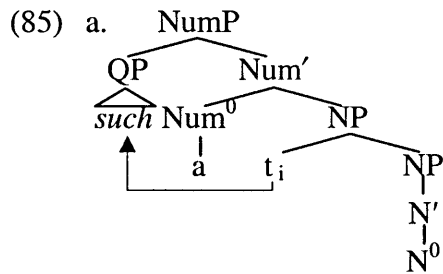
Since *a* is semantically null, the meaning of the NP node in (85) is the same as that of the Num′ node. So how can we argue for preferring (85a) over (85b)?

We will show later (section 4.3) that degree fronting constructions can appear in argument positions, where *a* is interpreted as an existential quantifier. In such circumstances, the degree operator cannot be base-generated in its surface position (its sister would have the wrong semantic type). Here we will show that such an analysis can be argued against even where it is semantically possible.

3.4.2.   Such an xAP

In this section we will show that the structure in (85b) does not derive the correct interpretation of *such* when the xNP contains an adjective. Examples like (86) provide the starting point:

(86)   a.   such a pretty pony

      b.   what an incredible idiot

Intuitively, *such* applies to the xAP *pretty* in (86a) and *what* applies to the xAP *amazing* in (86b), rather than to the entire xNPs. To show that this is indeed so, consider the interpretation of examples (87). As Bolinger (1972) notes, examples like (87) are ambiguous, but examples like (88) are not:

(87)   Such misbehavior always frightens me.

      a.   misbehavior such as this

      b.   misbehavior to such an extent

(88)   Such behavior frightens me.

      a.   behavior such as this

      b.   *behavior to such an extent

Depending on whether the head noun is scalar or not, *such* is interpreted as identifying, as in (87a), or intensifying, as in (87b). Now what about the NPs in (86)?

The noun *pony* in (86a) is clearly non-scalar. This means that it cannot combine with the scalar adjective *pretty*. In order for *pretty* to combine with *pony*, the degree variable of *pretty* has to be saturated or quantified over. As a result, the AP *d-pretty* is not scalar, nor is the entire NP *pretty pony* (simplified) in (89a):

(89) a.

$$\text{NP}_{\langle e, t \rangle}$$

AP$_{\langle e, t \rangle}$ NP$_{\langle e, t \rangle}$

d   *pretty*$_{\langle d, \langle e, t \rangle \rangle}$ *pony*$_{\langle e, t \rangle}$
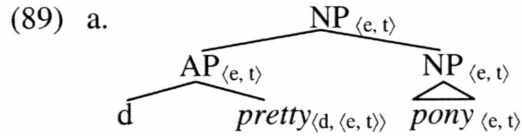
The same reasoning can be applied to (86b), even though both the adjective *incredible* and the noun *idiot* are scalar. Suppose that the adjective incredible has the semantic type $\langle d, \langle e, t \rangle \rangle$. We cannot combine it with the noun *idiot* directly by Predicate Modification, because the rule of Predicate Modification is only defined for sisters of the type $\langle e, \sigma \rangle$. Had we tried to modify the rule to deal with sisters of any semantic type (i.e. interpret as conjunction any node whose two daughters have the same semantic type), the interpretation we would have obtained would have been wrong:

(89) b.   *   NP$_{\langle d, \langle e, t \rangle \rangle}$ $= \lambda d \in D_d \,.\, \lambda x \in D_e \,.\, x$ is a d-incredible idiot to the degree d

AP$_{\langle d, \langle e, t \rangle \rangle}$ NP$_{\langle d, \langle e, t \rangle \rangle}$

incredible   *idiot*
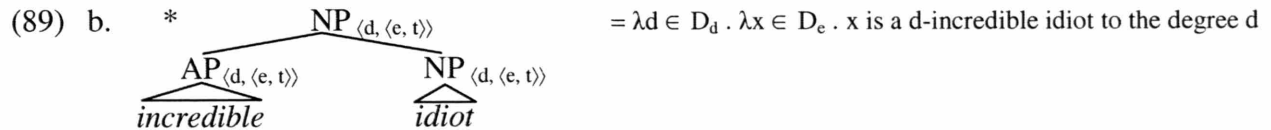
We conclude that because of how Predicate Modification works, an NP containing an xAP is always non-scalar. This means that if we assume that *such* and *what* are base-generated outside the indefinite article, they combine with a non-scalar entity in (86), and as (88) shows, when the noun is not scalar, the intensifier interpretation of *such* is more difficult to achieve:

(90) a.   *Cakes and Ale* is such a book!

     b.   I have such a headache!

     c.   W. is such an American!

The three cases above show that the interpretation of a non-scalar noun in a scalar context is not always the same. (90a) claims that *Cakes and Ale* is a very *good* book, while my headache in (90b) is presumably very bad. In (90c), the most salient interpretation of *such an American* is that of a *typical* American. If we conceive of every notion as having a prototype structure, then what the intensifier *such* means is that the subject is close to the center of the prototype with respect to some contextually salient property.

(91)
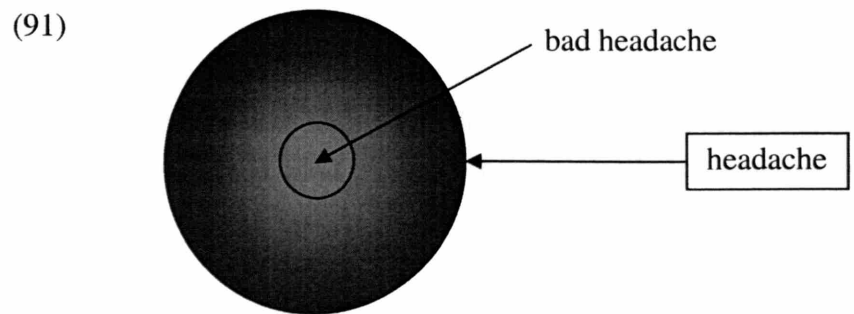
Such closeness to the center of the prototype usually means being bad for a headache and good for a doctor, for extra-linguistic reasons, but other relevant properties can also be selected. The question is why cases like (86) do not easily receive the interpretations in (92):

(92)   a.   such a typical/good/bad pretty pony

       b.   what a typical/good/bad incredible idiot

To be sure, the interpretations in (92) are not impossible, but they are superseded by much more available interpretations where *such* and *what* modify the adjectives *pretty* and *incredible*.

In order to obtain the correct interpretations of (86) a base-generation approach to degree fronting needs to assume that *such* and *what* are associated with the adjectives by some semantic or pragmatic process. One such process will be presented in the next section.

3.4.3. *Such* and *so*

From the semantic point of view, there seems to be no difference between *so* and *such*, although the former cannot modify a noun:

(93)   a.   so *(small) a sound

       b.   such a small sound (cf. *such small a sound*)

In both examples above, *so/such* modifies the adjective *small* and appears to the left of the article. In (93a) the adjective appears next to the degree operator, while in (93b) it stays in situ. The distributional difference between *so* and *such* is that *such* always surfaces as a sister to xNP, while *so* is excluded from this position. Examples like (94) show that *so* is compatible with PPs, as long as they are scalar:

(94)   a.   Red was **so** out of his mind that he needed a rest.

       b.   *Red was **so** out of the hotel that it took him three hours to walk back.

To analyze these cases, we adopt the simplest analysis: *such* and *so* are underlyingly the same degree operator, whose surface form depends on whether it surfaces as a sister to NumP or to some other extended projection (*so clever, so out of her mind*). If *such* is base-generated as a sister to an xNP or an xAP, it will be interpreted as modifying this xNP or xAP as a matter of fact. The same analysis works for the exclamative *what/how*.

In order to deal with examples like (93), the base-generation analysis in (71), repeated in (95a) below, would need to argue that the similarity between the two cases is incidental. In an

analysis where the degree operator is always base-generated in the surface position, *so* has to be base-generated together with the predicate, while *such* modifies the entire xNP:

(95) a.

```
            NumP
          /      \
        AP        Num′
      /    \     /     \
so capable  Num⁰       NP
             |       /    \
             an    assassin
```

b.

```
        NumP
      /      \
   DegP       Num′
   /   \     /     \
 such  Num⁰        NP
        |       /      \
        a     xAP       NP
             /   \     /   \
          capable   assassin
```
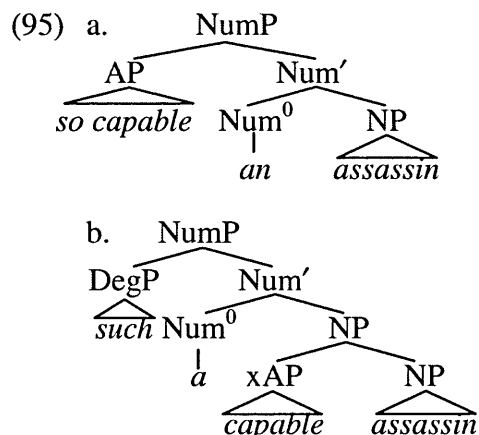
   Leaving aside the fact that degree operators such as *so* do not always front, as well as other objections raised in section 3.3, the structure in (95a) is interpretable. If the indefinite article is semantically vacuous, (95a) is interpreted straightforwardly as a case of adjectival modification. Since *so* is a degree operator, it has to be adjoined to a type $\langle t \rangle$ node in order to be interpretable. As the sister of *so* in (95a) is of the type $\langle d, \langle e, t \rangle \rangle$ (a scalar predicate), *so* has to raise. In doing so, it leaves behind a variable of the type $\langle d \rangle$, which combines with *capable* by Functional Application.

   (95b) is more complicated. As we said, *such* requires a degree variable slot in its sister. However, the Num′ in (95b) (*a capable assassin*) is non-scalar. The degree variable of *capable* has to be saturated before it can be combined with *assassin* via Predicate Modification. The resulting NP node has the semantic type $\langle e, t \rangle$ (non-scalar). In other words, we cannot interpret (95b) straightforwardly (unless we resort to scalarity coercion, which will not give us the correct interpretation here).

   One way of creating a degree variable slot in the constituent that *such* combines with in (95b) and ensuring the correct interpretation is to propose that the xAP in (95b) contains a null degree operator moving to the left periphery of the DP, just below *such*:

(96)

$$\text{FP}_2 = \lambda d \in D_d . \lambda x \in D_e . \text{ x is a d-capable assassin}$$

$$[\![\text{OP}_d]\!] = \varnothing$$

$$[\![a]\!] = \varnothing$$

$$= \lambda d \in D_d . \lambda x \in D_e . \text{ x is d-capable}$$

FP$_3$ [DegP [*such*] FP$_2$ [OP$_d$ FP$_1$ [λd NumP [Num^0 [*a*] NP [AP [t$_d$ A' [A^0 [*capable*]]] NP [*assassin*]]]]]]
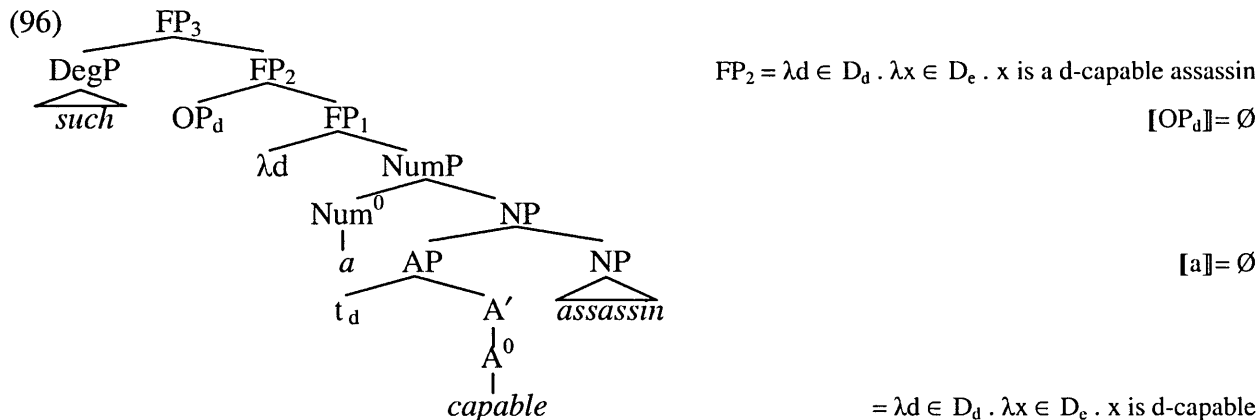
Movement of the degree operator creates a λ-abstract of the right type to combine with *such* and ensure that *such* modifies the right degree variable. Of course, *such* still has to raise and adjoin to some $\langle t \rangle$-type node to ensure the correct interpretation, but from the semantic point of view, (96) is interpretable.

We now see what would be the problem with a Delsing-type analysis, where the DegP and the xAP it semantically combines with start out as independent constituents (Delsing's original analysis):

(97)

DegP [Deg^0 [*so*] AP [A^0 [*fantastic*] NumP [Num^0 [*a*] NP [*creature*]]]]
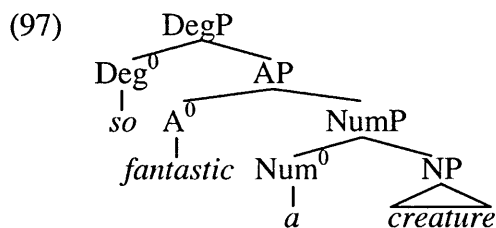
The structure in (97) is uninterpretable without scalarity coercion for the same reason (95b) is: the constituent that *so* combines with is not scalar. The NumP *a creature* combines with the A^0 *fantastic* and the resulting AP combines with the degree operator *so*. However, to combine a non-scalar noun and a scalar adjective, the degree variable of the adjective has to be saturated before the combination. The resulting "AP" *fantastic a creature* is not scalar and thus is unable to combine with the degree operator *so* (unless rescued by scalarity coercion).

(97) cannot be interpreted compositionally unless some additional assumptions are made. Even leaving aside the issue of whether DP-peripheral adjectives are heads or phrases (though the arguments levied against "adjectives as heads" approach would hold for DP-peripheral adjectives as well), we cannot maintain that DP-peripheral degree operators are heads, given that they can also be modified:

(98) a.   no less interesting a wordsmith

b.   just as interesting a character

Irrespective of whether the DP-peripheral degree operator and the adjective are phrasal, in order to interpret them, we need to base-generate a null degree operator within the AP *fantastic*, which raises to a position below *so* and creates a scalar predicate (i.e. a predicate with an open degree variable slot, which can be bound by our fronted degree operator). This scalar predicate can combine with *so* and receive the expected interpretation (disregarding superfluous functional heads):

(99)

$= \lambda d \in D_d \cdot \lambda x \in D_e \cdot x$ is a d-fantastic creature
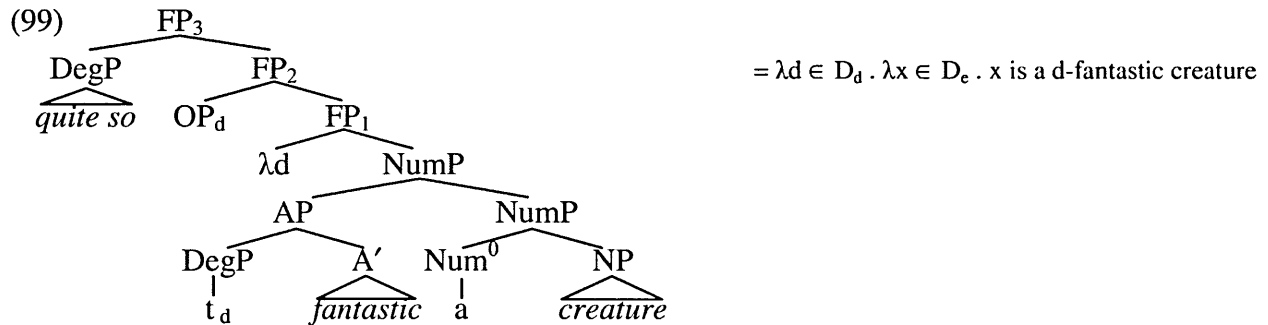
In other words, when the degree operator and the adjective it semantically combines with do not form a constituent, we need to postulate a null degree operator, which moves to ensure the correct interpretation. This analysis is theoretically inferior to a simple fronting analysis because in addition to postulating a null operator, it requires movement nonetheless.

It is true that the particular mechanism of interpreting the base-generation structure in (71) that we have proposed is necessary because of the model of compositional semantics that we are assuming. However, even outside this model, the base-generation structure in both (70) and (71) would still need to assign very different syntax to *such* and *so*. In the case of *so*, the simplest analysis is to assume that the degree operator and the xAP it semantically combines with form a constituent, which is interpreted compositionally. In the case of *such* something else needs to be said.

On the other hand, in our movement approach the difference between *so* and *such* is that *so* triggers xAP pied-piping and *such* does not. In section 4.2.2 we will see that *rather* and *quite* can undergo fronting with or without pied-piping the xAP.

3.4.4. Summary

The degree operators *such* and *what* do not surface next to the attributive xAPs they semantically combine with. In the movement analysis that we propose, *such* and *what* are base-generated next to these adjectives and then fronted. Unlike *so* and *how*, they do not trigger xAP pied-piping.

We have shown that an analysis base-generating *such* and *what* on the DP-periphery needs an additional mechanism (e.g. null operator movement) to ensure that these degree operators are correctly interpreted. We have argued that such mechanisms need to be postulated whenever an xAP is not base-generated as a sister to the degree operator it semantically combines with, i.e. also for the analysis in (99).

Combining these results with those of section 3.3, we conclude that the degree fronting analysis requires the least number of assumptions. The DP-peripheral position of *such* and *what* and the DP-peripheral position of xAPs containing a degree operator are both due to the movement of the degree operator (possibly accompanied by xAP pied-piping). We can now turn to the question of what distinguishes those degree operators that move to the left DP-periphery from those that do not.

CHAPTER 4

TO MOVE OR NOT TO MOVE?

The position of a degree operator can be influenced by several factors. First of all, some degree operators (e.g. *more*) are DP-internal by default, while others (e.g. *as*) are DP-peripheral. Some operators (*more*, *as*) can appear both DP-internally and DP-peripherally, while others (*that*, *least*) are confined to only one position. The fact that the same degree operator can have a default position and a non-default one suggests that the reasons for degree fronting have nothing to do with the lexical meaning of the operator.

Secondly, the type of the DP the degree operator is contained in plays an important role in the availability of degree fronting. We will show that the behavior of a degree operator can be influenced by the presence of an indefinite determiner (no fronting in non-indefinite DPs) and by whether it is overt (no xAP pied-piping in absence of an overt indefinite determiner).

We will use the above effects to argue that the surface position of a degree operator reflects its scope: the DP-peripheral position means that the degree operator has clausal scope.

4.1.   The mechanics of degree fronting

As we have argued in chapter 2, a degree operator cannot be interpreted in its base position. Because the semantic type of a DegP is $\langle\langle d, t\rangle, t\rangle$, it cannot be interpreted as a sister to a degree predicate (type $\langle d, \langle e, t\rangle\rangle$). When a degree operator raises, it leaves behind a trace of the type $\langle d\rangle$, which can (and must) combine with a scalar predicate. In its landing site (a node of the type $\langle t\rangle$), the degree operator creates a λ-abstract of the type $\langle d, t\rangle$, which can function as an argument to the operator.

(100)
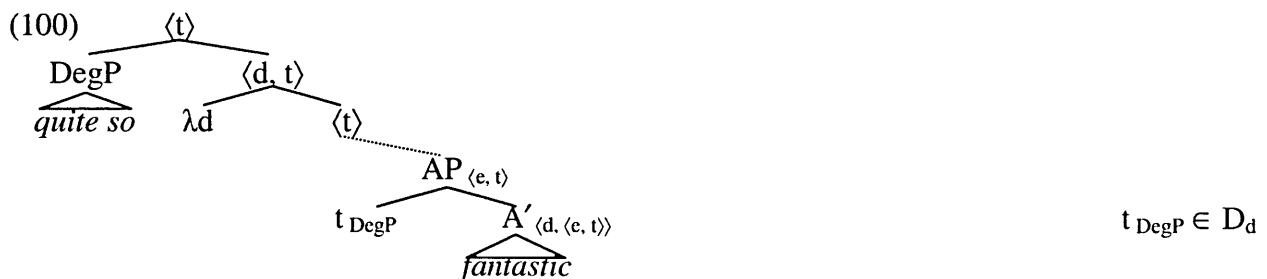
What happens if the AP in which the degree operator is originally contained is attributive? It is the standard assumption that extraction out of a DP proceeds through an escape hatch (see also Kennedy and Merchant 2000, who propose that movement of the null operator out of degree

(*as* and *than*) clauses proceeds through such an escape hatch, for totally independent reasons). Our assumption here is that the degree fronting position on the left periphery of the DP is in fact this escape hatch for degree operators raising to a clausal level.[29]

4.2.   When is degree fronting overt?

Whenever a degree operator is combined with an attributive/DP-internal adjective in English, the final surface string may be one of the following three options. The degree operator may appear DP-peripherally, as in (101a); it may appear adjacent to the xAP it semantically combines with and DP-internally, as in (101b); or both the degree operator and the xAP adjacent to it may appear DP-peripherally, as in (101c):

(101) a.   The H2K2 convention was **such a controversial event** that AT&T was nervous.
      b.   Beethoven's 7th symphony enjoyed **a longer round of applause** than Bernstein's overture.
      c.   Tamerlan was **no less influential a politican** than Talleyrand.

Many degree operators have default positions where they appear (DP-peripherally for *so*, DP-internally for *more*, etc.), but often they can also appear in other positions. This means that the appearance of a degree operator in a DP-internal or DP-peripheral position is not related to the semantics of the degree operator itself, since the very same degree operator can appear in a position that is not default for it.

4.2.1.   Forced choices and preferences

Abstracting away from rightward degree movement (on which see Chapter 6), degree operators in English fall into three categories: those that must appear on the left periphery of the DP; those that cannot appear there and those that can appear both DP-peripherally and DP-internally, but appear in one of these positions by default.

Degree fronting is mandatory with *how*, *so* and the emphatic *this/that*:

(102) a.   how harrowing a tale/*a how harrowing tale/*how a harrowing tale
      b.   so long a story/*a so long story/* so a long story

---

[29]   In the minimalist framework (Chomsky 1995-2001), escape hatches are required only for (strong) phases (CP, transitive vP). There exists evidence both for and against analyzing DPs as (strong) phases. The DP-peripheral position of degree operators can be viewed as evidence for an escape hatch out of the DP and thus for DPs being phases.

c.   that delightful an opera/*a that delightful opera/*that a delightful opera

d.   this odd a film/*a this odd film/*this an odd film[30]

The degree operators *so*, *as* and *too* trigger degree fronting as long as they are not modified by something else. The presence of a modifier makes the in-situ position also available:

(103) a.   Not a *(quite) as interesting movie as I hoped.[31]

b.   A lot of the time, senior resources tend to do things in a *(far) too complicated way.[32]

Comparatives on the other hand, prefer to stay DP-internally, though degree fronting (with obligatory xAP pied-piping) is also possible, as shown in the examples below:

(104) a.   One couldn't imagine **more handsome** a doctor.

b.   **More handsome** a doctor than Dr. John has not walked the face of the Earth.

The fact that *more* and *as* have different default positions inside the DP despite their semantic similarity suggests that degree fronting is not a matter of the lexical meaning of the degree quantifier itself. The fact that the same degree operator can appear in a non-default position when it is modified (*as*) or in some pragmatically determined environment (*more*) also argues that the choice of one position (e.g. the DP-internal one for *more*) is not imposed by the impossibility of interpreting a degree operator in the other position. On the other hand, the interpretation of the degree quantifier in these two positions may be different, since they would have different scopes. We suggest that the DP-peripheral position of a degree operator does indeed indicate that it has raised to some clausal level.

In the next section we will provide some evidence that degree fronting is not a factor of the lexical meaning of a degree operator. The same will be shown to be true with respect to xAP pied-piping, since the same operator can trigger pied-piping or not.

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[30] From *http://www.dragonfare.net/AL/rev/hercules.html*:

(i)   A lot of people simply couldn't accept this odd a film from the Disney machine...

Bolinger (1972:138) makes the same point with the same adjective in his ex. (7).

[31] The grammatical example is from *http://www.deardiary.net/show/diaries/27148/1018051200*. This is an environment where the insertion of a second indefinite article, noted by Delsing (1993) often occurs (*?? a not quite as interesting a movie*).

[32] The grammatical example is from *http://www.agile.net/technology/this_month.xml*.

4.2.2.   Optional fronting/xAP pied-piping

An additional argument for deciding that fronting and non-fronting degree operators do not have radically different semantics is the degree operator *quite*. Its uniqueness is that it can stay inside the DP, as in (105a), outside the DP with the adjective it modifies, as in (105b), or outside the DP without the adjective, as in (105c). No other degree operator pied-pipes the xAP optionally:

(105) a.   It was **a quite clever** decision, if we do say so ourselves.[33]

b.   **Quite annoying a** job, but finally it's done.[34]

c.   **Quite a boring** person really.[35]

Bolinger (1972:137) shows that *quite* can also appear with a DP containing no adjective, as in *quite a fool*. When *quite* appears alone to the left of the article, as in (105c), it is difficult to say whether it intensifies the scalar adjective *boring*, or of the scalar NP *boring person*.

Whereas the latter is always an option (given that *quite* can always modify the entire NP), we can use scalarity coercion as a means of determining if *quite* can unambiguously modify the attributive adjective inside a DP, when *quite* itself appears above the indefinite article, as in (106):

(106) a.   The album has quite a French feel to it...[36]   = a feel that is quite French

b.   We are quite a French House, as well as an English one.[37]

= we have properties of a French house to the same degree as we do of an English one

The DPs in (106) contain a non-scalar adjective *French*, and the NPs *French feel* and *French house* are not scalar. If *quite* is like *such* in that it can associate with the adjective then we expect a coerced meaning both for the non-scalar adjective and for the entire NP. (106a) is biased for the former interpretation and (106b), for the latter one. The difference stands out even more sharply in the following example:

(107) quite a Nazi general

a.   a general that is somehow Nazi

b.   someone who has characteristics of a Nazi general

---

[33] *http://www.electromagnetic.net/press-releases/theline.php*, and there are many similar cases.

[34] *http://gcc.gnu.org/ml/gcc-patches/1999-06n/msg00341.html*. Such examples seem to be quite rare.

[35] From: *http://www.voy.com/21015/21.html*, similar cases are also very frequent.

[36] *http://s-t.org.uk/music/3-albums.htm*.

[37] Charles Dickens, *A Tale of Two Cities*.

In (107a), the referent has to be a general, but in (107b) it doesn't (in fact, the converse is more likely to be true). Note that in cases where the degree operator unambiguously combines with the adjective, as in (108), a reading like (107b) is unavailable:

(108) so Nazi a general
   a. a general who is so Nazi
   b. ≠someone who has characteristics of a Nazi general to a high degree

Another optionally pied-piping operator is *rather*. When *quite* and *rather* modify the xAP (rather than the NP) and front without pied-piping the adjective, the result appears by preference in a predicate position:

(109) This is rather an interesting/a rather interesting/rather interesting a problem.

(110) a. Sherlock Holmes found a quite/rather interesting problem.
   b. ??Sherlock Holmes found quite/rather an interesting problem.
   c. Sherlock Holmes found quite/rather interesting a problem.

To summarize, *quite* and *rather* show that the abilities to trigger degree fronting and xAP-pied-piping are idiosyncratic lexical properties of a degree operator and have nothing to do with the meaning of the operator.

4.2.3. Not at all

Before we conclude this section, we need to mention another optionally fronting degree operator: *not at all*. This operator resembles *what* and *such* in that it does not trigger xAP pied-piping, but differs from them in that it can stay inside the DP next to the adjective it modifies, thus providing support for the claim that *what* and *such* can be base-generated as adjective modifiers:

(111) a. ...Reagan uses a number of metaphors in his opening paragraph such as "democracy is proving itself to be a **not at all** fragile flower" and "Regimes planted by bayonets do not take root."[38]
   b. The driest of the wines from this young winery is a **not at all** dry kiwi wine.[39]

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[38]   *http://www.sfu.ca/~muntigl/ciceroburke.html.*

[39]   *http://www.stratsplace.com/rogov/not_only_from_grapes.html.*

A highly unusual property of *not at all* is that it can appear as a discontinuous string (more felicitous even than fronting the entire operator, as in (111)). The position of negation with respect to the infinitival copula in (112a) argues that *not* is not sentential negation here:

(112) a.   Democracy is proving itself to be **not** a fragile flower **at all**.

     b.   ^{??}It's **a not** dry kiwi wine **at all**.

Given that *not...at all* is infelicitous in true argument positions, as in (), it may in fact be a combination of constituent negation and an emphatic clause-level operator (*at all*) rather than a DP-internal degree operator.

(113) a.   ^{??}A not at all beautiful rose is hard to find.

     b.   ^{??}Not a beautiful rose at all is hard to find.

Further investigation is required to understand what *not at all* really is.

4.2.4.   Summary

It would seem that the ability/necessity for a given degree operator to front cannot arise out of interpretational necessity, because the same degree operator (e.g. *rather*) can appear in both positions, with or without xAP pied-piping. However, some degree operators, e.g. *how*, can only appear in the fronted position.

Before we address the question of what the trigger for degree fronting might be, we need to see how degree fronting is constrained. We will show that degree fronting is only possible in non-specific indefinite xNPs. We will argue that the target position of degree fronting is [Spec, NumP] because xAP-pied-piping is even further constrained to be only possible when the indefinite article is overt.

4.3.   NumP revisited

Several factors play a role in what is allowed in degree fronting constructions. On the one hand, there is a strong preference for placing degree-fronted DPs in predicate positions. On the other, there is a syntactic requirement that degree fronting is only possible in non-specific indefinite xNPs (indefinite singulars, bare plurals and mass noun). When degree fronting is accompanied by xAP pied-piping, the constraint is further narrowed to DPs containing an overt indefinite article.

The fact that the overtness of NumP influences the availability of degree fronting with xAP pied-piping is a strong argument for the target position of degree fronting being [Spec, NumP].

4.3.1.   Predication

Degree fronting, with or without xAP pied-piping, is most felicitous in predicate positions. In fact, Bresnan (1973:299) argues that DP-internal degree operators are felicitous only when the DP containing the fronted operator is a predicate (her exx. (159)-(163), with her judgments):

(114) a.   She is as brilliant a/*the woman as her mother .

     b.   What her mother wants her to be is as strong a person as possible.

     c.   ? As brilliant a woman is here.

     d.   ? I've known a person as strong as Louise.

     e.   I've never known a person as strong as Louise.

Delsing (1993:34) suggests that a similar restriction applies to all xNPs containing a degree operator in Scandinavian. If an xNP contains a degree operator (and thus the indefinite plural article), it is infelicitous in an argument position (from his exx. (26)):

(115) a.   *Ena   duktiga   läkare   opererade min   mor   i   våras

         Indef-pl competent doctors operated   my   mother in spring

     b.   ??Han köpte   ena   vackra   stolar i går

         he   bought Indef-pl beautiful chairs yesterday

A corpus search suggests, however, that fronted degree operators, even without xAP pied-piping, can appear in argument positions in English:

(116) a.   The statistics provide Satterthwaite **with** quite an appealing sales pitch to potential shareholders.[40]

     b.   Students are leaving college **with** not at all a realistic idea of what they will be doing.[41]

     c.   This presents us **with** rather a complex situation...[42]

Degree operators triggering xAP pied-piping (and of course, prepositions other than *with*) are also possible, although modal (other than assertive indicative) contexts are preferred:

(117) You have no idea how difficult it is writing **from** as difficult a point of view as that.[43]

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[40] *http://www.prismamicrofinance.com/Downloads/Prisma%20Haverford%20College%20Article.pdf*

[41] *http://www.ualberta.ca/htbin/lwgate/INCLUSION/archives/Inclusion.1998-07/Subject/article-94.html.*

[42] *http://www.vanessen.com/en/projects/txt/nwsbrf04.asp.*

[43] *http://www.1freespace.com/catilina3/angels.html.*

The preference for predicate positions is an indication that degree fronting is not neutral with respect to information structure (old/new information) even when it is obligatory. Degree fronting with xAP pied-piping is even more constrained, since it requires the presence of an overt indefinite article.

4.3.2. Indefinites

Most researchers working on degree fronting comment on the fact that adjectives can appear DP-peripherally in English only if the DP is a singular indefinite:

(118) a.   **How clean** *glasses/*water/✓a glass did you drink out of?

b.   St. George fought **so dangerous** *dragons/*crime/✓a dragon.

(119) a.   * **How clean** one/every/some glass did you drink out of?

b.   * One/every/some **how clean** glass did you drink out of?

If a degree operator is fronted without xAP pied-piping, degree fronting is possible in bare plural and mass noun DPs as well. It is impossible to tell from the surface strings in (120) and (121) whether *such* and *what* appear above or below the null Num^0, but from their behavior in singular indefinites, we know that *such* and *what* cannot stay in situ. We conclude that *such* and *what* are fronted in (120) and (121), and thus it is xAP pied-piping that is sensitive to the overtness of the indefinite article.[44]

(120) a.   They bought **such incredibly cheap slaves**.

b.   How can you stand **such impertinence**?

(121) a.   **What incredibly cheap slaves** these were!

b.   What nonsense!

That the indefiniteness requirement is a constraint on degree fronting is clear from the fact that no other determiners are allowed with *such* and *what* in their degree readings. However, if *such* is interpreted as an identifier, the restriction disappears:

(122) a.   such/what a/*some/*any/*one/*every Christian ending

b.   *some/one/any such/what Christian ending   ✓ with the identifier reading of *such*

c.   (*three/*all/*any) such/what Christian endings   ✓ with the identifier reading of *such*

---

[44] With *rather* and *quite* in plural or mass xNPs it is impossible to distinguish degree fronting without xAP pied-piping from degree fronting with pied-piping, and both, from the in-situ position of the degree operator.

By using a non-scalar adjective like *Christian* we ensure that the intensifier interpretation of *such* is clearly distinct from the identifier one. The intensifier interpretation does not survive in the presence of any overt determiner except *a*.

Two questions must be raised in this connection: what is the constraint on degree fronting, and what is the constraint on xAP pied-piping due to.

4.3.3.   Overt indefinite article

As noted above, degree fronting with xAP pied-piping can only happen when the DP is headed by an overt indefinite article. We will argue that this cannot be a semantic constraint.

Our analysis hinges upon the assumption that degree fronting is a symptom of degree QR to a clausal level. From the semantic point of view, the only thing that moves then is the degree operator (with its dependents, see section 2.3.3). This means that xAP pied-piping is a purely syntactic phenomenon (the way pied-piping generally is) and as such cannot be constrained by whether the DP is semantically singular.

Further evidence comes from the fact that in degree fronting constructions *such* and *so* are semantically equivalent, but *such* does not require the overt indefinite article, and *so* does (unless the xAP appears on the right DP-periphery, as in (123c) – a situation to be discussed in Chapter 6):

(123) a.   **such tall men** (that they can reach the forbidden fruit)

   b.   * **so tall men** (that they can reach the forbidden fruit)

   c.   men so tall (that they can reach the forbidden fruit)

Indefinite singular xNPs in English differ from indefinite plural and mass xNPs in that only in the former case there is an overt article. This overtness could mean an extra projection (which we will refer to as NumP), absent from plural and mass xNPs, or it could mean that the head of this projection is null with plural and mass nouns.[45]

Suppose that Num^0 is not projected in plurals and mass nouns. Consider then what happens with *such* and *what*. In singular xNPs, *such* and *what* must front. If we say that the indefinite singular article is obligatorily specified for the [degree] feature (an EPP feature triggering overt degree fronting), then we will be predicting that English should behave like Scandinavian, i.e.

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[45] Note that we do not argue that the DP-peripheral position of a fronted xAP has to be [Spec, NumP] (and *of*-insertion shows that this may not be the case). But since the overtness of Num^0 plays a role it is natural to assume that the fronted xAP at least passes through [Spec, NumP].

that the indefinite article is necessarily accompanied by a scalar adjective or a degree operator. This is clearly an incorrect prediction.

However, if we said that the [degree] feature is optional on the overt Num^0, we would be predicting that *a such wrong answer* is grammatical! We conclude that the necessity to front is a property of a degree operator rather than of the article.

Suppose the necessity for some degree operators to front were encoded by specifying them as [+Num].[46] Raising the degree operator to [Spec, NumP] would establish the correct relation for checking this feature. But if bare plurals and mass nouns do not project a NumP, the putative [+Num] feature on *such* and *what* cannot be checked.[47]

We conclude that if raising to [Spec, NumP] is a property of some degree operators but not others, NumP must be projected even in bare plurals and mass nouns. This means that it has to be phonological covertness that rules out degree fronting with xAP pied-piping in plural and mass xNPs.

Further evidence in the same direction comes from the singular indefinite article in Dutch. Bennis, Corver and den Dikken (1998:102) show that the indefinite singular article *een* 'a' is obligatory in the Dutch *wat*-exclamative construction (as well as in the so-called *N of an N* construction, similar to exclamatives in also being a scalarity-sensitive context, see Matushansky 2002 for the discussion). The indefinite singular article shows up in scalarity-sensitive contexts even when the head noun is plural or mass (which is why Bennis et al. call the Dutch indefinite singular article *spurious*):

(124) a. wat   *(een) jongen!
          what-EXCL a   boy
          what a boy!

     b. wat   *(een) jongens!
          what-EXCL a   boys
          what boys!

---

[46] We will show in section 4.3.4 that such a solution is untenable.

[47] As David Pesetsky (p.c.) notes, a feature-driven attraction analysis is technically possible if overt Num^0 can be specified either for uninterpretable [degree-1] (whose interpretable counterpart is part of feature specification of *so*) or for uninterpretable [degree-2] (whose interpretable counterpart is present on *such*), and null Num^0 only for [degree-2]. We will not pursue this hypothesis here.

As we already know, exclamatives contain degree operators and are obligatorily fronted to the left periphery of the DP. Neither in Dutch nor in English do exclamatives pied-pipe the xAP. However, Dutch exclamatives are sensitive to the presence of an indefinite article, while English exclamatives are not, which suggests that this sensitivity is unlikely to be semantic.

Indeed, suppose that the obligatoriness of the indefinite article in Dutch exclamatives and in English adjective fronting constructions were semantically based. Then we would need to say (a) that the meaning of the Dutch exclamative morpheme is different from the meaning of the English exclamative morpheme, or (b) that the meaning of the English singular indefinite article is different from the meaning of the Dutch singular indefinite article. Neither approach seems enticing.

In Scandinavian languages, the use of indefinite articles with predicate nouns is sensitive to whether the noun is scalar or not. According to Delsing (1993:33), the plural indefinite article in Scandinavian is used in "descriptive predicative NPs" (e.g. *idiots*) but not in "classifying" ones (e.g. *medical doctors*): [48]

(125) a.   Per-Erik   och   Anna   är   (*ena)   läkare.   Delsing 1993:33, ex. (22a)
            Per-Erik   and   Anna   are   a-PL   doctors
            Per-Erik and Anna are doctors.

      b.   Pelle och Lisa   är   *(ena)   idioter.   Delsing 1993:34, ex. (24a)
            Pelle and Lisa   are   a-PL   idiots
            Pelle and Lisa are idiots.

The scalarity of the head noun is not the determining factor in the appearance of the plural indefinite article. Other scalarity-inducing environments, such as the presence of an evaluative adjective, also require the indefinite article ((28) from Bennis et al. 1998:100):

(126) a.   Lisa   och   Kalle   är   riktiga   doktorer.
            Lisa   and   Kalle   are   real   doctors

      b.   ?Lisa   och   Kalle   är   ena   riktiga   doktorer.
            Lisa   and   Kalle   are   Indef-pl   real   doctors

---

[48] Unfortunately, most examples of "classifying predicates" that Delsing gives are profession names, which cross-linguistically can lose an indefinite article in the predicate position, e.g. in French. However, the indefinite singular article also appears with scalar mass nouns, as in (128b) below, showing that the Scandinavian indefinite article is indeed sensitive to scalarity.

In both examples (126) the predicate can be translated as *real doctors*. There is, however, a slight difference in meaning. In (126b), *real* is interpreted as a degree adjective (as in *real fool*), while in (126a) it has the literal meaning of *genuine*.

Recalling the solution we have used for article doubling in German and Northern Swedish, what stops us from saying that the indefinite plural article in Scandinavian is also some sort of a degree operator? There are two reasons against adopting such a hypothesis. First of all, the plural indefinite article itself does not influence the semantics of *real* in (126). Both these meanings are quite common cross-linguistically, in languages both with and without articles, and appear also in VP-adverbs based on the same stem:

(127) a.   Is Stephen Hawking really a genius?   genuinely

b.   He has really impressed a lot of people.   to a high degree

Secondly, the Scandinavian (plural) indefinite article is not optional in the same way the German and Northern Swedish article doubling is, since it cannot be omitted when the predicate is scalar in (125b).

We conclude that the Scandinavian indefinite article is a diagnostic for the presence of a scalar operator rather than a scalar operator itself. This conclusion is supported by the fact that it is obligatory in other scalar contexts, even with mass nouns (Bennis et al. (1998:100), Delsing (1993:35)):

(128) a.   så   stort   et   hus   Delsing 1993:138, ex. (60)
so   big   a   house
so big a house

b.   de   var   ??(ett)   starkt   kaffe   du   lagar
it   was   a   strong   coffee   you made
It was strong coffee that you made!

The data in this section shows that scalar environments exhibit idiosyncratic behavior with respect to the indefinite article.[49] Thus in English, the indefinite singular article is required in adjective fronting constructions, but not in exclamatives, whereas in Dutch, exclamatives require the indefinite singular article even when the head noun is mass or plural. In Scandinavian, nouns

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[49]   Another environment sensitive to the presence of the indefinite singular article is the so-called *N of an N* construction. For the most recent discussion of the syntax of this scalarity-sensitive environment see den Dikken 1995, 1998, Bennis et al. 1998, Español-Echevarría 1997, 1998, Doetjes and Rooryck 2001, and Matushansky 2002.

(even mass nouns) appear with an indefinite article in all scalar environments, with or without overt movement.

The constraint on the presence of an overt article in certain degree modification structures is not semantic, because it seems to be sensitive to the *morphological* resources of a language (an obligatorily singular indefinite article in English, a spurious one in Dutch, and both singular and plural ones in Scandinavian).

4.3.4. Why the article

From the discussion in the previous subsection we conclude that the requirement on the presence of the indefinite article is either phonological or syntactic. In this subsection we will show that to the extent we can make a generalization about this requirement, it is a constraint on xAP pied-piping.

The empirical generalization seems to be that null indefinite articles (Num^0) disallow an xAP in their specifiers, as in (129a). If the xAP does not have to move overtly, as is the case with *such* in (129b) or *less/just as* in (129b), there is no prohibition against bare plurals or mass nouns.

(129) a.   * so/as/too complicated issues/existence
   b.   such complicated issues/existence
   c.   less/just as complicated issues/existence

Suppose that the restriction were syntactic. Assuming that movement is feature-triggered, the obligatory overtness of the article with xAP pied-piping would mean that a feature checked by xAP in [Spec, NumP] cannot be checked when Num^0 is empty. There are two possibilities: this feature can be a feature of the attractee (the xAP or the degree operator) or it can be a feature of Num^0.

We cannot put a stipulative uninterpretable [Num] feature on the xAP, because this would rule out any degree operator raising without xAP pied-piping, predicting that *such* does not exist. An alternative would be to assign [Num] to all xAP pied-piping degree operators. This is simply a restatement of the problem. Worse, it would not work because most obligatorily pied-piping operators can be left in situ under certain conditions, such as modification by *not* for *so*, by *just* for *as*, etc.:

(130) a.   a nearly as important issue
   b.   a not so tough problem

The existence of examples like (130) shows that degree fronting is probably not triggered by a syntactic feature on some degree operators, unless we are willing to postulate a feature that can be checked by either raising to [Spec, NumP] or by merging with a modifier.

Suppose now that Num^0 is responsible for xAP pied-piping. Suppose that Num^0 can bear a stipulative [adjective] feature, which is uninterpretable and thus must be checked by an xAP in [Spec, NumP]. Suppose also that [adjective] can only appear on an overt Num^0. Now what if we have a plural xNP with a null Num^0? The degree operator is attracted, but the xAP does not have to be pied-piped. Why is (131) an impossible underlying structure for (129a)?

(131) *

```
          NumP
         /    \
      DegP     Num'
     / \      /    \
   so  Num^0      NP
        |        /   \
      ø-pl  AP        NP
           /   \       issues
        t_DegP  A'
                |
                A^0
                |
            complicated
```
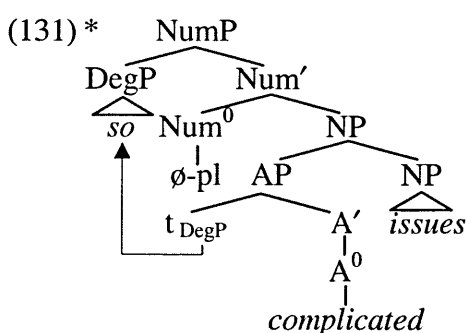
To rule out (131) we need to stipulate another feature, call it [xAP], this time on the degree operator itself, to force this degree operator to appear next to the xAP it semantically combines with. If Num^0 is specified [adjective], then the xAP is attracted alongside the degree operator and [xAP] is checked. In other words, to rule out (131) we need two features, one highly suspicious from the theoretical point of view, and a stipulation about feature specification of null indefinite articles.

Let us now consider the problem from a different angle. We know that *such* and *what* must front, so null indefinite articles presumably can host a degree operator but not the pied-piped adjective. We propose that the restriction is a low-level phono-syntactic one: a null article can only contain a functionally light XP in its specifier. An example of the same constraint is the ability of English light main verbs *have* and *be* to raise to I^0, which more contentful verbs cannot do.

We emphasize again that there is nothing deep about this constraint. In a sense, it strongly resembles Bolinger's (1972) proposal that degree fronting is conditioned by prosody. According to to Bolinger, English dislikes the stress pattern (two consecutive unstressed syllables) emerging in sequences like (132a), which are then strongly dispreferred, unless remedied by an intervener, as in (132b):

(132) a. * an as interesting proposal

b.   a just as interesting proposal

A major problem with this proposal is that it cannot explain why adjective fronting should be sensitive to the presence of a degree operator.[50] It may of course be incidental that only degree operators create a stress clash, given that they are generally shorter than say, manner adverbs, but short manner adverbs, like *fast*, do not trigger xAP fronting, and neither do short degree adverbs, like *very*:

(133) a. * fast moving a car

b.   * very charming a boy

Even reducing our inquiry to obligatory degree fronting (with or without xAP pied-piping), we still cannot view prosody as a *trigger* for the movement, because obligatorily fronting degree operators can in fact be stressed, especially contrastively:

(134) a.   The story is not less interesting, it is AS interesing.

b.   You can't be TOO rich!

Perhaps degree operators cannot be stressed inside attributive xAPs? Examples (135) show that some degree operators in the DP-internal position can be contrastively stressed.

(135) a.   I want a LESS expensive novel this time.

b.   Who would want a MORE life-threatening injury?

So what rules out stressing *as* or *so* and leaving the entire xAP in-situ? A possible answer may come from the interaction between pragmatics and prosody. Note that DP-peripheral xAPs are not informationally neutral: those degree operators that cannot remain DP-internal under any circumstances (*that, this, how, what* and *such*) are either emphatic (evaluative) or interrogative.

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[50] To be sure, the identifier *such* below is not scalar and nonetheless appears before the indefinite article.

(i)   No one has seen such a creature before.

It may be that degree fronting is a special case of a larger generalization, but we do not see it at this point. An indication that this way of thinking may be productive comes from the "prototype/kind" interpretation associated with scalarity coercion and the fact that in concealed exclamatives, "kind" can sometimes take on the meaning of "much" (Irene Heim, p.c.):

(i)   I'm amazed at the books she reads.

(ii)   I don't have that kind of money!

We conclude that, although degree fronting is sensitive to phonology (the impossibility of xAP pied-piping when Num^0 is null), prosody is not the reason why it happens. We leave the mystery of triggers of overt degree fronting as a topic for future research.

4.3.5. NumP or else

We can now examine the evidence for the target position of degree fronting being [Spec, NumP]. We have shown that on the one hand, any other functional projection disallows degree fronting; on the other hand, overtness of Num^0 determines whether xAP pied-piping is possible.

The fact that overtness of NumP influences the availability of degree fronting with xAP pied-piping does not strictly speaking prove that [Spec, NumP] is the target position of degree fronting. Alternatively (see Kennedy & Merchant 2000), [Spec, NumP] is merely a way station towards another DP-internal position, a specifier of a head sometimes pronounced as *of.* Under either hypothesis, NumP is the projection responsible for the syntactic properties of degree fronting.

4.3.6. Summary

Contrary to Bresnan (1973) and Delsing (1993), degree modification and degree fronting can occur in positions other than predicative ones. The real constraint is that degree fronting only happens in indefinites. When the xAP is pied-piped after the degree operator, the constraint is even stronger – there has to be an overt indefinite article present. We have argued that this latter restriction cannot be semantic or have anything to do with features triggering the movement, and hypothesized that a null Num^0 cannot attract "heavy" items. When a degree quantifier pied-pipes the adjective, the xAP is too "heavy" to raise to the specifier of a phonologically empty Num^0.

This speculation, however, does not explain why degree fronting does not occur with the overt *definite* article. This is the question we will address in the next chapter.

CHAPTER 5

THE SCOPE OF DEGREE OPERATORS

As discussed in section 2.3.4, degree operators cannot be interpreted in their surface/base position inside the xAP. In order to be interpretable, they have to raise and adjoin to a $\langle t \rangle$-type node. In this chapter we will show that the availability of degree fronting only in indefinite (or more precisely, non-specific indefinite) xNPs follows from our idea that fronted degree operators are necessarily interpreted at a clausal level.

5.1.   Non-indefinite degree fronting

The observation that xAP pied-piping is possible only if Num^0 is overt says nothing about why examples like (136) are impossible:

(136) a.   * as interesting the/every story (cf. ✓ *as interesting a story*)

       b.   * the/every as interesting story

Overt movement of the operator is a factor, as shown by the relative felicity of the same examples when the xAP is not excluded from the low position in (137a) or when the operator doesn't have to front, as in (137b).

(137) a.   the/?? every just as interesting story

       b.   the/every more interesting story

The fact that *what* and *such* also cannot occur with non-indefinite determiners shows that this problem has nothing to do with pied-piping:

(138) a.   * such/what the interesting story (cf. ✓ *such/what an interesting story*)

       b.   * the such/what interesting story

The ungrammaticality of examples like (136) is due to the necessity for degree operators such as *so* or *as* to front. While (136a) could have been ruled out by postulating that a non-indefinite D^0 does not have the feature to attract the degree operator (i.e. (136a) could have been bad because the movement is not triggered), (136b) shows that there is an actual necessity for the degree operator to front. We can show that the requirement is for the degree operator to raise to the DP-periphery rather than to [Spec, NumP].

If *such* and *what* could say in situ, examples like (139a) would have been grammatical. Given that they are not, it is reasonable to assume that *such* and *what* raise to [Spec, NumP] even where the result is string vacuous, as in (139b):

(139) a.   * such difficult a problem

     b.   such difficult problems

Suppose non-indefinite DPs also contain a null Num^0 and the requirement on a fronting degree operator is to raise to [Spec, NumP] (rather than to the DP-periphery). Then examples like (138b) should have been grammatical under the following analysis:

(140) *
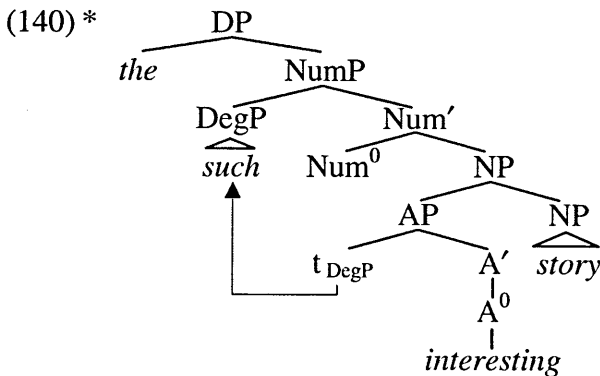
A brute force solution would be to say that NumP is not projected in non-indefinites or the feature attracting degree operators to its Spec is not present. But if NumP is not present in some DPs, does it mean that these DPs do not have any semantic number? This would seem unlikely. We then have to say that number is not encoded on Num^0, and this in turn means that Num^0 does not have any easily identifiable semantics. In other words, if we try to attribute the impossibility of degree fronting in non-indefinites to some property of Num^0 in non-indefinites, we would in fact deprive Num^0 of any syntactic and semantic content whatsoever. We would just be saying that the degree operator is raised to some position in indefinites, but not in other DPs.

We have a better solution, however. We have proposed that degree fronting is the first step of successive cyclic movement of the degree operator to a position where it would take clausal scope. Now we will argue that what is ruled out in non-indefinites is movement of the degree operator out of the DP.

5.1.1.   DP-internal degree scope

The semantics of degree operators is such that they cannot be interpreted in situ and have to raise to a node of the type $\langle t \rangle$. So far we have confined our discussion to degree QR to a clausal level

(i.e. a CP or a vP). However, since we want to claim that degree operators cannot QR out of definite DPs, we better make sure there is a ⟨t⟩-type node inside the DP, or we would end up with an uninterpretable structure! The reason why we need a ⟨t⟩-type node inside the DP is because there are cases where clausal scope of a DP-internal degree operator can be shown to be ruled out (such as *the more interesting book*), and nevertheless such DPs are interpretable.

In fact the existence of such a node has been independently argued for, in order to obtain certain interpretations of DP-internal quantified DPs. Consider examples like (141), from Heim & Kratzer (1998:221):

(141) No student from a/any foreign country was admitted.

The most natural interpretation of (141) is with the existential quantifier in the scope of the negative existential one, i.e. *no student from any foreign country was admitted* (the only possible reading for the NPI *any*). Heim & Kratzer (1998) demonstrate that this meaning cannot be obtained by adjunction to a IP (or to any node other than the DP in which the two quantifiers are contained). The problem is that under the standard analysis, DPs do not contain a proposition (i.e. a type ⟨t⟩ node) inside them, because they do not contain a subject position.

Indeed, consider the semantics of a DP like *a linguist*. The noun *linguist* has the semantic type ⟨e, t⟩. When it is combined with the existential quantifier *a* (semantic type ⟨⟨e, t⟩, ⟨⟨e, t⟩, t⟩⟩), the resulting NP has the usual generalized quantifier type ⟨⟨e, t⟩, t⟩, and needs to either be in the subject position of a predicate (type ⟨e, t⟩) or to move to a node of the type ⟨t⟩. Suppose there was a subject position inside the DP. Then the *e* variable slot would be filled by it, and the quantifier *a* would not be able to apply, because its semantics requires it to combine with a predicate of the type ⟨e, t⟩. So how can we interpret a quantifier inside a DP?

There are two possible solutions to this problem. One is to use flexible types: the meaning of a quantifier can change so that it would be able to combine with a predicate rather than with a proposition. However, type-shifting is too powerful a tool and eliminates all need for QR (which we have independent syntactic evidence for). The other possibility is to postulate some clausal structure in a DP: (141) is then interpreted in the same manner as (142). Following Heim & Kratzer, we opt for the latter.

(142) No person who is a student from some foreign country or other was admitted.

As mentioned above, if we just introduced a subject position DP-internally, then we would get a proposition, when what we eventually want to end up with is a generalized quantifier (or its

trace, of the type $\langle e \rangle$). Heim and Kratzer propose that the covert DP-subject position is filled by a semantically vacuous DP, which they refer to as PRO:[51]

(143)

$$
\begin{array}{c}
\text{NP} \\
\nearrow \quad \searrow \\
\text{PRO} \qquad \text{NP}_{\langle e, t \rangle} \\
\qquad \nearrow \quad \searrow \\
\text{NP}_{\langle e, t \rangle} \qquad \text{PP}_{\langle e, t \rangle} \\
\text{student} \quad \text{P}^0 \qquad \text{DP} \\
\qquad | \qquad \overline{} \\
\text{from } a \text{ foreign country}
\end{array}
$$
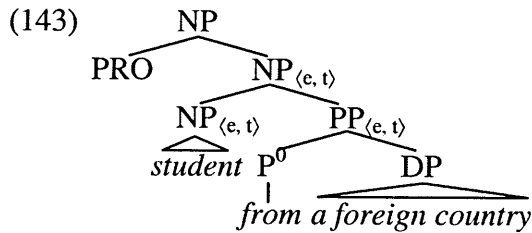
Under the stipulation that PRO is semantically vacuous, the semantic type of the xNP in (143) is still $\langle e, t \rangle$. However, Heim and Kratzer also assume that if PRO moves, it leaves behind a trace of the type $\langle e \rangle$. The corresponding NP node (indicated by an arrow in (144)) then becomes a possible adjunction site for a quantifier:

(144)

$$
\begin{array}{c}
\text{DP}_{\langle\langle e, t \rangle, t \rangle} \\
\text{no} \qquad \langle e, t \rangle \qquad\qquad\qquad \text{possible quantifier adjunction site} \\
\text{PRO}_x \qquad \langle e, t \rangle \\
\lambda x \in D_e \qquad \langle t \rangle \\
\text{DP} \qquad \langle e, t \rangle \\
a \text{ foreign country} \quad \lambda y \in D_e \quad \text{NP}_{\langle t \rangle} \\
x \qquad \text{NP}_{\langle e, t \rangle} \\
\text{NP} \qquad \text{PP}_{\langle e, t \rangle} \\
\text{student} \quad \text{P}^0 \qquad y \\
| \\
\text{from}
\end{array}
$$
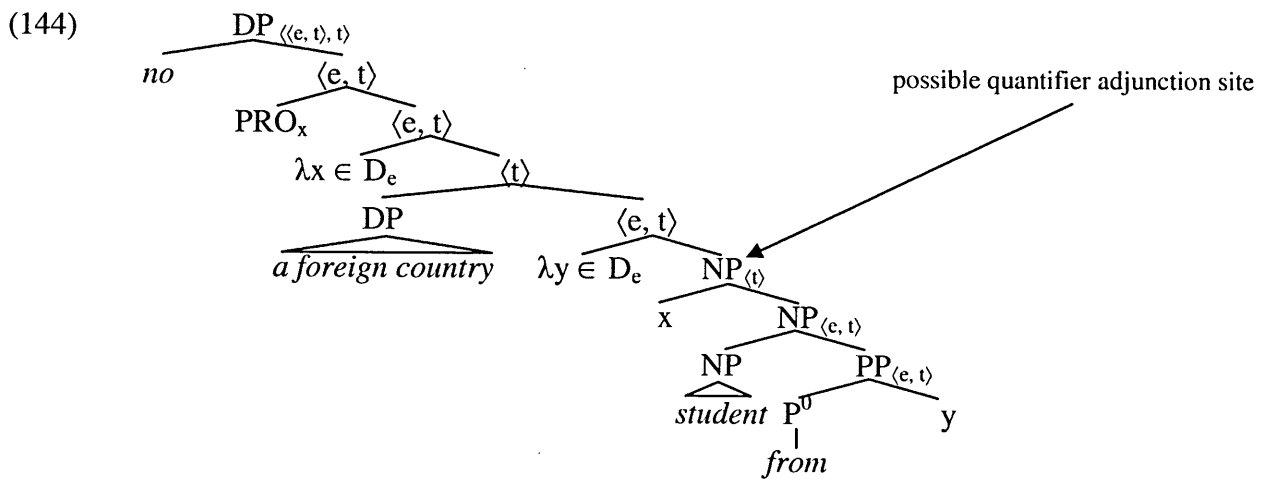
The same technique can be used to interpret degree quantifiers DP-internally. If we assume that a DP contains a PRO subject position, a degree operator can be adjoined to a position above it:

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[51] The relation between this PRO and the one in control structures will be left unspecified.

(145)

$$
\begin{array}{l}
\text{DP}_{\langle\langle e,\, t\rangle,\, t\rangle} \\
\quad \text{D}^0 \quad \langle e,\, t\rangle \\
\quad \mid \\
\quad \textit{the} \quad \text{PRO}_x \quad \langle e,\, t\rangle \\
\qquad\qquad \lambda x \in \text{D}_e \quad \langle t\rangle \\
\qquad\qquad\qquad \text{DegP} \quad \langle d,\, t\rangle \\
\qquad\qquad\qquad \textit{more than this} \; \lambda d \in \text{D}_d \quad \text{NP}_{\langle t\rangle} \\
\qquad\qquad\qquad\qquad\qquad x \quad \langle e,\, t\rangle \\
\qquad\qquad\qquad\qquad\qquad \text{AP}_{\langle e,\, t\rangle} \quad \text{NP}_{\langle e,\, t\rangle} \\
\qquad\qquad\qquad\qquad\qquad \textit{d-dangerous} \quad \textit{road}
\end{array}
$$
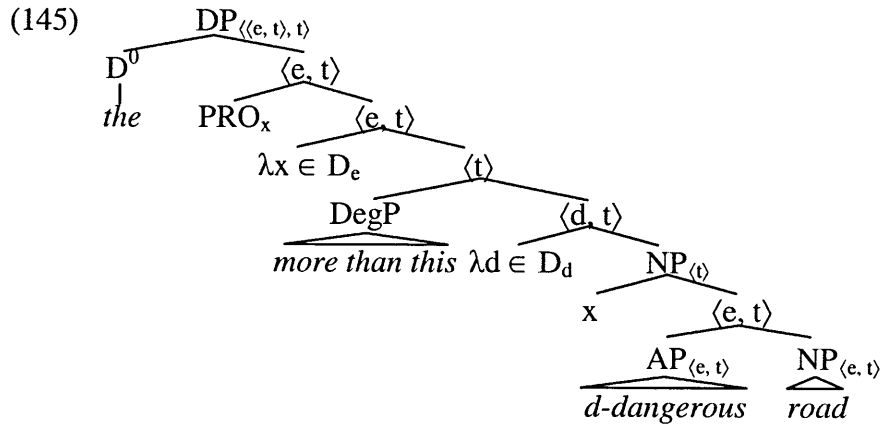
If a DP-internal landing site is available for a degree operator, then it does not have to be interpreted at a clausal level and thus does not have to raise out of the DP. Under the assumption that the DP-peripheral position ([Spec, NumP]) is the intermediate landing site for degree QR to a clausal level, when a degree operator is interpreted DP-internally, it cannot show up DP-peripherally.

If we can show that in non-indefinites degree operators must be interpreted DP-internally, then we will have explained why they never appear on the left periphery of a non-indefinite DP: a degree operator cannot appear in the intermediate landing site unless it is on its way to a higher position. However, before we can raise this question we need to see that the addition of another landing site for degree QR DP-internally has not made redundant the existence of a clausal-level scope position.

5.1.2. Degree scope in indefinite xNPs

When a degree operator is contained in a non-specific indefinite xNP, the truth conditions come out the same irrespective of whether the degree operator is interpreted DP-internally or at the clausal level:

(146) The Cyclops ate a tastier man than Ulysses.

a. $\exists x \in \text{D}_e : \max \{d : x \text{ is a } d\text{-tasty man}\} > d_U$. the Cyclops ate x   DP-internal

b. $\max \{d : \exists x \in \text{D}_e : x \text{ is a } d\text{-tasty man}$. the Cyclops ate x $\} > d_U$ clausal

(146a) means that there was a man x such that the maximal degree to which x is tasty exceeds the degree of tastiness of Ulysses and the Cyclops ate this man x (i.e. some man that the Cyclops ate was tastier than Ulysses). (146b) means that the maximal degree d such that there exists a man x such that x is tasty to that degree and the Cyclops ate x, is higher than the degree

of tastiness of Ulysses. There is no difference in the truth conditions of (146a) and (146b), since both are true when there exists some man that the Cyclops ate and the degree of tastiness associated with this man is higher than the degree of tastiness of Ulysses.

However, Heim (2001) shows that scope interaction between *more* and *as* and monotone quantifiers always results in identical truth conditions. This possible confound should disappear if we use *less*:

(147) The Cyclops ate a less tasty man than Ulysses.

    a. $\exists x \in D_e : \max \{d : x \text{ is a d-tasty man}\} < d_U$. the Cyclops ate x   DP-internal

    b. $\max \{d : \exists x \in D_e : x \text{ is a d-tasty man}$. the Cyclops ate x $\} < d_U$ clausal

(147a) means that there was a man x such that the maximal degree to which x is tasty is lower than the degree of tastiness of Ulysses and the Cyclops ate this man x (i.e. some man that the Cyclops ate was tastier than Ulysses). In other words, (147a) means that the Cyclops ate a man who was less tasty than Ulysses. On the other hand, (147b) means that the maximal degree d such that there exists a man x such that x is tasty to that degree and the Cyclops ate x, is lower than the degree of tastiness of Ulysses, i.e. that the *most* tasty man that the Cyclops ate was less tasty than Ulysses. The existence of the reading in (147a) demonstrates that DP-internal scope of the degree operator is available.

We have shown that the truth-conditions for the DP-internal scope of a degree operator are stronger than the truth-conditions for the clausal scope of a degree operator. Then how can we show that the interpretation of a degree operator at a clausal level is available? We can ensure a clausal-level interpretation of a comparative or an equative by making sure that the degree clause contains an ellipsis:

(148) a.   Aragorn chose a more dangerous road than Gandalf.

    b.   Aragorn chose a more dangerous road than max $\{\lambda d'$. Gandalf ~~chose a d′ dangerous road~~$\}$

Degree clauses involve movement of a null operator to the clausal level. Because ellipsis resolution requires parallelism, we need to assume that the main clause also involves movement of a degree operator to a clausal level. The main clause vP will then be t_i *chose a d-dangerous road* and can be used as an antecedent for the vP in the degree clause. Note that the degree operator can still be pronounced DP-internally, as in (148).

Now, can the fronted degree operator in an example like (149) have DP internal scope? In other words, can the degree operator raised to the left periphery of the DP and then reconstruct?

(149) more charming a doctor than Dr. John

Unfortunately, from the syntactic point of view, we can do nothing to ensure that a degree operator inside an indefinite xNP is interpreted DP-internally, and since the two interpretations are truth-conditionally identical, we cannot distinguish them on semantic grounds. However, we will shortly see some circumstantial support for the connection between degree fronting and DP-external interpretation of degree operators, based on the behavior of degree operators in non-indefinite DPs.

5.2.   Scope interactions of degree operators

As discussed above, only non-specific indefinite xNPs allow degree fronting. We will argue that this constraint is due to the independently motivated generalization governing extraction of degree operators out of quantified DPs (Beck 2000).

5.2.1.   Strong determiners

Bolinger (1972) and Bresnan (1973), among others, claim that only non-specific indefinite xNPs can contain degree operators. However, there exists a class of immediately evident exceptions to this general claim: superlatives, which must be definite, and definite comparatives (which are interpreted as superlatives):

(150) a.   Gertrude first married **the better** of the two brothers.

b.   When in love with both members of a couple, choose **the smarter** one.

Beil (1997) gives a principled explanation for the effect observed by Bolinger (1972) and Bresnan (1973) and provides the class of environments where it vanishes. Though comparatives are generally ungrammatical in quantified DPs, as in (151a), we find no such restriction when the comparison set is contextually salient, as in (151b):

(151) a.   Sue bought a car. *George bought every faster car.   Beil (1997), ex. (8)

b.   Of those cars, Sue bought one. George bought every faster car.   Beil (1997), ex. (7)

Beil attributes the ungrammaticality of (151a) to presupposition failure. Strong quantifiers such as *every* or *the* always presuppose their domain. When we utter *The students voted for the best movie*, we presuppose the contextual domain of students (e.g. *MIT linguistics students* or *students of MIT*) and the domain of relevant movies (e.g. those shown at the local movie theater). Once the domains are specified or clear from the context, strong determiners become felicitous:

(152) a.   Frank bought Earth because **every** better planet was already sold.

   b.   After the fiasco with the Death Star, they should have switched to **some** less lethal
         weapon.

Other degree operators also show a certain reluctance to appear in quantified DPs, but even obligatorily fronting degree operators such as *too* and *as* can appear in definite DPs. Importantly, obligatorily fronting degree operators can do so only under the same conditions under which they can remain DP-internal in indefinite xNPs – i.e. when they are modified by *not*, *nearly*, etc.:

(153) a.   **The *(not) too** overly possessive Russian pronouns.[52]

   b.   Many bioethicists have begun to invoke **the *(nearly) as** chilling "duty to die" rather
         than decrying Kevorkian's ideas.[53]

Examples (153) show that a degree operator can appear in situ inside a non-indefinite DP only if they can appear in situ in the corresponding indefinite xNP. Under our hypothesis that the DP-peripheral position is indicative of clausal-level interpretation, this means that degree operators inside a non-indefinite DP are obligatorily interpreted DP-internally. Strikingly, the same conclusion has been reached by Beck (2000) for totally independent reasons.

5.2.2.   Degree operators and other quantifiers

Obligatorily fronting degree operators, such as *how* (with xAP pied-piping) or *such* (without xAP pied-piping), are ungrammatical with strong determiners:[54]

(154) a.   *the how interesting book/how interesting the book

   b.   *the such interesting book/such the interesting book

Unlike for xAP pied-piping, the overtness of the movement is not the issue here. Lerner (1992, 1993) and Lerner & Pinkal (1995) (as cited by Beck 2000, who notes that the constraint extends to DPs containing *different*) claim that strong determiners block (LF) movement of DP-internal degree operators to a clausal level. To see that this is indeed the case, compare (155a), Beck's (24b), and the minimally different (155b):

(155) a.   *Charles solved every harder problem/most harder problems than Emily.

   b.   ?Charles solved every harder problem/most harder problems than this one.

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[52]   The grammatical ex. is from *http://www.departments.bucknell.edu/russian/language/possess.html*.

[53]   The grammatical example is from *http://www.feministsforlife.org/taf/1999/summer/eutdisab.htm*.

[54]   The identifier reading of *such* is possible in e.g. *Every such idea should be recorded.*

The degree clause in (155a) is an ellipsis site. Assuming that degree clauses are interpreted by raising a null degree operator to [Spec, CP] (cf. Bresnan (1972) and much subsequent work), in order to ensure parallelism between the main clause and the degree clause, the degree operator in the main clause must raise out of the DP. No such requirement is placed on (155b), where the only thing restored is the predicate *d'-hard problem*:

(156) a.   ...than max { $\lambda d'$. Emily ~~solved every d'-hard problem~~}

b.   ... than max {$\lambda d'$. this one ~~d'-hard problem~~}

In (156b) the degree operator is interpreted DP-internally, while in (156a) it is interpreted at the clausal level. Why is (156a) impossible? Two explanations are likely: that (156a) has no interpretation (semantic) or that the QR of a degree operator to the clausal level in (156a) is blocked (syntactic).

From the semantic point of view, the quantified DP containing a comparative operator in (155a) is perfectly interpretable (Beck's ex. (24c)):

(157) The maximal degree d such that every problem that Charles solved was d-hard is greater
than the maximal degree d' such that every problem Emily solved was d'-hard.

(155a) should mean that the easiest problem that Charles solved was more difficult than the easiest problem that Emily solved. The ungrammaticality of (155a) is then not due to the absence of interpretation.

From Beck's point of view, the problem with (155a) is that the ellipsis in the degree clause requires the comparative operator to move out of the DP, but it cannot cross over a strong D^0. We have changed the generalization slightly to include other degree operators:

> **IV.   Beck's Generalization:**
>
> A degree operator cannot be contained in an NP headed by a quantificational determiner if it needs to take scope over the determiner.

In other words, degree operators cannot outscope quantificational determiners.[55] But if they cannot, it is impossible for the degree operator to ever appear on the left periphery of the DP, which is why there is no degree fronting in any DPs except indefinites.

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[55] Superlatives are exempt from this generalization, but there are reasons to believe that the definite article in superlatives may be semantically vacuous.

To be sure, it is unclear what is the cause and what is the effect. If degree operators cannot escape quantificational DPs, there is no reason for them to appear on the left periphery of those DPs. Conversely, if degree operators cannot, for some reason, move to the DP-periphery (i.e. to be fronted), they cannot escape the DP and thus be interpreted at the clausal level.

5.2.3.   Kennedy's generalization

The constraint on the unavailability of clausal scope inside quantified DPs strongly resembles the so-called Kennedy's Generalization, as formulated by Heim (2001) following Kennedy (1997):

V.   Kennedy's generalization:

If the scope of a quantificational DP contains the trace of a degree operator, it also contains that degree operator itself.

Kennedy's Generalization says that a degree operator cannot cross over a quantified DP unless this DP itself raises to a scope position higher than the eventual landing site of the degree quantifier under consideration. Consider the interpretation of (158), Heim's (25):

(158) (The frostline is 3 and a half feet deep.) Mary set every post exactly 2 feet deeper than that.

Suppose the comparative operator *exactly 2' -er than that* took scope over *every post*. This would mean that the maximal degree such that every post was set deep to that degree is lower than the frost line by exactly two feet. In other words, the sentence would be true if Mary set just the least deep post exactly 2' below the frost line, but she set the other posts deeper. Intuitively, (158) is false in this case, which means that a degree operator cannot cross over a quantificational DP.

Cases like (155a) violate Kennedy's Generalization because the comparative operator *more* outscopes the quantifier/definite determiner scoping over its trace. In order to ensure parallelism with the ellipsis in the degree clause, the comparative operator needs to move to the clausal level, which under our analysis means that it must move to the DP-periphery and thus cross over the determiner. (159) shows that this violation occurs at the earliest stage of derivation:[56]

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[56] It is not important for us at this point whether the degree clause *than Emily* is merged as a sister of *more* at the base-generation site of *more* or later (as proposed by Bhatt & Pancheva 2002). See section 6.3.

(159) *

DP
├── DegP
│   *more [max { λd′. Emily ~~solved every d′-hard problem~~}]*
└── DP
     ├── λd ∈ D_d
     └── DP
          ├── D⁰
          │ |
          │   *every*
          └── NP
               ├── AP
               │   *d-hard*
               └── NP
                    problem
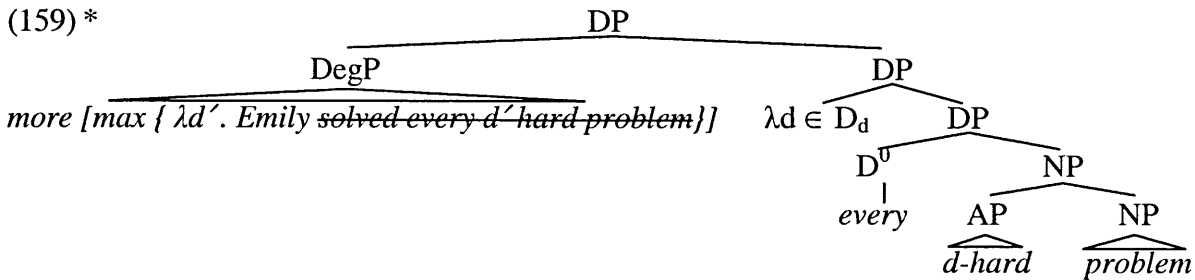
The difference between Beck's Generalization (IV) and Kennedy's Generalization (V) is that Beck's Generalization is about quantifiers/determiners (D^0) and Kennedy's Generalization is about DPs. As both authors note, the missing meanings are not contradictory, redundant or in any way semantically impossible, and therefore, the interplay between the scope of degree quantifiers and nominal quantifiers is probably constrained by syntax rather than semantics.

Neither Beck's Generalization (IV) nor Kennedy's Generalization (V) says anything about relative scopes of degree operators and nominal operators in situ. It is only some post-movement configurations that both Beck's Generalization and Kennedy's Generalization seek to rule out (irrelevant projections omitted):

(160) a.   * DP   Beck's Generalization
       ├── DegP
       └── DP
            ├── Q⁰/D⁰
            └── NP
                 ├── t_DegP
                 └── ...

b.   * XP   Kennedy's Generalization
   ├── DegP
   └── YP
        ├── QP
        └── ZP
             ├── t_DegP
             └── ...
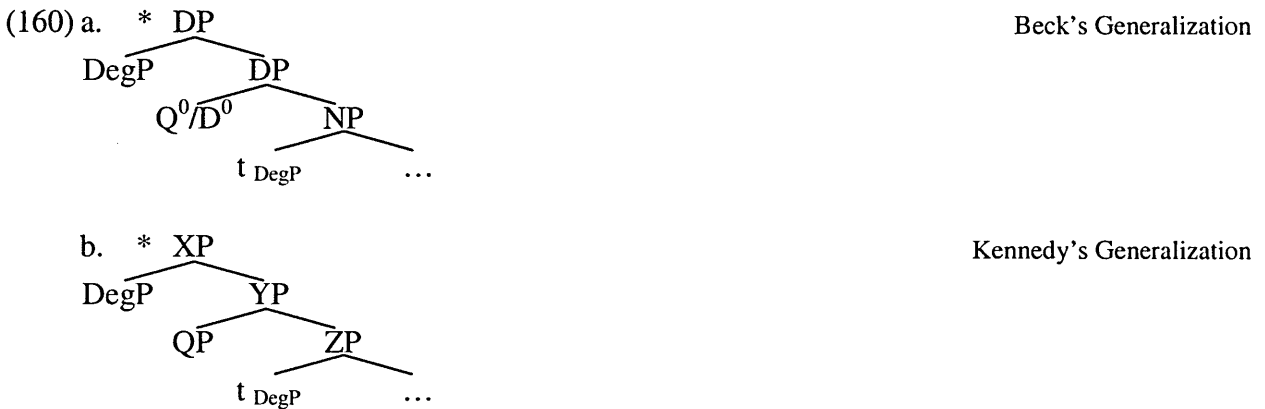
The first apparent difference is the fact that definite DPs do not count as interveners for Kennedy's Generalization while definite determiners do, for Beck's Generalization. Fortunately, this is easy to explain away – since definite DPs are islands for movement, extraction of degree operators out of definite DPs is excluded because any extraction out of definite DPs is.[57] The generalization is then that a degree operator cannot cross over a Q^0 (though it can cross over a trace of QP). Given that it does not seem to matter whether the intervener is a head or a phrase, we conclude that the constraint is most likely related to featural composition.

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[57] Definite islandhood also rules out extraction out of an *every*-DP, but not out of a *some*-DP.

While we do not know what the joint Beck's/Kennedy's generalization is due to, it shows that the unavailability of clausal scope for DP-internal degree operators in quantificational DPs is part of a broader phenomenon and not due to some syntactic constraint on extraction to the left periphery of a quantificational DP. In other words, degree fronting is restricted to non-specific indefinite xNPs because clausal scope of degree operators is constrained by what determiners a degree operator can cross (Beck's Generalization), and the constraint on determiner crossing does not seem to be restricted to extraction out of DPs (Kennedy's Generalization).

However, there exists a crucial difference between Kennedy's Generalization and Beck's Generalization: indefinites are exempt from the latter, but not from the former:

(161) a.   Charles solved a harder problem than Emily.   ✓-$er > a$

      b.   Mary set a post exactly 2′ deeper than that.   *-$er > a$

Suppose the comparative operator *exactly 2′ -er than that* took scope over *a post*. This would mean that the maximal degree such that a post was set deep to that degree is lower than the frost line by exactly two feet. In other words, the sentence should be true if Mary set just the deepest post exactly 2′ below the frost line. As Heim notes, truth conditions for this reading are more stringent than for the reading where the existential quantifier scopes above the comparative operator (and where nothing is said about other posts), and so it is hard to prove that this reading is indeed unavailable in (161b), although intuitively, this is not what (161b) means.

However, there exists a class of counterexamples to Kennedy's Generalization, involving indefinite complements to adjectives of distance such as *close* (Heim 2001, fn. 11). In such cases we can interpret the argument of the adjective to scope below an intensional verb (*de dicto*) and use ellipsis in the degree clause to force the degree operator to raise above the intensional verb:

(162) Mel wants to live closer to an airport than Cindy does.

(162) has an interpretation where what Mel wants is to live a certain distance from an airport (e.g. 10 miles), and this distance happens to be shorter than the distance at which Cindy wants to live away from the airport (say 50 miles). In other words, the degree operator *more* is interpreted above the intensional verb *want*, while the existentially quantified DP *an airport* is interpreted in the scope of this verb.

Suppose that the PP argument of *close* is interpreted *de dicto*, i.e. that the contents of Mel's desire is to live at a certain distance from a non-specific airport. This means that the existential DP *an airport* is interpreted below the intensional verb *want*. However, it cannot be interpreted in situ, because its sister (*close*) is not of the semantic type $\langle e, t \rangle$ (*close* has the semantic type of

$\langle$e, $\langle$d, $\langle$e, t$\rangle\rangle\rangle$. Since its object position is saturated, it has the type $\langle$d, $\langle$e, t$\rangle\rangle$ when it merges with *more*). The object of *close* must therefore raise to some $\langle$t$\rangle$-type node. Whatever the details are, *an airport* definitely raises above the base-generation site of *more* inside the infinitive.

The interpretation of the degree clause in (162) involves raising a null degree operator to its specifier (above *than*). This means that in the degree clause the degree operator scopes above the intensional verb:

(163) a.   ...than max {λd' . Cindy does ~~want to live d'-close to an airport~~.

In order to resolve the ellipsis in this way, we need to have a parallel structure in the main clause, which means that the comparative operator also scopes above *want* in its clause:

(163) b.   [more [than max {λd' . Cindy does ~~want to live d'-close to an airport~~}]] λd . Mel
             wants to live d-close to an airport

In other words, the comparative operator (as well as the null operator in the degree clause) scopes above the intensional verb *want*, while the indefinite xNP *an airport* is interpreted *de dicto*, i.e. below *want*. This means that a degree operator can move higher than the scope position of an indefinite xNP.

Under the assumption that *a* is interpreted as an existential quantifier and must move to be interpretable, (162) is an exception to Kennedy's generalization (V). Note that no other quantifier is permissible there:

(164) Mel wants to live closer to some airport than Cindy does.   *-er > want > some*

Since indefinite xNPs offer exceptions both to Beck's Generalization (IV) and to Kennedy's Generalization (V), the two generalizations may have the same basis. What unifies the two circumstances under which a degree operator can cross over an indefinite existential determiner (degree operator being extracted out of an xNP, as in our case; quantified DP being extracted out of the complement of an adjective of distance, whose degree operator raises over it) a remains a puzzle.

5.2.4.   Interpretability

An alternative explanation of Beck's Generalization, based on the Copy Theory of Movement, may have nothing to do with Kennedy's Generalization. As discussed in Chapter 2 we are assuming the Copy Theory of Movement, under which each trace is a full copy of its antecedent.

Now consider (165), which is a fragment of the DP structure we have proposed for DP-internal interpretation of degree operators in (145):

(165)

$\langle t \rangle$

DegP $\langle d, t \rangle$

more than d_d $\lambda d \in D_d$ $NP_{\langle t \rangle}$

x $\langle e, t \rangle$

$AP_{\langle e, t \rangle}$ $NP_{\langle e, t \rangle}$

d-dangerous   *road*
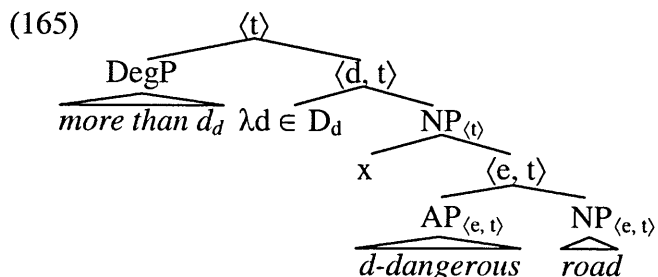
Because the PRO in the subject position of the extended NP has moved out, the NP node in (165) is a possible landing site for degree QR. Suppose PRO had not moved out and the semantic type of the NP node were $\langle e, t \rangle$, rather than $\langle t \rangle$. What would have happened?

(166) $NP_{\langle e, t \rangle}$

PRO $\langle e, t \rangle$

$AP_{\langle e, t \rangle}$ $NP_{\langle e, t \rangle}$

d-dangerous   *road*
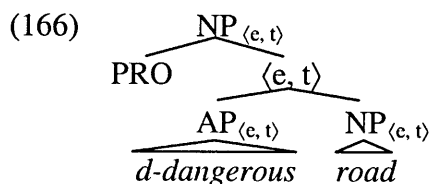
The answer is that if DegP (semantic type $\langle \langle d, t \rangle, t \rangle$ had merged with the NP in (166), the structure would be uninterpretable. The problem would disappear once DegP had reached the position where it would be interpretable, but locally, the merger of a $\langle \langle d, t \rangle, t \rangle$ node and an $\langle e, t \rangle$ node would have resulted in a type clash.

Suppose now that such a type clash causes the derivation to crash — an operator can only QR to a position where it is potentially interpretable (cf. Fox 2000, who argues that successive-cyclic QR is to all (and only) $\langle t \rangle$-type positions, where the operator is potentially interpretable). This means that an attempt to QR a degree operator to a position above the definite article (type $\langle e \rangle$) for definites and specifics or a quantifier (type $\langle \langle e, t \rangle, t \rangle$) would result in a local type clash. Extraction of degree operators out of non-indefinite DPs is thus blocked, even if the degree operator does raise to [Spec, NumP], because it never reaches the DP-periphery and cannot escape. A possible problem with this approach is that [Spec, NumP], where the degree operator lands, is not, strictly speaking, the outermost specifier of the xNP — there is also the landing site of the DP-internal subject (PRO):

(167)   NumP$_{\langle e, t \rangle}$

PRO̶ ‾‾‾‾‾̶$\langle$e, t$\rangle$

λx ∈D̶$_e$ ‾‾‾‾‾$\langle$t$\rangle$

DegP ‾‾‾‾‾$\langle$d, t$\rangle$

more than d$_d$ λd ∈ D$_d$ Num′

Num⁰   NP$_{\langle t \rangle}$

|
a   x $\langle$e, t$\rangle$

AP$_{\langle e, t \rangle}$ NP$_{\langle e, t \rangle}$

d-dangerous   *road*
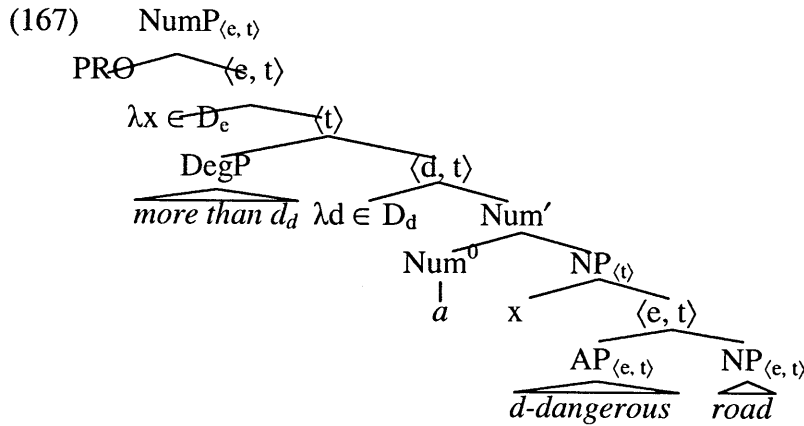
However, this problem is resolved if we assume that all Specs of a particular head have the same status from the point of being or not being at the periphery

It is still unclear why extraction of a degree operator should proceed through an escape hatch, given that in other pied-piping cases (168) the wh-word does not have to (in fact may not) move to the left periphery of the xNP it is base-generated in:

(168) a.   A book about which famous scientist did you read?

b.   *[[Which famous scientist] $_i$ a book about t $_i$] $_j$ did you read t $_j$?

c.   Which famous scientist did you read a book about t $_i$?

We have no explanation for this effect.

5.3.   Position and interpretation

We have shown that non-specific indefinite xNPs differ from other DPs in that they allow a degree operator in them to escape and raise to a clausal level. Since degree fronting is contingent on clausal scope, it is unsurprising that only non-specific indefinite xNPs allow degree fronting. However, what do we say about the DP-internal position of degree operators?

We will argue that a DP-internal position of a degree operator does not necessarily entail that it is interpreted DP-internally. Although a fronted position of a degree operator means that it takes scope outside the DP, the reverse does not hold: a degree operator can take clausal scope and remain DP-internal.

5.3.1.   Default in-situ position

As discussed above, bare plurals, mass nouns and indefinite singular DPs are the only DPs that allow degree fronting (abstracting away from the fact that adjective pied-piping is not possible in bare xNPs):

(169) a.   such incredible stories/such incredible passion/such an incredible story

 b.   what incredible stories/what incredible passion/what an incredible story

Does the PF position of the degree operator (in situ or DP-peripheral) say anything about where it is interpreted at LF? The answer that our theory provides is asymmetric: while the DP-peripheral position indicates a DP-external interpretation, the in-situ position is uninformative about the scope.

This approach is supported by the fact that such semantically similar operators as *more* and *as* behave differently with respect to degree fronting. If the in-situ position of a degree operator were only compatible with a DP-internal scope, (170) would have been ungrammatical:

(170) Loki failed a more difficult task than Thor (did).

As in (155a), the ellipsis in the comparative clause forces the degree quantifier to raise out of the DP to the clausal level. In (170), such clausal scope is grammatical, showing that the degree operator is interpreted at the clausal level – despite its DP-internal position:

(171) [more [max $\{\lambda d' \in D_d . \exists x \in D_e . x$ is a d'-difficult task . Thor failed x]$\}$] ($\lambda d \in D_d . \exists x \in$ $D_c . x$ is a d-difficult task. Loki failed x)

(171) means that the maximal degree such that there exists a task difficult to this degree and Loki failed this task (i.e. the maximum of the set of degrees of difficulty of some task that Loki failed) is higher than the maximal degree such that there exists a task difficult to that degree and Thor failed this task. In simple English, this means that there exists a task that Loki failed and this task is more difficult than every task that Thor failed.

Can we force a DP-internal reading of the degree operator? Not in (170), where the ellipsis in the degree clause forces clausal scope for the comparative in the main clause, but what about (172):

(172) Loki failed a more difficult task than this one.

As we have argued in section 5.1.2, the DP-internal and the clausal readings of *more* cannot be truth-conditionally distinguished. For *less*, the DP-internal reading is in fact the default

one and weaker than its clausal scope reading. Unfortunately, *less* is only fronted in emphatic environments, as in (173), whose exact interpretations and the interaction with other quantifiers and generic operators (as in (173b)) are far from clear:

(173) a.   The less complicated a task you pick, the easier it is to solve it.
      b.   Less complicated a task is difficult to imagine.
      c.   No less important person than Gandhi said so.

To summarize, we can argue on syntactic grounds (parallelism in ellipsis resolution) that a degree operator can raise to a clausal level out of an indefinite xNP, even if it is pronounced in its in-situ position (like *more*). Therefore, the in-situ position is compatible with any scope of the degree operator.

Table 3: Scope, position and definiteness

	DP-internal scope	clausal scope
in-situ	✓indefinites ✓non-indefinites	✓indefinites *non-indefinites
fronted	*indefinites *non-indefinites	✓indefinites *non-indefinites

To conclude, in non-indefinite DP, a degree operator can only have DP-internal scope. In non-specific indefinite xNPs, a degree operator can always have clausal scope. We will assume that if the degree operator is fronted, clausal scope is obligatory.

5.3.2.   Fronting operators

In this subsection we will show that while there is no conclusive evidence that a degree operator in the DP-peripheral position is interpreted as having a clausal scope, there is no evidence against it either. We will consider three types of data: obligatorily fronting operators, whose semantics requires them to have clausal scope; mostly DP-peripheral operators like *as*, whose interpretation provides no clue as to where they are interpreted; and the appearance of these operators in situ.

Assuming that the DP-peripheral position is the escape hatch for QR of a degree operator to the clausal level, we definitely do not expect a degree operator to appear on the left periphery when it is interpreted DP-internally. On the other hand, if a degree operator has clausal scope, as in (170), it does not have to appear on the left periphery.

VI.   Degree fronting and scope:

Degree fronting entails clausal scope.

The degree operators that cannot appear in the in-situ position are either exclamative (*that*, *this* and *what*), or interrogative (*how*).[58] To be interpreted, these operators presumably must have the widest scope (proposition). This fact is certainly compatible with the hypothesis that the DP-peripheral (fronted) position entails scoping above the DP. Even though we do not claim that the DP-peripheral position is a pre-requisite for movement to a clausal level (recall that *more* can be interpreted with a very wide scope and still remain in situ), the correlation is certainly in the right direction.

Does obligatory fronting of such degree operators as *so*, *too* and *as* mean that they cannot be interpreted unless they have clausal scope? The answer is no, since such degree operators can appear in definite DPs, where clausal scope is ruled out:

(174) a.   **The just as** ridiculous personal prejudices of those people who are afraid of them for whatever reason however, sadly make them necessary...[59]

b.   Finally, I want to make it possible for every young American and **every not so young American** who wants to go to college to borrow the money to do it.[60]

c.   Ok, here is **my way too long and utterly boring list of sites** which are far too important in my life for one reason or another.[61]

The fact that adding a modifier permits an otherwise obligatorily fronting degree operator to stay inside a DP argues against the hypothesis that obligatorily fronting degree operators are only interpretable DP-peripherally. But when there is a choice between the in-situ position and the DP-peripheral one, as in the case of *just as*, does the in-situ position rule out clausal scope? Can *just as* in situ co-occur with an elliptical degree clause, where the parallelism requirement would force the equative operator to have a clausal scope?

(175) a.   [?]Ellie made a just as interesting discovery as Tom did.

---

[58] The degree operator *such* cannot appear in situ either, but, first of all, it can be viewed as exclamative in some sense and secondly, it may be a spell-out variant of *so* (which can remain in-situ).

[59] *http://www.loneweb.net/Critter_Holler/lessons.htm.*

[60] *http://www.ibiblio.org/pub/docs/speeches/clinton.dir/c32.txt.*

[61] *http://www.eskimo.com/~strange/sitelist.html.*

b.   Ellie made just as interesting a discovery as Tom did.

The minor contrast in (175) does not argue for the unavailability of clausal scope for the in-situ position of *just as*, because the presence of any degree clause makes the in-situ position of *just as* infelicitous:

(175) c.   ??Ellie made a just as interesting discovery as this one.

We conclude that the surface position of a degree operator tells us precious little about its interpretation. On the one hand, the in-situ position of a degree operator is certainly compatible with it having clausal scope, as is the case with *more*, but on the other hand, the DP-peripheral position of a degree operator is truth-conditionally indistinct from its DP-internal position.

Our proposal that the DP-peripheral position is a diagnostic for clausal scope explains the correlation between obligatory clausal interpretation of exclamatives and interrogatives and their obligatory fronting, as well as the impossibility of degree fronting in non-indefinite DPs, but we cannot provide any semantic evidence that DP-peripheral degree operators must scope outside the DP. Since the in-situ and the clausal scope of a monotone degree operator have identical truth-conditions, we cannot check whether a fronting operator like *as* can be interpreted below its surface position. However, the correlation between the necessity for certain operators (e.g. the unmodified *as*) to front and their inability to appear in definite DPs (where clausal scope is ruled out) is highly suggestive.

5.3.3.   Position at PF

The difference between the behavior of *as* and *just as* leaves us with two options: one is to say that for some obscure reason *as* must have clausal scope and the addition of *just* removes this reason; the other is to say that *as* (and other fronting operators) and *just as* (and other in situ operators) have exactly identical interpretational possibilities, and the actual surface position of the operator (and the adjective it modifies) is due to some other factor. Bolinger (1972) argues that prosody is this factor, while Corver (1993) suggests that English has a ban on a sequence of two functional elements.

Bolinger's approach relies on the fact that English dislikes an immediate succession of two or more accents. Fronting an xAP containing a monosyllabic adjective then prevents having a sequence of three main stresses, which happens quite often, given that English nouns are usually stressed on the first syllable (examples and judgments from Bolinger (1972:138)):

(176) a.   *He's a tóo ódd mán.

   b.   ?He's a tóo unúsual mán.

   c.   It was a tóo unhéard-of propósal.

   d.   *He's tóo an ódd mán.

   e.   He's tóo ódd a mán.

As Bolinger himself notes, prosody can explain the contrast in acceptability between *rather difficult* and ?*rather hard*, but it obviously has little to say about why there should be a contrast between the monosyllabic *too* and the monosyllabic *less*. If Auden can say *the day of your death was a cold cold day*, succession of stresses is not the only factor determining the surface position of *as*, *so* and *too*. Finally, Bolinger's approach has nothing to say about why xAPs modified by *more* or *just as*, which are allowed in situ, can occasionally front. In other words, prosody cannot possibly be the trigger for degree fronting, though it is not impossible that, all other things being equal, prosody could rule out an in-situ position for a particular combination of a degree operator and an adjective, especially if clausal scope (and thus the possibility of degree fronting) will not result in a truth-conditionally identical meaning. It is likely, however, that the in-situ position can have a slightly different pragmatics from the point of view of discourse saliency, which would also influence the acceptability of a given degree-containing xAP in the base position.

Corver's analysis, also cannot explain the behavior of obligatorily fronting operators in non-indefinite DPs:

(177) a.   another *(just) as interesting problem

   b.   every *(not) so interesting problem

In non-indefinite DPs clausal scope is unavailable for degree operators. Why can't such degree operators as *so* and *as* be interpreted DP-internally? We claim that this is because they must have clausal scope. Corver's analysis necessarily relies on a stipulatory sub-division of functional elements into those that permit a degree operator to stay inside the DP, as in (177), and those that force it to raise, as in (178):

(178) **The more interesting a problem** you choose, the more interesting will be the solution.

It should be noted that Bolinger's prosodic approach is also in trouble here, because while *a* could possibly be viewed as a phonologically weak element with quirky properties, it is difficult to claim the same for *another* or *every*.

Worse still for Corver, most functional elements that combine with degree operators allow both the high and the low position for the xAP:

(179) Note that, in normalized performance terms, assuming **a twice as fast disk** is exactly
equivalent to assuming **a twice as slow CPU**. <...> Going the other direction, along with
the technology trends, we can look at the next lower line to see the performance of a
system with twice **as fast a processor** relative to its disk.[62]

The exclamative/interrogative *how*, which can only have clausal scope, cannot be lowered
no matter what functional material is added to it. Neither Bolinger's nor Corver's approach can
explain why an item like *just* allows the equative operator *as* to stay in its low position but fails
to do the same for *how*:

(180) (no matter) (*a) just how interesting *(a) problem...

Finally, coordination can force a normally low degree operator, such as the synthetic *-er*, to
a high position, as in (181a), but it cannot force an obligatorily raising degree operator, such as
so, to appear in the low position (unless we add a modifier that allows it to stay in situ, as in
(74b), repeated below as (181b)):

(181) a.   I am now older, and wiser, and hopefully **more careful a cruising sailor**.[63]

   b.   I could invent **this very long and *(not) so interesting story** about the ancient
          meanings of those words but how about I tell you the truth.[64]

This major asymmetry dovetails with the fact that while there are functional elements such
as the comparative correlative *the* that can force degree fronting, there are no comparable items
that can force the low position for a degree operator.

Because in non-specific indefinite xNPs the low and the high positions of a degree
quantifier cannot be distinguished by the interpretation, the assumption that obligatorily fronting
quantifiers such *as* and *so* must raise to the clausal level captures the facts correctly without
noticeable side effects. On the other hand, *less* or *more* can have clausal scope without being
fronted, which means that a degree operator does not have to be fronted to have clausal scope.

To recap, we have not been able to uncover any immediately obvious factors that would
determine whether a degree operator with clausal scope fronts overtly. The semantics of a given
degree operator is clearly not a factor, given that the same operator may change its position with
the addition of a modifier like *nearly*. The phonological shape of all degree operators is nearly

identical, and just phonology would not be able to explain why such degree operators as *too* or *as* cannot appear inside a non-indefinite DP, whatever the phonological shape of the determiner. Finally, from the syntactic point of view, we would need a cluster of features on both the degree operator and Num^0 to lexically distinguish fronting degree operators from non-fronting ones (i.e. basically stipulating the pattern) and even then we would not be able to explain why adding a modifier can change the behavior of a given degree operator.

It is possible that there is an additional factor such as the emphatic nature of some degree operators that we are not taking into consideration, and we need to introduce another factor into our account. In other words, the motivation for overt degree fronting is still a topic for future research.

CHAPTER 6

RIGHT EXTRAPOSITION

In this chapter we will examine cases of right extraposition of xAPs containing a degree operator. We will argue that such cases need to be distinguished from right extraposition triggered by the presence of a complement (right-branching structure). We will analyze them as QR to the position where a degree operator can be interpreted DP-internally argued for in section 5.1. This analysis explains why the right extraposition happens at all and why degree operators pattern with other scope-bearing elements in this respect. We will use our analysis to explain why pre-nominal and DP-peripheral degree operators can license their argument on the right periphery of the DP (*a more interesting book than this*).

The emerging picture of right extraposition bears remarkable similarity to the successive-cyclic theory of extraction out of the vP, developed by Nissenbaum (2000), in particular in what concerns the similarities between degree right extraposition and Heavy NP Shift.

6.1. Degree right extraposition

In section 5.1 we have argued that degree operators can be interpreted DP-internally. Does this interpretation correspond to a change in the PF-position of the operator? We do not necessarily expect this, given that clausal scope does not imply movement to the left periphery of the DP, even though we have argued that such movement is obligatory. In (182) below, the comparative operator *less* can be interpreted above the intentional verb *is required*, but the QR of *less* to this position remains covert:

(182) Brule is required to handle less dangerous missions than Trigger.

The existence of another DP-internal position that can be occupied by an xAP on the right edge, exemplified in (183) raises the question of how this position correlates with the interpretation of degree operators:

(183) a.   **as simple** a matter **as that**

b.   a matter **as simple as that**

We know that degree operators are not interpretable in their base position, because degree operators have the semantic type $\langle\langle d, t \rangle, t \rangle$ (assuming that all their additional argument positions

have been saturated) and adjectives they combine with have the semantic type $\langle d, \langle e, t \rangle \rangle$ (under the same assumption about other arguments). Therefore, a degree operator cannot stay in situ.

Given that we have semantic evidence for the existence of a DP-internal landing site for degree QR and overt movement to the right periphery, can we argue that movement to the right periphery is in fact overt degree QR?

6.1.1. Reduced relatives

At first blush, the appearance of the extended adjectival projection on the right has nothing to do with degree modification. The so-called recursion restriction (also known as the *head-final filter* (Williams 1982), also noted by Emonds 19xx, and discussed by Zwart 1974 as cited by Cinque 1994) is intended to rule out cases where a pre-nominal (or pre-verbal) modifier is right-branching:[65]

(184) a.   * a proud of her children professor

b.   * a clever to an unusual extent theory

However the recursion restriction is properly formulated, as a result right-branching xAPs appear on the right periphery of the DP:

(185) a.   a professor proud of her children

b.   a theory clever to an unusual extent

There are conflicting views on whether this right edge position is due to base-generation (in which cases the xAPs in (185) are viewed as reduced relative clauses) or to movement. The following contrast, due to Bresnan (19xx), has been taken to argue for a reduced relative analysis of right extraposition:

(186) a.   # a taller man than my mother

b.   a man taller than my mother

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[65] The prohibition of right-branching structures does not explain the grammaticality of cases like (i), where the degree operator is presumably a sister of the adjective to the same extent the adverbial *to an unusual extent* is in the ungrammatical (184b), or the ungrammaticality of cases like (ii), where the presence of a measure phrase argument on the left rules out a pre-nominal modifier.

(i)   a clever enough solution

(ii)   *a 2 inches taller ladder, a 6 feet tall bookcase

We have no explanation for these effects.

The reason why (186a) is infelicitous has to do with the fact that the head noun is interpreted in the scope of the degree operator. Let us combine the DP-internal interpretation of degree operators as discussed in Chapter 5 with the assumption that linearization of the QRed degree operator is to the right:

(187)
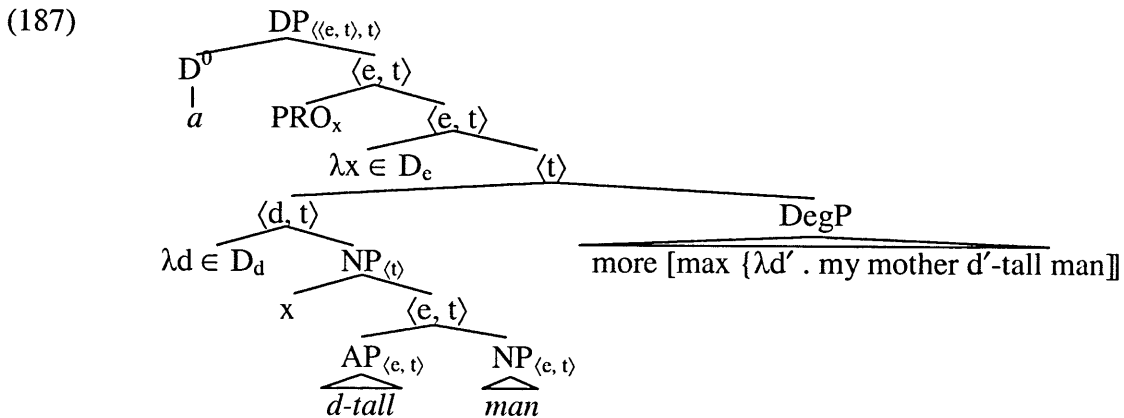
The comparative operator (with the degree clause) cannot be interpreted in situ, so it has to move and adjoin to a $\langle t \rangle$-type node. In order to be interpreted, the ellipsis in the degree clause has to be resolved. Since we need a $\langle t \rangle$-type node in the degree clause as well, the smallest possible antecedent for the ellipsis is the NP [x d-tall man].[66]

Suppose now that (186b) were just (187), with the QRed xAP spelled out in its landing site on the right edge. Then the interpretation of (186b) should have been identical to that of (186a), which is clearly not the case. Therefore, the argument goes, the so-called right extraposition is not due to movement.

This looks like very bad news for our hypothesis, until we realize that (186b) may well have the deviant interpretation of (186a), alongside the normal interpretation. Since the interpretation in (186a) is deviant, we would not detect it in (186b). Suppose that the contrast in (186) shows is that an additional meaning is somehow available on the right DP-periphery. Can we check whether the deviant meaning is? The answer is yes:

(188) a.   I have finally found a doctor better than my mother.

     b.   Greta Garbo is a movie star more celebrated than Valentino.

The examples in (188) are certainly compatible with my mother being a doctor or Valentino being a movie star – in fact, these are the preferred interpretations of (188). Do we

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[66] If a DP-internal $\langle t \rangle$-type position is not available, why not an AP-internal one? See section 6.4.2.

know that the examples in (188) are interpreted in this way, though? Suppose that (188a) asserted that I have finally found a doctor, who is better than my mother in some relevant way (e.g. as a cook or as a driver). This assertion would certainly be compatible with my mother being a doctor. The same argument would go through for (188b). Because the interpretation that we are interested in has weaker truth-conditions than the interpretation with a reduced relative structure, we would never know if the degree clause in (188a) can mean [than my mother is a d-good doctor] from semantics alone.

However, there are syntactic arguments for the idea that there are two structures resulting in the surface string in (186b): one is a reduced relative, but the other is overt degree QR.

6.1.2. Exclamatives

The intensifying/exclamative *that* and *this* can appear to on the right periphery of the DP even if the xAP is not right-branching. The same is true of *how* in echo-questions:

(189) a.   Its hard to believe **a man that clever** once agreed to become the Red Rooster.[67]

   b.   I don't think I've ever played a point and click adventure with **a story this interesting and well written.**[68]

(190) **A cup HOW dirty** did you drink out of?

What unifies the deictics *that* and *this* with the echo *how* is that certain surprise seems to be required, i.e. the echo *how* in (190) is also exclamative. Making *more* and *so* exclamative (in the sense of introducing an unexpectedly high degree to which the predicate holds) permits them to extrapose as well, even when the dependent clause is not present:

(191) I have *(never) heard of a doctor more/so capable!   *without prior context

Exclamatives cannot be comfortably analyzed as alternatives to the violating the recursion restriction, since we know that normally non-right-branching xAPs are not allowed on the right periphery:

(192) a.   *a woman (extremely/very/exceptionally) proud
   b.   *a dinosaur (several feet) tall[69]

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[67] *http://www.ddtdigest.com/updates/1998011m.htm.*

[68] *http://reservatory.org/review.php?game=gknight.*

[69] Note that adding a degree operator, even inside the measure phrase, makes the example grammatical:
      (i)   a dinosaur more than several feet tall

Note that we do not wish to argue that it is the exclamative interpretation that triggers right extraposition of an xAP containing a degree operator, because such xAPs can be interpreted exclamatively both in situ, as long as the degree operator doesn't have to front, or fronted:

(193) a.   A more capable doctor I have never heard of!

b.   More capable a doctor I have never heard of!

What we are claiming is that the right-edge position occupied by the exclamative xAPs is the landing site for degree QR. It is available for exclamatives because they are degree operators and must move there to be interpreted, and this QR can be overt. The reason why xAPs that do not contain a degree operator cannot move there is because they do not need to QR.

6.1.3.   Implicit arguments

Presence of a clausal dependent can result in right-extraposition of the xAP containing the degree operators *more, less, as, too, so* and *enough*:[70]

(194) a.   a discovery **more/less interesting than** extraterrestrial intelligence

b.   a discovery **just as interesting as** they predicted

c.   a discovery **way too interesting to** ignore

d.   a discovery **so interesting that** it made the headlines

e.   a discovery **interesting enough to** make the headlines

So far these cases look like the reduced relatives in (185). However, the argument need not be overt. If the comparison set is mentioned in the previous discourse, comparatives and equatives can be right-dislocated:

(195) The discovery of extraterrestrial intelligence shook the world. Decoding their message was **a breakthrough no less/even more/just as interesting**.

Relational operators *too, so* and *enough* can trigger right extraposition if the degree that the comparison is made to is implied and not named:

(196) a.   The only thing that'd make Iris forget she was mad was the thought of **a story interesting enough**.[71]

If the degree operator inside a measure phrase cannot be interpreted in situ (for the same reasons it cannot be interpreted in situ inside an xAP), then its closest landing site would still be the right periphery of the DP.

[70]   Cases where only the dependent is extraposed will be discussed in section 6.3.5.

[71]   *http://www.dreamwater.net/bloomstories/supergirlhero/dreams14.html.*

b.   ...nevertheless, however we may be disinclined to disturb **a story so interesting**, it is perhaps equally possible that the pits spoken of being shallow, were walled around the trees...[72]

c.   The criminal can't be paroled, because he has committed **a crime too outrageous**.[73]

In (196a) *interesting enough* can be understood as 'interesting enough for the contextually relevant purpose' (with the implication of 'very interesting') rather than 'interesting enough to make Iris forget she was mad'. In (196b) *so interesting* means 'as interesting as the contextually relevant story', and finally, the threshold of *too* in (196c) is 'for the criminal to be paroled'.

From the point of view of pragmatics, such cases are clearly different from the exclamative cases discussed in the previous section. They also cannot be assimilated to the standard right-branching cases in (185), because the argument is implicit. Normally implicit arguments do not license right extraposition, suggesting that either implicit arguments do not affect syntax, or they are not right-branching (in the relevant sense):

(197) a.   This is a problem related *(to yours).

b.   I want a solution different *(from yours).

Once again, pragmatics (the comparison set has to be salient) is involved in the licensing of right extraposition of degree operators. Here too, we can show that it is not by itself the trigger of the movement, because all these pragmatic conditions can be met by an xAP in situ.

6.1.4.   Other cases of right dislocation

Before we attempt to characterize the syntax of degree right extraposition, we need to show that it is not related to a few other cases of right extraposition.

The first candidate is the so-called *temporary property* reading, first discussed by Bolinger (1967):

(198) a.   stars visible, person or persons guilty/responsible   temporary property

b.   visible stars, guilty/responsible person or persons   temporary or permanent property

It is easy to ascertain that degree right extraposition does not create the temporary property reading. It is equally obvious that degree right extraposition has nothing to do with the reversal

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[72]   *http://www.pa-roots.com/~clarion/books/caldwell/oil1.html.*

[73]   Thanks to Noam Chomsky for this example. I have not been able to find similar cases on the web, but this may be due to the fact that I had to look for particular cases, such *a crime too __*.

of the relative positions of the xAP and the head noun triggered by the raising of light quantified nouns to D^0 (Abney 1987):

(199) someplace interesing

Finally, such adjectives as *asleep* and *aloof*, which are syntactically PPs, also cannot have anything to do with degree right extraposition.

6.1.5.   Prosody and focus

Prosody seems to offer an alternative explanation of why non-prepositional AP-modifiers do not license right-extraposition. Suppose that modifiers do not trigger right-extraposition of the xAPs they modify because they are not "heavy enough".

Indeed, non-right-branching xAPs containing a degree operator can appear on the right DP periphery if their dependents (degree clauses for comparatives and equatives, result clauses for *so*, *too*, etc.) are contextually salient or if the degree operators themselves are exclamative (*this*, *so*, etc.). One could argue that the exclamative intonation or the contextual saliency of the dependent provides enough "heaviness" for right-dislocation.

Further evidence that focus plays an important role in the availability of right extraposition comes from the fact that the two degree operators that can never be right-extraposed, *quite* and *rather*, cannot be focused either:

(200) a.   #This was a QUITE/RATHER interesting story.
      b.   #This was QUITE/RATHER interesting a story.
      c.   #This was QUITE/RATHER an interesting story.
      d.   *This was a story quite/rather interesting.

Nonetheless, it cannot be claimed that focalization is the trigger for right extraposition, or even its licenser, since nearly all AP-modifiers can be focalized in situ, as is the case in (201a), and focalizing them does not license right-attached xAPs, as in (201b):

(201) a.   an INCREDIBLY/CLEARLY/POSSIBLY interesting story
      b.   *a story INCREDIBLY/CLEARLY/POSSIBLY interesting

We thus continue to maintain our original hypothesis that DP-internal right extraposition of an xAP containing a degree operator results from the obligatory movement (QR) of the degree operator to the lowest position inside the DP where it can be interpreted. When this movement

occurs before the cyclic Spell-Out, xAP pied-piping is obligatory and some element in the xAP must be interpreted as focalized.

6.1.6.   Summary

We have shown that right extraposition of xAPs containing a degree operator is not a special case of right-branching reduced relatives, though this alternative structure is also available. The interpretation of right-extraposed degree-containing xAPs is certainly compatible with the degree operator being interpreted inside the DP, as suggested by our analysis in section 5.1.

Table 4 shows the existence of a correlation between the ability of a degree word to front and its ability to right-dislocate. All fronting degree operators that pied-pipe the xAP, with the exception of *quite* and *rather*, permit right extraposition without an overt dependent, as long as either the dependent is contextually salient or the operator is exclamative.

Table 4: Rightward degree movement

	rightward movement	**degree operator fronting**
almost	no	no
altogether	no	no
somewhat	no	no
very	no	no
such	no	obligatory, no pied piping
what	no	obligatory, no pied piping
quite	no	optional
rather	no	optional
as	yes	default
so	yes	default
too	yes	default
that	yes	obligatory
this	yes	obligatory
how	yes (in echo-questions)	obligatory
not at all	yes	optional
enough	yes	optional, marked
less	yes	optional, marked
more	yes	optional, marked
least	yes (intensifier)	optional, marked
most	yes (intensifier)	optional, marked

We have shown that degree right extraposition cannot be explained away by the pragmatic constraints under which it is possible. Although degree right extraposition is not informationally neutral, focus or discourse-salience do not by themselves suffice to trigger it.

In the next section we will present new facts that can be easily explained by the assumption that the landing site of a degree modified xAP on the right periphery is the DP-internal scope position.

6.2.   The recursion restriction

The view of degree right extraposition as QR cannot offer any new perspectives on the more standard cases of obligatory right dislocation/reduced relative formation triggered by right branching of the modifier, irrespective of whether the right branch is an argument, as in (202), or a modifier, as in (203):

(202) a.   * a proud of her children professor

     b.   * a more controversial than cloning issue

(203) a.   * a proud to an unusual degree professor

     b.   * a more controversial by far issue

We believe that the ungrammaticality of (202) and (203) is due to a separate constraint totally unrelated to degree movement. Empirically, the generalization would seem to be that DP-internal right-dislocation of PPs and CPs is obligatory. Unfortunately, this formulation has nothing to say about right-dislocation triggered by a measure phrase, be it an argument of the adjective as in fn. 65 or of a degree operator, as in (204):[74]

(204) a.   * A two inches taller woman would have reached the ceiling.

     b.   A woman two inches taller would have reached the ceiling.

However, measure phrases should probably be assigned to a special category of their own, given that a measure phrase is not at all possible DP-internally:

(205) a.   * a 2 inches taller ladder

     b.   * a 6 feet tall bookcase

If the generalization is correct, it may be that (204b) only has the reduced relative structure, i.e. the right edge position of the xAP *two inches taller* has nothing to do with degree QR. At this point we cannot offer any evidence for this view.

6.3.   Degree right extraposition as degree QR

We will show that degree operators behave unlike degree modifiers, or any other modifiers, for that matter, with respect to right extraposition, which is a strong evidence for the QR-like nature

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[74] We have tested (204) in domestic conditions and verified that this is indeed true, especially if she stands on a chair.

of the movement. Conversely, degree operators are not the only scope-bearing elements that can trigger right extraposition, and we will provide additional points of similarity between degree operators and other DP-internal scope-bearing elements.

The availability of a syntactic position seems crucially dependent on the interpretation, in a manner suggestive of cyclic Spell-Out (Nissenbaum 2000, Chomsky 2001b): if a degree operator moves before the Spell-Out, it is pronounced at the right periphery of the DP and obligatorily pied-pipes the xAP it is contained in; if it moves after the Spell-Out, the movement, though still essential for interpretability, will have no phonological effect.

6.3.1.   No right extraposition of modifiers

We have shown that apart from the usual right extraposition of right-branching modifiers (Zwart 1974), right extraposition of an adjective can be licensed by degree operators. AP-modifiers, be they degree modifiers or not, do not trigger such extraposition:

(206) a.   a building this/so/just as unsafe   degree operator

     b.   *a building extremely/very/exceptionally unsafe   degree modifier

     c.   *a building structurally unsafe   non-degree modifier

The contrast in (206) is easily explained by the hypothesis that the right DP periphery is the DP-internal scope position for degree operators. Unlike modifiers, degree or otherwise, which can, and in fact must, be interpreted in situ, degree operators must raise above the DP-internal subject position for interpretability. If the right DP-periphery is the landing site for DP-internal degree QR, the contrast between degree operators and modifiers ensues. Degree operators must move for interpretability. If all movement, QR included, is triggered, then there is a trigger for the movement of the degree operator to the right periphery. If they are pronounced in the right-dislocated position, they are interpreted as discourse-new. Conversely, modifiers do not have to move for interpretability, and so it does not seem that they do (but if they did, it would have had no effect on the semantics).

The dissimilarity between degree operators and degree modifiers is a very strong argument for the QR-like nature of right extraposition. It shows that right extraposition of xAPs containing a degree operator is not merely attraction of a degree-bearing element, in which case there would have been no difference between degree operators and modifiers, but is crucially dependent on the necessity to interpret the degree operator.

6.3.2. What moves and how?

The first generalization about degree right extraposition is that there are no operators whose default position is on the right periphery. This suggests either that degree right extraposition is not feature-triggered (which is fully compatible with the idea that it is nothing but QR) or that there are no degree operators whose meaning obligatorily contains the uninterpretable counterpart of the feature triggering rightward extraposition (in other words, if the feature triggering rightward extraposition is like [wh], there are no lexical items specified as [wh]). If the right edge Spell-Out of a degree-containing xAP is due to information structure considerations at PF and the actual reason for the movement is QR, this peculiarity is unsurprising.

Another interesting generalization is that unlike degree fronting of *such*, *quite* and *what*, where xAP may (or must) not be pied-piped, there are no cases where a degree operator would appear on the right periphery without the xAP it semantically combines with. Whenever a degree operator appears on the right periphery, the adjective it modifies is pied-piped along:

(207) a.   *an interesting story as

b.   *an interesting story enough

There are two ways of looking at this generalization. Either *such* and *what* are semantically incompatible with right-extraposition or right-extraposition requires pied-piping.

Once pied-piping is out of the picture, we could check whether the ability of a degree operator to move to the right periphery correlates with its ability to appear in the left periphery. The correlation is unidirectional: only those degree operators that can front can right-extrapose. There exist fronting operators, such as *quite*, which seem to not be able to right-extrapose:

(208) a.   a quite interesting story

b.   quite interesting a story

c.   *a story quite interesting

The correlation is unsurprising if both the fronting position and the right edge position are landing sites for QR – only degree operators will be able to move there.

A major difference between right-extraposition and degree fronting is that the former does not require the presence of an indefinite article, and is in fact compatible with any determiner, despite the fact that adjective pied-piping is obligatory:

(209) a.   Any/no **assassin this/so dangerous** should be at the royal service.

b.   She is fascinating. I have not encountered many/other **goblins just as interesting.**

If the right DP-periphery is the DP-internal scope position, the insensitivity to the article is expected, since this position is below the DP escape hatch.

6.3.3. Degree clause

One argument for analyzing right-peripheral xAPs as reduced relatives is the fact that the degree clause associated with a right-peripheral comparative cannot force clausal scope:

(210) a.   Loki has never fathered a son more dangerous than Fenris.

b.   *Odin has never fathered a son more dangerous than Loki (did).

If the post-nominal comparative in (210b) is a reduced relative, the ungrammaticality of the ellipsis in it is due to the fact that the comparative operator in this reduced relative cannot escape from the xNP:

(210) b′.   *Odin has never fathered a son [**REL** C^0 t_i **more** dangerous than than Loki (did).

The relative pronoun in (210b′) blocks the raising of the comparative operator (intervention effect, standard for relative clauses) and therefore the VP-ellipsis in the degree clause cannot be resolved. The grammaticality of (210a) shows that the comparative operator can be interpreted in a lower position (inside the reduced relative) as long as there is no ellipsis to resolve.

Does our additional alternative structure, with the right extraposition interpreted as QR to a DP-internal ⟨t⟩-type node, provide additional interpretive options? Under our assumptions, right extraposition is overt QR to a DP-internal landing site, so we expect the degree operator in this position to have DP-internal scope:

(211)
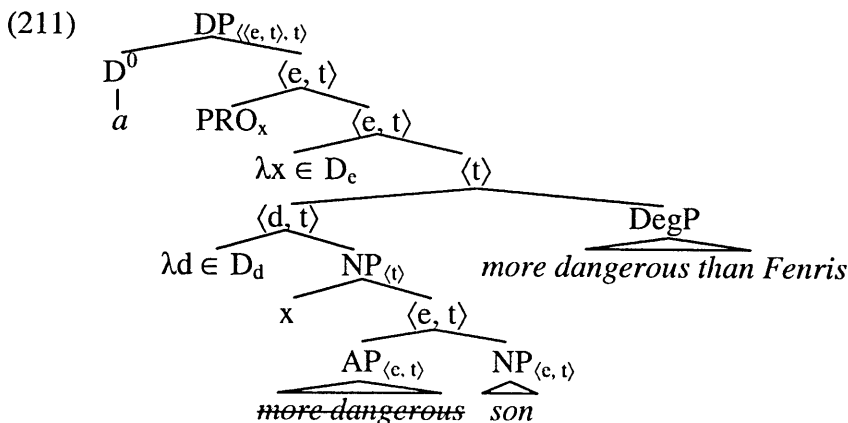
What the unavailability of clausal scope for (211) shows is that a right-extraposed degree operator must take scope in its surface position (no covert QR from an overt QR position).

6.3.4. Scope-bearing adjectives

Degree operators are not the only scope-bearing elements that can appear inside xAPs. Heim (1985), Carlson (1987), Moltmann (1992), and Beck (2000), among others, have argued that the comparison adjectives *different, similar, comparable,* etc., cannot be interpreted in situ and need to move for interpretability. Under our assumption that there is a $\langle t \rangle$-type node inside a DP, this means that the comparison adjectives could possibly be interpreted inside the DP, as well. If so, why can't they appear on the right periphery without a complement?

(212) a.   Ada loved a different woman (from Lucette).

b.   Ada loved a woman different *(from Lucette).

Recall that right extraposition of degree operators has a peculiar property that movement of just the degree operator, without the xAP it combines with is impossible:

(213) a.   * an expensive spaceship such

b.   a spaceship so expensive

Whatever the reason for the inability of a bare degree operator to right-extrapose, it seems to apply to comparison adjectives as well. This predicts that if somehow we could ensure pied-piping, right extraposition should be possible. In fact, if an xAP is modified by an adverb formed on the basis of a comparison adjective, this xAP can appear at the right DP-periphery:

(214) They have arrived at a phenomenon similarly/comparably incomprehensible.

Under the hypothesis that the landing site of right extraposition is the DP-internal scope position, right extraposition of xAPs modified by comparison adverbs is simply the Spell-Out of a QRed comparison operator (e.g. *similar*), accompanied by xAP pied-piping. Additional support for such an analysis of comparison operators comes from their behavior with respect to argument separation.

6.3.5. Argument separation

A right-branching modifier cannot appear on the left of the head noun, which means that right-branching modifiers appear on the right periphery:

(215) a.   * a proud of her children professor

b.   * a proud professor of her children

c.   a professor proud of her children

(215b) provides an argument against deriving (215c) by extraposition of the right-branching xAP to the right periphery. (215b) shows that even though it is the PP argument of the adjective that is responsible for the inability of the xAP to appear pre-nominally, this PP argument cannot appear on the right periphery independently. Under a movement analysis, one needs to explain why xAP-pied-piping is obligatory in (215c), since we know that argument PPs can be extracted out of xAPs:

(216) a.　What are you proud of?

　　　b.　What books is *Ada* similar to?

However, if we analyze the adjective on the right periphery of the DP as a reduced relative clause, (215b) is no puzzle – the argument PP cannot move to the right periphery alone because it does not move there at all.

This fact provides yet another argument for formally distinguishing reduced relatives like (215c) from genuine degree right extraposition:

(217) a.　a more/less interesting discovery than extraterrestrial intelligence

　　　b.　a just as interesting discovery as they predicted

　　　c.　a way too interesting discovery to ignore

　　　d.　so interesting a story that it made the headlines　　　　degree fronting obligatory

　　　e.　an interesting enough discovery to make the headlines

One possible explanation is to say that what is attracted to the right periphery in examples (217) is the dependent of the degree operator. Suppose that PPs and CPs (since degree dependents come in both varieties) must move to the right DP-periphery, and xAP pied-piping is optional. If so, "argument separation" in (217) tells us nothing about degree movement.

Fortunately, this hypothesis cannot be maintained. Consider the following contrast:

(218) a.　a building designed by Gehry larger than this one

　　　b.　*a building designed larger by Gehry than this one

If PPs and CPs had to extrapose to the right edge, (218a) would have been ungrammatical (the PP *by Gehry* did not extrapose) and (218b), grammatical. We conclude that it cannot be the dependent of the degree operator that triggers right extraposition. So why can degree operators be separated from their arguments, while adjectives cannot?

A possible answer is the counter-cyclic merge. Bhatt & Pancheva (2002) propose that the first argument of a degree operator (the comparison set for comparatives and equatives, the result

clauses for sufficiency operators like *enough* and *so*, etc.) is merged not at the base-generation position of the degree operator, but at its scope position.

(219)

$$IP$$

= 'Mary's father works harder than her boss does e.'

[Tree diagram:]

IP
- *Mary's father*
- $\langle e, t \rangle$
  - $\lambda x \in D_e$
  - I'
    - I^0
    - $\langle t \rangle$
      - $\langle d, t \rangle$
        - $\lambda d \in D_d$
        - VP
          - ~~Mary's father~~
          - V'
            - V^0
              - *work* ~~more~~
            - AP
              - *hard*
      - DegP
        - Deg^0
          - *more*
        - CP
          - *than her boss does* t_i ~~work d hard~~
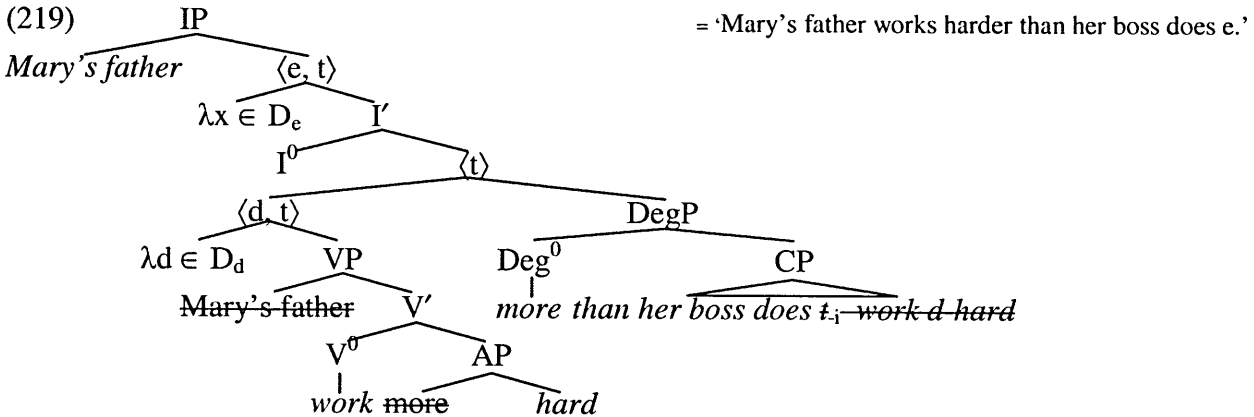
The semantic type of a comparative operator in this system is $\langle d, \langle \langle d, t \rangle, t \rangle \rangle$ (i.e. it first takes a degree clause (type $\langle d \rangle$), and then a predicate over degrees). This means that the comparative cannot be interpreted in situ. The trace that it leaves behind is of the type $\langle d \rangle$, which can combine with the scalar predicate *hard*, and then with the verb *work*. Once the subject is merged with V' (disregarding irrelevant projections), we obtain a node of the type $\langle t \rangle$. Such a node is a possible landing site for QR, so we re-merge the comparative operator there. Bhatt and Pancheva suggest that this is also the stage of the derivation at which the degree clause/phrase is merged as a complement to *more*, counter-cyclically creating a DegP node.[75]

Bhatt & Pancheva show that their proposal avoids a number of theoretical and empirical problems associated with movement analyses of the PF discontinuity of the comparative operator and its degree clause. It also derives the fact that the scope of the degree operator is exactly as high as the surface position of the degree clause, and certain distributional constraints on degree clauses.

The same algorithm can be used for attributive comparatives. Then the lowest landing site for the comparative operator, the right DP-periphery, is also a position at which the degree clause can be merged with the degree operator.

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[75] Counter-cyclicity is not a necessary assumption here, since the same result can be achieved by merging the degree clause/phrase above the landing site of the degree operator and reversing the order of the arguments. This approach, however, will not able to capture the fact that a given degree operator (e.g. *more* or *as*) is correlated with a particular realization of the CP of the degree clause (i.e. *than* or *as*).

(220)   DP   = 'a harder worker than this'

```
(220)        DP                                    = 'a harder worker than this'
         D⁰——————⟨e, t⟩
          |      /\
          a    PROₓ  ⟨e, t⟩
              λx ∈ Dₑ ——⟨t⟩
              /\          \
           ⟨d, t⟩          DegP
          /    \          /    \
     λd ∈ D_d  ⟨t⟩      Deg⁰    CP
              /  \        |    /\
             x   NP     more  than this
                /  \
              AP    NP
             /  \   /\
           more hard worker
```
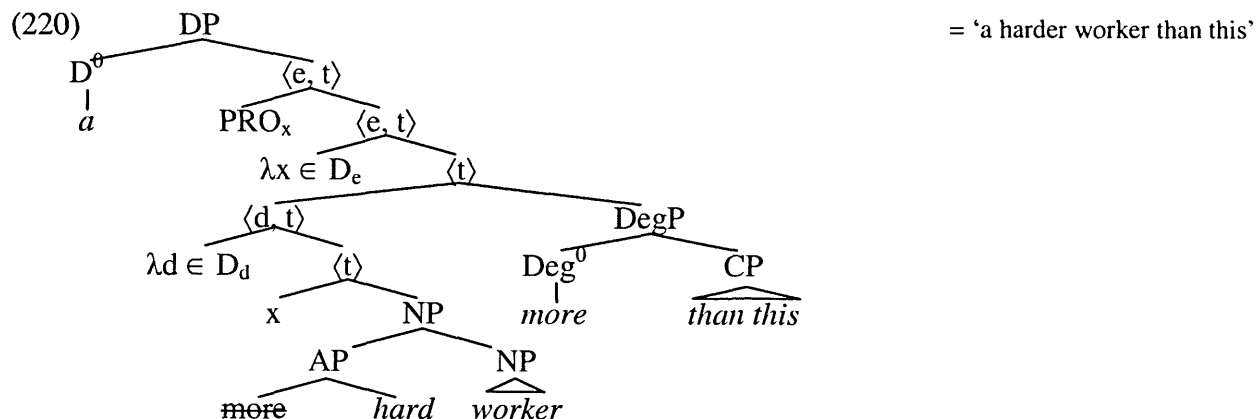
As we have established, the actual Spell-Out position of the degree operator does not have to be at the right DP-periphery. On the other hand, the degree clause/phrase is spelled out where it is base-generated (although its actual scope position may be higher). As a result, we have a configuration where the comparative operator (and the adjective) is spelled out in situ, though still licensing the merger of the degree clause/phrase at the right DP-periphery.

Once we have understood why argument separation can occur with degree operators, we can use the same analysis for other scope-bearing modifiers with dependents, such as *different*:

(221) a.   a **sufficiently** complicated problem **for you to give up**

b.   a **different** problem **from this one**

Arguments of an adverbial degree operator in (221a) or of a comparison adjective in (221b) can appear on the right DP-periphery, even if their predicates remain pre-nominal. Given that all these elements can take scope inside the DP, the same considerations apply.

Fox & Nissenbaum (1999) argue that arguments, unlike modifiers (PPs or relative clauses), cannot be merged late (counter-cyclically). Bhatt & Pancheva propose that the restriction applies only to arguments of lexical heads, while arguments of such functional heads as *less*, etc., can be merged late. There are two reasons to believe that there is no distinction between arguments and non-arguments in this respect, and something else must be held responsible for the impossibility of separating arguments of NPs from the NPs.

First of all, as we saw above, arguments of such presumably lexical heads as *different* can be stranded, just like arguments of degree operators. This means that either we are not dealing with counter-cyclic merge (see fn. 75), or there is no difference between functional and lexical heads with respect to argument separation. An indication that the latter hypothesis is probably true comes from behavior of arguments of non-quantificational adjectives, as in (222), brought to my attention by David Pesetsky (p.c.), and in (223):

(222) a.   a more destructive storm to our coastline   experiencer extraposition

     b.   a more boring book to read

(223) a.   a hard question to answer   *tough*-infinitive separation

     b.   a difficult book to read

Experiencer extraposition in (222) is a somewhat marked construction, usually found in the predicate position, but not exclusively there, meaning that the experiencer is not merged with the vP but appears as part of the DP, as in the following example:

(224) I cannot remember a *(**more**) destructive storm to our coastline.

Example (224) shows that experiencer extraposition appears to be licensed by the presence of a degree operator, but unlike with degree right extraposition, the stranded PP is an argument of the adjective rather than of the degree operator. This means that we cannot use counter-cyclic merge to Deg^0 here, which makes these examples more similar to Fox & Nissenbaum's counter-cyclic merge inside the extraposed tree (e.g. merger of the relative clause below the determiner) as opposed to at the root of the extraposed tree (merger of a complement to Deg^0, for Bhatt & Pancheva).

The existence of experiencer extraposition shows that, contrary to what Fox & Nissenbaum claim, an argument can be right-extraposed, and contrary to Bhatt & Pancheva, an argument of a lexical head (the experiencer adjective) can be right-extraposed.

How can we handle such examples? A possible generalization may be that the experiencer argument is not the direct argument of the adjective but introduced by an applicative head (see Pylkkänen 2002 and references cited therein for a discussion of applicative heads in the verbal domain). If so, the experiencer argument is technically not an argument of a lexical head and thus included in Bhatt & Pancheva's generalization.

It is less easy to make the same claim with *tough*-infinitive separation. The existence of examples like (225) suggest that the infinitive is indeed an argument of the adjective:

(225) a.   It is less easy to make same claim with *tough*-infinitive separation.

     b.   John is easy to please.

As with degree operators, we have two options. The entire xAP may appear on the right periphery of the DP (possibly as a reduced relative), as in (226a), or the infinitive can be separated from the adjective, as in (226b):[76]

(226) a.   a problem difficult to explain

b.   a difficult problem to explain

It seems unlikely that there is another functional projection in *tough*-adjectives, given that the threshold argument (the infinitival dependant) is part of the meaning of these adjectives. On the other hand, the analysis of *tough*-movement by Chomsky (1981), among others, does involve an operator, albeit inside the infinitive:[77]

(227) John$_i$ is easy [$_{CP}$ O$_i$ [PRO to please e$_i$]].

If this intuition is correct, then again argument separation seems dependent on some sort of operator movement, even though the structure in (227) still makes the extraposed constituent an argument of a lexical head, and this a counterexample to Bhatt & Pancheva's (2002) claim that arguments of lexical heads cannot be merged counter-cyclically.

To summarize, both argument separation and right extraposition place degree operators into the same category as scope-bearing non-degree elements. Under the assumption that the landing site of right extraposition and argument separation is the DP-internal scope position, the fact that these elements behave the same is expected and the phenomena of argument separation and right extraposition are naturally explained. Argument separation with comparison adjectives (*different*), experiencer adjectives (*difficult*) and *tough*-adjectives suggest that (a) argument separation is fully dependent on operator movement, and (b) neither the argument/non-argument distinction nor the functional/non-functional head one are significant for the possibility of argument separation.

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[76]   As a side note, *tough*-constructions in German are exempt from the recursion restriction:

       (i)   ein   leicht zu   lösendes   Problem

            an   easy   to   solve-Prpl-Prs.Nsg problem-N-sg

          * *an easy to solve problem* (lit.: *an easy to solving problem*)

We have no intuition as to why this should be the case.

[77]   Here PRO is understood syntactically, as opposed to PRO in DP-internal scope constructions, where it is more like an operator. We will not attempt to investigate the similarity between these two uses of the term.

6.4.   Right periphery and QR

In this section we will briefly examine the similarities between overt degree QR cases examined here (degree right extraposition and argument separation) and overt QR to [Spec, vP] studied by Fox & Nissenbaum (1999) and Nissenbaum (2000), i.e. Heavy NP Shift and right extraposition out of a DP. We will show that the fact that both QR cases target the right periphery when overt permits us to explain why degree operators inside attributive xAPs cannot be interpreted inside these xAPs.

6.4.1.   The other white meat: Heavy NP Shift as QR

Nissenbaum (2000), and following him Chomsky (2001) analyze Heavy NP Shift in English as overt QR of the object to the right periphery of the vP. We analyze the right extraposition of xAPs containing a degree operator as overt QR of the degree operator to the right periphery of the DP. There are multiple similarities between the two cases. First of all, the Heavy NP Shift position can host a dependent of the NP (Fox & Nissenbaum 1999):

(228) a.   We saw a painting yesterday [a painting from the museum].

b.   We saw a painting yesterday [a painting that was reported as stolen].

Secondly, as Fox & Nissenbaum argue in detail for cases in (228) and Bhatt & Pancheva do for degree clauses, the scope of the QRed element is at least as high as the landing site of the dependent. This is not unexpected if the "extraposed" dependent is base-generated in the lowest possible scope position for the QRed element.[78] The difference between dependent separation with degree right extraposition and right extraposition out of a DP is that dependents of degree operators or comparison adjectives are semantically arguments, whereas dependents of QRing DPs are semantically modifiers.

Finally, the similarity that appears the most intriguing is that the landing site is on the right periphery of the DP/vP, with all the corresponding pragmatic effects. *A priori*, this would seem to be an unimportant linearization fact, but it has interesting theoretical consequences for the interpretation of degree operator in attributive adjectives.

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[78] That degree operators are not interpretable in any position lower than the site of right extraposition is self-evident given that degree operators are not interpretable in their base position. The same claim is more difficult to maintain for extraposition out of subject DPs, which should be interpretable in situ. Fox & Nissenbaum (1999, fn. 1) mention that such extraposition is possible, but do not describe its properties.

6.4.2.   AP-internal landing sites

In the original Heim & Kratzer analysis of DP-internal scope of quantifiers, they propose that the landing site of the quantified DP *from any foreign country* in (229) is within the PP (above its subject), as in (230), rather than above the subject of the NP:

(229) No student any foreign country was admitted.

(230)
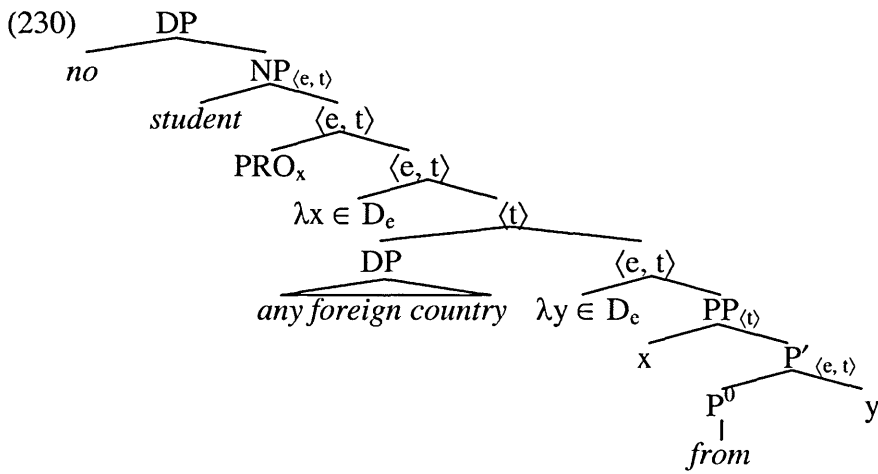
(231) No student who is from some foreign country or other was admitted.

Why can't (229) have the structure in (230) and be interpreted as (231)? If a subject position is available PP-internally and can be filled with PRO, why can't we do the same AP-internally? In other words, why can't we interpret (232a) as (232b):

(232) a.   *a taller man than my mother

       b.   a man (who is) taller than my mother

However, suppose that AP-internal degree QR behaves like DP-internal degree QR and vP-internal Heavy NP Shift – namely, that the landing site for QR is on the right periphery of the AP (even when the degree clause is absent):

(233) * NumP

Num⁰ ... NP$_{\langle e, t\rangle}$

| a ... $\langle e, t\rangle$ ... *man*

PRO$_x$ ... $\langle e, t\rangle$

$\lambda x \in D_e$ ... $\langle t\rangle$

$\langle e, t\rangle$ ... DegP

$\lambda y \in D_d$ ... AP$_{\langle t\rangle}$ ... *more (than my mother is d-tall)*

x ... A$'_{\langle e, t\rangle}$

~~more~~ ... A⁰

tall
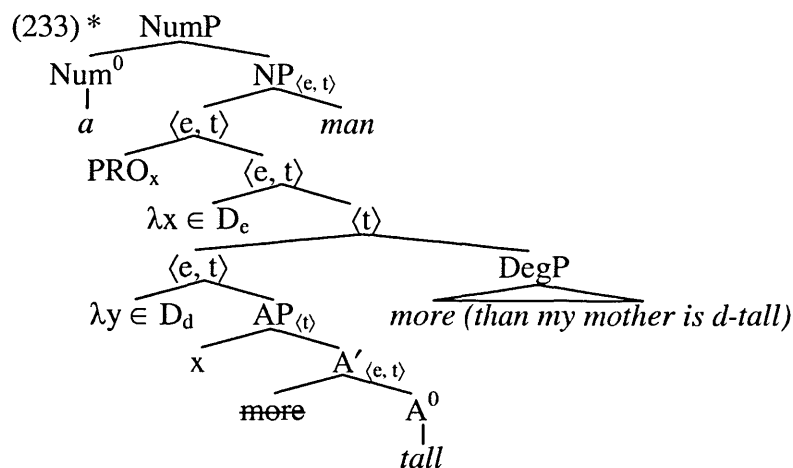
Irrespective of whether the DegP in (233) contains an overt *than*-clause or not, the resulting structure is right-branching. Since right-branching pre-nominal modifiers are impossible due to the recursion restriction, (233) is ungrammatical. This result can be taken as a confirmation of the hypothesis that all non-clausal scope positions are right-branching.[79]

6.4.3.   Summary

The assumption that degree right extraposition is Spell-Out of degree QR to the right periphery of the DP permits us to compare it to another case with the same analysis: Nissenbaum's analysis of Heavy NP Shift as QR. We have shown that the two processes have much in common: both permit argument separation, which partially determines the scope of the QRing element (which cannot be interpreted lower than the stranded dependent), and both are linearized to the right. This latter feature has enabled us to derive the unavailability of an AP-internal interpretation of degree operators from the recursion restriction.

6.5.   Conclusion

We have argued that the right-edge position of degree operators is the landing site of DP-internal QR of degree to a position where it can be interpreted, under the assumption that xNPs contain a covert subject position, filled with PRO.

We have presented semantic arguments for the DP-internal subject position and thus a DP-internal landing site for degree QR in section 5.1. In this section we argued that this position can

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[79] Degree clauses, even when interpreted at the clausal level, appear at the right periphery, which is why we are making no theoretical claim about linearization of landing sites for clausal QR.

in fact be filled by overt movement, namely, by right-extraposition of xAPs containing a degree operator. We have shown that right-extraposition is licensed only by operators, such as *differently* or *less*, as opposed to modifiers, degree or otherwise. Although the ability to bear focus and discourse-new interpretation are necessary conditions for overt right-extraposition, neither condition is sufficient to license it. Furthermore, we have shown that the ability of degree clauses/phrases to appear separated from degree operators whose arguments they are follows naturally under the independently proposed assumption that degree clauses/phrases can be merged at the landing site of degree QR.

The similarities between degree right extraposition and Heavy NP Shift provide additional evidence for our analysis of degree right extraposition.

CHAPTER 7

CODA

A degree operator contained in attributive xAPs cannot be interpreted in situ due to the fact that its sister has the wrong semantic type. Such degree operators then have (minimally) two possible landing sites: a DP-internal $\langle t \rangle$-type node and a clausal $\langle t \rangle$-type node (CP, and quite possibly vP as well; embedding under intensional verbs creates further possible landing sites for degree QR). We have argued that both positions can be reflected in the overt position of the degree operator (and the adjective it semantically combines with).

7.1.   Conclusions

We have shown that the fronting of an attributive xAP to a position before the indefinite article only occurs if the xAP contains a degree operator. The possibility of degree fronting is a diagnostic to decide whether a given degree word is an operator, along with such more standard diagnostics as the presence of a second degree argument and semantics.

Degree fronting (the appearance of a degree operator, possibly with the xAP it is combined with) at the DP-peripheral landing site indicates QR of the degree operator to a clausal level. We have shown that independent conditions rule out clausal scope for all but non-specific indefinite xNPs, which is why degree fronting is only possible with non-specific indefinite xNPs.

The DP-internal landing site is the only possible one for non-indefinite DPs and means that the degree operator is interpreted DP-internally. We have argued that degree right extraposition is QR to the DP-internal scope position. This assumption makes DPs look very similar to vPs from the point of view of QR. We have shown that the similarity between degree QR (degree right extraposition) and regular QR (Heavy NP Shift) explains why a degree operator cannot be interpreted inside the xAP it is contained in.

7.2.   Problems

The hypothesis that degree fronting is a necessary indicator of clausal scope predicts that when a degree operator that can appear both above or below the indefinite singular article (such as *more*) appears above it, this degree operator must have clausal scope. Unfortunately, clausal and DP-internal scopes of most degree operators cannot be truth-conditionally distinguished in neutral sentences and in non-neutral sentences additional factors are introduced.

Another, more general issue is that of pied-piping in the Copy Theory of Movement, where all links of a chain are copies. It would seem that in general, when the trigger for the movement is a degree operator, this operator cannot be pronounced in a position higher than the adjective it (optionally) pied-pipes, i.e. the option in (234d), with an invented degree operator *quite-2*, does not exist:

(234) a.   a more interesting person   no movement, no pied-piping

      b.   such an interesting person   movement, no pied-piping

      c.   so interesting a person   movement, pied-piping

      d.   *interesting a quite-2 person   no movement, pied-piping

Here we distinguish between movement, where such option (i.e. the appearance of the xAP that a degree operator combines with appears above this degree operator) is unavailable, and counter-cyclic merge, where a dependent clause can appear on the right periphery, in a position, that we claim to be higher than the degree operator:

(235) a.   a more interesting option than one would think

      b.   a way too complicated matter to disentangle

Perhaps this is a misanalysis, and what we view as counter-cyclic merge is in reality just this case of pied-piping that we declared to be missing. If so, the difference between movement to the left and movement to the right is quite striking and cannot be ascribed to the distinction between overt and covert QR. We leave this question as a topic for future research.

It should also be noted that the hypothesis that cases such as (235) are derived by counter-cyclic merge (cf. Bhatt & Pancheva 2002) raises further questions for syntax and semantics of such constructions. For example, we do not know why arguments of xNPs cannot be right-extraposed (Fox & Nissenbaum 1999), while no such restriction exists for degree operators or for scope-bearing adjectives (e.g. *a different book from mine*).

We still have no answer to the question why a degree operator must move through a DP-peripheral position to raise to the clausal level nor why further movement out of the DP is never overt. As discussed in section 5.3.1, no such condition exists for wh-movement, at least not in English.

The discourse status (focus, old information) of the fronted and right-peripheral positions also merits further discussion. As we have noted in section 6.1, an xAP on the right periphery of the DP is usually discourse-new, but discourse-novelty itself is not the trigger to this movement.

APPENDICES

Appendix 1 addresses the question of whether the special syntactic operation of adjunction is necessary for the linguistic theory. Appendix 2 shows why the approach where pre-nominal adjectives are analyzed as heads rather than xAPs cannot work. Appendix 3 addresses Cinque's (1994) proposal that adjectives are introduced as specifiers of invisible functional heads inside the DP. Appendix 4 examines an alternative to the rule of Predicate Modification, which would have been compatible with a different argument ordering than the one we are assuming, and Appendix 5 provides a more detailed account of scalarity coercion.

APPENDIX 1
IS THERE ADJUNCTION?

In a system that has both multiple specifiers and adjuncts the question arises whether both are conceptually necessary. In this appendix I will review existing motivation for adjunction and argue that it is insufficient for postulating an additional syntactic operation.

In the semantic model we are using, two sisters in a node compose in two different ways: by functional application and by predicate modification (Heim & Kratzer 1994, on whose work most of the discussion below is based).

I. Functional application

For $\alpha \in D_\sigma$, $\beta \in D_{\langle \sigma, \tau \rangle}$ and γ s.t. γ immediately dominates both α and β

$[\![\gamma]\!] = [\![\beta]\!]([\![\alpha]\!])$

Functional application (I) says that when the meaning of one sister (β) is a function with an empty argument slot of the type σ and the meaning of the other sister (α) is of this type σ, the meaning of the mother is the result of applying the meaning of β to the meaning of α.

II. Predicate modification

For $\alpha \in D_{\langle e, \sigma \rangle}$, $\beta \in D_{\langle e, \sigma \rangle}$ and γ s.t. γ immediately dominates both α and β

$[\![\gamma]\!] = \lambda x . [\![\alpha]\!](x)$ and $[\![\beta]\!](x)$

Predicate modification (II) deals with situations where two sisters have the same semantic type. In this case the mother node is interpreted as a conjunction of its two daughters.

Constraints such as Theta-Criterion are superfluous in such a system, since all that they do follows from our rules. If an argument slot of a predicate is not saturated, it has the same effect as saying that its θ-role is not assigned. However, unlike the Theta-Criterion, which only focuses on arguments, the semantic machinery consisting of (I) and (II) can consider the interpretation of modifiers.

A1.1. Arguments and modifiers

If we assume the definitions in (I) and (II), the difference between arguments and modifiers is hardwired into the model: it's impossible to interpret a modifier (the same semantic type as the modified XP) as an argument, and vice versa. However, the definitions in (I) and (II) say nothing about the syntax of modification and predication. Suppose now that these semantic mechanisms are reflected in syntax, in other words, suppose we want predicate modification (II) to apply to adjuncts and functional application (I) to apply elsewhere (to specifiers and complements).

It is not enough to use the rules that we already have, because they are neutral with respect to syntactic composition. If we wanted to have two types of MERGE, e.g. pair-merge (adjunction) and set-merge, following Chomsky (2001), we will have to add to our semantic rules an additional clause saying that each of them only applies to one syntactic structure: functional application (I) to set-merge and predicate modification (II) to pair-merge.

Suppose we have indeed added such additional constraining clauses to the two rules. What do we gain? The syntactic structure of adjunction will be compatible only with modification, and functional application will apply in all other cases.

A1.2. Morphology

It is reasonably clear that syntax interacts with morphology, though the degree of this interaction is subject to academic dispute. But even a minimal connection that one can imagine should have led us to expect that items merged in a tree in ways as different as set-merge (*substitution*) and pair-merge (*adjunction*) would have a slightly different morphology. That this expectation isn't realized is not in itself an argument against the existence of pair-merge, but it is fully consistent with its absence.

A1.3. Are all adjectives created equal?

Attributive adjectives are considered to be a classical case of modification. However, by far not all attributive adjectives are interpreted by the predicate modification rule in (II). What status do they receive in a system where items can be merged as arguments or as adjuncts?

One can envisage two possibilities. (1) the semantics of modification is perfectly mapped into syntax: a modifier is always an adjunct and (2) the syntactic status of an item as an adjunct or an argument will be reflected in its behavior, e.g. morphology. The former system is clearly redundant – the latter makes wrong predictions.

A1.3.1. Thematic adjectives

Kayne (1981), Giorgi & Longobardi (1990), and Cinque (1993) suggest that in structures like (1a) the adjective *Italian* expresses the AGENT theta-role of the noun *invasion* and the entire construction has the interpretation similar to (1b):

(1)   a.   the Italian invasion of Venice

       b.   the invasion of Venice by Italy/Italians

The meaning of the adjective in (1a) can probably be best described not as receiving the AGENT theta-role, but rather as expressing the presupposition on who the agent is. The fact that the agent is not syntactically present can be seen from the fact that it cannot be referred back to, either by a reflexive or by a pronoun:

(2)   a.   *The Roman description of them(selves)/it(self) was quite flattering.

       b.   ??The Italian invasion of Venice made everyone consider them(selves)/it(self) stupid.

Nonetheless, adjuncts should not receive theta-roles, which is why Cinque (1993) argues that *Italian* occupies [Spec, NP] there. (1a) then contrasts with (3):

(3)   the Italian designer

However, the two sentences do not seem to contain different adjectives, either in English or cross-linguistically, which suggests that morphology treats them in the same way. Judging by the fact that no adjectives can appear after *Italian* in both cases (barring taxonomization, where a new notion is created out of the adjective-noun sequence, as in *Italian generative linguist*) and those adjectives that appear after it are ordered in the same way, syntax doesn't seem to draw any distinctions either. An attempt to assign the adjunction structure to (3) and an argument structure to (1a) would require additional stipulations to explain why the only difference between the two

cases is semantic. Worse, neither Functional Application (I) nor Predicate Modification (II) can obtain this interpretation without assuming that the adjective modifies the agent of invasion, which would require the projection of an external argument position within the derived noun.

Fortunately, this is not required. An alternative explanation of the interpretation of *Italian* in (1a) is a pragmatic one. Suppose that *Italian* is always interpreted in the same way, namely, as having something to do with Italy (cf. *Italian wine*, *Italian style*, *Italian capital*, etc.). However, when we talk about an invasion having something to do with Italy, the only contextually relevant senses are "done by Italy" or "done to Italy":

(4)   a.   The Italian invasion of Ethiopia eventually failed.

        b.   The Ethiopian was a failure.

Additional support for the claim that thematic adjectives are interpreted as modifying the contextually relevant argument is the interpretation of adjectives formed by the adjectivizing suffix -*ian*:

(5)   a.   Shakespearean 'by Shakespeare'   the spelling is accidental

        b.   Montegovian 'created by Montague'   (also Newtonian, Einsteinian, Chomskyan, etc.)

        c.   Cartesian 'compatible with Descartes' ideas'

        d.   Jackendovian 'à-la Jackendoff'

        e.   Jovian 'having something to do with Jupiter'

The list can be continued, but what is important is that the interpretation of each adjective depends on how we contextualize the notion 'having something to do with'. The interpretation in (1a) resembles that of (5a) the most and can be subsumed under the same general heading (e.g. *related to*) with the rest of the cases up to (5e). Thematic adjectives then behave like *bona fide* modifiers throughout. Neither special syntax nor special semantics is required to handle them.

A1.3.2. Possessives

In many languages, Russian and Italian included, possessives have the morphology and syntax of adjectives. These possessives provide a more unambiguous case of an item composed with the head noun via Functional Application, but treated by the language in the same manner as regular adjectives interpreted by Predicate Modification:

(6)   a.   *moja* 'my'   m-   oj-   a

                        1sg-LF-SUF- FsgNom

b. Et-i   vash-i   deti   strašno šumjat.

these-Nom 2pl-pl-Nom children terribly make-noise

These children of yours are making a lot of noise.

In (6a), the feminine singular possessive *moja* 'my' not only contains a special suffix used to create the so-called long form adjectives, but is also inflected for gender/number and Case. The same is true for (6b), where in addition the possessive adjective is contained in a definite DP. While demonstrating that Russian possessives are morphologically and syntactically APs is beyond the scope of this work (though see Halle & Matushansky (in progress) on the declension of Russian adjectives), the primary evidence, as well as the data from Italian, seems to argue against adjunction as a separate process. If in some languages possessives and adjectives are treated the same by the grammar, then morpho-syntax does not seem to distinguish between set-merge and pair-merge.

A1.3.3. Non-predicative adjectives

There exists a class of adjectives that can only appear in the attributive position, such as *former*, *alleged*, etc. (*non-predicative* adjectives):

(7) a.   a former fashion model

b.   *This fashion model is former.

The reason why (7b) is ungrammatical has to with how *former* and its kin are interpreted. The referent of an NP composed of a non-predicative adjective and a noun is not the intersection of the set of fashion models and the set of "former" things (even if the latter made any sense). In fact, if there's one thing that the referent of the NP in (7a) excludes, that's fashion models. What (7a) refers to is the set of all things that used to be fashion models. Semantically, this is captured by applying the adjective to the noun:

III.   Non-predicative adjectives

$[\![alleged]\!] = \lambda f \in D_{\langle e, t \rangle} . \lambda x \in D_e$. $\forall w$ compatible with allegations made in the real world . $f(x) = 1$ is true in w

...

$[\![former]\!] = \lambda f \in D_{\langle e, t \rangle} . \lambda x \in D_e . \exists i \leq NOW. f(x) = 1$ at i

---

As the sample lexical entries in (III) show, a non-predicative adjective takes a predicate as its argument and returns another predicate (semantic type $\langle\langle e, t\rangle,\langle e, t\rangle\rangle$), whose truth conditions depend on whether the argument predicate was true either at some point in time (*former, future*) or in some possible worlds (*alleged, fake*).

To illustrate, consider what happens in example (7a). Applying *former* to *fashion model* ($[\![$fashion model$]\!] = \lambda x$. x is a fashion model), we obtain the following truth conditions:

(7) c. $[\![$former$]\!]$ ($[\![$fashion model$]\!]$) =

$[\lambda f \in D_{\langle e, t\rangle}$. $\lambda x \in D_e$. $\exists i \leq$ NOW. $f(x) = 1$ at $i]$ ($[\lambda x$. x is a fashion model$]$) =

$\lambda x \in D_e$. $\exists i \leq$ NOW. x is a fashion model at i

What we have obtained is that the predicate *former fashion model* is true of its argument x iff the predicate *fashion model* was true of x at some point in the past. These are in fact the truth conditions we associate with *former*.

But consider now what happened. The semantic type of *former* is $\langle\langle e, t\rangle, \langle e, t\rangle\rangle$ and that of *fashion model* is $\langle e, t\rangle$, we have not obtained the interpretation in (7c) by predicate modification, which requires identical types. Therefore, we must have used functional application. But haven't we said that functional application is not compatible with adjunction?

However, if cases like *former fashion model* cannot involve adjunction, the same problem that we discussed in the previous section resurfaces – why does former behave like an adjunct if it has such different semantics? In English, this claim is hard to support, but in languages with richer morphology, such as French or Russian, *former* behaves like an adjective. Granted, there are languages where it is not an adjective, but how do we account for languages where it is?

Finally, it should be noted that non-modificational readings also exist for event-modifying adjectives such as *occasional* (Bolinger 1967, Larson 1998), and value adjectives such as *good* or *beautiful* (Larson 1995).

To summarize, adjectives are supposed to be a prototypical case of modifiers, as most of them are. However, there exist adjectives that are interpreted by functional application. Let us assume then that such adjectives are specifiers. Our semantic rules can now apply to them, but the similarities in their syntax and morphology are inexplicable. Conversely, if we make them adjuncts, our semantic rules cannot apply to them!

A1.4. Less simple cases

While xAPs are usually modifiers, it is not always so, as the two previous sections demonstrated. My main topic being adjectives, I will only touch upon some of the less simple cases having to do with other parts of speech.

A1.4.1. DP-internal syntax

The argument/adjunct distinction is less clear inside the DP than it is in the clausal domain. First of all, most DP-internal arguments are optional when the head noun denotes an object or an actor rather than an event:

(8) a.   The Louvre has recently bought another portrait of great value.
     b.   The Louvre has recently bought another portrait of Mona Lisa.
     c.   The Louvre has recently bought another portrait by Leonardo.
     d.   The Louvre has recently bought Leonardo's portrait of Mona Lisa.

(9) a.   a teacher (of mathematics)
     b.   a (French) teacher

(9) is a case of an *-er* nominalization of a transitive verb *teach* that shows that the THEME argument can be omitted in the *-er* nominal. This can also happen when the noun is derived from a transitive verb whose THEME argument cannot be omitted (as in *destroyer*).

Another problematic case is that of Saxon Genitives. Arguments of the head noun can be expressed by a Saxon Genitive. But whereas most Saxon Genitives are arguments, as in (10), their status in (11) is less obvious:[1]

(10) a.   Mae West's portrait   = of Mae West
     b.   Dalí's portrait   = by Dalí
     c.   MOMA's portrait   = belonging to MOMA

(11) a.   a month's holiday
     b.   all tomorrow's parties/Einsteins

It is highly suspicious that arguments and adjuncts should be able not only to appear in the same position but to have the same morphosyntax.

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[1]   Williams 19xx notes that the only thematic relation that cannot occur between the Saxon Genitive and the head noun is that of predication.

A1.4.2. Time and space

Once VP-internal xPPs are examined, the line between arguments and modifiers becomes even more blurred. Consider the paradigm in (12):

(12) a.   send *(a letter) *(to my sister)

   b.   post *(a letter) (to my sister)

   c.   email (the news) *(to my sister)

   d.   mail (a letter) (to my sister)

Both the direct and the indirect objects in (12) are clearly arguments, even though arguments can be optional. The question is how the directional PPs in (12) are different from the directional PPs in (13):

(13) a.   roll the ball (into the cellar)

   b.   drop the letter (on the floor)

The interpretation of the directional PPs is the same in (12) and in (13), yet in the latter case the directional PPs are generally viewed as adjuncts. The line becomes even more blurred with verbs of motion, where a directional PP may change the interpretation – or it may not:

(14) a.   jump (onto the altar)

   b.   walk (into the cathedral)

It would seem that there are no meaning an accepted adjunct might have that cannot be the meaning of an argument. One could imagine that locative PPs cannot be arguments. Nonetheless there are at least two cases where they are obligatory, though a temporal argument would do just as well:

(15) a.   There was a fly *(in your soup/some time ago).

   b.   The murder occurred *(in Brazil/at midday).

From the semantic point of view, the difference between arguments and modifiers is the difference between being interpreted by Functional Application (I) or by Predicate Modification (II). What is the difference from the syntactic point of view? It cannot be optionality because we have seen that presumed arguments can be optional, as in (12). It cannot be interpretation, because directional arguments and directional adjuncts have the same meaning. So what is?

A1.4.3. <u>Degree and manner</u>

Another possible problem for the binary argument/adjunct distinction is measure phrases:

(16) a.   Mt. Everest is *8848 meters* tall.

      b.   The Ginnunga gap is *infinitely many miles* deep.

From the semantic point of view, as was made clear in chapter 1, measure phrases can only be arguments, since they saturate the degree argument slot of scalar adjectives such as *tall* or *deep*. However, it is far from clear whether they are arguments or adjuncts: they can be omitted, as in (17a), and they are questioned with that epitome adjunct wh-word, *how*:

(17) a.   The Ginnunga gap is deep.

      b.   How deep is the Ginnunga gap?

The question becomes more pressing when we consider amount phrases, which don't differ from measure phrases in any significant way, but are subcategorized by the verb (Ross 1984):

(18) a.   The Golden Gate Bridge spans *(almost 9000 ft).

      b.   It weighs *(887,000 tons).

Yet another adjunct/argument problem comes from certain manner adverbials that cannot be omitted:

(19) a.   The rebels treated the envoy *(shamefully/with disrespect).

      b.   The message was worded *(carefully/in a careful manner).

We conclude that syntactic optionality and same morpho-syntactic realization (as adverbs, adjectives, or PPs) doesn't map into the semantic difference between modifiers and arguments. But then we have to find a separate explanation for all the idiosyncrasies traditionally associated with adjuncts, such as optionality, extraction, etc.

The positive proposal that I will argue for here is that there's only one type of MERGE: set-merge (Chomsky 2001). The only distinction that follows from that is between the first merge (a head merging with a non-head) and everything else (an XP merging with a YP).

A1.5. Optionality and iteration

Anyone who has ever taken a syntax class knows that modifiers are optional and can be iterated, while arguments can be obligatory:

(20) a.   the still-life

b.   the still-life **with flowers**

c.   the **Dutch** still-life with flowers

d.   the **small** Dutch still-life with flowers

e.   the **beautiful** small Dutch still-life with flowers

f.   the **fake** beautiful small Dutch still-life with flowers

The syntactic explanation used to be that adjuncts don't change the label of the node they attach to (XP → Mod XP, X' → Mod X'), so they can be iterated. However, it is not at all clear how this idea can be restated in the Bare Phrase Structure approach or in Minimalism (Chomsky 1995).

Consider: the label of a projection in the Bare Phrase Structure approach is the head of that projection (the label of the projection of a verb is V). So what's the difference between merging a specifier (V remains V) and merging an adjunct (V still remains V)?[2] A possible answer would try to resuscitate the Theta-Criterion and say that since adjuncts don't receive theta-roles, they can be iterated or omitted. However, since the Theta-Criterion says nothing about how adjuncts are interpreted, the appeal to it is of necessity too weak.

Now if we consider how predicate modification (II) works, both optionality and iteration fall out. Suppose we start out with the nominal predicate *still-life* (type $\langle e, t \rangle$). This predicate can take an argument of the type e or be taken as an argument by another predicate that has an empty slot of the type $\langle e, t \rangle$ (a quantifier, like *the*, or a non-predicative adjective, like *former*). If we choose to merge it with *the*, we will get (20a).

However, suppose we have chosen a different option and put *still-life* together with another predicate of the same type, e.g. *with flowers*. By predicate modification, the resulting type will be again $\langle e, t \rangle$ and the NP *still-life with flowers* will have the same semantic properties as *still-life*. We can now merge it with *the* and get (20b) or continue to (20c).

Nothing has to be added, since the formulation in (II) derives both optionality of modifiers and the possibility of their iteration. It should be noted that the correlation is not bi-directional: arguments can be optional, as in (12b-d) or in cases below:

(21)   a.   We ate (herring) at 5.

      b.   We danced (polka).

---

[2]   We will abstract away from the fact that the Bare Phrase Structure approach permits multiple specifiers of the same head, since those have only been used as positions for movement (though nothing theory-internal prevents them from being used as theta-positions).

c.   We followed (her).

If there is an empty slot in the predicate, what happens when it is not filled? One possible solution is to say that it is in fact saturated by a null variable, which is later bound by Existential Closure (Diesing 19xx):

(22) a. $\exists x \in D_e . \exists y \in D_e$. we mailed y to x

      b. $\exists x \in D_e$. we ate x at 5

The context then constrains the meaning of variables to letters, edible things and possible goals. Importantly, binding by Existential Closure presupposes some restrictions on the argument positions. If this option is available, then the only difference between arguments and modifiers is indeed in mode of interpretation.

However, the reverse question then has to be raised: why are some arguments obligatory, as in (12a) or in (23):

(23) a.   The murderer put *(the knife) *(under the victim's body).

      b.   The jury gave *(him) *(a life sentence).

We don't have a satisfactory answer to this question.

A1.6. Ordering

As note Schütze (1995), Schütze & Gibson (1999), following Jackendoff (1977), arguments generally precede modifiers (unless an argument is right-extraposed with the focal stress):

(24) a.   a member of Parliament with gray hair

      b.   *a member with gray hair of Parliament

(25) a.   a man from Paris with gray hair

      b.   a man with gray hair from Paris

A purely syntactic solution (arguments vs. adjuncts) provides no insight why this should be the case. Semantically, on the other hand, the order in which arguments and modifiers appear depends on the semantic type of modifiers.

Take a modifier like *with gray hair*. Given what we know about Predicate Modification (II), it is most likely to have the semantic type $\langle e, t \rangle$ to be able to combine with *man* and result in the correct interpretation:

(26) a.   ⟦with gray hair⟧ = $\lambda x \in D_e$. x has gray hair

Now a relational noun like *member* takes two arguments, i.e. has the type $\langle e, \langle e, t \rangle \rangle$:

b. $[\![\text{member}]\!] = \lambda x \in D_e . \lambda y \in D_e$. x is a member of y

Suppose now we had tried to merge the latter with the former to obtain (24b). We will then have a node one of whose daughters has the type $\langle e, t \rangle$ and the other, type $\langle e, \langle e, t \rangle \rangle$. Neither of the two interpretation rules that we have can apply and the result is uninterpretable.

An interesting question to ask is what types modifiers can possibly have. We know of the existence of $\langle e, t \rangle$ modifiers (xAPs and xPPs), of $\langle i, t \rangle$ modifiers (time modifiers), presumably of $\langle w, t \rangle$, such as *possibly*, etc. Can there be modifiers of the same type as a relational noun, i.e. of the type $\langle e, \langle e, t \rangle \rangle$? And if yes, can they be merged lower than the common arguments? It would seem that the answer is no, and at this point we have no idea why.

The generalization about what semantic types modifiers can have permits us to account for another distinction between arguments and modifiers in what concerns pro-forms. When an NP is replaced by the pro-form *one* (Lakoff 1970) or a VP is replaced by the pro-form *do so* (Lakoff & Ross 1976), an argument cannot appear with the pro-form, but a modifier may:

(27) a. We may find a semantic answer to the question, not a syntactic one.

     b. *We may find an answer to this question, not one to some other problem.

(28) a. We may find the answer soon, but I don't think we will do so until tomorrow.

     b. *We may find the answer soon, but I think we will only do so more questions.

What this tells us is that pro-forms have a specific semantic type (namely, $\langle e, t \rangle$ for the NP pro-form *one* and presumably $\langle e, \langle i, t \rangle \rangle$ for the verbal pro-form *do so*). How accidental is it that pro-forms have exactly the semantic type of modifiers?

A1.7. Linearization

In a right-branching language like English, complements are distinguished from everything else in that they appear to the right of their sister (the head) as in *kiss the child, the story of O, proud of her accomplishments*, etc. Specifiers, on the other hand, appear on the left of their sister (*the child's kiss, a story was told*, etc.). Modifiers seem to fall into neither of these categories:

(29) a. the still-life **with flowers**

     b. the **Dutch** still-life

     c. the still-life **that Elmyr painted**

Examples (29) would seem to suggest that modifiers from different syntactic categories are linearized differently. The reverse, however, is not true:

(30) a.   a more interesting/better book

b.   a book more interesting/better than *Then and Now*

Two questions arise in this connection: (1) if linearization sets modifiers apart, why does it do so, and (2) what is the algorithm for linearization of modifiers?

Before answering both questions, it should be noted that hardwiring the adjunct/argument distinction into the system doesn't solve the problem in an obvious way, except providing syntax with a way of singling out modifiers. Indeed, while the theory could say "adjuncts are linearized differently", it neither explains why this should be so, nor why some adjuncts go on the left and some on the right.

However, is the problem indeed confined to modifiers? The answer would seem to be *no*, since adjectival arguments such as thematic adjectives (section A1.2) behave like other non-right branching xAPs in that they appear on the left, while argument xPPs, such as *the story of O*, invariably appear on the right. The same is true for modifier and argument relative clauses (*the allegation that alligators lied about* vs. the *allegation that alligators lied*). In other words, how an xXP is linearized has nothing to do with its status as an argument or modifier and everything, with what its lexical head is.

To summarize, the mode of combination of an xXP with its sister (functional application vs. predicate modification) is not reflected in its phonological properties. As before, this result is fully consistent with the idea that Predicate Modification has no special syntactic status.

A1.8. Extraction out of

There exist two types of domains that do not permit extraction out of them: *strong islands*, which disallow any element to move out of them, and *weak islands*, which only forbid some types of elements to escape. Sentential modifiers belong to the former type, as diagnosed by the fact that extraction of a PP incurs a much more severe violation than extraction of an xNP (Cinque 1990):

(31) a.   *This is a dragon about which the hero died without talking t_i.

b.   ?This is a dragon which the hero died without talking about t_i.

It is common knowledge that clausal adjuncts are strong islands:

(32) a.   *Who$_i$ did Tuppence survive because her dog attacked t_i?

b. *What old crime$_i$ would someone be upset if the Beresfords solved t$_i$?

Huang (1982), Lasnik & Saito (1984, 1992), Chomsky (1986), and Johnson (2002) argue that the proper condition on extraction (having to do with *lexical government*) groups together adjuncts and subjects, which are not governed by the verb, as opposed to complements, which are. Johnson (2002) proposes that the proper restriction on extraction has to do with whether the constituent lies on the main branch of computation (Johnson's (2)):

IV.   Islandhood

   An adjunct is a phrase whose sister is also a phrase and whose mother is not its projection.

Johnson hypothesizes that the non-transparency of islands has to do with the way syntactic computation proceeds. It is clear that the entire clause cannot be derived by simple binary merge, because specifiers and adjuncts (i.e. non-complements) have to be assembled separately before they can be merged together with the rest of the clause.

Additional support for grouping together subjects and adjuncts comes from the fact noted by Ross (1967) that wh-extraction of or out of a DP-internal PP is possible as long as the PP is not a modifier (ex. (33a)). Interestingly, the same is true for DP-internal subjects (a sub-case of the Left Branch Condition):

(33) a.   Which *shelf/√subject did you read an article on t$_i$?

   b.   *Whose did you read t$_i$ paper?

Suppose that the intuition grouping non-complements together is false. Why are adjuncts islands? An alternative explanation attributes islandhood to the fact that adjuncts are merged late in the derivation.

A1.8.1. Late insertion of modifiers

Lebeaux (1988) argues that adjuncts can be merged late and thus neither c-command nor are c-commanded by the rest of the clause. Evidence comes from the fact that argument and modifier relative clauses differ with respect to their binding possibilities:

(34) a.   *Which story about John did he hate?

   b.   Which story that John is an idiot did he hate?

If a relative clause can be merged counter-cyclically, then it is not present at that stage of the derivation when the wh-phrase is still c-commanded by the pronoun, and the Condition C of the Binding Theory is obviated.
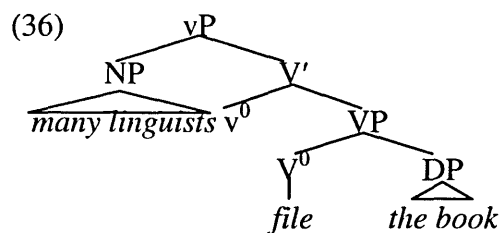
It should be noted, first of all, that it is absolutely not a problem to state the same condition for modifiers, i.e. in semantic rather than syntactic terms. Suppose merger is unconstrained and we could merge an item at any time in the derivation. Now suppose we have a structure like (35):

(35)

```
          vP
        /    \
      v⁰      VP
            /    \
          V⁰      DP
          |      /\
        file   the book
```
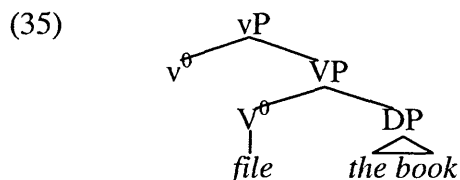
Suppose that our numeration contains, among various functional items such as T^0, C^0, etc., the CP *without reading it* (of the semantic type $\langle i, t \rangle$, abstracting away from intensionality, where *i* is an interval (time) variable) and the DP *many linguists* (semantic type *e*). The semantic type of the vP in (35) is $\langle e, \langle i, t \rangle \rangle$, i.e. it is an open predicate with an unsaturated time variable. Suppose that instead of merging the vP with the subject DP *many linguists* we now try to merge the vP with the adjunct CP *without reading it*.

The tree is uninterpretable at this point, because of the type mismatch: neither Functional Application (I) nor Predicate Modification (II) can apply. Is this a reason for the derivation to crash (assuming that type shift/coercion is not available) or does the derivation proceed with the option of merging the subject later on? Clearly if we want the countercyclic insertion to work in the right way, our theory needs to say that the derivation crashes because of the type mismatch.

Now suppose we have merged in the subject and have the choice between merging the CP *without reading it* or not:

(36)

```
              vP
           /      \
         NP        V'
        /  \      /    \
 many linguists v⁰      vP
                      /    \
                    V⁰      DP
                    |      /\
                  file   the book
```

At this point of the derivation the vP can merge with T^0 or with the CP. It is a true choice, since either solution is interpretable: if we merge in T^0, the resulting node will be interpreted by Functional Application (the vP is type $\langle i, t \rangle$ and T^0 is either of the type *i*, or of the type $\langle \langle i, t \rangle, t \rangle$ (a

quantifier over times), depending on the implementation). The CP can be merged later because it doesn't change the semantic type of the vP node and thus doesn't cause a type mismatch.

Note that the countercyclic merge hypothesis necessarily presumes that interpretation is not constructed as the derivation proceeds (on-line), but rather on the resulting representation.

There is no reason to prefer stating conditions on countercyclic merge in syntactic terms (can only happens to adjuncts, however they are defined) as opposed to semantic terms (can only happen to modifiers, defined as specifiers interpreted by Predicate Modification).

A1.8.2. Relative clauses

It should be noted that there is an alternative explanation of why extraction out of relative clauses is ungrammatical. Our first assumption is that relative clauses involve movement, i.e. we assume either a head-raising analysis, as in Brame (1968), Schachter (1973), Vergnaud (1974), Kayne (1994), and most recently Bhatt (2002), or the head-external analysis, as in Montague (1970), Partee (1975), Chomsky (1977), and Jackendoff (1977), but not a matching analysis, involving deletion of the lower of the two matching NPs, inside and outside the relative clause. Now if there is an Ā-movement inside the relative clause, then movement of any other Ā-operator will be ruled out due to the simple intervention effect. In a way, this assimilates relative clauses to weak islands (section A1.9).

A1.8.3. Countercyclic merge?

Chomsky (2001b) argues against countercyclic merge on a conceptual basis. Instead, he proposes to use the special syntactic operation of adjunction that would put modifiers out of the c-command domain of the clause.

The central idea is that adjunction of α to β doesn't change the properties of α. Suppose we have a situation where X c-commands the pair-merged item <α, β> (where β is the head and α is the adjunct). Since β is not an adjunct, it was introduced by the usual set-merge and is therefore, c-commanded by X, and this relation should not be lost when α is adjoined to β). Now, extending the c-command relation to α would be an extra operation that is not empirically motivated, and therefore, α is not c-commanded by X. The argument would presumably work just as well in the opposite direction.

A serious problem for this approach is the fact that there is in fact no evidence that adjuncts are not c-commanded. If this was true, how could there be a binding relation established between an argument in the main clause and a pronoun inside a sentential modifier, or vice versa?

(37) a.   Anyone can try to ski down Mt. Everest if they want to die.

b.   If someone had skied down Mt. Everest, their remains would have not been found.

QR out of a sentential modifier is clearly possible. If adjuncts are on some separate plane, opaque to c-command or any syntactic relation (as argued for non-restrictive relative clauses by Demirdache 1991), this is inexplicable.

A1.8.4. A semantic account of strong islands?

Cinque (1990) notes that strong islands are not fully ungrammatical with a DP-gap (den Dikken & Szabolcsi's ex. (4):

(38) a.   *This is a topic about which John left <without talking t_i>.

b.   ?This is a topic which John left <without talking about t_i>.

c.   *This is the way that John left <without behaving t_i>.

Sentential modifiers are strong islands, as seen by the fact that extraction of a DP out of an argument in (38a) or of a modifier in (38a) is worse than extraction of an argument PP in (38b). Finiteness strengthens the effect:

b'.   *This is a topic which John left <before his cousin started talking about t_i>.

Now let us consider how the countercyclic merge can account for the fact that a DP can be extracted out of a strong island in (38b). All the syntactic accounts suggested above are based on the assumption that adjuncts are somehow special, as a result of Re-Numeration (Johnson 2002), of countercyclic merge (Lebeaux 1988) or of a special syntactic operation (Chomsky 2001). But in all these proposals such special syntactic status is a binary issue – either extraction is possible or it is not.

On the other hand, there exist viable semantic analyses of weak islands (section A1.9). We already know that both strong and weak islands are strengthened by finiteness. But if there is one such factor, there could be more. Thus one could imagine that the basis of strong islands is also semantic, with possibly more than one factor combined to cause strong ungrammaticality.

A1.9. Extraction of

The so-called weak islands include certain VP-adverbs, negative and other affective operators, certain quantifiers, (tenseless) wh-islands, response stance and non-stance predicates (such as *verify* and *realize*), etc. (see Szabolcsi & den Dikken 1999, on whose work this section is based).

The original observation was that the argument/adjunct distinction made a difference for whether an expression could escape a weak island (Huang 1982, Lasnik & Saito 1984, 1992, Chomsky 1986):

(39) a.   The hero wondered how the sorcerer behaved.

   b.   *The hero wondered how the sorcerer didn't behave.   negative island

   c.   The hero wondered who the sorcerer didn't bewitch t_i.

(40) a.   How was the Wicked Witch planning to eat the boy?

   b.   *How was the Wicked Witch wondering whether to eat the boy?   (tenseless) wh-island

   c.   ?Who was Wicked Witch wondering whether to eat?

(41) a.   How did the witch think that the charm was made?

   b.   *How did the witch deny that the charm was made?   factive (stance predicate) island

   c.   Who did the witch deny that she saw t_i?

The original analysis that weak islands had no escape-hatch was quickly compounded by new data. VP-adverbs block the so-called *quantification at a distance* (Obenauer 1984/85) and VP-adjunct extraction (Doetjes 1997):

(42) a.   J'ai   beaucoup consulté [t_i de   livres].   quantification at a distance
       I+have   a-lot   consulted   of   books
       I consulted a lot of books.

   b.   Combien   as-tu   consulté [t_i de   livres].
       How-many   have+you   consulted   of   books
       How many books did you consult?

   c.   *Combien   as-tu   beaucoup consulté [t_i de   livres]?
       How-many   have+you   a-lot   consulted   of   books

(43) a.   *How did you behave t_i a lot?   VP-adjunct extraction

   b.   *How did you behave t_i twice?

Rizzi's (1990) theory of Relativized Minimality proposed that weak islands result from a kind of an intervention effect – a higher element of a certain syntactic type (head, A-specifier, Ā-specifier) block the extraction of a lower element of the same type. This approach could also be applied to affective islands (cf. (39b)), though not to response stance and non-stance predicates

(exemplified in (41b)). It is because of affective and stance islands that the syntactic approach to islandhood was gradually replaced by a semantic one.

Den Dikken & Szabolcsi show that a purely syntactic approach is too crude. For one thing it cannot explain why the temporal adverbial *when* is less sensitive to weak islands than *why* or *how* ((44a), their ex. (28)), and why the possibility of extracting *where* does not seem to depend on whether it is subcategorized for or not ((44b), their ex. (29)):

(44) a.   *Why/*How/$^?$?When did John ask whether to do this t_i?

      b.   ?Where did John ask whether to put/read this book t_i?

To resolve this problem, Rizzi (1990) proposes that manner and reason phrases differ from temporal and locative phrases in that they are arguments, though they don't have the theta-role of event-participants. This brings the former into the same category as amount phrases (Ross 1984), which are also sensitive to weak islands, even though they are subcategorized by the verb (exx. (30) and (31) from den Dikken & Szabolcsi 1999):

(45) a.   What did no imitation pearls touch t_i?

      b.   *What did no imitation pearls cost t_i?

Cases like (45b) show that originating in an argument position is not enough: in order to be able to be extracted, an XP must also be *referential* in some sense. Cinque (1990) proposes that in order to be extractable out of a weak island, an XP must be D-linked, i.e. drawn from a set that has been established in the previous discourse, as shows the difference between examples below ((32) and (33) from den Dikken & Szabolcsi 1999):

(46) a.   *How many books are you wondering whether to write t_i next year?

      b.   How many books on the list are they wondering whether to publish t_i next year?

Szabolcsi & Zwarts (1993) show that D-linking doesn't quite capture the data. "Aggressively non-D-linked" wh-expressions like *what the hell* (Pesetsky 1987) can be extracted out of a weak island when the context provides a *salient checklist*, e.g. (47) (their (37)) is felicitous when you see someone rifling through a dictionary, i.e. when there is evidence that there exists a referent of the complement of the verb:

(47)   What the hell do you still not know how to spell t_i?

These and similar data lead to the conclusion that the difference in ability to escape weak islands is directly related to the individual/non-individual distinction. Szabolcsi & Zwarts (1993) demonstrate that manners, reasons, amounts, and other expressions sensitive to weak islands are

not individuals, unlike *what* and *which* phrases. Further evidence in favor of their generalization comes from the fact that functional readings of wh-phrases are sensitive to weak islands (Cresti 1995), as shown by (48), Szabolcsi & den Dikken's (40)):

(48) a.   *I know that you wonder whether no/any student read her mother's book.

       b.   I know that you wonder whether no/any student read *War and Peace*.

Cresti (1995) and Rullman (1993) stipulate that elements that can be extracted out of an island must be of type *e*, the type of individuals, and Szabolcsi & Zwarts (1993) present a general theory of scope that explains why this should be the case. An alternative explanation by Honcoop (1998) is also semantic.

To recap, the assumption that weak islands are sensitive to argument/modifier distinction is factually wrong. It is the semantic type of an element that plays a role in determining whether it can be extracted out of a weak island.

A1.10. Conclusion

We have defined the difference between arguments and modifiers in terms of which semantic rule applies. Both interpretational rules, Functional Application (I) and Predicate Modification (II) are necessary independently of whether the difference between arguments and modifiers is reflected in syntax (arguments vs. adjuncts).

We then addressed the question whether the semantic distinction between arguments and modifiers could and/or should be reflected in syntax. We have shown that the usual assumptions about what is syntactically an argument and what is not do not often correspond to the semantic interpretation. One case in point is that of modal adjectives like *former*, which morphologically and syntactically behave like any other adjective, but are interpreted as combining with their sisters by the rule of Functional Application (I) rather than Predicate Modification (II).

We have then showed that standard distinctions raise more problems than it would seem. Optionality does not distinguish arguments and adjuncts, because (a) too many arguments can be optional, both in DPs and in the clausal domain and (b) there are obligatory adjuncts, such as manner adverbials with verbs like *treat*. What emerges from a more careful consideration of the standard argument/adjunct distinctions is that particular morpho-syntax (e.g. being an adjective) usually associated with modification doesn't have to be interpreted by Predicate Modification.

We now turn to the syntactic distinctions between arguments and modifiers. Most of them, such as optionality, iterability, ordering and pro-form substitution follow from the semantics of

modification. A little trickier are various islands constraints. At least some of these latter can be to semantics as well, as argued by Szabolcsi & Zwarts (1993), Honcoop (1998), and Szabolcsi & den Dikken (1999) for weak islands. The non-uniform behavior of PPs and DPs with respect to strong islands also hints at a semantic solution.

APPENDIX 2
ADJECTIVES AS HEADS

If one wants to say that adjectives are heads, there are two possible structures that are compatible with this. Berman (1973), Abney (1987), Delsing (1993) and Bouchard (1998) suggest that NP is the complement of A^0 (cf. (49a)). The alternative (never seriously entertained to my knowledge, with good reason) is that N^0 takes as a complement the first modifying AP, as in (49b). In both cases, outer APs take inner ones as complements.

(49) a.

b.
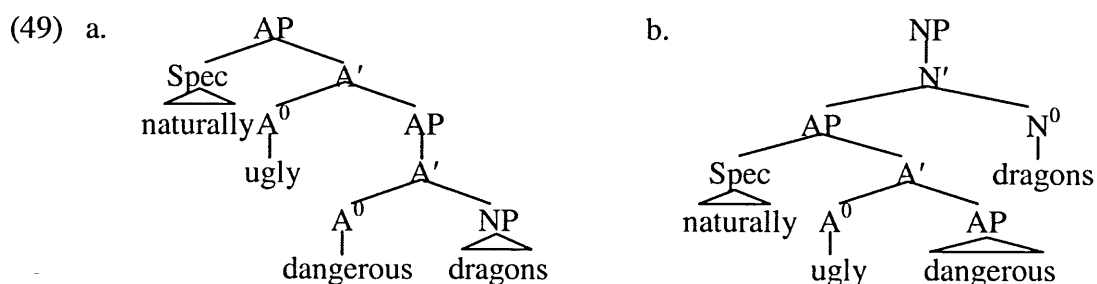
The syntax of the proposal is the most detailed in Abney's work and crucially relies on the notion of a lexical head and the notion of a semantic head. Because the theory became more precise now, certain assumptions that Abney makes can no longer be maintained. We will show that in the current framework, there are too many problems with this analysis for it to be worth it.

A2.1. Scope of the proposal

The idea that adjectives are heads was entertained only for prenominal adjectives, due to the so-called "recursion restriction" in English: modifiers appearing on the left xNP branch do not take complements:

(50) a. *a sure of herself woman
     b. a woman sure of herself

(51) a. *to as boldly as possible go
     b. to go as boldly as possible

The recursion restriction doesn't apply to post-nominal adjectives. If prenominal adjectives are heads taking the rest of the xNP as a complement, the recursion restriction follows: there is no additional complement position in the structure available for other arguments of the adjective.

The (49b) variant is slightly more permissive because it allows a complement to the last adjective.

However, we will show that the meager gain is not worth the syntactic problems associated with the approach.[3]

A2.2. The recursion restriction

The recursion restriction only applies with adjectival modification. When the modifier is a noun, as in N-N structures (on which see Napoli 1989), it can have complements:

(52) a.   *a true to herself teacher

  b.   an adjunction to NP approach

How do we describe the difference between (52a) and (52b)? From the semantic point of view, they are both modificational. However we describe the syntax of (52b), it is a challenge to explain why adjectives cannot have this syntax.

Furthermore, under certain circumstances, pre-nominal adjectives can have complements:[4]

(53) a.   He greeted me with *greater than normal* politeness.   van Riemsdijk (2001), ex. (14b)

  b.   a similar problem *to this one*   Svenonius (1994), ex. (10b)

Van Riemsdijk (2001) provides arguments against analyzing *greater than* as a constituent to the exclusion of *normal*, and from the semantic point of view, *similar* has to combine with *this one*. If adjectives are heads, the structure in (53a) cannot even be generated and the structure in (53b) can only be interpreted under very special assumptions about how predicate modification works. We will return to constructions in (53) later.

A2.3. Linearity in syntax

It seems to be a robust cross-linguistic generalization that there's no language where prenominal adjectives are phrasal and post-nominal ones are not. How does this mesh with the proposal that adjectives are heads? The proposal in (49) says adjectives can come in two syntactic guises – as heads or as phrases. Should this interact with linear order?

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[3]   The remainder of section Appendix 2 is dedicated to the refutation of the proposal. Readers who disagree with (49) for their own reasons can skip to p. Error! Bookmark not defined..

[4]   The reader has already noticed that such examples appear to contradict the earlier generalization that nothing can be extracted out of a Predicate Modification Structure (the Left Branch Condition). Adjectives violating the Left Branch Condition all belong to a specific semantic class and will be discussed later.

Claiming that only prenominal adjectives are heads contradicts everything we know about how theories should work: the proposal in (49) effectively says that a certain structure is available only when associated with a certain linear order. However, most of work done on syntax is done under the assumption that hierarchy not linear order is the defining feature of syntax.

A2.4. Cross-linguistic variation

There are languages where attributive prenominal adjectives do take complements, e.g. German or Russian:

(54) a.   ein leicht zu lösendes   Problem

           an easy to solve-Prpl-Prs.Nsg problem-N-sg

           *an easy to solve problem (lit.: **an easy to solving problem*)

     b.   nikomu   ne   ponjatnoe   rešenie

           nobody-Dat Neg understandable solution

           a solution that no one can understands

A priori, the availability of a phrasal adjective in a prenominal position in a language is not a problem, if prenominal phrasal adjectives in English, Romance, etc., are ruled out by a special mechanism (an assumption necessary in any approach).

However, the differences in interpretation between prenominal and post-nominal adjectives documented for French by Bouchard (1998) do not disappear in Russian or German. The approach sketched in (49) then has to depart from the minimal assumptions by introducing two distinctions between prenominal and postnominal positions: one having to do with their (non-)phrasal status, and another for everything else. There are also syntactic and morphological differences between the two classes that further support this unwelcome conclusion <MORE>.

Svenonius (1994) also cites cases where prenominal adjectives take complements linearly to their left, as in Swedish (his example (11)):

(55) a.   den fienden överlägsna armén   Swedish

           the enemy superior   army

           the army superior to the enemy

     b.   ett sedan i går   välkänt   faktum

           a   since   yesterday well.known fact

a fact well-known since yesterday

It is unclear what the "adjectives-as-heads" theories predict for Swedish.

A2.5. Modification and complementation

Any approach to adjectival modification has to account for the fact that adjectives within the extended noun phrase can be modified (Svenonius 1994, ex. (10a)) and that modified nouns can take complements:

(56) a.   some *barely* hot black coffee   AP-modification

b.   the [NP [NP [N' right solution]] *of the problem*]   NP-complementation

Both theories in (49) make wrong predictions with respect to these examples: Abney's theory has to resolve the problem of combining an adjective with its modifier in (56a), given a structure like (49a), while the mirror image structure in (49b) is forced to assume that the argument of the noun in (56b) is an adjunct to NP rather than the complement of N^0 (because it presupposes that the sister of N^0 is the AP).

Both problems can be addressed in the same way (originally suggested by Abney (1987) and used by his followers): by assuming a different constituent structure. As (49a) shows, the modifier of a prenominal adjective can be proposed to form a constituent not with the adjective but rather with the adjective-noun complex. This gives rise to a series of further semantic and syntactic problems.

A2.6. C-selection

Any theory of adjectival modification has to account for the following two facts:

As shown by (57a), certain degree operators and modifiers such as *very* or *as* can combine with xAPs but not with xNPs or xPPs (Corver 1997, Doetjes 1997, and Doetjes, Neeleman and van de Koot 1998). On the other hand, (57b) demonstrates that determiners cannot combine with adjectives or adjectival modifiers. If prenominal adjectives are heads, these two facts come into conflict, as in (57c):

(57) a.   very dangerous/*very dragon
b.   the *very/*dangerous/✓dragon
c.   the very dangerous dragon

On the one hand, *very* requires that the constituent [dangerous dragon] be an AP. Since *very* is not a head (but even if it were), the resulting constituent [very [dangerous dragon]] is an AP. However, *the* cannot combine with APs. An additional mechanism must be postulated.

A2.7. Syntactic constituency

The theory that adjectives are heads means that you combine the adjective with the head noun before you combine both with the adverbial modifier [barely [hot coffee]]. This means that the inner constituent [hot coffee] should be able to function to the exclusion of the modifier *very*, in the same way *coffee* could function separately from *hot* in [hot [coffee and tea]. This prediction doesn't hold:

(58) a.   *some barely [hot coffee and cold water]

The mirror image theory in (49b), where adjectives are grouped together to the exclusion of the head noun, makes a similar prediction. Since the head noun takes the adjectival sequence as a complement, the adjectival sequence should behave as a constituent. This prediction also doesn't hold:

(58) b.   *some [hot black] and [cold light-brown] coffee

While the structure in (58b) is acceptable in right-node raising constructions with a suitable stress pattern,[5] simple coordination of doubled adjectives is clearly ungrammatical. This strongly suggests that adjectives don't form a syntactic constituent to the exclusion of the noun and that the adjective-noun sequence doesn't form a syntactic constituent to the exclusion of the modifier.

A2.8. Extended projection

Abney's analysis predicts that if examples like (59) have the structure in (49), they should behave like adjectives rather than like nouns:

(59)   small red Chinese dragons

If the expression in (59) is an AP, it is unclear why it has the external syntax of an NP.

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[5] The fact that right node raising (henceforth, RNR) can apply to an NP also argues against the adjunction to NP approach, because a segment (i.e. a non-maximal projection that is not a head) cannot be targeted by movement or any other syntactic operation (Chomsky 1995).

A2.9. Predication

It is a property of adjectives that they can be iterated. The only way of implementing this in both theories in (49) is by making higher adjectives take lower adjectives as complements. However, once this option is available, it doesn't have to be used within modificational structures only. So why can't the same strategy be used in the predicative position?

(60)   *This dragon is small Chinese.

Given that there can be quite a few adjectives in a sequence and each adjective can impose constraints only on its complement, how do we ensure that whenever more than one adjective is used, there should be a noun somewhere in there (in the end of the sequence in English, in the middle of it in Romance and in the beginning in Hebrew)? In other words, how do we impose the restriction that such complementation can only happen in attributive positions? We will return to this question when we examine the theory of adjective ordering as arising from the ordering of functional heads.

We conclude that the idea that adjectives are heads is not a viable theory.

APPENDIX 3
MULTIPLE FUNCTIONAL HEADS

Cinque (1994) argues for the existence of multiple functional heads within the xNP on the basis of adjective ordering facts and the position of the noun in the ordered adjective string.

A priori, it would appear that our argument that adjunction as a special syntactic operation doesn't exist favors Cinque's hypothesis. Indeed, if there is only one kind of syntactic relation, sisterhood, an xAP can be only a specifier. The question is if it is a sister of the xNP it modifies or of some functional head.

I will argue against Cinque's theory. On the one hand, adjective ordering is not explained by postulating multiple functional heads, because what has to be explained then is the ordering of these functional heads. On the other hand, as Bouchard (1998) argues, the position of an adjective before or after the noun correlates with its interpretation in a predictable way, suggesting that the generalization in Cinque (1994 may be reinterpreted in a different way.

A3.1. Adjective ordering

Adjective ordering seems to be fairly constant across languages, with more "concrete" adjectives appearing lower in the structure and thus closer to the head noun (Bever 1970, Dixon 1982, Crisma 1991, 1993 & 1996, Hetzron 1978, Laenzlinger 2000, Scott 1998, among others, for psycholinguistic studies see also Danks & Schwenk 1972, 1974, Lockhart & Martin 1969, and Martin 1968, 1969a, b, & 1970.[6] Examples of the orders in English object-denoting and event nominals are provided in (62).[7, 8]

(61) a.   value > size > shape > color > origin   object-denoting nominals

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[6]   The relative concreteness of a predicate also appears to correlate with the likelihood that it is syntactically realized as an adjective in a given language (cf. Dixon 1982): if a language has adjectives, more "concrete" (*Italian*) or modal (*former*) predicate are less likely to belong to this category than the less "concrete" *red* or *big*.

On the other hand, Pustejovsky (1995) notes that adjectives assigned by Dixon (1982) to the same semantic class often do not show the same syntactic behavior. For example, his QUALIFICATION class includes both raising (*likely*) and non-raising (*probable*) predicates.

[7]   Scott (1998) and Laenzlinger (2000) provide further elaboration of the adjective hierarchy (see section A3.3).

[8]   Certain minor deviations from the universal adjective ordering have been attested. Hetzron (1978) reports that in Amharic, Japanese, Rumanian and Spanish, the adjective "big" (but not "small") appears before all other adjectives. I do not believe that these facts shed any light on the central part of Cinque's proposal.

b.	speaker-oriented > subject-oriented > manner > thematic		event nominals
(62) a.	good large round red Californian apples		object-denoting nominals
b.	probable clever complete Martian invasion of Jupiter		event nominals

Cinque (1994) argues that adjective ordering can be accounted for in the same way as adverb ordering is captured by Cinque (1999). Cinque (1999) argues that cross-linguistic adverb ordering is exactly mirrored in the ordering of functional projections in the xVP (a clause). To capture this correspondence, Cinque proposes that adverbs are introduced as specifiers of functional heads in the extended VP (frequency adverbs as Specs of FreqP, modal adverbs as Specs of ModP, etc.). In the same way, adjective ordering can be explained by postulating that adjectives are also introduced by functional heads, and it's the functional heads that are ordered.

Cinque (1999) proposes that we already have a mechanism in the syntax to handle ordering – that of c-selection. If a functional head F_1 requires the functional head F_2 as its complement, and F_2 requires F_3, then F_3 will always appear below F_1. If each functional head is specified as to its c-selectional properties, the correct ordering of adverbs and verbal affixes/auxiliaries follows.

Does this solution work? Even leaving aside the question of what happens in the xVP, does it work for adjectives? My answer is no. There are several reasons why it doesn't. The main one is that it doesn't *explain* adjective ordering, but just shifts the question to a different domain of the grammar: why are adjective-introducing functional heads ordered the way they ordered? But even leaving that aside, there are multiple implementational problems to be detailed below.

A3.1.1. C-selection

Suppose each adjective $\hat{A}_i$ is introduced as a specifier of the functional head F_i. In order to make adjective ordering $A_1...A_n$ to follow from the ordering of functional heads $F_1...F_n$ hosting them in their specifiers, two components are required: a constraint on the complement of each F_i (F_i must c-select F_{i+1}) and a constraint on the specifier of F_i ([Spec, FP $_i$] must be AP $_i$).

C-selection is a very local syntactic mechanism, since an X^0 can only c-select the head of its complement. In order to ensure then that A_1 c-commands A_3, we need to ensure that not only F_1 and F_3, but also F_2 be present. In other words, to derive adjective ordering from c-selection, all the functional heads in the extended NP domain must be present.

However, not all nouns can be modified by all adjectives, even if we're dealing with concrete nouns only. For example, we can speak of *old* but not *long* wine or of *French* but not *deep* cheese. Conversely, a *long time* is possible, but an *Italian time* is not. If adjective ordering

is fixed by the obligatory presence of adjective-introducing functional heads, what do we say about these cases?

At a first blush, nothing special needs to be said. After all, what is the problem with a null functional head in the extended NP projection as long as it doesn't contribute anything to the semantics? If we said that "Length[0]" says nothing about length, just introduces the right kind of adjective, what is the problem?

A3.1.2. Specifier

The problem is with the second half of the issue: the constraint on [Spec, FP$_i$].

How do we ensure that [Spec, SizeP] can only contain adjectives related to size? The only way of doing so is to give the head the right semantics, i.e. something like (63):

(63) $Size^0 = \lambda\, f \in D_{\langle e, t \rangle} . \lambda g \in D_{\langle e, t \rangle} : g$ describes size $. \lambda x \in D_e . f\,(x)$ and $g\,(x)$

(63) is strange. Its meaning is that of Predicate Modification, with an additional constraint on its second argument. In a sense, (63) and its equivalents for other functional heads replace the general rule by a cluster of less specific rules. If we attempt to generalize their semantics, we come back to the question why their order should be as it is (SizeP is above LengthP, etc.). If we don't, we're missing an obvious generalization.

Returning to c-selection, SizeP has to be projected even when the head noun has no size-modifiers. However, the lexical entry in (63) requires a predicate mentioning size. Even if we use some other lexical entry for this functional head, it has to mention a size predicate. So what do we do to interpret it when a modifier is not there?

It is not impossible to appeal to Existential Closure (Diesing 1990). However, the meaning that we will get then is something like "there exists a predicate describing size and it applies to the head noun under consideration". What this implies is that by uttering "a ball" the speaker is committing herself to some default size for this ball: "there exists some predicate describing size and it is true of x and x is a ball" (the same would of course be true of color, length, shape, etc.).

For the xVP domain it may make some sense, given that even if say the feature [perfect] is not expressed, as in (64a), it can still be interpreted as having the default value (negative, in English, as the ungrammaticality of a *since*-adjunct shows). Not so for adjectives: when you utter (64a), you do not necessarily have in mind such physical properties of the throne as its size or color, which are nevertheless rigidly ordered:

(64)   a.   The king sat on the throne (*since midday).

       b.   The king sat on the large green throne.

c.   *The king sat on the green large throne.

The unavailability of a default reading is particularly clear from the interpretation of an indefinite DP in the scope of another quantifier:

(65) a.   Every apple comes from an apple tree.

b.   Not a single cat showed up.

Neither *apple tree* in (65a) nor *cat* in (65b) can possibly be interpreted as having some default specification for size, color, etc.

We conclude that if we want to make adjective ordering follow from c-selection, we need to make sure that these functional heads have no semantics that is in any way related to the semantics of the adjectives they introduce. But then how do we ensure that [Spec, SizeP] is in fact an adjective of size?

One could object that the "solution" we're proposing here doesn't work because it is based on a specific semantic framework. An alternative in a different framework might have worked. I doubt it. Suppose we do find a way of interpreting an absent [Spec, SizeP] as "not applicable" or "not relevant". But then why is the "default" interpretation that null verbal heads/adjuncts have not applicable here (and vice versa, why don't verbal heads have the "N/A" interpretation)?

We will also have a problem with nouns that are incompatible with some modifiers, such as *wine* – how do we interpret the missing [Spec, FP] with them? It would seem that the status of a missing length adjective should not be the same with *wine* as with *rope*. Obviously this would further increase the numbers of ways of interpreting a missing specifier.

An alternative is to put size somewhere into the syntactic properties of a given adjective. This means splitting the lexical category of adjectives into syntactic categories of size adjectives, shape adjectives, color adjectives, etc., and forcing $Size^0$ to c-select the syntactic category of size adjectives. (The division would still be rooted in semantics, of course, but our syntax need not know about it.)

Is this insane? I believe so, but one could object that different languages do in fact make such distinctions. For example, English has origin adjectives (*French, Spanish*), while Japanese doesn't.

A3.2. Non-adjectival modifiers

As we said before, Cinque's analysis is built on two assumptions: that adjective ordering results from the ordering of functional heads whose specifiers host xAPs, and that the ordering of these functional heads is syntactic.

Both assumptions are vital for the analysis, because the only evidence for DP-internal null functional heads came from the existence of their specifiers (what Taraldsen 1991 refers to as "Argument Type 2"). As noted before, these heads are phonologically null. They cannot have any semantics because if they did, we would have expected some default value, size, shape, etc., interpretation for object-denoting nouns, the way we see it within the extended VP projection. Even supposing that the parallelism is far-fetched, it is unclear what semantic contribution one is to expect from them.

Suppose we said that adjective ordering is due to some other, possibly cognitive, factor. What argument is there then for adjectives being base-generated as specifiers of dedicated heads rather than being just merged where they can be semantically interpretable ("adjunction", but without a special syntactic mechanism)? Cinque (1994) does bring in such an argument, and we will examine it in section A3.4. Here our goal is to demonstrate that adjective ordering is, in fact, semantic.

A3.2.1. Other prenominal modifiers

It is easy to show that adjectives are not the only prenominal modifiers in English:

(66) a.   baby driver
      b.   baby seal
      c.   baby food

While usually such prenominal xNP modifiers consist of a single noun, this doesn't have to be the case, as long as the xNP refers to a salient cognitive category (*taxon*):[9]

(67) a.   an [adjunction to NP] approach
      b.   a [ballroom dance] festival

---

[9] Taxons, like compounds, can be made on the fly, as shown by the relative felicity of 'sad baby carriage' (a carriage where you would put a sad baby). This doesn't undermine the general point, though, just as scalarity coercion doesn't undermine the existence of scalarity.

The semantics of prenominal xNPs is not that far from that of adjectives, as witnessed by the similarity of (68a) and (68b):

(68) a.　a giant clam

　　 b.　a gigantic clam

It seems that xNPs are subject to ordering principles similar to those constraining xAPs in that changing the order results in certain infelicity:

(69) a.　a giant sci-fi novel

　　 b.　#a sci-fi giant novel　　　　　　interpretable only if a *giant novel* is a cognitive category

(70) a.　a large erotic novel

　　 b.　#an erotic large novel　　　　　　interpretable only if a *large novel* is a cognitive category

Moreover, the ordering restrictions treat xAP and xNP pronominal modifiers alike:

(71) a.　#an erotic giant novel

　　 b.　#a sci-fi large novel

An additional reason for treating prenominal xNP modifiers like xAP modifiers in the fact that in languages with richer morphology, such as Russian, "content" and "material" modifiers are in fact derived adjectives:

(72) a.　gigant-sk-　ij　　　　　nauč-　n-o-　fantastič-　esk-ij　　　　roman
　　　　　giant-　Adj-　Msg-Nom　science-　Adv-　fantasy　　Adj Msg-Nom　novel
　　　　　a giant sci-fi novel

　　 b.　serebr-jan-　oe　　　　　kol'co　　　　　　　　　　　　　　　　　Russian
　　　　　silver　Adj-　Nom-Nsg　ring
　　　　　a silver ring

Another example of non-adjectival prenominal modification comes from Scott (1998). Non-adjectival xPPs can appear in the AP position as long as they are semantically compatible with the head (Scott's ex. (20a)):

(73)　an off-the-cuff remark

(73a) contains a PP in a prenominal position, which is normally impossible. Scott shows that "off-the-cuff" has a mixed AP/PP behavior in that it can be modified by *too/rather*/etc., coordinated with APs, and co-occur with *straight* (his exx. (21a) and (22a)):

(74) a.   We found his remarks (rather) off-the-cuff and uninteresting.

b.   His remarks were straight [off-the-cuff and to-the-point/*uninteresting]

The dual AP/PP status of such expressions permits them to appear as prenominal modifiers with suitable (manner) semantics.

So it would appear that English can have anything as a prenominal modifier as long as the semantics is right. This fact is, however, a serious problem for a strictly syntactic approach to adjective ordering. The only factor unifying *giant* and *gigantic* in (68) is the common meaning of size. As we have shown in section A3.1, if we try to make the restriction on adjective ordering to follow from the meaning of functional heads introducing these adjectives, we cannot deal with cases where the specifier of a given functional head is not filled or cannot be filled. Our solution was to divide adjectives into syntactic subclasses.

However, this solution cannot work if possible specifiers of each functional head are not only xAPs but also xNPs and xPPs. There cannot be a syntactic class unifying them.

To summarize, English allows non-adjectival prenominal modifiers, which seem to share ordering properties with adjectival modifiers. The fact that what is a non-adjectival modifier in English is an adjective in Russian suggests that, if we assume that all adjectives are introduced by functional projections, then there must be functional projections introducing materials (*silver*) and contents (*erotic*, *sci-fi*) in these languages. It then makes little sense to claim that in English, prenominal xNP modifiers are introduced by something other than these functional projections. The constraints on what appears in the specifier of such a functional projection are then semantic rather than syntactic.

We have therefore reached in impasse. A syntactic way of constraining what can appear in the specifier of a given functional head ([Spec, SizeP] can only host adjectives from the lexical subclass of "size adjectives") cannot work, because items from different syntactic classes can appear there. This is shown by the fact that modifier ordering is not defined for a single lexical category. On the other hand, a semantic constraint (the second argument of $Size^0$ can only be a modifier that describes size), raises serious problems when the modifier is not present.

A possible way out would be to say that English pronominal modifiers are all adjectives, with null morphology. Then we can use our syntactic solution and assign different pronominal modifiers to different adjectival categories.

A3.2.2. Postnominal modifiers

The problem is that this solution won't work cross-linguistically, since not all languages allow pronominal modifiers. For example, in Romance, modification in (69) and (72) is expressed by postnominal Genitive PPs:

(75) a.   un roman de science fiction   French
           a   novel of   sci-fi
           a sci-fi novel

     b.   un anneau d'argent
           a   ring   of+silver
           a silver ring

Unsurprisingly, postnominal Genitives in French are ordered. Examples (76) show that the ordering places the material modifier closer to the noun than the size modifier, exactly the order that we saw for pronominal modifiers in English and for postnominal adjectives in Hebrew:

(76) a.   un anneau d'argent de grande taille
           a   ring   of+silver of large   size
           a silver ring of large size

     b.   *un anneau de grande taille d'argent
           a   ring   of large   size   of+silver

It now becomes very difficult to argue that modifier ordering results from purely syntactic reasons. Although languages differ as to whether a modifier with a given semantics is a noun, an adjective or a PP, it is still ordered in with respect to other modifiers. Postulating null functional heads doesn't add an ounce of explanation to the description, because there is no way of ensuring that specifiers of these heads belong to the right semantic class.

    English relative clauses and PPs give rise to the same problems:

(77) a.   a girl (who is) admired by everyone
     b.   a wine of considerable age

What do we do with examples like (77)? The modifier in (77a) is expressed by a (reduced) relative clause only because English doesn't allow right branching APs prenominally. The PP in (77b) has semantics not much different from that of the adjective *old*.

    Suppose that cases like (77) engage the same functional projections. Now consider an AP, a (reduced) relative or a PP in the same semantic class. By hypothesis, whenever one of them is

present in a sentence, it is projected as the specifier of the functional projection associated with that semantic class. By default, then, whenever a PP is introduced, it appears as a Spec of some functional head. But the semantics of PPs and especially relative clauses is more diverse than APs (e.g. there's no adjectival equivalent to the PP *with flowers* or to the relative clause *who was indeed a person of infinite-resource-and-sagacity*) – does it mean that the quantity of functional heads in the xNP domain increases further?

Another minor objection is that xPPs and (reduced) relative clauses don't have the same morphology as xAPs do. If morphology is at least somewhat dependent on syntax (note the fact that verbal complements usually bear Accusative and [Spec, TP] is usually Nominative), we might expect a similarity here too.

Finally, some relative clauses may not be ordered with respect to each other, as (78) shows, but some must:

(78) a.   a girl whom I met last week who likes to dance
      b.   a girl who likes to dance whom I met last week

(79) a.   a girl who has red hair whom I met last week
      b.   ⁇a girl whom I met last week who has red hair

With relative clauses it is easier to argue that the difference between (78) and (79) is due to pragmatics, but once pragmatics is brought in, one could co-opt it to explain adjective ordering as well.

We conclude that adjective ordering cannot be explained by syntax.

A3.3. Number of adjectives

Cinque claims that the number of adjectives in an xNP is restricted to those specified in (61):

(61) a.   value > size > shape > color > origin   object-denoting nominals
      b.   speaker-oriented > subject-oriented > manner > thematic   event nominals

In his analysis, this restriction is brought about by the number of functional projections hosting these adjectives in their Specs. In a purely syntactic approach this is an advantage, since it restricts the number of modifiers (which is supposedly infinite, since modifiers can be freely iterated).

A3.3.1. Semantics of iteration

From the semantic point of view, the number of modifiers should not be constrained. Consider how Predicate Modification (II) works. As discussed above, it takes two elements of the same type, say $\langle e, t \rangle$, and return one element of the same type, whose meaning is the conjunction of the two original elements:

(80) a.

$$
\begin{array}{ccc}
\text{NP}_i & \text{NP}_i & \text{NP}_i \\
[\![\text{red} \quad \text{hat}]\!] & [\![\text{red}]\!] \quad [\![\text{hat}]\!] & [\lambda x_e . x \text{ is red}] \quad [\lambda x_e . x \text{ is a hat}]
\end{array}
$$
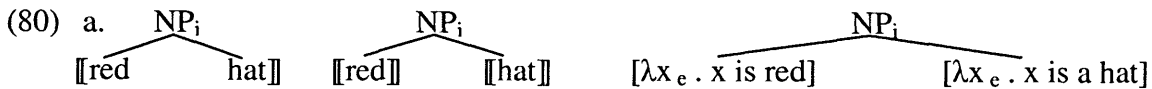
b. $[\![\text{NP}_i]\!] = \lambda x \in D_e . x$ is red and x is a hat

The result of Predicate Modification is an element of the same semantic type $\langle e, t \rangle$ as what the modifier has applied to. We can then theoretically apply yet another modifier to it:

(81) a.

$$
\begin{array}{ccc}
\text{NP}_i & \text{NP}_i & \text{NP}_i \\
[\![\text{large} \quad \text{red hat}]\!] \quad [\![\text{large}]\!] & [\![\text{red hat}]\!] & [\lambda x_e . x \text{ is large}] \quad [\lambda x_e . x \text{ is red and x is a hat}]
\end{array}
$$
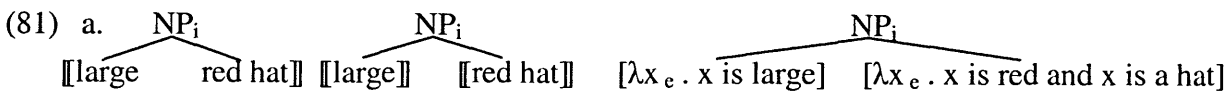
b. $[\![\text{NP}_i]\!] = \lambda x \in D_e . x$ is large and x is red and x is a hat

The game should be able to go on *ad infinitum*, but it doesn't. As the number of modifiers increases, the result becomes more and more difficult to process:

(82) a.   a beautiful large red hat
     b.   a former beautiful large red hat
     c.   a valuable former beautiful large red hat
     d.   a forgotten valuable former beautiful large red hat

...

Nonetheless, continuing iteration is not impossible. Consider clausal complementation and relativization. There is no theoretical upper limit on the number of embeddings, but in practice, only very few writers, such as Proust or Durrell, exceed 5. The same can be done with adjectival modification, especially when the adjectives are well-chosen:

(83) that former former former... diplomat

We conclude that Cinque's upper limit is pragmatic rather than syntactic.

A3.3.2. How many functional heads?

Scott (1998) further refines Cinque's hierarchy of adjectives in result/object-denoting nominals by using additional distributional tests (Scott's (47)): [10]

(84) Subjective Comment > ?Evidential > Size > Length > Height > Speed > ?Depth > Width > Weight > Temperature > ?Wetness > Age > Shape > Color > Nationality/Origin > Material

If adjective ordering is syntactic, the hierarchy in (84) reflects the hierarchy of functional heads in the extended NP projection. Given that adjectives appearing with event nominals and adjectives appearing with object-denoting nominals form partially intersecting sets, the potential number of "adjectival" FPs increases to near 30. This number can be further augmented by variations in the information structure of the DP (ex. (85) below) and by scope of "modal" adjectives:

(85) I don't just want a big balloon. I want a RED big balloon.

While it is not impossible that there may be thirty functional projections inside one small xNP, the burden of proof is on those who propose them. Since these hypothetical functional heads are phonologically null and semantically empty, the only evidence from their existence comes from the position of the noun. So for each of the positions between adjectives in (84) there should be a language such that the head noun appears only in that position.

A3.3.3. Phonological realization

The fact that in English these postulated functional heads cannot be detected either by eye or by ear should not surprise us, given how poor English morphology is. But are they ever visible?

Note that the proliferation of functional heads in the xNP domain predicts more than just that some of these heads should be visible in some languages. Remember that F_1 is necessarily different from F_2 in some way, or else how can they have different c-selectional properties? In other words, not only do we expect overt Fs in some languages, we expect various Fs for various adjectives, optimally, as many different Fs as we can have different adjectives.

Needless to say, I know of no language where each adjective would be accompanied by a different functional morpheme. As we proceed, we will see that once the true facts of adjective

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[10] Laenzlinger (2000) takes up some issues of ordering and the differentiation between prenominal (attributive) and post-nominal (predicative) modification that Cinque (1994) uses to resolve some of them, and provides a slightly different adjective hierarchy on more semantic grounds. Since my main concern here is with the gist of the "APs-as-Specs" proposal, I will not address the details here.

ordering are taken into account (see section A3.3.2), the expectation becomes highly improbable. Let us therefore address the simpler claim – that adjectives should be accompanied by some functional head.

Two candidates spring to mind: adjectivizing affixes, such as *-able*, and concord.

Leaving aside English, in many languages adjectives agree with head nouns in number and gender – and this marking may not be the same as true agreement (in the predicate position). In languages that have concord, very few adjectives are exempt from it. Can the phi-features on the adjective be the expression of the functional head introducing it?

Several considerations argue against this. Intuitively, concord is about the head noun, not about the adjective. But even more importantly, not only adjectives show concord. In quite a few languages (e.g. Italian, Russian) possessives agree with the head noun and show the declensional paradigm of adjectives (cf. Halle & Matushansky ms.). Numerals can also agree with the head noun (as in Hebrew), as do articles. In other words, the ability to reflect the number and gender of the head noun is not an exclusive property of adjectives. Now, if we were to argue that concord is the realization of the functional heads introducing adjectives, we will have a problem with other elements that show it.

Moreover, adjectives in the same semantic category may behave differently with respect to concord: in German, the adjective *rot* 'red' agrees with the noun it modifies, while the adjective *rosa* 'pink' doesn't.

Suppose that lexical insertion into the Spec may influence if the head is overt. This doesn't help. Both agreeing and non-agreeing adjectives can be modified, which doesn't influence their concord properties. We will then have to make the overtness of the functional head introducing the adjective dependent on the lexical insertion into the head of its specifier. This is an unlikely stipulation.

We conclude therefore that concord cannot be an overt manifestation of the hypothetical adjective-introducing functional heads. What about adjectivizing suffixes?

First of all, not all adjectives have special suffixes. While Russian *bednyj* 'poor, miserable-Msg-Nom' is transparently derived from the root *bed-* 'trouble' by the productive adjectivizing suffix *-in-*, *belyj* 'white-Msg-Nom' has no derivational suffix (*-yj* is the Msg-Nom suffix). The same effect can be seen in Romance: the French *éblouissante* 'dazzling-Fsg', just like its English counterpart, is derived from the verb *éblouir* 'to dazzle' by adding the suffix *-ant-* 'ing' (*-e* is the Fsg marker, triggering the pronunciation of the final consonant of the suffix). On the other hand, *petite* 'small-Fsg' is not derived. Furthermore, adjectives in the same semantic class may have

different derivational suffixes, as is the case with the Russian *umnyj* 'smart-Msg-Nom', from *um* 'mind' plus the same suffix *-in-*, vs. the underived *glupyj* 'stupid-Msg-Nom'. If adjectivizing suffixes were functional heads, then the surface realization of adjective-introducing functional heads would be dependent on the lexical realization of the adjective.

Another alternative is augmentative and diminutive affixes, which could be viewed as possible candidates for Size^0 (Mark Baker, p.c.). However, diminutive and augmentative affixes are much closer to the noun than adjectives of size:

(86) a.　amiquita　francesa 　　　　　　　　　　　　　　　　　　Spanish
　　　　　friend-Dim French
　　　　　little French friend

　　　b.　francuzskaja podružka 　　　　　　　　　　　　　　　　Russian
　　　　　French-Fsg　friend-F-Dim
　　　　　little French friend

If affixation of the diminutive affix resulted from head-movement of the noun to Size^0, we would have expected the head noun to appear in the same position with respect to a thematic adjective in all languages. However, in Russian the thematic adjective is pre-nominal, while in Spanish it is post-nominal.

To conclude, we have not seen any plausible candidates for the surface manifestation of the hypothetical functional heads introducing adjectives into xNP. This doesn't mean that such heads don't exist, but their absence is conspicuous, given that their counterparts in xVP (auxiliaries or verbal affixes) are quite frequent. We will show now that c-selection by functional heads *cannot* account for adjective ordering.

A3.3.4. Adjective scope

Svenonius (1994) notes that the examples below are not truth-conditionally equivalent:

(87) a.　valuable broken pottery 　　　　　　　　　　　　Svenonius (1994), exx. (18c)
　　　b.　broken valuable pottery

Whereas the xNP in (87a) denotes pottery that is valuable (perhaps despite being broken or even thanks to being broken), the xNP in (87b) refers to pottery that used to be valuable but may not be so any more. Neither order is neutral here.

To understand the implications of such examples on Cinque's theory, recall that c-selection is highly local: a head can only c-select the head of its complement. We know for a fact that the order in (88a) is the default one while that in (88b) is not:

(88) a. a valuable small vase

b. ? a small valuable vase

In Cinque's system, this ordering results from c-selection: ValueP requires a SizeP. But a modal adjective like *broken* can appear either before or after either of the adjectives above:

(89) a. a small/valuable broken vase

b. a broken small/valuable vase

The differences in meaning are minor in the case of *small*, but still detectable: (89b) says nothing about whether the vase is still small after the breaking – it is our knowledge of the world that supplies the inference. That this is true can be seen from examples like (90):

(90) a. a large former city

b. a former large city

While the referent of (90a) is unquestionably large, the referent of (90b) may not be. What this shows us is that a modal adjective can appear anywhere in the ordered adjective sequence. If ordering results from c-selection, then (a) every adjective can c-select a modal adjective (because a modal adjective can appear under any adjective), and (b) adjective ordering effects should disappear when a modal adjective intervenes (because a modal adjective can appear above any adjective and thus the strict locality of c-selection is disrupted). This is not true:

(91) a. a beautiful former large city

b. ??a large former beautiful city

Unless some special status is given to modal adjectives (e.g. they are not introduced by a special functional head), c-selection cannot explain the adjective ordering.

A3.4. Feature bundling

Sproat & Shih (1988) note that in Mandarin Chinese, adjectives from the classes quality>size and shape>color, contiguous on the scale of adjectival hierarchy, cannot co-occur within the same DP as direct modifiers (their exx. (19e, f):

(92) a. *hao xiao pan-zi
    good small plate

  b. *xiao hao pan-zi
    small good plate

(93) a. *yuan hong pan-zi
    round red plate

  b. *hong yuan pan-zi
    red round plate

Assuming that a functional head is defined as a feature bundle (Chomsky 1995), the choice of a Spec can be restricted by the featural composition of the head (c-selection). Suppose that in English the head F_1, whose Spec is AP_1, is composed of features f_1 and f_2, while the head F_2, with an AP_2 Spec, is the feature bundle $[f_2, f_3]$. The collapse of adjectival categories can then be reduced to impoverishment ($F = [f_2]$), to merger of two feature bundles into one ($F = [f_1, f_2, f_3]$), or to a combination thereof. [Spec, FP] can then host either AP_1 or AP_2, but not both at once.

On the other hand, one of defining properties of adjunction is that adjuncts are not selected. Do we need a separate mechanism to handle category collapse? I will argue later that it may not be necessary.
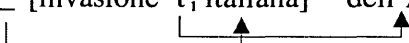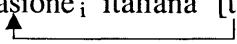
A3.5. Thematic APs

Cinque's main empirical argument for the presence of some functional heads within the DP and movement of N^0 to it comes from thematic APs discussed in section A1.3.1.

(94) the Italian invasion of Venice

Whether thematic APs are theta-marked by the head noun and are really base-generated in [Spec, NP], as suggested by Kayne (1981) and Giorgi & Longobardi (1991), or not, they have to be sufficiently close to the head noun to satisfy or modify its external argument position. However, in Romance, they appear between the noun and its complement:

(95) a. *L'italiana invasione dell'Albania
    the+Italian invasion of+the+Albania

  b. L'invasione italiana dell'Albania

  c. *L'invasione dell'Albania italiana

The fact that the complements of the noun in examples like (95) appear in the final position also argues for the head noun having started out as its sister and then head-moved within the DP. Whereas the first half of the argument depends on the assumption that thematic APs start out in [Spec, NP], the final position of the complement in relation to the noun strongly argues for some displacement having occurred. Two possibilities arise:

(96) a.   l' _ [invasione t_i italiana]   dell'Albania $_i$

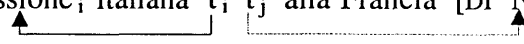   b.   l'   invasione $_i$ italiana [t_i dell'Albania]

The ordering in (95b) is obligatory. While (96a) achieves this with one operation of head-movement, (96b) requires two: Heavy NP Shift and adjective postposition.

A3.5.1. N⁰-movement vs. complement postposing

Cinque argues that while obligatoriness is a quite natural property of head-movement, it is less natural with Heavy-NP-Shift, and thus the structure (96b) is to be preferred. Moreover, when several complements are present, all of them appear on the right periphery of the xNP in the neutral DO-PP word order (his ex. (i) in fn. 5):

(97) a.   la   cessione   italiana   di Nizza   alla   Francia   neutral
           the cession   Italian   of Nizza   to+the   France

      b.   la   cessione   italiana   alla   Francia   DI NIZZA   contrast
           the cession   Italian   to+the   France   of Nizza
           the Italian cession of Nizza to France

When the complements of the noun appear in the DO-IO order, as in (97a), they must be interpreted (and pronounced) neutrally. On the other hand, the IO-DO order in (97b) imposes a contrastive focus on the direct object. If the right edge position of the complements were derived by a double application of Heavy NP Shift, Cinque argues, then these results would have been inexplicable. He therefore argues for N⁰-raising and a single application of Heavy-NP-Shift in (97b):

(98) la cessione $_i$ italiana t_i t_j alla Francia [DI NIZZA] $_j$ contrast

It can be argued, however, that there exists a class of obligatory operations postposing the complement to the right periphery, as in (99) and (100).

(99) a.   *a similar to this one problem

  b. a similar problem to this one

  c. a similar problem to this one

(100) a. *a better than yours solution

   b. a better solution than yours

   c. a solution better than yours

Cinque's argument crucially relies on English exhibiting an unmarked word-order, with no head-movement. Due to the recursion restriction, prenominal adjectives can't have complements. While for the majority of adjectives this means that the whole AP appears in the post-nominal position as in (99c) and (100c), certain APs can appear prenominally as long as their complements are moved to the right periphery of the DP, as in (99b) and (100b).

Whatever triggers the movement in (99b) and (100b), and whatever position it targets,[11] the same kind of movement could derive the right-edge position of nominal complements in Italian. The remaining question is how the unmarked ordering of complements is derived.

However, we need first to ascertain whether their ordering is in fact basic. As Aoun & Li 19xx argued, the unmarked ordering of complements in xVP is IO-DO, with the indirect object c-commanding the direct object, despite appearances to the contrary:

(101) a.
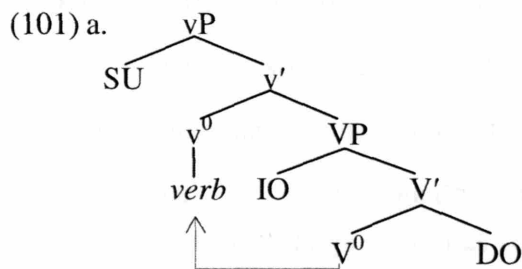
If Aoun & Li are right, then the order of arguments in the deverbal nominal in (96b) above is already a departure from the base order. The same order is unmarked in English and in Italian because the same factors postpose the indirect object. If in Italian this postposition is followed by another postposing operation similar to that required in (99b) and (100b), the restoration of the surface word-order would be due to superiority.

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[11] For the discussion of such right-shifting see SECTION.

(101) b.
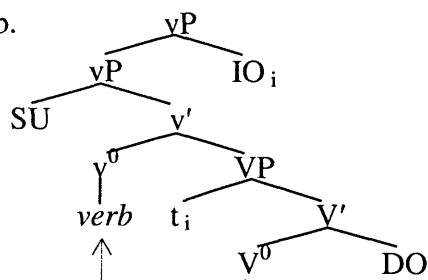
As (101b) shows, the indirect object remains higher in the structure even after postposition. Due to superiority, any movement operation targeting both the direct and the indirect objects and resulting in adjunction to the right[12] will preserve the hierarchy. The indirect object will therefore always appear on the right periphery, unless Heavy NP Shift moves the direct object past it.

We conclude that the "unmarked" order of complements in the Italian DP tells us nothing about N^0-movement.

On the other hand, the position of the noun in the adjective string is incontestably a good argument for head-movement. Whereas the scope arguments to be presented below raise certain doubts as to the true facts in event nominals, in object-denoting nominals the universal ordering facts (repeated in (102a)) are quite clear, and the difference between English and Romance ((102b) vs. (102c) and (102d)) indeed argue for Cinque's approach.

(102) a.   value > size > shape > color > origin   object-denoting nominals

     b.   good large round red Californian apples   English

     c.   bei   grandi quadri   tondi   grigi italiani   Italian
           beautiful large   pictures round gray Italian
           beautiful large round gray Italian pictures

     d.   beaux   grands tableaux ronds gris français ·   French
           beautiful large   pictures round gray French
           beautiful large round gray French pictures

We conclude that while an alternative derivation could account for the displacement of the complements of the noun in Italian, no such alternative is available to explain the position of the object-denoting head noun in the adjective string in (102).

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[12] Cinque's analysis is fully consistent with the Linear Correspondence Axiom, or the LCA (Kayne 1994), which disallows right adjunction. Even without it, the argument that the DO-IO order is non-basic holds, though some syntactic acrobatics is required to derive it.

A3.5.2. What functional head?

Although we have argued that thematic APs are normal modifiers rather than theta-role bearers, Cinque's argument does not depend on the assumption that they are generated in [Spec, NP] (as opposed to [Spec, FP]), as long as their linear position with respect to the noun is constant. Assuming that adjectives are specifiers ensures that they are linearized to the left of the head in an LCA-compliant framework (Kayne 1994).

However, do thematic adjectives argue for xAPs being introduced by functional heads? In fact, they don't. If thematic adjectives are generated in [Spec, NP], they by themselves are an exception to the rule. On the other hand, if they are not different from any other adjective, the varying position of the head noun in English and in Italian by itself says nothing about where the adjective is generated.

Why? Imagine an underlying structure like (95b) without any commitment as to where the thematic adjective is base-generated:

(103) a.   l' italiana ...[invasione$_i$ dell'Albania]

Now, following Cinque, the head noun raises to some functional head.

(103) b.   l' invasione$_i$ italiana ...[t$_i$ dell'Albania]

What functional head does the noun raise to? It is probably not some adjective-introducing functional head, because there is no additional adjective there. So unless we postulate that all Fs of the extended NP are always present (a stipulation required by Cinque's theory), we just need *a* functional head for N^0 to move into. In other words, the fact that N^0 appears to the left of the thematic adjective rather than to the right doesn't argue for an adjective-introducing functional head that could host it – it argues for *some* functional head. We will argue that such functional heads (DP-level TopPs) are necessary for totally independent reasons.

A3.5.3. Motivation for DP-internal noun movement

As noted by Laenzlinger (2000), Cinque (1994) provides no motivation for N^0 movement in Italian, nor does Shlonsky (2000), for the snowballing NP-movement in Hebrew. Laenzlinger suggests that the trigger is the necessity to check agreement features on the adjective (concord). He argues that, assuming that concord is an instance of agreement (which is not at all obvious), agreement is defined for a Spec-head configuration, but not for any other one.

However, as Laenzlinger himself notes, German concord is minimally different from French and Italian (in fact, it is stronger than Romance in that German adjectives are also marked

for Case, as are Russian ones). However, there is no DP-internal noun-movement in German, which is just like English in that all adjectives are prenominal.

A3.5.4. Focus

Suppose we're discussing what you want for your birthday present. In the context of a neutral question (*So what do you want?*), you can felicitously reply with (104a) but not (104b):

(104) a.　　I want a big red hat.

     b.　　$^{??}$I want a red big hat.

If you're adding information (*Do you want a big hat? – Yes. In fact...*), or contrasting (*Do you want a big blue hat? – No...*), a non-neutral order is possible:

(105) a.　　I want a big red hat.

     b.　　I want a RED big hat.

When an adjective is focused, it can be fronted. The existence of a focus position within a DP is not by itself a surprise, but it suggests that other information structure positions can exist. If they do, they can be targeted by movement, as in the case of comparatives in (106):

(106) a.　　I want a redder big hat.

     b.　　*I want a big redder hat.

Additional information structure projections pose no problem to a proponent of multiple functional heads within the xNP, because what Cinque's analysis is set to explain is the default ordering of adjectives. The fact that this order may change has no effect on the assumption that it arises as a result of some syntactic principle (c-selection, for Cinque).

However, it is well-known that information structure positions have syntactic properties. A good example is CP in German. [Spec, CP] and C^0 both must be filled due to some grammatical property of German. This requirement gives rise to the following cluster of phenomena:

V.	**German CP**
a.	C^0 must contain the verb (V2)
b.	If [Spec, CP] contains the subject, the sentence is neutral with respect to information structure.
c.	If [Spec, CP] contains an XP other than the subject, this XP is the topic of the clause.

In other words, the same position may be informationally neutral (for subjects or V^0) or be interpreted as the topic (for non-subjects). We hypothesize that the same may happen in the DP. In fact, Longobardi (1990) argues that in Italian, N^0 optionally moves to D^0 if N^0 is a proper name:

(107) a.   L'antica   Roma fu   la   città più   importante del   Mediterraneo
                the+ancientRome was the city most important of+the Mediterranean

       b.   *Antica Roma fu   la   città più   importante del   Mediterraneo
            Ancient Rome was the city most important   of+the Mediterranean

       c.   Roma antica fu   la   città più   importante del   Mediterraneo
            Rome ancient was the city most important   of+the Mediterranean
            Ancient Rome was the most important city of the Mediterranean.

What Longobardi doesn't discuss is the fact that this N-to-D movement has an effect on the interpretation of *solo*:[13]

(108) a.   Maria sola/   la   sola   Maria gli crede   subject position
             Maria alone-Fsg / the alone-Fsg Maria him believes
            Only Maria believes him/Maria alone believes him.

       b.   Ho   parlato con la   sola   Maria.   non-subject position
            Have-1sg spoken with the alone-Fsg Maria
            I have spoken only with Maria/I have spoken with Maria while she was alone.

       c.   Ho   parlato con Maria sola.   non-subject position
            Have-1sg spoken with Maria alone-Fsg
            I have spoken with Maria while she was alone.

If *solo* means 'only' (i.e. if we are dealing with a focus-linked quantificational item), N-to-D movement can only occur in a non-subject position. In the subject position, N-to-D movement is unconstrained. A tentative explanation may come from the possibility that N-to-D movement

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[13]   Thanks to Ivano Caponigro and Luca Storto for the judgment.

of a proper name removes it from c-command domain of *only*, and therefore, out of its scope, though we still don't know why there is no such effect in the subject position.[14]

Independently of what the constraint on the 'only' interpretation is due to, we have now found an example of DP-internal N^0-movement around a prenominal adjective, which may or may not have a semantic effect. This offers further support for the hypothesis that all DP-internal head-movement is to positions related to information structure rather than some hypothetical adjective-introducing functional heads with no phonological or semantic content.

A3.6. Non-English adjective ordering

Cross-linguistically, adjective ordering can manifest itself in one of three ways. Taking English to be the default, as usual, let us schematize the ordering of adjectives in it as $AP_1...AP_n$ N. The fact that adjective ordering is hierarchical rather than linear is traditionally demonstrated by the existence of languages where the ordering is [N $AP_n...AP_1$], as in Hebrew:[15]

(109) a.   drakonim sinim   adumim   gdolim
           dragons   Chinese-pl red-pl   large-pl
           large red Chinese dragons

     b.   yain italki taχim
          wine Italian tasty
          tasty Italian wine

Cinque (1994) bases his argument on the fact that adjective ordering in Romance is the same as in English, but the position of the noun in the string is not in the same position. In Romance, the noun is found in the middle of the sequence – a state of affairs schematically represented as $AP_1...\grave{A}P_i$ N $AP_{i+1}...AP_n$.

A3.6.1. Head parameter

The standard adjunction to NP approach handles the reverse orders in English and in Hebrew as another manifestation of the so-called head-parameter, defining how various sub-constituents of

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[14]   Suppose we were to argue that the effect is not really N-to-D, but rather adjective extraction. The problem with this hypothesis is that it is precisely from the subject position that this extraction should be blocked, not the other way around.

[15]   Other languages exhibiting the mirror image pattern are Indonesian (Hetzron 1978), Selepet (Dixon 1982), Thai and Mokilese (Sproat & Shih 1988). We will discuss them in section A3.6.3.

a projection are linearized. While the head-parameter in English is set to linearize adjectives to the left of the head noun, in Hebrew it has the opposite setting.

(110) a.

```
              NP
          ┌────────┐
         AP         NP
        ┌──┐    ┌───────┐
      large  AP        NP
            ┌──┐   ┌───────┐
           red  AP        NP
               ┌──┐       │
            Chinese       N′
                          │
                          N⁰
                          │
                       dragons
```

b.

```
                    NP
                ┌────────┐
               NP         AP
           ┌───────┐    ┌──┐
          NP        AP  gdolim
          │        ┌──┐
          NP      AP  adumim
          │      ┌──┐
          N′    sinim
          │
          N⁰
          │
       drakonim
```
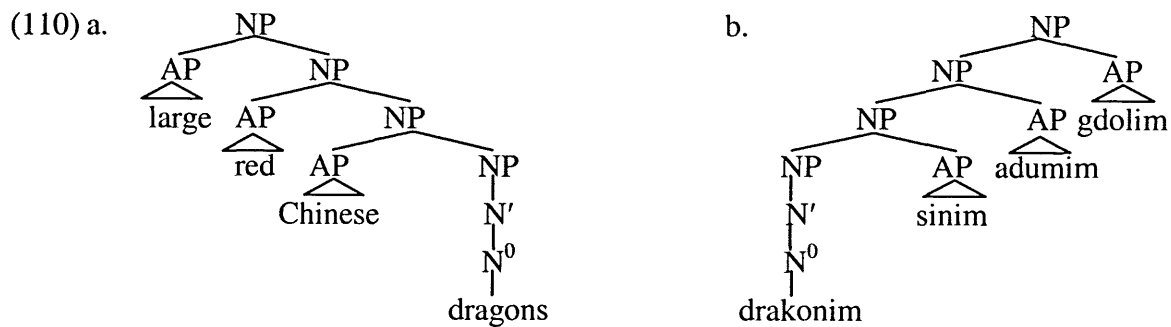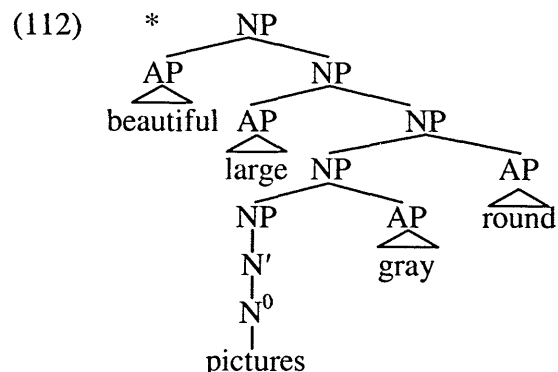
Irrespective of how the head-parameter is formalized in syntax, it is unclear how it applies to Romance, where adjectives can appear both to the right and to the left of the head noun. The problem is that in Italian and other Romance languages adjectives appear in the same order as in English, with the noun sandwiched in between them (adapted from Cinque's exx. (25) and (24)):

(111)   a.   bei   grandi   quadri tondi grigi   italiani
             beautiful large   pictures round gray   Italian
             beautiful large round gray Italian pictures

        b.   probabili goffe   reazioni immediate t_i alla   tua   lettera
             probable   clumsy   reactions immediate   to+Def   your   letter
             probable clumsy immediate reactions to your letter

One possibility is to say that in Romance some adjectives are parameterized to linearize to the left and others to the right. However, such a mixed left- and right-adjunction approach makes a wrong prediction about the order of adjectives to the left and to the right of the noun. Indeed, consider again the hierarchy in (102a):

(102) a.   value > size > shape > color > origin   object-denoting nominals

In Italian, the first two adjectives in the sequence appear to the left of the noun and the last two, to the right. Assuming that origin adjectives are the closest to the noun and value adjectives, the farthest, we then predict the following tree for the adjunction:

(112)   *   NP
              /‾‾‾‾‾\
           AP   NP
          /\   /‾‾‾‾\
    beautiful AP   NP
             /\   /‾‾‾‾\
          large NP   AP
               /‾‾‾\   /\
             NP   AP   round
             | /\
             N' gray
             |
             N⁰
             |
          pictures

Comparing the tree in (112) to the actual word order in (111a), we see that the adjunction to NP approach makes an incorrect prediction. Post-nominal adjectives in (111a) are not ordered as in Hebrew but as in English. If the appearance of adjectives on the right of the head noun were due to the head-parameter, this would have been unexpected.
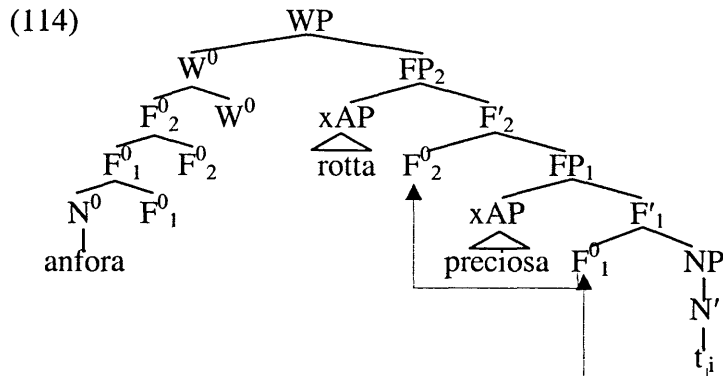
A3.6.2. Scope

The picture is however, much more complicated than it seems. To see this, we must return again to modal adjectives. As Svenonius (1994) notes, when two different orders result in different truth-conditions, there is no default adjective ordering (ex. (87a) repeated below):

(87) a.   valuable broken pottery

      b.   broken valuable pottery

In Cinque's approach, in accordance with the LCA, the linear order of two XPs reflects the c-command relation between them. This means that a sequence of two adjectives should always be interpreted with the first adjective taking scope over the second one (except in cases like Hebrew, where a different analysis is proposed). However, the prediction doesn't come true for Italian (Svenonius' example (22)):

(113) a.   un'anfora   rotta   preziosa
            an+amphora broken precious
            a precious broken amphora

      b.   un'anfora   preziosa   rotta
            an+amphora precious   broken
            a broken precious amphora

In Cinque's approach, (113) is derived by successive N^0-movement:

(114)

$$
\begin{array}{l}
\text{WP} \\
\quad \text{W}^0 \qquad\qquad \text{FP}_2 \\
\quad \text{F}^0_2 \;\; \text{W}^0 \quad \text{xAP} \qquad \text{F}'_2 \\
\quad \text{F}^0_1 \;\; \text{F}^0_2 \quad \text{rotta} \quad \text{F}^0_2 \qquad \text{FP}_1 \\
\quad \text{N}^0 \;\; \text{F}^0_1 \qquad\qquad\qquad \text{xAP} \qquad \text{F}'_1 \\
\quad \text{anfora} \qquad\qquad\qquad \text{preciosa} \;\; \text{F}^0_1 \quad \text{NP} \\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \text{N}' \\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad t_{,i}
\end{array}
$$

In a structure like (114), the scopes of the two adjectives should be unaffected. However, as the translation indicates, the linearly second adjective scopes over the first one. It must be concluded that the surface order of adjectives does not reflect scopal relations between them here.

The behavior of modal adjectives suggests that Italian postnominal adjectives may appear after the noun not as a result of noun movement but because they are base-generated there. It is not impossible that some classes of adjectives are linearized to the right of the noun, while others are linearized to the left. Further investigation is required to test this hypothesis.[16]
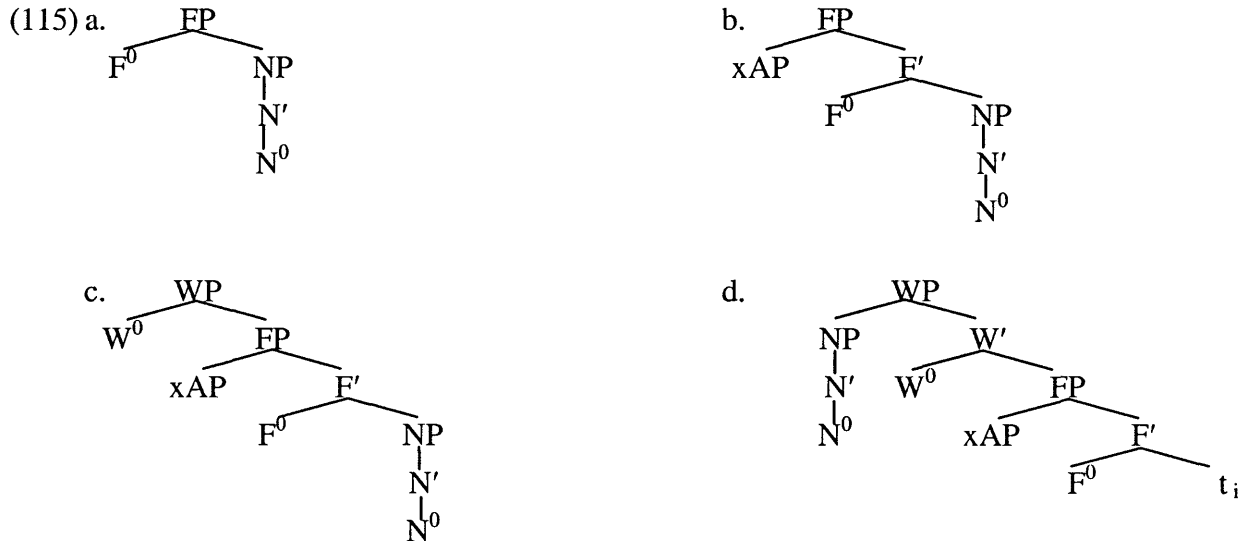
A3.6.3. Mirror image languages

In Hebrew, Celtic and Indonesian adjectives appear in the order opposite to that of English. A previous version of Kayne (1993), GLOW-1992 as reported by Cinque (1994), as well as Cinque (2000), Shlonsky (2000) and Sichel (2001) propose that these reverse orders are derived by repeated pied-piping of an NP/DP constituent across an adjectival head.

VI.	**Right adjunction of an xAP via remnant movement**
(1)	Merge an F^0 with the NP as a complement
(2)	Merge the xAP to [Spec, FP]
(3)	Merge a W^0 taking the FP as a complement
(4)	Move the FP to [Spec, WP]

---

[16] All adjectives whose scope depends on position appear to belong to the group of "modal" adjectives (also including subsective adjectives like *former*, and possibly *broken*). As Cinque notes (p. 104), in Italian some of these adjectives, like *mera* 'mere' or *solo* 'only', can only appear prenominally with common nouns, and others have different interpretations in pre- and post-nominal positions.

An analysis where adjectives always start out to the left of the head noun and then move brings reverse adjective orderings in line with the Linear Correspondence Axiom (Kayne 1994). Steps (1) through (4) are shown in (115):

(115) a.

$$\begin{array}{c} \text{FP} \\ \diagup \diagdown \\ \text{F}^0 \quad \text{NP} \\ | \\ \text{N}' \\ | \\ \text{N}^0 \end{array}$$

b.

$$\begin{array}{c} \text{FP} \\ \diagup \diagdown \\ \text{xAP} \quad \text{F}' \\ \diagup \diagdown \\ \text{F}^0 \quad \text{NP} \\ | \\ \text{N}' \\ | \\ \text{N}^0 \end{array}$$

c.

$$\begin{array}{c} \text{WP} \\ \diagup \diagdown \\ \text{W}^0 \quad \text{FP} \\ \diagup \diagdown \\ \text{xAP} \quad \text{F}' \\ \diagup \diagdown \\ \text{F}^0 \quad \text{NP} \\ | \\ \text{N}' \\ | \\ \text{N}^0 \end{array}$$

d.

$$\begin{array}{c} \text{WP} \\ \diagup \diagdown \\ \text{NP} \quad \text{W}' \\ | \quad \diagup \diagdown \\ \text{N}' \; \text{W}^0 \quad \text{FP} \\ | \quad \diagup \diagdown \\ \text{N}^0 \; \text{xAP} \quad \text{F}' \\ \diagup \diagdown \\ \text{F}^0 \quad \text{t}_i \end{array}$$

The schema in (VI)/(115) is not just about Hebrew adjectives. In an LCA-compliant grammar all right adjunction is achieved in this way. The question is how we achieve this.

From a purely descriptive point of view, in order to achieve reverse adjective ordering, we need to enforce the following rule in Hebrew: every time an FP is merged, a WP is merged and attracts the NP.

A priori, this rule seems an easy thing to achieve in a grammar providing for EPP-features: suppose that W^0 bears such an EPP-feature and an N-feature. Overt NP-movement to [Spec, WP] will then be obligatory.

Consider now what happens in languages where (at least some) adjectives are prenominal, as in English. The situation in English is described by Emonds' recursion restriction: when the predicate of a projection is its rightmost element, the projection is linearized to the left of the noun. To simplify grossly, modifying adjectives, nouns, and idiomatic expressions like *off-the-cuff* in English appear to the left of the head noun while PPs appear to the right.

So how do we specify when the NP moves to [Spec, WP] in English? Descriptively the NP moves to [Spec, WP] iff [Spec, FP] contains a PP. An LCA-compliant grammar must then have a way of establishing a relation between a head and the specifier of its complement.

To complicate the situation further, we have been so far considering very small xNPs, with only one modifier. What happens when you have more than one? The generalized description of right adjunction would then look like (VII):

VII.   Generalized right adjunction via remnant movement

Take L^0 to be the lexical head and YP to be the adjunct.
(1)   Merge an F^0 with the current xLP as a complement
(2)   Merge the YP to [Spec, FP]
(3)   Merge a W^0 taking the FP as a complement
(4)   Move the largest constituent containing xLP and not containing the YP to [Spec, WP]

How can we derive the description of the step (4) of (VII)? The simplest way of doing so is by reformulating it as attraction of the maximal xLP, period. We now need the constraint that W^0 cannot attract its complement, and then the maximal available xLP will be the complement of F^0, i.e. "the largest constituent containing xLP and not containing the YP".

Interestingly, this constraint can be made to follow from independent considerations. As Pesetsky and Torrego (2001) note, Comp-to-Spec movement would effectively amount to merging a head with the same constituent twice, and thus has to be excluded. As a result, we can simplify the step (4) of (VII) to:

---

(4)   Move the largest available xLP to [Spec, WP]

The "rolling-up" derivation in (115) ensures that the scope of an adjective is reflected in its surface position: the farther to the right an adjective is, the higher it was originally merged and thus its scope will include everything that linearly precedes it.

To summarize, right adjunction via remnant movement requires two constraints built into syntax: the independently motivated impossibility of Comp-to-Spec movement and an ability for a head to "see" the specifier of its complement.

A3.7. Inter-linguistic variation

In this subsection we will show that if right adjunction is derived by successive movement of the NP-remnant, certain cases are extremely difficult to account for.

A3.7.1. The French connection

As we have seen in section A3.6.2, if scope is indicative of hierarchy, postnominal adjectives may surface after the noun as a result of N^0-movement or as a result of "right adjunction". Additional evidence for the existence of factors at work comes from the fact that they can co-occur within a single language. Thus Valois (1991) (fn. 11, p. 101) notes certain cross-linguistic variation in Romance:[17]

(116) a.   l'invasion   martienne brutale de Jupiter   French

           the+invasion Martian   brutal   of Jupiter

           the brutal Martian invasion of Jupiter

     b.   *l'invasion brutale martienne de Jupiter

(117) a.   the brutal Martian invasion of Jupiter   English

     b.   *the Martian brutal invasion of Jupiter

(118) a.   l'atteggiamento ostile   americano   Italian

           the+attitude   hostile American

     b.   *l'atteggiamento americano ostile

If the Italian and English adjective ordering is taken as basic, then it is the French adjective ordering that must be explained. If Cinque (1994) is right, then the underlying order of the French case must be:

(119) a.   brutale martienne invasion de Jupiter

How do we obtain (116a) out of this? If Cinque's proposal is right, the head noun must raise to some position above *brutale*:

(119) b.   invasion [$_{FP2}$ brutale [$_{FP1}$ martienne [$_{NP}$ t $_i$ de Jupiter]]]

DP-internal N^0-movement is a necessity for French because of how the rest of adjectives are ordered. The question is now how to put *martienne* before *brutale*. Obviously we cannot just move FP$_1$ because this would necessarily pied-pipe the NP-remnant, producing a wrong result:

---

[17] Cinque (1994, fn. 8) claims that neither (118a) nor (118b) are grammatical because the two adjectives have the same degree of "absoluteness" (Sproat & Shih 1988). The English (117a) is acceptable because the "absoluteness" criterion doesn't hold in English, and the French (116a) is grammatical because *invasion martienne* is interpreted as a compound. It should be noted that both Russian and Hebrew allow the co-occurrence of *Martian* and *brutal*.

(119) c.　*invasion [FP1 martienne [NP t $_i$ de Jupiter]] $_j$ [FP2 brutale t $_j$]

Therefore, the complement of the head noun has to be extraposed. But this brings us back to Cinque's own argument *against* deriving the adjective ordering in Italian by the extraposition of the complements of the head noun. The same factors that made it unlikely for Italian exist in French:

(120) la　cession italienne de　Nice　à　la　France
　　　the cession Italian　of　Nizza to　the France
　　　the Italian cession of Nizza to France

To repeat the argument, (120) can potentially be derived by either raising the head noun to some position before the thematic adjective or by extraposing both arguments of the head noun. Cinque argues that the former solution is superior, because it automatically results in the default DO-IO order and the default intonation. If the right edge position of the noun complements were derived by a double application of Heavy NP Shift, why is it neutral?

(121) la cession t $_i$ t $_j$ italienne [de Nice] $_i$ [à la France] $_j$

However, once we see that in French more than one adjective can intervene between the head noun and the complements in what Cinque claims to be the non-default order, extraposition of the complements is required. But then there is no real reason for arguing that the position of the noun in Romance results from head-movement, and therefore, no real argument for invisible heads in the DP.

Of course, it is not impossible to continue from (119b) by moving *martienne* to a position before *brutale*, but if such an operation is available in principle, why do we need the successive pied-piping of the NP-remnant used for Hebrew?[18]

---

[18]　Another possible example of the same phenomenon is Finnish, which departs from the universal order with respect to the positions of "subjective comment" and "size" adjectives (Scott 1998, ex. (39b)):

　　(i)　pitkät kauniit　punaiset　hiukset　　　　　　　　　　　　　　　Finnish
　　　　　long　beautiful red　　hair
　　　　　beautiful long red hair

It should be noted, however, that even in English these two adjectives are not very restrictively ordered, as shown by the fact that *long beautiful hair* and *beautiful long hair* have approximately the same grammatical status (with some variation between speakers as to which is considered to be default), while there can hardly be any doubts about **red long hair*.

To summarize, the behavior of exceptions to the universal adjective ordering in French provides independent motivation for right extraposition of the complements of the head noun. If such extraposition exists, then the position of the head noun before most adjectives in Italian may be due to phrasal movement of the remnant NP after extraposition of the complements rather than to head-movement of N^0.

A3.7.2. Mirror images in Italian

It would appear that adjectives are not parameterized as a category with respect to their position with respect to the head noun (however we implement it in syntax). To see this, consider again the scope facts noted by Svenonius (1994) and repeated below:
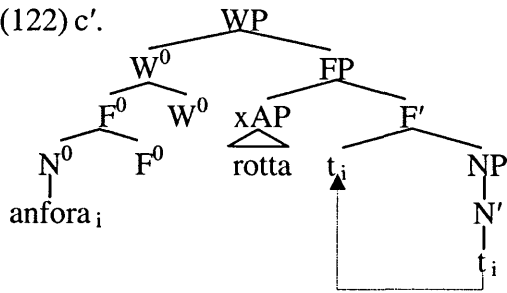
(113) a.   un'anfora   rotta   preziosa

           an+amphora broken precious

           a precious broken amphora

As Svenonius (1994) shows, if Italian adjective ordering were derived by head-movement of the noun, then the linearly first adjective *rotta* would have scoped over the linearly second one *preciosa*, which is untrue. To obtain the right scope relations and maintain the LCA, (113a) has to be derived via NP-remnant pied-piping:
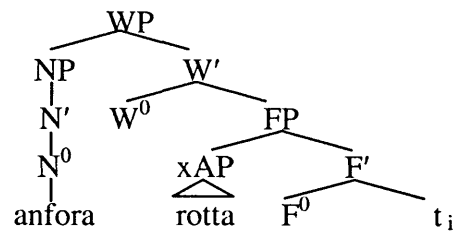
(122) a.
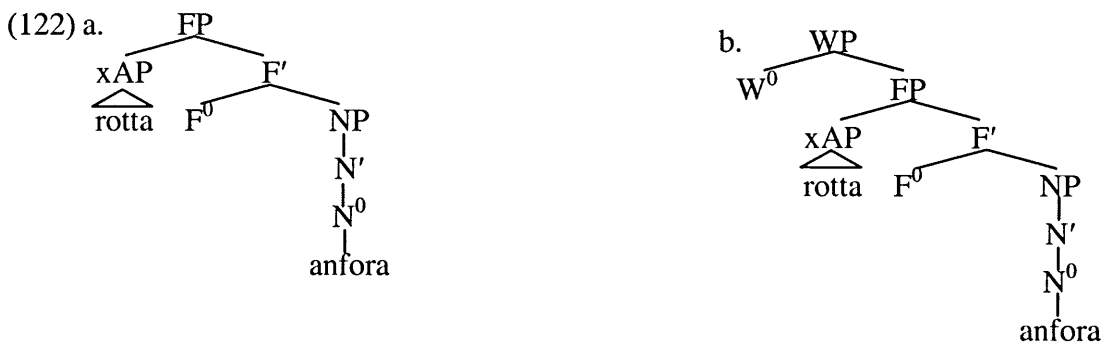
Depending on the analysis, the next step could be either head-movement of N^0 to W^0 via F^0 (if we believe that the ordering of the head noun with respect to other adjectives in Italian results from N^0-movement) or phrasal movement of the NP to [Spec, WP].
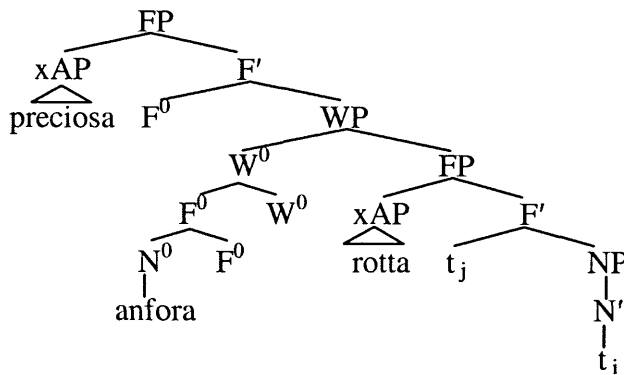
(122) c'.

```
              WP
          ___/  \___
        W⁰          FP
      _/  \_      _/   \_
    F⁰     W⁰   xAP      F'
   _/ \              △   _/  \_
  N⁰   F⁰          rotta  tᵢ    NP
  |                             |
 anforaᵢ                        N'
                                |
                                tᵢ
```

c".

```
              WP
          ___/  \___
       NP          W'
        |        _/  \_
       N'      W⁰      FP
        |            _/   \_
       N⁰         xAP       F'
        |          △      _/  \_
     anfora      rotta   F⁰     tᵢ
```
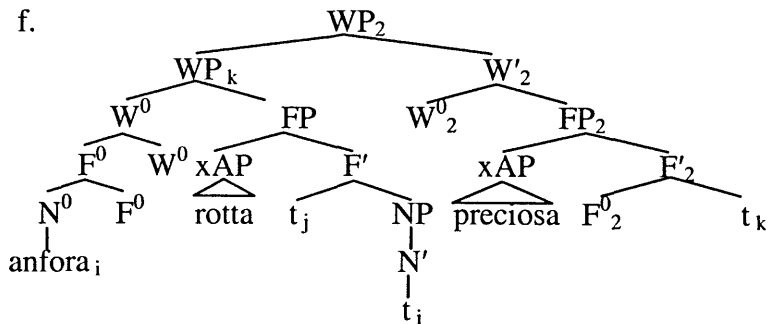
To simplify matters, we will choose the option (122c'), which is more consistent with the rest of the Italian data. We can now merge the second adjective and move the NP-remnant:

(122) d.

```
              FP
          ___/  \___
       xAP          F'
        △         _/   \_
     preciosa  F⁰         WP
                       _/   \_
                     W⁰       FP
                    _/ \     _/  \_
                  F⁰   W⁰  xAP     F'
                 _/ \       △    _/  \_
               N⁰   F⁰    rotta tⱼ   NP
               |                     |
             anfora                  N'
                                     |
                                     tᵢ
```

f.

```
                    WP₂
             ____/       \____
          WPₖ                  W'₂
        _/   \_             _/    \_
      W⁰       FP        W⁰₂        FP₂
     _/ \    _/  \_              _/    \_
   F⁰   W⁰ xAP    F'          xAP       F'₂
  _/ \    △    _/  \_          △       _/   \_
 N⁰  F⁰ rotta tⱼ    NP     preciosa  F⁰₂     tₖ
  |                  |
anforaᵢ              N'
                     |
                     tᵢ
```

Leaving aside the fact that we have somehow to ensure that N^0 moves to F^0_1 but not to F^0_2, how do we ensure that WP is moved to [Spec, WP₂] only when [Spec, FP₂] contains a modal adjective? As explained above, in a language like English xAPs are linearized to the left and xPPs to the right. To implement right-linearization of PPs by movement of the NP-remnant to [Spec, WP], W^0 needs to see what category the specifier of its complement belongs to – is it an xAP (in which case no movement occurs) or an xPP (in which case the NP-remnant must raise to [Spec, WP]).

Cases like (122) seem to suggests that an even stronger constraint on W^0 holds in Italian: the NP-remnant is pied-piped to [Spec, WP] if the specifier of the complement of W^0 ([Spec, FP]) contains either an xPP (the usual case, shared with English) or a modal adjective.

This is a very strong argument in favor of right adjunction and against deriving the Hebrew adjective order by successive pied-piping of the NP remnant, because what we are doing here is effectively making a syntactic operation dependent on very fine-grained semantics.

A3.8. Conclusion

Cinque's analysis is an attempt to account for two main factors of adjective distribution: certain universality of ordering and the position of the head noun in an adjectival sequence in Romance. We have argued that this attempt fails on both accounts and introduces a variety of additional complications.

First of all, what the difference between Germanic and Romance argues for is *a* functional projection within the DP-domain. While it is certainly likely that the head noun does move to the head of this functional projection in Italian, as suggested by the positions of the complements of the noun in Italian, French shows that remnant NP-movement cannot be ruled out. In order to prove that each xAP is introduced by its own functional projection one needs to demonstrate that for all thirty possible xAPs there exists a language where the head noun appears between this xAP and the one following it in the adjectival hierarchy.

Secondly, Cinque's proposal is not really an explanation of universal adjective ordering. If adjective ordering follows from the ordering of functional heads, then it is the ordering of these heads that has to be explained. Furthermore, c-selection as a means of rigidly ordering adjectival functional heads raises several serious problems. On the one hand, not only xAPs but also xNPs and xPPs are ordered by the same semantic hierarchy, so the notion of size has to be encoded in the meaning of the functional head $Size^0$ rather than in its syntax. On the other hand, it is unclear how these functional heads are interpreted when their specifiers are not present, especially when a particular head noun is not compatible with that modifier (e.g. *long wine*).

APPENDIX 4
EXTENDED PREDICATE MODIFICATION

As discussed above, the Predicate Modification rule interprets nodes whose daughters have the same semantic type $\langle e, \sigma \rangle$:

II.   Predicate modification

For $\alpha \in D_{\langle e, \sigma \rangle}$, $\beta \in D_{\langle e, \sigma \rangle}$ and γ s.t. γ immediately dominates both α and β

$[\![\gamma]\!] = \lambda x \in D_\sigma. [\![\alpha]\!](x)$ and $[\![\beta]\!](x)$

One could imagine a less restricted rule that would require only the first argument to be the same:

VIII.   Extended predicate modification (to be discarded)

For $\alpha \in D_{\langle \sigma, \sigma \rangle}$, $\beta \in D_{\langle \sigma, \tau \rangle}$ and γ s.t. γ immediately dominates both α and β

$[\![\gamma]\!] = \lambda x \in D_\sigma. [\![\alpha]\!](x)$ and $[\![\beta]\!](x)$

The two approaches make different predictions about argument ordering, because the latter extends the space of possible hypotheses about argument ordering. Consider an adjective like *tall*, containing a degree argument. If it has the semantic type $\langle d, \langle e, t \rangle \rangle$, there is no difference in predictions between (II) and (VIII). However, what if the adjective has the semantic type $\langle e, \langle d, t \rangle \rangle$?

(II) cannot combine two elements of different semantic types. But if (VIII) holds, we could expect the adjective to first combine with the noun and then with its degree argument. This would result in the constituency advocated by Abney (1987), Delsing (1993) and Bouchard (1998), among others, and shown to be impossible in Appendix 2:

(123)
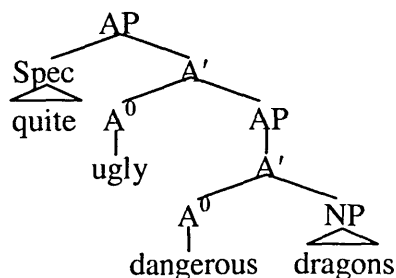
We conclude that scalar adjectives cannot have the semantic type $\langle e, \langle d, t \rangle \rangle$, irrespective of which rule of interpreting modificational structures we choose. Note that if they have the type $\langle d, \langle e, t \rangle \rangle$, they are compatible with both rules.

Suppose we are combining a noun of the type $\langle e, \langle e, t \rangle \rangle$ (a relational noun like *mother*, which takes an individual x and an individual y and returns true if y is the mother of x) and an adjective of the type $\langle e, t \rangle$ (a non-scalar adjective, like *French*, which takes an individual and returns true if this individual is French:

(124) a.　　$[\![\text{mother}]\!] = \lambda x \in D_e . \lambda y \in D_e . y$ is the mother of x

　　　 b.　　$[\![\text{French}]\!] = \lambda x \in D_e . x$ is French

The Predicate Modification rule (II) can't apply to a node whose daughters are *French* and *mother*, because the description of the rule requires the two daughters to be of the same semantic type. On the other hand, the Extended Predicate Modification (VIII) can apply:

(124) c.

$$
\begin{array}{c}
\text{NP} \\
\overbrace{} \\
[\![\text{French}]\!] \quad [\![\text{mother}]\!]
\end{array} =
$$

$$
\begin{array}{c}
\text{NP}_{\langle e, t \rangle} \\
\overline{} \\
[\lambda x \in D_e . x \text{ is French}]_{\langle e, t \rangle} \qquad [\lambda x \in D_e . \lambda y \in D_e . y \text{ is the mother of } x]_{\langle e, t \rangle}
\end{array} =
$$

$$
\lambda x \in D_e . \lambda y \in D_e . x \text{ is French and } y \text{ is the mother of } x
$$

(124c) is clearly a wrong meaning for *French mother* because it asserts that it is the child (the inner argument of *mother*) that is French rather than the mother (the referent of the entire xNP). The first argument of *mother* should have been saturated before the noun was combined with the modifier. But how do we ensure this?

It is not impossible to imagine reversing the order of the arguments. However, this would have some syntactic consequences, such as the fact that the c-command relation between the two arguments would be reversed. If the subject (referent) of a relational noun is merged before the possessor (object), then the object should be able to bind the subject and not vice versa. This is clearly false:

(125) a.　　[No one] $_i$ can t $_i$ be [t $_i$ a mother of herself].

　　　 b.　　*We considered herself a mother of Sue.

Suppose that c-command relations are not established between the original theta-positions but rather after some movement of the subject has occurred. This is not impossible given that in

many languages, including Russian and Japanese, anaphors refer back to the subject rather than to just any c-commanding element. Consider now the reverse situation – where the noun is type $\langle e, t \rangle$ and the adjective is $\langle e, \langle e, t \rangle \rangle$ (with the first argument being the subject and the second one being the object). We then predict that an adjective may first combine with the noun and then with its complement, which is factually untrue:[19]

(126) a. *a proud woman of her work   vs. *a woman proud of her work*

　　 b. *demanding work all your attention   vs. *work demanding all your attention*

The underlying generalization is that syntax reflects argument ordering: higher arguments are more internal. If modificational structures were interpreted by the rule of Extended Predicate Modification, this correlation and thus the ungrammaticality of cases like (126) wouldn't follow from anything. On the other hand, the Predicate Modification rule (II) is incompatible with the reverse argument ordering.

The correlation between argument ordering and syntactic hierarchy is also manifested in what is and is not possible in coordination. Consider the following ungrammatical examples:

(127) a. *proud and happy of her achievements

　　 b. *to talk and calm down about one's work

　　 c. *a father and husband of two   * under the non-bigamous interpretation only

Suppose that *and* is semantically vacuous. Then any structure involving it would have to be interpreted as a modificational one. The ungrammaticality of examples (127) then follows without any additional assumptions. On the other hand, if Extended Predicate Modification is assumed to be the rule of interpreting modificational structures, we need to give *and* a meaning that would rule out examples like (127).

We conclude that the rule of Extended Predicate Modification, while fully compatible with the facts, makes it possible to have unattested syntactic structures and is therefore too weak. On

---

[19] As discussed in section REF, there exists a class of xAPs allowing the surface order observed in (126):

　　(ii)　a better book than *War and Peace*
　　(iii)　the first title in the series
　　(iv)　a similar book to this one

We analyzed these cases as counter-cyclic merge into the scope position of the scope-bearing element. Since such scope-bearing elements are not interpretable in situ to begin with, the fact that e.g. a degree clause (an internal argument of a comparative) is not merged immediately would be just another factor demanding that the comparative operator be moved for interpretability.

the other hand, the rule of Predicate Modification enforces a particular argument ordering, which can be shown to be independently motivated.

We have also seen that apparently modification only occurs between particular semantic types (e.g. $\langle e, t \rangle$, but not $\langle e, \langle e, t \rangle \rangle$), and these types are exactly those that pro-forms like *do so* or *one* have (which explains why arguments cannot co-occur with these pro-forms). The Extended Predicate Modification rule doesn't require the modifier and the modified item to have the same semantic type and so the correlation between them is unexpected.

APPENDIX 5
SCALARITY COERCION

As Bolinger (1972) discusses in great detail, predicates fall into two categories depending on how easily they can be viewed as being true to a greater or lesser degree: scalar and non-scalar. Bierwisch (1989) proposes that scalar (*relational*, in his terms) predicates have an argument of the semantic type d (degree). Whereas a non-scalar predicate is either true of an individual or not (binary semantics), a scalar predicate may be true to a greater or lesser degree.

Typical examples of scalar predicates are dimension adjectives, such as *wide* or *small*, and value adjectives, such as *good* or *capable*, and possibly color adjectives such as *red* (Sapir 1944), but the list is not limited to these:

(128) a.   Pluto is large.

     b.   This doctor is quite capable.

(128a) means that Pluto is large to some contextually specified norm, which is different for dogs, gods and planets. (128b) is less vague in that the contextually specified norm to which the degree of this doctor's capability is compared is more obvious – the degree at which a doctor is considered to be capable. But even here, the same person can be judged to be capable as a doctor or not depending on whether we need a child's tooth pulled or a tracheotomy to be performed. No such vagueness exists for binary (non-scalar) predicates: thus a person either is French or is not, and if a cathedral is wooden, no amount of contextual input is going to change this fact.

Formally, scalar predicates are defined as in (129):

(129) **Scalarity**: A lexical item is scalar if it has an open variable slot of the type d (degree).

Let us assume that the lexical entry for a typical scalar adjective is (130), borrowed from Heim (2000):

(130) $[\![\text{large}]\!] = \lambda d \in D_d . \lambda x \in D_e . x$ is d-large

If that were all, examples like (128a) would have always been true, as long as Pluto has some size. However, the *norm* of largeness to which we are comparing Pluto is different, depending on what Pluto is. In other words, scalar predicates depend on a contextually provided *comparison class* (cf. Klein 1980).

The meaning of (128) should thus be something like (131a) and its semantics, like (131b):

(131) a.   Pluto is large (for a planet).

> b.   [[Pluto is large]] = 1 iff ∃d'.[λd ∈ D_d , d > N_P , where N_P is the contextually defined
>   large size for a planet. λx ∈ D_e . x is d-large] (d') (Pluto) = 1

The comparison class relativity clause ($d > N_C$, *where N_C is the contextual norm*) is not part of the lexical entry *large*, but rather comes from the way scalar predicates are interpreted (without being more specific). The degree variable d, however, is part of the lexical entry of any scalar predicate.

The degree variable of a scalar predicate can be saturated by an overt measure phrase such as *2"*(at least, in English), modified by a degree modifier such as *very* or *extremely*, or bound by a degree operator such as *more* or *so*:

(132) a.   The Ginnunga gap is *infinitely many miles* deep.   saturation
      b.   Which means it is *very* deep.   modification
      c.   Considerably *more* so than the Marianas Trench.   binding

So what happens if we try to place a non-scalar predicate into any of these contexts?

A5.1. Measure phrases

Measure phrases are extremely restricted in their distribution. Apart from appearing as objects of certain verbs such as *weigh* or *measure*, they are only compatible with a sub-class of dimension adjectives and with some degree operators:

(133) a.   The Moon is (**many tons*) heavy/(**quite a few lumens*) bright.
      b.   The Moon is *many miles* wide/*far/*narrow.

(134) a.   Mercury is *many tons* heavier/*many lumens* brighter than the Moon.
      b.   Which is *3 tons* too heavy/*3 lumens* too bright to be used as a demon lamp.

In fact, most scalar adjectives cannot take measure phrases, and those that can (dimension adjectives) are all positive adjectives (see Kennedy (1997) for an explanation). Degree operators are less constrained.

The possibility of adding a measure phrase to an adjective that normally does not take one seems to be heavily conditioned by pragmatics. If we can imagine a unit of measurement for an adjective, the result is not ungrammatical:

(135) a.   ?The Emerald City is 5 leaves green(er).
      b.   ?The US is many Rothschilds (more) prosperous.

It is unclear what such examples show, since *green* and *prosperous* are perceived as scalar in some way (*green* with respect to closeness to some prototypical green, *prosperous* as an open scale of wealth). But nationality adjectives such as *Israeli*, material adjectives such as *wooden*, or relational adjective such as *classical* are not compatible with measure phrases:

(136) a. **2 sabra generations* Israeli

b. **3 layers* wooden

c. **7 Mozarts* classical

Since the distribution of measure phrases is much more constrained than that of degree operators and modifiers, their unavailability with non-scalar adjectives tells us close to nothing about how non-scalar predicates behave when placed in a context requiring scalarity.

A5.2. Degree operators and modifiers

Degree operators and degree modifiers behave alike when combined with predicates such as *flat* or *Roman*, which are normally perceived as binary.

(137) a. Flatland is extremely flat.

b. Flatland is more flat than your average table.

In both cases, the interpretation of the adjective is not usual. Normally, a surface either is flat or is not. But in examples (137) we are discussing a slightly different property: (137a) means that Flatland possesses extremely many properties that are stereotypically viewed as characteristic of being flat (e.g. it is even, has two sides, etc.), and (137b) means that Flatland possesses more of such properties than your average table does.

The case is even more clear with *prime*. From the mathematical point of view, *prime* is a strictly binary property – either a number is divisible by more than two other numbers, and then it is not prime, or it is not, and then it is prime.[20]

Nonetheless it is possible to say:

(138) Somehow, 7 is much more prime than 2.

Both 2 and 7 are prime numbers, but 7 is perceived as closer to the 'prototype' of *prime*. It is this relativization to stereotypical properties that we will refer to as the scalarity coercion, and the meaning of the predicate thus obtained is the coerced meaning.

---

[20] There exists another definition of *prime* as a relation between two numbers (having no common divisor except 1), but we will use the more standard one.

Note that the coerced scalar meaning of a predicate is very close to that emerging in the so-called metalinguistic comparison in (139a). Its interpretation is something like (139b):

(139) a.   The *hoi polloi* are more ignorant than stupid.

b.   The predicate *ignorant* is more applicable than the predicate *stupid*.

The difference between metalinguistic comparison and coercion is that the former is not possible when neither predicate applies

Metalinguistic comparison does not trigger scalarity coercion. We can see this when we try to use it with a strictly binary predicate such as *prime*:

(140) *7 is more prime than ___.

It is unclear what predicate can be placed in a higher applicability relation with *prime*. On the other hand, predicates such as *ignorant* and *stupid* are viewed as belonging to one semantic domain. When we pick predicates from different semantic domains, metalinguistic comparison is impossible:

(141) *The Moon is more heavy than bright.

No such issues arise for scalarity coercion, where what we are concerned with is not the applicability of a predicate (a binary notion in itself), but the degree to which it applies. We will formalize scalarity coercion as the projection of an additional operator:

(142) $CoOp = \lambda f \in D_{\langle e, t \rangle} . \lambda d \in D_d . \lambda x \in D_e$. d is some reflection of the extent to which various properties stereotypically associated with being f apply to x

The degree to which characteristic properties of a predicate apply to its argument can be a reflection of how many of these properties apply at all, or of to what extent one of them applies. For example, you can be *more French than Napoleon* by either having more stereotypical French characteristics associated with you (e.g. you eat cheese, you detest processed cheese, you drink wine with every meal, you have a French passport, etc.) than Napoleon does (e.g. Napoleon was Corsican), or by beating Napoleon at the degree to which you possess a particular contextually relevant characteristic (e.g. you flirt with more members of the opposite sex). What is important is that when scalarity coercion occurs, instead of evaluating a particular predicate (e.g. *French*) we are evaluating properties stereotypically associated with this predicate.

All degree operators and modifiers trigger scalarity coercion when combined with a non-scalar predicate. This means that we can (a) determine whether a particular predicate is scalar by observing whether its meaning changes in the context of a degree operator or modifier, and (b)

decide if a particular context contains a degree operator or modifier by placing into it a known non-scalar predicate. Since the meaning change is predictable, scalarity coercion is a reliable diagnostic for the presence of a degree variable.

A5.3. Non-adjectival scalarity coercion

Bolinger (1972) shows that scalar adjectives are not the only scalar predicates available. There is a difference between scalar nouns such as *idiot* or *nonsense*, and non-scalar nouns such as *thesis*, just as there is a difference between scalar and non-scalar PPs (*out of her mind* or *out of synch* vs. *out of the room*). PPs and NPs behave differently with respect to scalarity coercion, and degree operators and modifiers behave differently with respect to NPs.

A5.3.1.NPs and PPs

Like adjectives, both NPs and PPs are compatible with open class degree modifiers (*utter/utterly*, *extreme/extremely*, etc.):

(143) a. an utter/extreme idiot/nonsense

b. utterly/extremely out of her head

Because open class degree modifiers do not require additional functional elements (such as *of* or *much*) to combine with NPs or PPs, they provide the best testing ground for whether a PP or an NP is scalar:

(144) a. a complete idiot/?professor

b. completely out of her head/?out of the room

Of degree operators, *such* and *what* can also be used for NPs, and all other operators (*so*, *more*, etc.) can be used for PPs:

(145) a. such/what a fool/?professor

b. more/so out of her mind/?out of the room

As with scalar and non-scalar adjectives, non-scalar NPs and PPs change their meanings in the context of a degree modifier: a contextually salient characteristic property of the predicate is usually chosen (e.g. absent-mindedness, or erudition for *professor*, absence of personal articles for *out of the room*) and then evaluated with respect to the degree operator.

A5.3.2.Classes of degree operators

Corver (1997) notes that degree operators fall into two classes. Degree operators such as *very* or *as* disallow *so*-pronominalization, while others, such as *more* or *enough*, permit it:

(146) Tolstoy was fond of children.

    a.   Maybe too/very *(much) so.

    b.   His wife was less so.

Doetjes, Neeleman and van de Koot (1998) propose that the difference is due to the fact that some degree operators are sensitive to the syntactic class of the item they compose with. While most PPs can only appear with *more*, *less* or *enough*, as shown by the contrast between (147) and (148), certain PPs can appear with other degree operators as well, as in (149):[21]

(147) a.   He is [more [PP on drugs]] than any of his friends.   Doetjes et al.'s (11)

    b.   He is [less [PP into syntax]] than he was before.

    c.   He is [enough [PP over the limit]] to be arrested.

(148) a.   *He is [too [PP under scrutiny]] to be elected at this time.   Doetjes et al.'s (12)

    b.   *He is [as [PP over the limit]] as Bill.

(149) a.   He is [too [PP out of his mind]] to be elected at this time.

    b.   He is [as [PP in love]] as Bill.

Doetjes et al. argue that since *so* is a predicate pro-form that does not belong to any lexical class, it cannot combine with degree operators specified to c-select adjectives, such as *very* or *so*.

When we compare the PPs in (149) to those discussed in the previous section, we instantly see that they are scalar, as opposed to the PPs in (148), which are not. In other words, some degree operators can combine with non-scalar PPs and trigger scalarity coercion, while others cannot. Note, however, that all degree operators can combine with a non-scalar adjective, suggesting a fundamental distinction between APs and PPs with respect to coercion. The fact that scalarity coercion distinguishes between lexical categories may be interpreted as indicating that scalarity coercion is reflected in syntax and thus subject to such syntactic constraints as c-selection, or that certain meanings are more likely to be realized as PPs rather than APs.

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[21] Doetjes (1997), Doetjes et al. (1998) use these contrasts to argue for a syntactic difference between the two classes: degree operators such as *very* and *as* are heads, c-selecting their complement, while degree operators *more*, *less* and *enough* are phrases, either adjoined or merged in the specifier position.

An interesting complementary perspective on scalarity coercion is offered by Kennedy and McNally (1999), who suggest that the distribution of degree modifiers is sensitive to the nature of the "standard values" according to which a degree-modified adjectival predication is judged to be true.

Kennedy and McNally show that an adjective appears with *very*, *well*, or *much* depending of the nature of the standard value associated with it. While both *very* and *much* have the effect of "boosting" the standard associated with the adjective, *very* selects for an adjective that has a context-sensitive standard, while *much* needs a context-insensitive standard. *Well*, in contrast, is sensitive to whether the adjective it modifies has a scale with a maximal and minimal value.

It is more than likely that various degree operators are sensitive to both the scale created by scalarity coercion (open or closed) and to the standard associated with this scale (i.e. the positive value of the original non-scalar predicate). One indication that this is true comes from the fact that different non-scalar PPs can be less or more felicitous with the same degree operator:

(150) a.   Lisa is more on drugs/*on IV than any other patient in the hospital.

   b.   Len is enough over the limit/*over the fence to be arrested.

We leave this question as a topic for further research.

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