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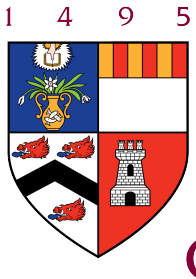

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Adjective Order: Svenonius and the Subsective/Intersective Distinction

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Declaration

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Christopher Bacon

Acknowledgements

Over the last year, I have often thought that adjectives have a mind of their own, but I've read too much Jerry Fodor to seriously believe that. So my first thanks go to Fodor for his, as always, insightful work on the mind, and biology more generally, which has been a welcome distraction when adjectives became too mischievous.

In any case, I have come to appreciate Hetzron's (1978: 175) remark that adjective ordering restrictions must be "one of the most delicate topics in linguistics." And so my utmost thanks go to my supervisor, Elspeth Edelstein, for guiding me through this delicate topic, encouraging my pursuit of syntax, and being a constant source of advice and knowledge.

Since this is my first piece of work on syntax, I must acknowledge Noam Chomsky, whose inspirational work led me to the field in the very first place.

To all of my friends, life would be a considerably poorer place without the opportunity to discuss such a varied range of different topics and have such diverse conversations, ranging from the philosophy of mind and free will, to economic and historical theories of money and credit.

Finally, and most importantly, to Michelle—the person I run all of my crazy ideas past first. Thank you for all of your love and kindness, and being the rock upon which all of this work has been carried out.

"Three syntacticians walk into A-bar."

Abstract

Peter Svenonius (2007), following Cinque (1994) and Scott (2002), proposes an account of adjective order whereby APs merge in [Spec, FP], where F is some functional head relating to the noun. More specifically, the account states that adjective order is constrained by a functional structure consisting of KiP, SORTP, DegP, *n*P, and √P. The role of this functional projection in AP order is the following. Focussed APs merge in [Spec, KiP]. The element SORT determines the mass/count distinction, with Deg optionally merging in [Spec, SORTP] as a degree modifier. If an AP merges in SORT or Deg, then the AP is interpreted subsectively. On the other hand, *n* constrains AP interpretation to be intersective. Finally, √ is the root element, where any AP merged in [Spec, √P] is interpreted idiomatically. This account provides an explanation as to why certain adjective ordering restrictions appear to hold—such as the subsective > intersective constraint (Truswell, 2009)—but, as we shall argue in this work, it is empirically inadequate for English. This shall be our first thesis. We shall additionally argue that the subsective > intersective constraint, and the semantic distinction between subsective and intersective APs itself, does not hold of English. This shall be our second thesis.

Contents

Chapter 1

Introduction

This dissertation will defend two theses. Firstly, we shall argue that Peter Svenonius' (2007) account of adjective order is not satisfactory. Secondly, we shall claim that Truswell's (2009) adjective order restriction, and corresponding semantic distinction, does not hold. In this chapter, we shall present briefly the theoretical background this work takes for granted, outline some general questions, and define some key terms.

1.1 Theoretical Background

We shall take a language *L* to be an *I*-language, a computational system of the mind that is internal, innate, intentional, and invariant across the species (Chomsky, 1986; Chomsky 1991). An *I*-language generates structural descriptions (SD) that are interpreted at the interfaces of the sensory-motor (S-M) and conceptual-intentional (C-I) systems. The S-M system typically corresponds to sound, but more broadly to any externalisation of *L*, and the C-I system corresponds to meaning and thought.

Taken to be inherent in *L* are conditions of economy. Any SD generated by *L* must satisfy *economy of representation* conditions, where the SD is fully interpreted by the two interfaces. Full interpretation (FI) obtains when all elements of SD are legitimate items at each interface. However, it is not enough for a SD to simply satisfy economy of representation (FI). It must also be an "admissible" option (Chomsky, 1995b: 220), where admissibility is determined by *economy of derivation* conditions, which demand that the SD is the most optimal choice. That is, it must be the least costly option, where such things as "length of derivation" are taken as indicative of "cost." If both economy conditions are satisfied, SD *converges*; otherwise it *crashes*.

The minimalist program is the attempt to show that *L* does in fact satisfy economy of derivation conditions; that is, that *L* is the "optimal solution to the conditions imposed by the general architecture of the mind/brain" (Martin, 2001: 1), "meeting [the] external constraints" imposed by the two interfaces "as well as can be done" (Chomsky, 1995a: 383). Put another way, the minimalist program is the venture to justify the

assumption that principles of economy are inherent properties of natural language, or that natural language is perfect.

As with all scientific inquiry, we extend considerations of economy, and more generally theory-internal considerations, to theory-construction. We shall attempt to use only what is necessary, applying general principles of parsimony and simplicity in order to arrive at a coherent and elucidated account of (in our case) adjective ordering and more generally *L*.

Proceeding to the tools of minimalist syntax, we define merge as the operation (1).

(1) $$M(\alpha, \beta) = \{\gamma, \{\alpha, \beta\}\}$$

γ, a label for one of the syntactic objects α, β (Chomsky, 1995b). This states that merge concatenates two items to form a set containing them both as well as a label for the set. Movement is defined as *internal merge*.

(2) $$M(\alpha, \beta) = \{\gamma, \{\beta, \alpha\}\}$$

β, a subset of α (Chomsky, 2001). If (2) is internal merge, then (1) is *external* merge. Both (1, 2) are instances of the same operation, the difference being between the relationship between the elements in the output.[1]

Following Epstein (2001), we define c-command as a derivational consequence of merge: α c-commands β iff α and β are paired together by merge $M(\alpha, \beta)$, where β is either terminal or non-terminal. This has the benefit of making c-command a "free" operation, riding on merge.

We shall assume the "strong minimalist thesis" (SMT) as our working hypothesis (Berwick & Chomsky, 2001; Bolhius, *et al*. 2014). SMT states that *L* is the optimal "algorithm," to quote Berwick & Chomsky (*ibid*), that generates inputs for the other computational modules of the mind (S-M and C-I), and that merge is the sole primitive operation of *L*.[2] More technically, *L* is a function that takes two lexical items as inputs

[1] *Self-merge* has also been proposed: $M(\alpha) = \{\alpha\}$ (Kayne, 2011; Adger, 2012).

[2] Hauser, *et al*. (2002) refers to the set merge/recursion, S-M, C-I, economy conditions as the "faculty of

and outputs the set of those lexical items, along with a label. This output is then taken as an input for the other computational modules, S-M and C-I.

1.2 Kuhn's Puzzles

Normal scientific inquiry is a "puzzle-solving" enterprise, to follow Kuhn (1962/2012: 35-42). Now, the puzzles we seek to resolve with regards to adjective placement can be subsumed under the following two questions.

(3) How are adjectives ordered (and merged)?

(4) Why are they ordered (and merged) that way?

These are, quite clearly, very general questions—much too broad to answer in full here. From the literature review in Chapter 2 we shall break these questions down into more manageable parts and examine how they are answered by Svenonius' account.

1.3 Adjectival Semantics

Typically, adjectives are classed according to their semantic properties: as either *subsective* or *intersective* (Kamp, 1975; Abdullah & Frost, 2004, 2005; Drašković, *et al*. 2013). Intersective and subsective adjectives are defined set-theoretically as (5) and (6), respectively, where N is an arbitrary set of nouns, A a set of adjectives, and A′ a function taking (N(x)) as input.[3]

(5) $[\text{AP}_{\text{intersective}}\ \text{NP}] = \lambda x[\text{A}(x) \wedge \text{N}(x)]$

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language in the broad sense" (FLB), whereas the "faculty of language in the narrow sense" (FLN) is taken to just be merge/recursion. That is, FLN = *L* and FLB = *L* + (S-M + C-I)). We might be tempted to think of FLN as (some component of) Fodor's *language of thought* (1975), and that what separates human linguistic capabilities from non-human animal capabilities is the presence of FLN.

[3] Kamp (1975) and Truswell (2004) have taken the semantics of attributive adjectives to be second-order functions, ranging over possible worlds and properties. We shall leave the details aside in this work, only noting that the approach is essentially the same in that APs are set-theoretically defined over sets.

e.g. [*red wall*] = $\lambda x[\text{red}(x) \wedge \text{wall}(x)]$

(6) $[\text{AP}_{\text{subsective}}\ \text{NP}] = \lambda x[\text{A}'(\text{N}(x)]$

e.g. [*big animal*] = $\lambda x[\text{big}'(\text{animal}(x)]$ [4]

If an adjective is intersective, as in (5), then the interpretation we give the adjective-noun phrase is determined by the intersection of the set of adjectives and the set of nouns. If an adjective is subsective, as in (6), its interpretation is determined by the set of adjectives that are a subset of some noun. Both types of adjectives can be interpreted pre- and post-nominally.

(7) (a) the red/big wall

(b) the wall is red/big

Generally, intersective adjectives are taken to be, in some sense, "absolute," as they do not depend upon the noun for meaning (Truswell, 2004); whereas, subsective adjectives are interpreted relative to the noun (Siegel, 1980). Due of this, intersective adjectives are thought to obey the laws of classical logic, whereas subsective adjectives often do not—and this is taken as motivation for the distinction (see Panayidou, 2013; however, as Truswell (2006) has pointed out this is not quite right)[5].

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[4] Removing the lambda set-abstraction, perhaps, demonstrates more clearly the intersective and subsective nature of these definitions (Dowty & Wall, 1981):

[AP NP] = $\{x \mid x \in A\} \cap \{y \mid y \in N\}$
e.g. [*red wall*] = $\{x \mid x$ is red$\} \cap \{y \mid y$ is a wall$\}$

[AP NP] = $\{x \mid x \in A\} \subseteq \{y \mid y \in N\}$
e.g. [*big animal*] = $\{x \mid x$ is big$\} \subseteq \{y \mid y$ is an animal$\}$

In any case, there is no difference between the notation.

[5] A red face and a red double-decker bus do not entail the same *type* of red, and so red is relative to the noun it modifies and hence "not absolutely intersective" (Truswell, 2006: 5).

There is a third class of adjectives, namely *intensional* adjectives, such as *former*. These, however, cannot be defined set-theoretically (Panayidou, 2013) or appear post-nominally (**the president is former*), but together with subsective adjectives make up the set of *non-intersective* adjectives. We shall not be concerned with intensional adjectives in this work and so shall leave them aside.

Chapter 2

Literature Review

In this chapter we provide a literature review, reconsider some of the general puzzles facing any account of adjective order, and then examine how Svenonius' account answers those puzzles.

2.1 Literature Review

That adjectives occur in specific orders is a widely attested cross-linguistically fact (Sproat & Shih, 1991; Cinque, 1994; Truswell, 2004, 2009; Larson & Takahashi, 2007; Abels & Neeleman, 2012). In this chapter we shall review some of the theories and accounts that have attempted to describe and explain adjective order. We shall begin with Abney (1987) and proceed to Svenonius (2007).

2.1.1 Abney

Abney (1987) proposed that when an adjective combines with a noun, the adjective projects, making the noun the complement. This would suggest the structure [DP [AP [NP]]]. Abney adduced this structure from the fact that the following sentences are grammatical in some dialects of English.

(8) (a) too big of a house

(b) as nice of a man

(c) how long of a board (*ibid*: 206)

Take (8a). If the phrase *too big of* were to merge in specifier position of *a house*, then there would be no place for the preposition *of* to attach to. Furthermore, if APs take NPs as complements, then this explains why pre-nominal adjectives cannot take complements, whereas post-nominal adjectives can (cf. (9) and (10)).

(9) (a) the [proud] father

(b) *the [proud of his daughters] father

(10) (a) *the father [proud]

(b) the father [proud of his daughters]

Abney suggested that APs are actually similar to NPs, but lack the [+substantive] feature that NPs carry. When APs adjoin to NPs, they inherit the [+substantive] feature, projecting a category indistinct from the NP.

The following literature diverges from Abeny's proposal quite radically, in an instructive way.

2.1.2 Cinque & Scott

It is a fact about Romance languages that adjectives often appear post-nominally, as opposed to Germanic languages where they often (almost exclusively) appear pre-nominally, as evident from the Romance in (11) and the Germanic in (12).

(11) (a) la casa blanca
'the white house'

(b) l'invasione italiana dell' Albania
'the Italian invasion of Albania'

(12) (a) das weiße Haus
'the white house'

(b) the Italian invasion of Albania

In order to account for these differences, Cinque (1994) proposed that all languages have the following underlying base order:

(13) [DP [AP_1 YP [AP_2 N]]]

This straightforwardly accounts for the Germanic ordering—N is always in the right-most position—and to generate the Romance ordering there is a simple N-movement to Y, as follows.

(14) [DP [AP_1 N [AP_2 ~~N~~]]]

Note that this proposal makes the prediction that in Romance there will be a class of APs that are post-nominal, AP_2, and a class that are pre-nominal, AP_1, something that is borne out by the evidence. Furthermore, the few possible post-nominal adjectives in English can be accounted for—for instance, *the stars visible*.

To see how this works in practice, compare the Spanish *la casa blanca* with the English *the white house*:

(15) (a) [DP *la* [YP *casa* [AP *blanca* [NP ~~*casa*~~]]]

(b) [DP *the* [AP *white* [NP *house*]]]

Cinque (*ibid*: 100) posited that this difference between [N AP] and [AP N] structures was the "consequence of a different setting of a general head modifier parameter." Now, what is particularly interesting about Cinque's analysis is that he took recursive [AP [AP [... [N]...] structures to be highly constrained. For instance, for object denoting nominals, we have the following AP order restriction (*ibid*: 26).[6]

(16) POSSESSIVE > CARDINAL > ORDINAL > QUALITY > SIZE > SHAPE > COLOUR > NATIONALITY > N

Each adjective in the hierarchy would be merged in a unique Spec-position in the projection of a unique functional head, [Spec, FP] (F, a functional head), yielding the structure [Spec, FP [Spec, FP [Spec, FP]]].

Further, Scott (2002: 144) proposed a very tight interaction between syntactic and semantic categories, leading him to postulate the rather elaborate hierarchy:

(17) DETERMINER > ORDINAL NUMBER > CARDINAL NUMBER > SUBJECTIVE COMMENT > ?EVIDENTIAL > SIZE > LENGTH > HEIGHT

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[6] Throughout this work, the symbol ">" shall be used for both c-command and precedence, with context distinguishing the use. Of course, in minimalist thinking, precedence and order are features of the phonological component, not the syntax, which is the domain for c-command. Nothing will turn on this, however.

> SPEED > ?DEPTH > WIDTH > WEIGHT > TEMPERATURE > ?WETNESS > AGE > SHAPE > COLOUR > NATIONALITY/ORIGIN > MATERIAL > COMPOUND ELEMENT > NP

Again, this view takes APs to be "specifiers of distinct functional projections that are intrinsically related to aspects of their semantic interpretation" (*ibid*: 91). Quite clearly, this is in direct opposition to Abney, and as we shall see, Svenonius continues this tradition.

2.1.3 Truswell

We shall view Truswell's (2004, 2009) work as an attempt to reduce the reliance on so much semantic criteria in order to provide a syntactic description of adjective order. It is this project that we shall attempt to continue in the next chapter. In any case, what Truswell observed was that Cinque and Scott's functional hierarchies are both descriptively inadequate. Consider the following sentences, for example. (18) admits free ordering of NATIONALITY and COLOUR.

(18) (a) French red [$_{NP}$ doors]

(b) red French [$_{NP}$ doors]

(c) Russian black [$_{NP}$ dog]

(d) black Russian [$_{NP}$ dog]

(19) admits free ordering of SHAPE and COLOUR.

(19) (a) circular red [$_{NP}$ patch]

(b) red circular [$_{NP}$ patch]

(c) white round [$_{NP}$ table]

(d) round white [$_{NP}$ table]

(20) admits free ordering of QUALITY and SIZE.

(20) (a) big new [$_{NP}$ cuts]

(b) new big [$_{NP}$ cuts]

(c) kind small [$_{NP}$ man]

(d) small kind [$_{NP}$ man]

And (21) admits free ordering of NATIONALITY and MATERIAL.

(21) (a) Japanese wooden [$_{NP}$ dolls]

(b) wooden Japanese [$_{NP}$ dolls]

(c) German steel [$_{NP}$ plane]

(d) steel German [$_{NP}$ plane]

Clearly (16) and (17) are inadequate, as (18) and (19) violate the SHAPE $>$ QUALITY $>$ NATIONALITY ordering restriction, (20) violates the QUALITY $>$ SIZE restriction, and (21) violates the NATIONALITY $>$ MATERIAL restriction. Hence, Cinque and Scott's hierarchies are descriptively inadequate.

It is this work, which, according to Truswell (2009: 528, my emphasis), "amounts to a rejection of Cinque's and Scott's assumption that there is a unique specifier in each phrase, *and a unique position in the template for each adjectival class*," that led us to view of Truswell as attempting to reduce the amount of semantic criteria being used in the description of adjective order.

Notwithstanding this, Truswell (2009) has observed that there are *some* asymmetric relations between the adjectives considered. For example, the adjective order in each (a) is grammatical, whereas the reverse order in (b) is ungrammatical.

(22) (a) big French [$_{NP}$ bridge]

(b) *French big [$_{NP}$ bridge]

(23) (a) large green [$_{NP}$ coat]

(b) *green large [$_{NP}$ coat]

(24) (a) new circular [$_{NP}$ monument]

(b) *circular new [$_{NP}$ monument]

(25) (a) giant wooden [$_{\text{NP}}$ ship]

(b) *wooden giant [$_{\text{NP}}$ ship]

(26) (a) old copper [$_{\text{NP}}$ watch]

(b) *copper old [$_{\text{NP}}$ watch]

As can be seen, NATIONALITY and COLOUR do not precede SIZE ((22) and (23)), SHAPE does not precede QUALITY (24), and MATERIAL does not precede SIZE (25) or QUALITY (26), whereas SIZE and QUALITY precede all four semantic classes.

On the basis of (22) to (26), we can modify Cinque and Scott's hierarchies to the following:

(27) X[QUALITY/SIZE] $>$ Y[SHAPE/COLOUR/NATIONALITY/MATERIAL]

This is the kind of result that we would want, if we wanted to reduce the number of semantic categories in a syntactic description of adjective order, prompting us to think that QUALITY and SIZE are irrelevant classifications with respect to SHAPE, COLOUR, NATIONALITY and MATERIAL. It is along these lines that Truswell proposes the following hierarchy, ignoring the specific semantic classes of the adjectives involved, bringing together QUALITY *with* SIZE, and SHAPE *with* COLOUR, NATIONALITY, *and* MATERIAL.

(28) X = subsective $>$ Y = intersective

That is, the group of APs in X are subsective and the APs in Y are intersective, such that X is a head that licences subsective APs and Y a head that licences intersective APs. This appears to be quite promising, given that QUALITY and SIZE adjectives are, in fact, interpreted subsectively, whereas SHAPE, COLOUR, NATIONALITY and MATERIAL are generally interpreted intersectively (cf (29) with (30)).

(29) [SIZE/QUALITY-AP NP] $= \lambda x[\text{A}'(\text{N}(x))]$

(30) [SHAPE/COLOUR/NATIONALITY/MATERIAL-AP NP] $= \lambda x[\text{A}(x) \wedge \text{N}(x)]$

If this is the case, then it constitutes quite a strong counterexample to Cinque & Scott, but it does not follow that the entire project of unique specifier positions is falsified, but rather that the *specific* semantic classifications are falsified.

2.1.4 Truswell's Problem

Truswell (2009), using Google as a corpus, has found that there are also restrictions on adjective order regarding the type of noun in the structure—namely, whether it is mass or count. Consider (31), for instance.

(31) (a) *tiny gas

(b) *large water

(c) *square grass

(d) *circular liquid

The data in (31) appears to demonstrate the clear ungrammaticality of certain [AP mass-NP] combinations. On the other hand, some APs are permitted to occur with mass nouns.

(32) (a) clear gas

(b) expensive water

(c) green grass

(d) red liquid

What is particularly interesting about this is that the distribution of APs that can and cannot occur with mass nouns cuts across the subsective/intersective divide. For instance, SIZE (subsective) and SHAPE (intersective) cannot occur with mass nouns, but QUALITY (subsective) and COLOUR (intersective) can. Not only is this the case, but the distribution within the intersective and subsective sets is quite intriguing. This is because within the set of subsective APs, [+count] APs (unable to occur with mass) precede [-count] APs (able to occur with mass); whereas, on the other hand, within

the set of intersective APs [±count] is freely ordered. Consider (33a), which demonstrates [+count] > [−count] within the set of subsective APs, and (33b), which demonstates free ordering within the set of intersective adjectives. This is what we shall call "Truswell's Problem."

(33) (a) big expensive rings
??expensive big rings

(b) square wooden coaster
wooden square coaster (*ibid*: 530)

The existence of such an asymmetric restriction suggests that there is some exogenous element that influences the set of subsective APs such that the restriction [+count] > [−count] occurs, but which does not occur in a position such that it can influence intersective APs correspondingly. Later (see fn. 9), we shall consider a potential element.

2.2 Kuhn's Puzzles: Revisited

In chapter 1, it was asked how adjectives are ordered, and (consequently) how they must be merged. From the work just reviewed, we can now partly answer the first question.

(AOR) (1) $\text{AP}_{\text{subsective}} > \text{AP}_{\text{intersective}}$

(2) $\text{AP}_{\text{subsective}[+\text{count}]} > \text{AP}_{\text{subsective}[-\text{count}]}$

This puts us in a position to ask how adjectives are actually merged within the syntactic component.

(34) (a) How do we account for $\text{AP}_{\text{subsective}} > \text{AP}_{\text{intersective}}$?

(b) How do we account for $\text{AP}_{\text{subsective}[+\text{count}]} > \text{AP}_{\text{subsective}[-\text{count}]}$?

Clearly, Cinque and Scott's theories cannot provide an answer for (34a) or (34b). However, although Svenonius works within the same tradition as Cinque and Scott, adopting similar assumptions, we shall see that Svenonius can answer at least (34a).

2.3 Svenonius

Svenonius' (2007) proposal regarding the structure of adjectives relies upon taking adjectives, with one exception, to be merged in [Spec, FP] as a unique specifier, where FP is some functional projection relevant to the noun. This would generate a similar structure to Cinque's. However, the set of functional elements Svenonius employs are rather limited in comparison to Cinque and Scott's; they are: {Ki, Deg, SORT, *n*, $\sqrt{}$}.

Ki refers to the functional element, Kind, that imbues focus. For instance, if Smith wanted to emphasis some property of some object, as in (35), then the adjectival element would merge in [Spec, KiP].

(35) (a) it was the BLACK car, not the white one!

(b) it wasn't just a big bird; it was a GOLDEN big bird!

Deg refers to an element that modifies the degree to which the adjective applies, such as *very* or *extremely* (much like Zamparelli's indefinite degree phrase, 1993). It is this functional element that is the exception, as APs merge as complements to Deg, not specifiers.

(36) [DegP [$_{\text{Deg}}$ *very big*]

SORT determines the mass/count status of the noun, by licensing count nouns. If it is present, mass is divided into "countable entities" (*ibid*: 20), delineating the noun as a count noun; if, on the other hand, SORT is not present in the structure, then the noun will be a mass noun. Any adjective that merges in SORT will not be able to appear with a mass noun. Sentences in (37) indicate structures in which SORT is present and sentences in (38) indicate an absence of SORT.

(37) (a) the [SORTP *tiny room*]

(b) the [SORTP *long ruler*]

(c) the [SORTP *big stamp*]

(38) (a) *the tiny salt

(b) *the long water

(c) *the big mustard

The head *n* is a noun classifier that indicates intersective modification. Svenonius suggests that only non-gradable, intersective predicates may merge within the projection of *n*.

$\sqrt{}$ is the root element of the noun phrase. It is within the projection of $\sqrt{}$ that idiomatic (AP-NP compound) APs merge. For instance, given an idiomatic reading, *white board* would be interpreted not as a board that is white, but the object white-board, and *nervous system* would be interpreted as the object nervous-system, not as a system that is nervous—allowing us to say things like, *the black white board* (= the white board is black).

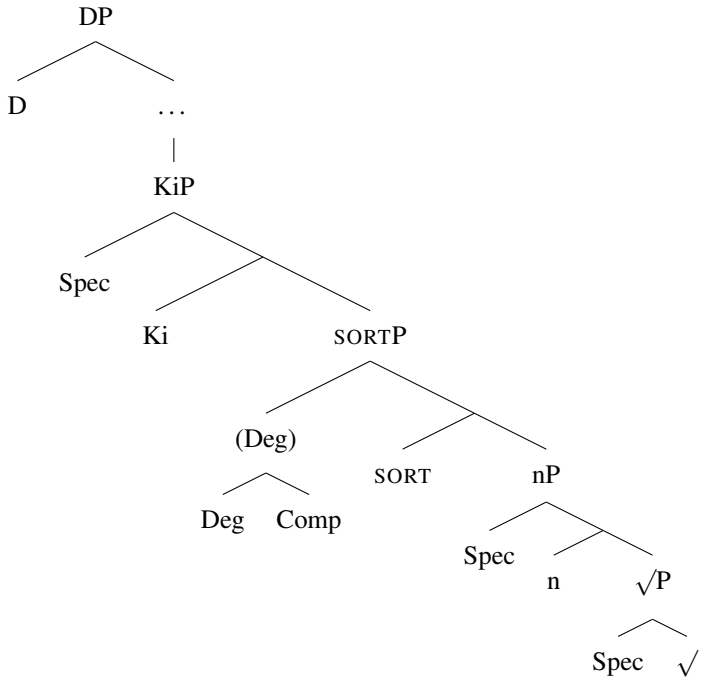
(39) (a) the [$\sqrt{}$P *white board*]

(b) the [$\sqrt{}$P *nervous system*]

Here *board* and *system* are the heads of the projection.

Bringing all of this together gives the structure (40).

(40)



We have used the ellipsis here to indicate that there is some additional structure between DP and KiP—for instance, number elements, such as *three*.

This concludes our literature review, bringing us to Svenonius' account. In the next chapter we shall consider minor modifications to make to Svenonius' structure, before considering more serious problems as well as the subsective/intersective distinction in Chapter 4.

Chapter 3

Minor Modifications

There are a few relatively minor issues to take with Svenonius' account, which we shall deal with now. The first involves the fact that only unique specifiers are allowed, and the second involves the question of where plural markers are base generated.

3.1 Multiple Specifiers

There is an important respect in which Svenonius' theory departs from SMT, which is something to take issue with here: namely, the restriction on merge that prohibits multiple specifiers. This restriction was adopted in line with Kayne's (1994) own restriction on more than one modifier per functional element. However, this prohibition violates the "best case" scenario, in which "there should be no further restrictions on merge" other than that it forms a set composed of two items (Chomsky, 2001: 7). As Chomsky (*ibid*) has argued, multiple specifiers are the "best case" because they are the minimal case. To see how, take a head H and the three elements A, B, and C. Assume that there are no restrictions upon merge. With this merge generates:

(41) {C, {B, {H, A}}}

A is a complement of H and B and C are in [Spec, HP].

Assume now that, like Svenonius, merge is restricted to generating a unique specifier for each functional head. This generates the set:

(42) {C, { X {B, {H, A}}}}

Where X is some arbitrary head; C is then generated in [Spec, XP].

The first option is the simpler,[7] and hence the second requires justification if it is to be favoured. This justification would be particularly burdensome for the reason that

[7] Set-theoretically simpler: it contains fewer elements.

(42) violates SMT, as noted the "best case"—and hence would amount to an imperfection of *L*. For this reason, we shall permit multiple specifiers, retaining SMT.[8]

3.2 Plural Markers

The account so far derived above is somewhat deficient in that the base-generated position of the plural marker has not been specified—the language that (40) describes is, so far, one that does not possess plural markers. Svenonius (2007: 35) remarks that based on cross-linguistic evidence, the likely underlying position of the plural marker is between the article and the noun: Art $>$ Pl $>$ N. Combining this with the account given above, he notes, plural markers most likely occur in the hierarchy: Art $>$ Pl/SORT $>$ *n* $>$ N, though this "is partly a matter of guesswork" (*ibid*: 7). We shall adduce further argument for this position.

Positioning Pl in SORT appears to gain support if we consider the fact that one of the defining features of a "count"-language is whether it has plural markers or not (Bale & Coon, 2014). If we argue that this is due to the fact that Pl occurs in SORTP, then this would, rather intimately, tie together the relationship between SORTP, plural markers, and the mass/count distinction: SORT licenses count nouns, and Pl merges in SORT, implying that if Pl is present, then so is SORT—hence, count status is also present. This would be quite an economical result if true, so we shall assume it is in fact true. Further, independent analysis of the position of Pl places it higher up the tree, in a position c-commanding NP (Wiltschko, 2008 and Alexiadou, 2011).[9]

In any case, this forces some kind of movement—although Svenonius does not consider it, hence a slight modification—as the base-generated structure in (43a), which would be realised as (43b), is not allowed in English (as seen in (43c)).

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[8] Abels & Neeleman (2012) furthermore, have demonstrated that Kayne's LCA, upon which unique specifier positions are predicated, does not actually entail a theory of unique specifiers.

[9] Moreover, Pl—as an exogenous element—is perhaps in a position to influence APs in SORTP such that the data in Truswell's Problem is accounted for. However, this would take us too far afield from present discussion.

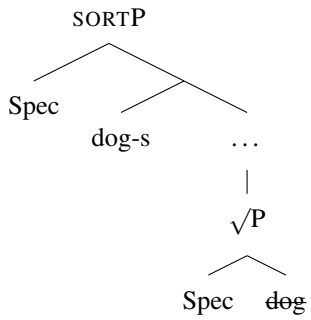
(43) (a) D [SORT [. . . [$\sqrt{}$]

(b) the [*-s* [. . . [*dog*]

(c) *the -sdog

This suggests that $\sqrt{}$ moves to SORT, generating the structure in (44).[10]

(44) the [SORTP *dog-s* [. . . [$\sqrt{}$P ~~*dog*~~]



Note that if there is some adjective in [Spec, *n*P], then it will occur post-nominally, validating Cinque's N-movement claim and analysis of Romance somewhat. For example, (45a) would be realised (45b).

(45) (a) perros rojos

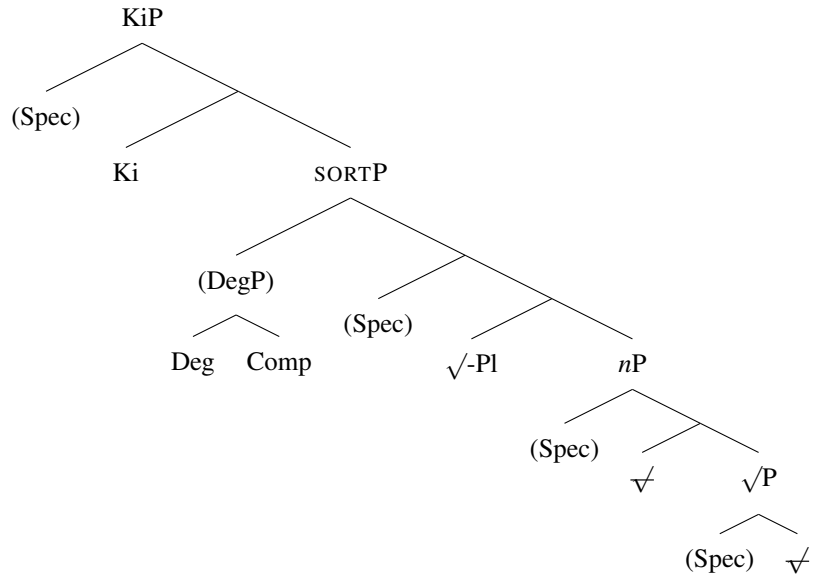
dogs red

(b) [SORTP *perro-s* [*n*P *rojos* ~~*perro*~~]]

These two modifications leave the tree in the following state, dropping DP.

(46)

[10] Note that the plural marker cannot move "down" the structure to adjoin dog because this violates the copy-theory of movement, in which the "highest" instance of an element is phonologically realised (Radford, 2009).



Each (Spec) indicates an optional, potentially endlessly iterative [Spec, XP] position, capturing the recursive, iterative nature of APs more clearly than before. Further, the plural marker, Pl, has been merged in SORT, to which $\sqrt{}$ has moved to join.

3.3 How Does It Answer The Questions Posed?

The structure we have arrived at has the advantage of providing a descriptively adequate account characterising the $\text{AP}_{\text{subsective}} > \text{AP}_{\text{intersective}}$ ordering restriction—all intersective APs merge in *n*P, which is lower than the generated position for subsective APs. This answers the question of how to represent $\text{AP}_{\text{subsective}} > \text{AP}_{\text{intersective}}$. However, there still remains the question as to why the ordering restriction holds.

Now, by tying adjectives to the functional structure of the noun, we are able to provide an answer to this question—and hence, why adjectives have *any* ordering restrictions at all (see, Scott, 2002: 96, for this line of argument). This is due to the fact that each projection within the functional structure exists in a c-commanding relationship with each other projection, and since certain adjectives are merged in certain projections, it simply follows from the fact of functional ordering that adjectives will also exhibit ordering patterns. We only have to stipulate, then, that APs carry certain

features that tie them to specific parts of the functional structure to obtain this result.

This is quite an appealing situation because we have, in effect, derived adjective order *for free* and as a by-product from other facts—facts about the functional nature of the nominal phrase.[11]

This, we take it, is one of Svenonius' account's strongest features: it provides a solution to a highly puzzling fact, explaining why adjectives occur as they do. Furthermore, it is wholly consistent with our minimalist thesis.

[11] Scott (2002: 97) puts this as: adjective ordering restrictions "fall out as a direct consequence of UG." This is what is meant by "for free."

Chapter 4

Problems

In this chapter, we shall contend and argue that Svenonius' structure in actual fact is not satisfactory. This is our first claim. We shall also argue that Truswell's distributional restriction (AOR1) does not hold. This is our second claim.

4.1 Plural Marker

Recall that we now have a plausible base-generated position for plural markers. However, this base-generated position is actually problematic for Svenonius' account because it over- and undergenerates. For instance, consider the following sentences, all of which involve intersective APs and count nouns:[12]

(47) (a) the Italian pizzas

(b) the wooden doors

(c) the red houses

Following the assumptions laid out already in the last chapter, the tree for the kind of sentences we are considering in (47) would be something like as follows.

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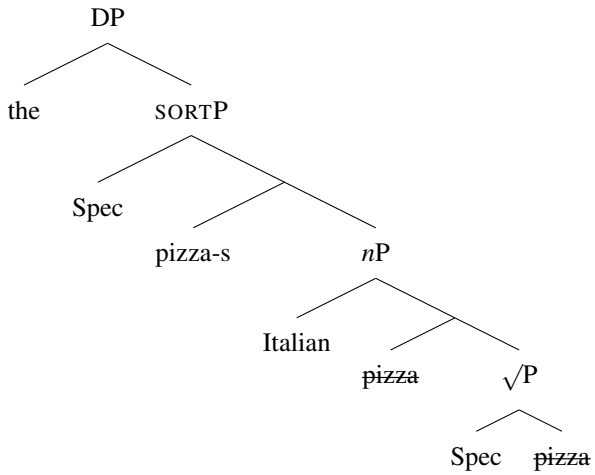
[12] The following examples would not work if the noun were a mass noun, since, presumably, SORTP would not be present in the structure.

(48)



This tree does not, however, represent a grammatical sentence in English. Therefore, it over-generates. As can be seen, the APs in (47) are pre-nominal, whilst the AP depicted in the tree is post-nominal. This is clearly because the root moves to the plural marker (SORT), in a position c-commanding the intersective APs. The account, therefore, under-generates in that it cannot not generate the sentences in (47), for the reason just given.

If this account generates such structures, it is clearly not valid as a description of English. If the root is to move to the plural marker, what is needed is some non-*ad hoc* way of moving intersective APs to a position c-commanding $\sqrt{}$+plural. We shall consider some possible steps to remedy this problem. As we will see, however, it will not be clear how to resolve the issue satisfactory.

4.2 Solutions?

Prima facie there are four relatively straightforward movement options that would provide a solution to the problem discussed. The first is to move *n*P; the second $\sqrt{}$P; the third to move [Spec, *nP*]; and finally to move [Spec, $\sqrt{}$P]; all into positions c-commanding SORT.

4.2.1 *n*P movement

We can straightaway dismiss *n*P movement for the reason that, as complement of SORT, moving *n*P to [Spec, SORTP] would violate the anti-locality condition on movement (Abels & Neeleman, 2012), which states that a complement of H cannot move to the specifier position of H, [Spec, HP], because the movement would be superfluous in terms of proximity to the head.

4.2.2 $\sqrt{P}$ movement

$\sqrt{}$P movement neither works because, without *n*P movement, the APs in *n*P would still occur post-nominally. That is, $\sqrt{}$P movement only does half the job.

4.2.3 [Spec, *n*P] and [Spec, $\sqrt{}$P] movement

We could overcome the anti-locality problem by moving [Spec, *n*P] and we could overcome the problem of only doing half the job by moving both [Spec, *n*P] and [Spec, $\sqrt{}$P]. This would mean that any APs in these positions would be moved up the structure, into a position c-commanding SORT—say, [Spec, SORTP]. However, the problem here is that this is precisely what we do not want to do because it will violate the subsective $>$ intersective syntactic distribution (that the derivation *big red* is fine, but **red big* is not). Recall that subsective APs merge in SORTP and intersective APs in *n*P. Clearly, moving [Spec, *n*P] into SORTP disrupts this distribution. So, this movement option is also unacceptable.

Furthermore, this option would present an additional problem in the form of what happens when the noun is a mass noun and there is no SORT in the structure for which [+count] intersective APs can move to, as recalling Svenonius it is SORT that divides mass.

4.3 Truswell's Problem: Implications

Truswell's Problem yields another, quite serious, obstacle for Svenonius. Recall that the set of subsective APs are not freely ordered with respect to [±count], whereas the

set of intersective APs are freely ordered with respect to [±count]. The problem is that, for example, since *big* and *expensive* belong to the set of subsective APs they, according to Svenonius, both merge in SORT or Deg. However, the data seen in 2.1.4 suggests that *big* precedes *expensive*, and this fact is not encoded in Svenonius' account: all subsective APs are freely ordered within SORTP.

This is problematic for any structure that lumps subsective APs together, as it will not capture the subtleties of the [±count] distribution within that group of adjectives. The solution can only be a radical revision of the structure in order to incorporate the data into it.

4.4 Summary

In the last few sections, we have seen that the insertion of the plural marker is highly problematic for the structure under consideration, as without movement, which under the current circumstances is not plausible, it incorrectly predicts that intersective and idiomatic APs occur post-nominally in English. Further, Svenonius' account fails to provide a solution to Truswell's (2009) data on the [±count] distribution within subsective APs (or AOR2). This satisfies the claim that Svenonius' account does not provide an adequate account of English adjective order.

We now proceed to the second claim, that the subsective > intersective constraint is not valid.

4.5 Subsective > Intersective

To show that Truswell's restriction upon subsective and intersective APs does not hold, we shall consider a set of counterexample [AP [AP [NP]]] combinations, in which the first AP is interepreted intersectively and the second AP subsectively. To begin, consider the following sentence (from Scott, 2002: 112).

(49) a good good typist

Let one instance of *good* have the interpretation *morally good*, and one instance *good-in-ability*. From this, there are two possibilities as to which interpretation we give each

AP.

(50) (a) a (*morally*)-good good-(*in-ability*) typist

(b) *a good-(*in-ability*) (*morally*)-good typist

The first option, where the *morally-good* interpretation precedes the *good-in-ability* interpretation, is not only *a* permitted reading of (49), but rather is the *only* reading of allowed, as (50b) is not allowed. This represents quite an interesting ordering restriction. We shall not concern ourselves with this apparent restriction here, but shall focus our attention on the interpretations specifically given to each AP.

What we are concerned with here is that the outermost (leftmost) AP is (or can be) interpreted intersectively, for we are not saying that of the set of typists this typist is morally good, but rather of the set of typists, this typist is good at typing *and* happens to be morally good.

We can multiply similar examples endlessly. Consider (51).

(51) (a) an ugly beautiful dancer

(b) a skilful unskilful surgeon

(c) an evil good banker

(d) an unfaithful honest merchant

(e) a clumsy adept butcher

(f) a poor wealthy politician

(g) the fast slow sprinter[13]

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[13] The following give similar interpretations for the rest of (51) as found for (51a) in the text:

b. *skilful in general, whose surgery is unskilful*

c. *morally evil, but a banker good at their job*

d. *unfaithful (perhaps to their spouse), but honest as a merchant*

e. *clumsy in general, adept for a butcher*

f. *poor morally, wealthy for a politician*

g. *mentally fast (quick-witted), but slow for a sprinter*

In each example, the first AP is interpreted intersectively. To take the first example: *an ugly beautiful dancer* is given the following interpretation.

(52) $\lambda x[\text{ugly}(x) \wedge [\text{beautiful}'(\text{dancing}(x))]]$[14]

This means that we take the set of dancing, *X*, and consider a subset of this set, such that the subset consists of beautiful dancing, *Y*. This entails that the AP in *beautiful dancer* is interpreted subsectively. Then, we take the intersection of *Y* and the set *Z*, where every member of *Z* is ugly, providing the outermost AP an intersective reading. Similarly for the rest of the examples in (51).

Now, contrary to (52), it might be thought that the first AP is, in actual fact, interpreted subsectively, because it still applies to some domain and is typically subsective. In a straightforward sense, this is just contradictory as in an *ugly beautiful dancer*, (51a), we would derive the reading [Smith's dancing is beautiful and Smith's beautiful dancing is ugly].[15] What if, however, the AP is interpreted subsectively relative to some general domain. For instance, *an ugly beautiful dancer* is interpreted as [Smith's dancing is beautiful and Smith is ugly-as-a-person], giving both APs a subsective reading. The problem with this argument is that the reading for *ugly* is now determined by something *outside* of the derivation. That is, it is simply an assumption (based on our holistic knowledge) that *ugly* refers to a subset of the set of people. This is problematic for two reasons.

Firstly, it makes the computation non-local, and *ipso facto* non-modular (see Fodor, 2001). This is troublesome because subsection is defined locally—i.e. the reading of a subsective A is dependent on the N following it in the derivation, $\lambda x[\text{A}'(\text{N}(x))]$—and

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[14] Expanding the lambda set-abstractor: $\{\{z \mid z \text{ is ugly}\} \cap \{\{y \mid y \text{ is beautiful}\} \subseteq \{x \mid x \text{ is a dancer}\}\}$

[15] There are some instances when this does work in a straightforward manner: the *small large firm* and *the large small firm* are both acceptable. In both cases, both APs are subsective. The rightmost AP modifies *firm* and the leftmost AP modifies [*the rightmost AP* [*firm*]], giving a reading where x is small for a large firm or large for a small firm. Whether a similar interpretation can be read from (51) is not relevant, though interesting, since the point is that we can get an intersective $>$ subsective reading, which we should not be able to. In any case, *ugly beautiful dancer* does not seem to cooperate with this double-subsective reading.

because we want any computational components to be modular. Secondly, it is an arbitrary choice as to which set the AP is a subset of. For instance, it may well be that *ugly* is interpreted as *ugly-for-a-person*, but equally as likely is *ugly-for-a-pigeon*, *ugly-for-a-goldfish*, *ugly-for-a-statue*, and so on.[16] Coming back to the point about non-localness: there is simply no way for the semantics to decide which interpretation to give, as the relevant information is not encoded in the derivation. From this it follows that *ugly* must be interpreted intersectively—along the lines $\lambda x[\text{ugly}(x) \wedge ... \ ]$.

Interestingly, it also seems impossible to interpret these sentences the other way around. That is, an *ugly beautiful dancer* cannot be interpreted such that *ugly* refers to the dancing and beautiful refers to a general state of being beautiful—at least, for as long as the APs are in *this* particular order. To get this interpretation, we would have to say *the beautiful ugly dancer*. And so on for the other examples.

Clearly, Truswell's restriction that $\text{AP}_{\text{subsective}} > \text{AP}_{\text{intersective}}$ just does not hold of the data here, as in each case intersectively interpreted APs precede subsectively interpreted APs. This suffices for our second claim.

It is quite clear to see why—if this claim is true—it follows that Svenonius' structure cannot be descriptively adequate, because Svenonius' account states that intersective APs are base-generated in *n*P, which is c-commanded by the base-generated position of subsective APs in SORT. Consequently, we should not have sentences like those in (51) in English. Yet we do; so intersective interpretation is given to APs higher than subsective APs in some cases; so the structure automatically fails.

Moreover, it cannot be the case that the rightmost AP is merging in $\sqrt{}$P—giving it an idiomatic reading, allowing the intersective AP to merge in *n*P—because the following sentence is not grammatical.

(53) *the [*n*P ugly French [$\sqrt{}$P beautiful dancer]

cf. the ugly beautiful [*n*P French dancer]

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[16] Moreover, the same can be said for intersective APs. It is *red-for-an-apple*, *red-for-a-car*, *red-for-a-sunset*, and so on. This serves only to blur the distinction between subsective and intersective APs.

The point is that if the rightmost AP (*beautiful*) merges in $\sqrt{}$P with an idiomatic reading (as in (53)), then it might be possible for the leftmost intersective AP (*ugly*) to merge in *n*P, in accordance with Svenonius. But then this sentence (with the addition of *French*) should be permissible, and as we can see it is not; whereas its counterpart, where the two APs under consideration merge above *n*P, is. Therefore, in this case, intersectively interpreted APs are merging out of position.

4.5.1 Implications

There are two possible implications of this finding. Either subsective and intersective APs are not as strictly ordered as Truswell thought, or the distinction between subsective and intersective APs *itself* is not adequate. The first implication falls out as a matter of logic: there are clearly some instances in which the restriction does not hold. The second implication is a bit more contentious.

Firstly, we need to distinguish whether the putative subsective/intersective distinction belongs to the syntactic or semantic component. Truswell (2004: 51) himself has expressed scepticism that it is a syntactic one, as he notes "it is not clear whether a syntactic treatment of this ordering distinction is appropriate." The data above appears to validate this scepticism. If we take it to be a syntactic distinction, then it should appear to be inadequate because of the counterexamples. That is, we cannot consistently maintain that the restriction is enforced by syntactic structure unless we devise some *ad hoc* intersective AP movement to deal with the counterexamples. This is not an attractive proposal. This suggests that the distinction is not syntactically adequate.

On the other hand, it may be that the distinction is imposed by the (external) C-I systems, though it is not clear how this would work in practice. This would make the distinction purely semantic, as opposed to a hierarchical syntactic one. However, this is a somewhat dubious position, as it commits us to the view that adjectives and nouns have corresponding sets/domains (being set-theoretic) to which the computational machinery in the C-I systems can read from. Opposition to this view can be found in the work of Sainsbury (1990) and Pietrosky (2003), who have argued that set-theoretic terms are not applicable to natural language. This kind of argument proceeds from the

correct assumption that the terms of natural language are vague, and as such argues that there is no definite description of the extensions of these terms. That is, we cannot say for all x, whether x is a member of a set corresponding to a term (the set of all red things, the set of all large things, etc). This, then, casts doubt on the enterprise of describing some [AP [NP]] structure as intersectively or subsectively interpreted.[17]

It might also be thought that this line of argument is in accord Truswell's own critique of Cinque and Scott, interpreted as the attempt to eliminate unnecessary, elaborate semantic classifications from the syntactic description of adjective order. It seems entirely plausible, in this case, that subsection and intersection should be eliminated too—that is, APs should not be characterised as subsective or intersective.

Whether this argument is sound or not, we shall pursue another time. However, what is eminently clear is that subsective APs do not always c-command, or precede, intersective APs, contradicting Truswell's distributional restriction.

An interesting consequence of this argument involves Truswell's Problem (AOR2). Now, instead of saying $\text{AP}_{\text{subsective}}[+\text{c}] > \text{AP}_{\text{subjective}}[-\text{c}]$ for some (subsective) APs and no restriction for other (intersective) APs, we must say that for some (non-defined) APs $[+\text{c}] > [-\text{c}]$ and for some other (non-defined) APs there is no restriction. This is quite problematic because we now have no semantic criteria that can distinguish whether an AP should belong in the "$[+\text{c}] > [-\text{c}]$" class or the "no restriction" class. We shall not address this issue here, other than to note that perhaps $[\pm\text{c}]$ itself is also not an adequate syntactic or semantic description (as Bale & Coon, 2014, have noted).

4.6 Conclusion

As we have seen, Svenonius' account of AP ordering is not descriptively adequate for English. We have not touched upon whether it is adequate for other languages due to

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[17] Though, perhaps one could mimic Jerry Fodor's (2000) remarks about computational theories of mind by saying that *though this is not the whole truth, it is the best we have*—unless we abandon formal semantics, and as Lakatos (1977: 1-7) discerned, "there is no refutation without a better theory." Having said that, this is not a critique of formal semantics, but a *subset* of it.

space, but *prima facie* it does not appear adequate for at least Spanish.[18] It may well be the case, however, that merging APs in [Spec, FP], for some functional head, is inherently problematic perhaps because it incorrectly leaves APs tied to the functional structure of the extended NP. One problem with this type of analysis is why APs can sometimes occur *above* an article (seen in Neeleman & Abels, 2012: *it was* [*so large a concert*]), questioning the claim that APs are intimately tied to the functional categories they supposedly are (on these accounts). We have further seen that modifying the account by stipulating phrasal or specifier movements does not help either.

We have also seen in section 4.5 that Truswell's semantic restriction upon subsective and intersective APs does not hold in English, because certain structures allow intersective APs to precede subsective APs. This, we have suggested, might point to the fact that APs are best not characterised as either subsective or intersective, further removing semantic criteria from the description of syntactic phenomena. Along which lines APs should be divided, we do not know.

Morever, as we saw in section 3.3, one of the advantages of Svenonius' structure was that it provided an adequate description of the subsective $>$ intersective restriction (AOR1), explaining why *the big red ball* is a valid derivation, whilst **the red big ball* is not. However, given the findings of section 4.5, the account loses its descriptive and explanatory power in this regard. Instead, there now remains a host of discrete phenomena lacking explanation, making the description and explanation of AP order a much more complicated affair.

This conclusion further leads to the complication of, as we named it, Truswell's Problem. We have also left this as a matter for further inquiry. In any case, the result is an interesting one, and warrants further investigation.

Both findings in this work suggest that adjective ordering is more relaxed than previously thought. As to the actual restrictions and relations between adjectives, we have not given any tentative answers. Suffice to say that if the tradition considered here

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[18] As Spanish permits post-nominal subsective adjectives: *la gran casa blanca caro* (*lit*. the big house white expensive). It is unclear how to accommodate this within Svenonius' structure.

(Cinque, Scott, and Svenonius) is to provide a satisfactory account of adjective order, much more work is needed to be done to overcome the issues raised.

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