Adjective ordering restrictions: exploring relevant semantic notions for syntactic ordering

Adjective Ordering Restrictions:
Exploring Relevant Semantic Notions for Syntactic Ordering[*]

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I propose that ordering restrictions among adjectives (e.g., *the big gray poodle*) are driven by the covert syntactic complexity of the adjectival projections. The more complex the projection containing the adjective, the higher in the structure it must merge. Intersective adjectives (*gray*) merge with the NP, and non-intersective adjectives (*big*) merge also with a covert *for*-PP that contains a copy of the NP. This differs from the usual approaches to adjective ordering, which turn to fine-grained semantic subclasses (e.g. *height, length, color*) or functional heads in the DP to explain adjective ordering restrictions.

1. Introduction

An important part of the literature on adjectives has been concerned with the relation between semantic categorization and syntactic distribution, but there is still no consensus as to which semantic classification of adjectives is relevant to the observed syntactic restrictions on their ordering. In this paper, I argue that the underlying (unmarked) order of adjectives arises from syntactic distinctions among them and consider how the semantics map onto these syntactic distinctions. Specifically, I propose a DP structure that involves merging intersective adjectives (like *green*) with N. Non-intersective adjectives (like *big*) merge first with a copy of N within a silent *for*-PP. The *for*-PP provides the comparison class for N that a non-intersective adjective requires (cf. Kennedy & McNally 2005). This analysis predicts that adjectives *within* the two classes – intersective and non-intersective – are not ordered. However, the different syntactic complexity determines the observed ordering across classes, following the hypothesis that more complex structures merge later (cf. Prinzhorn & Vergnaud forthcoming). In sum, this paper questions that semantic properties themselves drive syntactic ordering of adjectives, as has been claimed previously, and argues that distributional restrictions for adjectives come from the complexity of syntactic structure.

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2. The Correlation of Syntactic AOR and Semantics

2.1 AOR Data/Background

In English, non-intersective adjectives precede intersective adjectives (Svenonius 2008, Truswell 2009). The unmarked ordering occurs in assertions and wider-focused contexts (such as a focus on the DP).

(1)   a.   the big red car
       b.   *the red big car

There are two approaches to AOR in the literature. The first approach bases AOR on fine-grained semantic subclasses, such as size or color (Cinque 1994, Scott 2002, Laenzlinger 2005), see (2a). The second argues that AOR is based on functional properties of the DP, which are less fine-grained (Svenonius 2008, Truswell 2009), see (2b).

(2) Two Types of Adjective Ordering Restriction (AOR) Analyses:

a. AOR based on fine-grained semantic subclasses	b. AOR based on functional properties of the DP

Scott (2002):
DETERMINER > ORDINAL NUMBER > CARDINAL NUMBER > SUBJECTIVE COMMENT > ?EVIDENTIAL > SIZE > LENGTH > HEIGHT > SPEED > ?DEPTH > WIDTH > WEIGHT > TEMPERATURE > ?WETNESS > AGE > SHAPE > COLOR > NATIONALITY/ORIGIN > MATERIAL > COMPOUND ELEMENT > NP
	Svenonius (2008):
	
	GRADABLE, SUBSECTIVE ADJECTIVES
	    >
	NON-GRADABLE, INTERSECTIVE ADJECTIVES
	    >
	IDIOMATIC ADJECTIVES

Cinque (1994): QUANTIFICATION > QUALITY > SIZE > SHAPE > COLOR > NATIONALITY	Truswell (2009): SUBSECTIVE ADJECTIVES > INTERSECTIVE ADJECTIVES

The first approach, that ordering is based on fine-grained semantic subclasses, does not hold up empirically, as the adjective ordering is more flexible than the predictions of this approach (see Svenonius 2008). For example:

(3) a.   a long thick rope   (LENGTH, WIDTH)
     b.   a thick long rope
     c.   thin long legs
     d.   long thin legs   (from Svenonius 2008)

     e.   red round hat   (COLOR, SHAPE)
     f.   round red hat

     g.   beautiful cold snow   (EVALUATIVE, TEMPERATURE)
     h.   cold beautiful snow

The second approach, argued for primarily in Svenonius (2008), matches AOR up with specific functional heads in the DP that are independently motivated. The functional projections Svenonius (2008) claims are relevant to (unmarked) adjective ordering are:

(4)   SORTP $> n$P $> \sqrt{}$P

SORTP is the functional phrase where the mass/count distinction is made (similar to Borer's 2005 Classifier Phrase). nP is the level of lexical idiosyncrasy. $\sqrt{}$P is the bottom node of the nominal hierarchy, below nP. Specific classes of adjectives merge at different points of the functional hierarchy, and their interpretation with respect to three semantic properties is a result of their position of merge.

Svenonius places dimension adjectives in the specifier of SORTP, in part because they cannot merge with mass nouns:

(5)   red/*big liquid
(6)   yellow/*long mustard

Because there is an effect of mass/count for *big* and *long*, but not with color adjectives, Svenonius takes this as evidence for the involvement of SORTP with adjective ordering, and assumes that any constraints on adjectives merging with mass or count nouns must occur above this projection. With respect to gradability,

adjectives with a Deg head, or gradable adjectives, merge at SORTP. In addition to dimension adjectives, this includes certain color/origin/material adjectives, which can become gradable by combining with a Deg head. Finally, SORTP modification is subsective.

Adjectives that merge with *nP* are color, origin and material adjectives. This is argued to be the case because "modification of *n*P is essentially intersective" (Svenonius 2008: 20). Following Higginbotham (1985), he takes the type of color/origin/material adjectives to be of the same type as *n*P, and as a consequence, intersective modification occurs at this level. He claims adjectives at this level are non-gradable, and do not merge with a Deg head`. Adjectives that merge at *n*P can merge with mass and count nouns, as they merge before the distinction is made.

Finally, idiomatic adjectives (e.g. *wild* in *wild rice*) merge as the specifier of a √P, because this is the level of idiomaticity (cf. Marantz 2001).

Essentially, Svenonius' proposal links three semantic properties, gradability, the mass/count distinction, and intersectivity, with the functional heads he has independently motivated. Each level of the syntax sees different consequences for each of these properties.

In general, I follow Svenonius' empirical approach in that there is a restricted number of adjective classes. However, Svenonius predicts that the mass/count effects, gradability and intersectivity apply to the same classes of adjectives that are ordered (i.e. dimension adjectives can never merge with mass nouns, are gradable, and subsective). This is where I depart from his analysis. I show that of the three semantic properties that Svenonius argues are relevant to the syntax, intersectivity is the only property that is truly correlated with adjective ordering, and provide data that show that the other two semantic properties are independent of AOR.

2.2. Intersectivity is relevant for AOR

Of the three semantic properties, only intersectivity is relevant for AOR. The other two dimensions, gradability and the mass-count distinction, are independent of the unmarked ordering between *big* and *green*, as they predict ordering where it is not seen and/or do not predict ordering that is seen.

First, the mass/count distinction appears independent of AOR:

(7)   big red table   *red big table   red water

(8)   big square table   *square big table   *square water[1]

While both *big/red* and *big/square* are ordered pairs of adjectives, the color adjective can merge with the mass noun *water*, while the shape adjective cannot. This is problematic for an analysis that assumes that color/origin/material adjectives always merge in a lower position than *big* due to the fact that the intervening head is a SORT head. There is a similar mass-count selection effect on an adjective (*square*) that intersects below the point where the mass/count distinction is made.

Second, gradability appears independent of AOR between *big* and *green*. To show this, a clear definition of what semantic gradability means for color adjectives must be laid out, as Svenonius (2008) claims that color/origin/material adjectives can both merge with a Deg head (in SORTP) and merge as a non-gradable adjective (in *n*P).

Turning to the semantics of gradable and non-gradable color adjectives, Kennedy & McNally (2009) argue that color adjectives can be both gradable and non-gradable (in line with Svenonius). More specifically, non-gradable color adjectives have a 'correlated property' or classifying meaning (their (24)):

(9) $T(\text{green}_{\text{non-gradable}}) = \lambda x.P_i(x)$ & **cor**(P_i, green)

Essentially, at some point in time, under some conditions, the color green was manifest in the object, even if it is not anymore. For example, while (10) is still the color green, (11) is not white:

(10)   The green light is flashing
(11)   I prefer white wine.

However, both adjectival modifiers do not refer to the color of the object; rather, *green* is correlated with "proceed" in the context of a traffic signal and *white* refers to the type of wine.

On the other hand, when a color adjective refers to the quantity or quality of the color of a noun, it has the same gradable semantics as other gradable adjectives (their (25a-b)):

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[1] Note that this is not ungrammatical when *square water* is interpreted with some ellipsis of another noun: *a square container of water*. I take this to mean that there is silent structure involved when *square water* is available. This effect also occurs with dimension adjectives: *I'd like a big/tall water* can mean *tall glass of water* or *big bottle of water*.

(12) $T(\text{green}_{\text{gradable,quantity}}) = \lambda x.\textbf{quant(green)}(x) > \textbf{stnd(quant(green))}$
(13) $T(\text{green}_{\text{gradable,quality}}) = \lambda x.\textbf{qual(green)}(x) > \textbf{stnd(qual(green))}$

(14) The leaves are (half) green
        (Context: The leaves are for a stage set; they are painted green)

Using Kennedy & McNally's (2009) examples and semantics of gradable and non-gradable color, we can look at gradable and non-gradable color adjectives to see if they are ordered with *big*. Svenonius' theory predicts that a gradable color adjective will be freely ordered with respect to big, when it merges (by adjunction) to SORTP.

(15) The big green/*green big light is flashing.

(16) The big green/*green big cat just tipped over a can of paint (and is completely covered with green paint).

Here, both gradable and non-gradable *green* are ordered with respect to *big*. If the syntax were sensitive to gradability between dimension and color/shape/material adjectives, we would expect AOR to occur in (15), but not in (16).[2]
        More general than color alone, Svenonius predicts that a gradable color, origin, or material adjective (merged with a DegP) would be more freely ordered with respect to a dimension adjective (also merged with a DegP). We do not see this (using Svenonius' example):

(17) *A French big attitude (without focus)
(18) A big French attitude

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[2] The classifying, 'non-gradable' use of *green* seems to be more generalized (it can occur with dimension adjectives as well):
        (i) I like [small dogs]
Dimension adjectives that refer to a class or type of noun are closer to the noun than color adjectives:
        (i) I like [brown [small dogs]]
In this sense, gradability may also be represented in the syntax, between classifying and non-classifying adjectives (see McKinney-Bock 2010).

Finally, I follow Svenonius' claim regarding intersectivity, and provide further evidence that AOR are correlated with intersectivity:

(19)   NON-INTERSECTIVE > INTERSECTIVE
                          (big, pretty)   (red, square)

It seems that intersectivity, which we have seen is also reflected in other distributional differences between dimension and color/shape adjectives, is the relevant semantic property for syntactic ordering.

3. Proposal

3.1 Distribution of adjectives with overt *for*-PP

Higginbotham (1985) describes the following paradigm:

(20)   That is a big butterfly
(21)   That butterfly is big

(20´) That is a butterfly, and it is big (for a butterfly)
(21´) That butterfly is big (for an X)

The paraphrases show that "(21) can count as false with respect to an object for which (20) is true (Higginbotham 1985: 563)" – there is a different kind of "semantic link" between the predicative and attributive use of *big*. We return to this immediately in the next section. Importantly, for now, color adjectives cannot undergo this test, as they cannot merge with an overt *for*-PP:[3]

(22)   *That is a plant, and it is green for a plant
(23)   *That plant is green for a plant

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[3] With focus, this example improves:
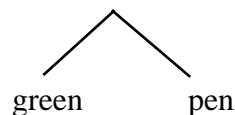   (i) That plant is very green/GREEN for a plant
I leave these examples for this presentation, but believe that focus quantification plays a different role, as it does for adjective ordering restrictions (the AOR disappear under focus conditions, and change with degree morphology)

This difference is important with respect to *big* and *green*, as it illustrates that dimension adjectives depend on the head noun for their interpretation and comparison class, while bare attributive *green* does not.
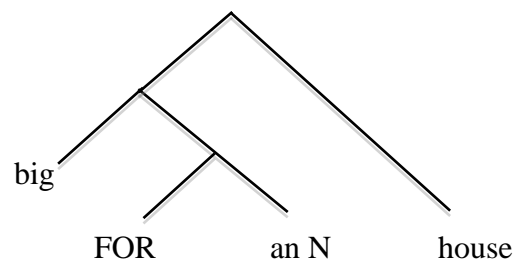
3.2 Syntactic Complexity and Semantic Intersectivity

The initial distinction between *big* and *green* shows that dimension adjectives can merge with a *for*-PP that sets the comparison class, while color adjectives cannot. I propose that dimension adjectives, when used attributively, merge with a silent [FOR an N] that sets the comparison class for the noun (cf. Kennedy 1999, etc). Essentially, dimension adjectives have an additional nominal argument that color/shape/material adjectives do not have, that is permitted with deletion under identity. Then, when dimension adjectives are used predicatively, as in *that is big*, the silent [FOR an N] is allowed to delete under the most general classificational N (or under identity). Finally, color adjectives, without focus or an overt intensifier such as *very*, lack this silent argument. The structures are as follows:

(24)

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        /\
       /  \
    green  pen
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(25)

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           /\
          /  \
         /\   \
        /  \   \
     big /\   house
        /  \
      FOR  an N
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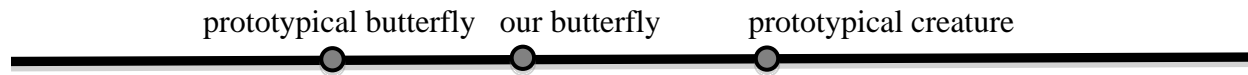
The structural difference between *big* and *green* drives AOR (see Section 5).

3.3 *for-PPs*

Another look at the differing truth conditions apparent with 'big butterfly' shows the predicative use of *big* differs from both the attributive use of *big* and the predicative use of *big* with an overt for-PP.

(26)[4] Context: A Giant Swallowtail butterfly flies by (a large species of butterfly)

prototypical butterfly   our butterfly   prototypical creature

(27)   That butterfly is big.
(28)   That is a big butterfly.
(29)   That butterfly is big for a butterfly.
(30)   That butterfly is a big one.

(27´) #That butterfly is big, but it is not big.[5]
(28´) That is a big butterfly, but it is not big.
(29´) That butterfly is big for a butterfly, but it is not big.
(30´) That butterfly is a big one, but it is not big.

A test using coordination with *but* shows that there can be different comparison classes between the attributive/predicative adjective with an overt *for*-PP when coordinated with bare predicative uses of *big*. However, (27) results in a contradiction (without focus). For *red*, it is the case with both attributive and predicative uses:

(31)   Context: You see a sunset in Portland, Oregon where the sunsets are relatively bland (unlike Arizona). However, tonight's sunset appears almost red/pink – perhaps because the cloud cover lifted.

prototypical Portland sunset   our sunset   prototypical sunset

(32)   That sunset is red.
(33)   That is a red sunset.
(34)   That sunset is a red one.
(35)   *That sunset is red for a sunset.[6]

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[4] I am being purposefully vague with respect to open/closed scales (Kennedy & McNally 2005)
[5] With focus 'morphology,' the case again changes:
      (i) #That butterfly is big, but it is not BIG.

[6] Again, with degree morphology/focus 'morphology,' the case changes.

(32´) #That sunset is red, but it is not red.
(33´) #That is a red sunset, but it is not red.
(34´) #That sunset is a red one, but it is not red.
(35´) #That sunset is very red for a Portland sunset, but it is not red.

We see here that the apparent 'link' is not separate in the cases where red is used attributively versus predicatively.[7]

The structure proposed for bare predicative dimension adjectives is that a silent *for*-PP with *big* can be deleted only under general conditions. This predicts that the possibility of coordination with *but* is not possible for the bare predicative use of *big*:

(36)   #That butterfly is big, but it is not big

However, coordination of a predicative *big* with an overt *for*-PP and a bare predicative *big* should be okay:

(37)   That butterfly is big for a butterfly, but it is not big.

Similarly, the analysis of attributive adjectives predicts that the possibility of coordinating an attributive *big* and a predicative *big* with *but* is possible for both of the following examples:

(38)   That is a big FOR A BUTTERLY, but it is not big.

A silent *for*-PP with attributive dimension adjectives explains the parallel between attributive *big* and the predicative *big* with an overt *for*-PP containing *butterfly*. The silent *for*-PP is the additional syntactic link that Higginbotham (1985) analyzes semantically as autonomous theta marking: *that is a big butterfly = that is a butterfly, and it is big (for a butterfly)*. This *for*-PP sets the comparison class for non-intersective adjectives. Predicative dimension adjectives do not have the same type of silent *for*-PP, as they behave differently (see section 4.1).

Finally, color adjectives do not participate in this alternation. Even with additional overt degree modification, when they permit a *for*-PP, they cannot

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      (i) That sunset is RED for a sunset.
      (ii) That sunset is very red for a Portland sunset.
I leave these examples for this presentation (see fn 3, 5).
[7] See appendix

coordinate with a predicative *red*. *Red* is not context-dependent in the same way as *big* (following observations in the literature about the 'absoluteness' of color adjectives, cf. Wheeler 1972). The proposed analysis, that color adjectives do not have a *for*-PP in attributive or predicative position, explains this fact.

4. Further Support

4.1 Bare Predicative Adjectives

The claim this paper has made is that bare predicative *big* has a *for*-PP that can be deleted under the most general classificational noun. For evidence, we look at copula sentences and nominal predicates more generally:

(39) a.   #This butterfly is a creature/an insect
      b.   This creature/insect is a butterfly

(40) a.   A butterfly is a creature/an insect
      b.   #A creature/an insect is a butterfly[8]

        In (39), with a demonstrative noun phrase, we see that the nominal part of the demonstrative subject must be more general than its nominal predicate. In (40), we see the reverse pattern with an indefinite subject; the indefinite subject must be more specific than its nominal predicate. In both (39) and (40), there is a classification relationship between *butterfly* and *creature/insect*; the former is a sub-class of the latter.
        If we look at this phenomenon with respect to bare predicative adjectives, we see that the reverse effect obtains for demonstrative subjects:[9]

(41) a.   This butterfly is big for an insect
      b.   #This creature is big for a butterfly

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[8] Jean-Roger Vergnaud, p.c.
[9] Substituting *creature* for *insect* in (44)-(45), with predicative *big*, makes the sentences intuitively false; there must be a limit to how we determine the relevant general classification (as with all objects). Roumyana Pancheva (p.c.) provides the following examples:
     (i) She is tall (*for a woman*, not *for a human*)
     (ii) She speaks many languages
(ii) is true, if she speaks three languages in the United States, but not true if this is in Switzerland. So this issue is broader than predicative adjectives.

The effect remains constant for indefinite subjects:

(42)   a.   A butterfly is big for an insect
       b.   #A creature is big for a butterfly

Thus the claim is that predicative *big* is evaluated under the most general classificational noun (or relevant classification; see fn. 8). The demonstrative subject is possibly allowed deletion under identity of butterfly as well, but not necessarily. The details are left to future research.

4.2 A note on coordination

A potential counterexample arises to the argument that attributive *big* and *red* involve different syntactic structures when one looks at coordination. These two classes of adjectives can be as comfortably coordinated as two dimension adjectives, or two color adjectives:

(43)   The big and red hat was bought by John.
(44)   The big and tall man was John.
(45)   The red and green hat was bought by John.
(46)   The big, and red, hat was bought by John.   (parenthetical)
(47)   The big, and tall, hat was bought by John.   (parenthetical)

This occurs also in predicative position:

(48)   The hat that was big and red was bought by John.
(49)   The hat, big and red, was bought by John.

However, the issue lies not within the argument in this paper, but rather with the argument that coordination always must be with exactly like constituents. For example:

(50)   The hat was big for a hat and red
(51)   The car that I bought is small for a car/automobile and European
(52)   The car that I bought is small for a car/automobile and from Europe.

The adjectival predicates in (50) and (51) can be as easily coordinated as the nominal predicate and PP in (52). It seems that different types of predicates can be

coordinated, even if their syntactic category differs. Also, although this is slightly degraded, adjectival predicates can be coordinated with predicative nominals:

(53)   ?The car that I bought is small (for an automobile/car) and a Toyota

Unfortunately, this test is not directly available for attributive adjectives in English, as prenominal PPs do not occur in a prenominal position, but the above examples cast doubt on the coordination of likes, rather than the analysis of syntactic differences between *big* and *red*.

5. Why does complexity of structure cause AOR?

One question I have left open is why the existence of a silent *for*-PP causes *big* to merge above *red*. A difference in syntactic complexity does not immediately seem to motivate an analysis of the order of merge. For this, I turn to the hypothesis by Prinzhorn & Vergnaud (forthcoming) that higher specifiers are larger constituents than lower specifiers: essentially, that the size of a specifier is correlated with the sister projection with which it merges. Simply put, the nominal phrase and verbal phrase grow 'in parallel' as the clause builds. This hypothesis extends naturally to adjectives, and the AOR discussed in this paper.

Additionally, there is a general observation about the DP that larger adjuncts tend to merge higher (Vergnaud 1974, Kayne 1994, Cinque 2009, etc.):

Reduced relative clauses merge closer to the noun than full relative clauses:
(54)   The man proud of his victory who ran an extra three laps
(55)   *The man who ran an extra three laps proud of his victory

Relative clauses merge above PPs
(56)   The book of poems that John wrote
(57)   *The book that John wrote of poems

Reduced relative clauses/PPs:
(58)   The book of poems written by Poe
(59)   *The book written by Poe of poems

A natural claim, then, is that ordered adjectives are structurally different, and that the higher adjectives are part of structurally more complex adjectival projections than lower adjectives. This paper has provided evidence that *big* is

indeed more complex, and has specified this complexity as a silent prepositional phrase containing a second occurrence of the head noun – this is correlated with the semantic property of intersectivity. I further hypothesize that the occurrence of this second noun is a *kind* noun, as its overt counterpart seems to be. I leave this to future research.

6. Conclusion

The proposal was put forth that syntactic AOR between dimension and color/shape adjectives are correlated with the semantic property of intersectivity, and not gradability or the mass/count distinction. AOR were proposed to be a result of different-sized adjectival constituents merging higher and lower in the structure, rather than stipulating that semantic properties correlate to syntactic heads. Differences between the two semantic classes of adjectives have other, albeit subtle, syntactic differences. A structural explanation for these differences motivates AOR as a part of a more general observation that larger constituents in the DP merge higher, rather than as a separate phenomenon. Following the proposal by Svenonius (2008) that semantic intersectivity corresponds to the syntax of the DP, there is an additional syntactic object, a silent noun, providing the semantic dependence that we see with dimension adjectives.

Appendix

The truth conditional effect with *big butterfly* only comes out when the attribute can have differing truth conditions for different entailment classes by the noun. When the individual being discussed is true for both the smaller and larger class, this effect disappears:

Context: You see an elephant walk by, and it is one of the largest breeds of elephant.

prototypical creature   prototypical elephant   our elephant

(i)   That elephant is big.
(ii)   That is a big elephant.
(iii)   That elephant is a big one.
(iv)   That elephant is big for an elephant.

(i′)   #That is a big elephant, but it is not big.
(ii′)   #That elephant is big, but it is not big.
(iii′)   #That elephant is a big one, but it is not big.
(iv′)   #That elephant is big for an elephant, but it is not big.

While this may seem like a counterexample for the difference between *red* and *big*, it is not. In this case, the two scales being conjoined with 'but' have the same truth conditions for the context – they are both smaller than our elephant - and so they become contradictory. What is key to the butterfly example is that the two scales have different truth conditions for the object.

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