

# Linear Order in Syntax: Selection in Coordination\*

Benjamin Bruening and Eman Al Khalaf, University of Delaware

(bruening@udel.edu, alkhalaf@udel.edu)

## Abstract

Researchers have long observed asymmetries in coordination in agreement, binding, selection, and other syntactic phenomena. To account for these asymmetries, typically researchers have posited a special status for the first conjunct in a coordinate structure, usually in hierarchical prominence. More recently it has been observed that, in the domain of agreement, the *final* conjunct can also enjoy special s (e.g., Benmamoun *et al.* 2009). This literature has concluded that linear order is the important factor for agreement. On the assumption that linear order is not present in the syntax, this literature has proposed that the valuation of conjunct agreement is postponed until PF, where linear order is computed (e.g., Bhatt and Walkow 2013). We examine asymmetries in selection in coordination, and show that in this domain, just as with agreement, linear order is the crucial factor. We show a number of cases where the *final* conjunct is what matters for selection. We argue that linear order must be part of the syntax, since selection is not something that can be delayed to PF. We spell out an analysis of coordination and selection that derives the observed patterns.

## 1 Introduction

It has long been known that coordination exhibits asymmetries between initial and non-initial conjuncts in agreement, selection, binding, and other syntactic phenomena (for overviews, see Progovac 1998a, 1998b and Al Khalaf 2015, chapter 1). For example, first conjunct agreement

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is observed in many languages, where the first conjunct rather than the coordinate NP as a whole controls agreement on an agreeing category:

- (1) Modern Standard Arabic (Al Khalaf 2015, 137, (301a))

qadam-at at-tilmiiḏ-ah wa at-tilmiiḏ al-imtiḥan  
take-3F.SG the-student.F.SG and the-student-M.SG the-test

‘The student (female) and student (male) took the test.’

In addition, Sag *et al.* (1985), Johannessen (1996; 1998), Zhang (2010), and many others show that in selection, the first conjunct must satisfy the selectional requirements of the selecting head, but other conjuncts may violate those requirements. For example, prepositions select NPs and do not select CPs:

- (2) a. You can depend on my assistant.  
b. \* You can depend on that my assistant will be on time. (Sag *et al.* 1985, 165, (125b))

However, a CP and an NP can be coordinated as the object of a preposition, so long as the NP comes first:

- (3) a. You can depend on [ [my assistant] and [that he will be on time] ]. (Sag *et al.* 1985, 165, (124b))  
b. \* You can depend on that my assistant will be on time and his intelligence.

To account for such asymmetries, most researchers have proposed that the first conjunct enjoys a special prominence within a coordinate structure. This generally takes the form of positing a hierarchically more prominent position for the first conjunct. This prominence is also often posited to permit the first conjunct to percolate its own features to the coordination as a whole (Munn 1993; Munn 1999; Johannessen 1998; Progovac 1998a; Zhang 2010; Larson 2013, and many others).

However, recent work has shown that conjunct agreement as in (1) above is actually a linear phenomenon. In some languages, when the agreeing category follows the coordinate NP, it is the *final* conjunct that controls agreement (Marušič *et al.* 2007, 2015; van Koppen 2007; Benmamoun *et al.* 2009; Bhatt and Walkow 2013). For instance, in (4), the conjunct that is closest to the verb is the one that agrees with it. In (4a), the coordinate follows the agreeing verb, and the first conjunct

is the agreeing one; but in (4b), the coordinate precedes the verb, and in this case it is the *final* conjunct that agrees:

(4) Slovenian (Marušič *et al.* 2007, 5, (8), (9) )

- a. Včeraj so odšle/\*odšla [krave in teleta] na pašo.  
yesterday AUX went.F.PL/\*went.N.PL [cow.F.PL and calf.N.PL] on graze  
'Yesterday cows and calves went grazing.'
- b. [krave in teleta] so odšla/\*odšle na pašo  
[cow.F.PL and calf.N.PL] AUX went.N.PL/\*went.F.PL on grazing  
'Cows and calves went grazing.'

Thus the right generalization is that the conjunct that controls agreement is the one that is linearly closest to the category it agrees with. This phenomenon has therefore been dubbed *closest conjunct agreement* (CCA) by Benmamoun *et al.* (2009).

Marušič *et al.* (2007), van Koppen (2007), Benmamoun *et al.* (2009), and Bhatt and Walkow (2013) propose that CCA results from a failure to value agreement in the syntax. This results in the valuation of agreement being accomplished at PF, where linear order rather than hierarchical structure becomes relevant. The shared assumption in these analyses is that linear order is not present in the syntax. Instead, purely hierarchical relations from the syntax are translated into precedence relations at PF. This assumption is a common one in the current syntactic literature, with Kayne (1994), Fox and Pesetsky (2005), and numerous others taking the position that linear order is unspecified until after the syntax is spelled out at the interface with the phonological component.

We argue instead that linear order must be part of the syntax, on the basis of evidence from selection in coordination. We undertake a more careful examination of data like that in (3), where only one conjunct satisfies the selectional requirements of a syntactic element. Note that in (3), the selecting preposition *precedes* the coordinate phrase. We look at cases where the selectional relations involve a category that *follows* the coordinate phrase, and show that in those cases, it is the *final* rather than the initial conjunct that must satisfy the selectional requirements. Just as in agreement, the correct generalization is that it is the linearly *closest* conjunct that matters.

Satisfaction of selectional requirements, unlike agreement, is not something that can be postponed to PF. Selection is generally thought to be extremely local, in fact it is usually thought to

require the syntactic relation of sisterhood at some level of representation. Sisterhood relations are wiped out at PF and are replaced with precedence relations; if satisfaction of selectional requirements were delayed to PF, there would be no way to specify the correct structural relations that must obtain. We therefore conclude that linear order must be present in the syntax, following Phillips (1996, 2003), Bruening (2014), and others.

We begin in section 2 by examining the empirical facts of mismatches in selection involving coordination. We show that final as well as initial conjuncts can be relevant to selection, depending on linear order. In section 3 we show that selection depends on hierarchy and cannot be stated in terms of precedence relations. This means that selection is not something that can be delayed to PF where hierarchical relations are wiped out. In section 4 we consider an alternative analysis where selectional violations in coordination are actually the result of clausal coordination plus ellipsis. We show that this alternative cannot account for all of our data. This section also shows that the syntax allows coordination of mismatched categories. In section 5, we build on this result to propose an analysis of coordination and an analysis of selection (following Bruening 2013) that explains all the facts. Section 6 then shows that there is a further constraint on coordination. Not all mismatches in category are allowed; coordination seems to be restricted by morphophonological parallelism in addition. Section 7 is a conclusion.

## **2 An Empirical Investigation of Selection in Coordination**

We start with an empirical investigation of the full range of facts in selection. To begin, selection involves a relation between some selecting element X (typically but not always a head) and a phrase that it selects. In coordination, two coordinate phrases YP and ZP may enter into a selectional relation with X. They may occur either before X or after X:

- (5) a. X [YP & ZP]
- b. [YP & ZP ] X

Or, two selecting elements X and Y may be coordinated and enter into a selection relation with a phrase ZP. Again, two linear orders are possible:

- (6) a. [X & Y] ZP

- b. ZP [X & Y]

This gives us four patterns that must be examined in an investigation of the effects of linear order on selection in coordination.

## 2.1 Case 1: X [YP & ZP]

The existing literature has only looked at cases of the type in (5a), of which (3) is an exemplar. Such examples were first introduced by Sag *et al.* (1985), and further discussed in Johannessen (1996, 1998), Zhang (2010), and numerous others. As we saw above, in pattern (5a), only the first conjunct must satisfy the selectional requirements of the head X. Another example follows:

- (7) a. Pat was annoyed by [the children's noise] and [that their parents did nothing to stop it]. (Sag *et al.* 1985, 165, (124c))  
b. Pat was annoyed by [the children's noise].  
c. \* Pat was annoyed by [that their parents did nothing to stop it]. (Sag *et al.* 1985, 165, (125c))  
d. \* Pat was annoyed by [that they were so noisy] and [their inability to sit still].

Similarly, *become* takes APs as complement, and may not select a PP as a complement. However, a coordinated AP and PP is a possible dependent so long as the closest conjunct to *become* is the AP:

- (8) a. At one point, she reportedly became [disheartened] and [on the verge of giving up her studies],...<sup>1</sup>  
b. She reportedly became disheartened.  
c. \* She reportedly became on the verge of giving up her studies.  
(9) a. Meetings became more discreet and behind closed doors in city flats and storefronts, ...<sup>2</sup>  
b. Meetings became more discreet.

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<sup>1</sup><http://www.isms.nsw.edu.au/about-montessori>

<sup>2</sup><https://www.ctc.usma.edu/posts/jihadist-radicalization-and-the-2004-madrid-bombing-network>

- c. \* Meetings became behind closed doors in city flats and storefronts.

Examples of pattern (5a) are compatible either with a special status for the linearly closest conjunct to the selector, or a special status for the first conjunct.

## 2.2 Case 2: [YP & ZP ] X

Examples of pattern (5b) have not, to our knowledge, been noted before. Subjects in English make a good test case, since they precede the selecting predicate. There are some predicates that select NP subjects and do not permit CP subjects:

- (10) a. \* [That he was late all the time] resulted in his being dismissed. (based on Pollard and Sag (1987, 131))
- b. His constant harassment of co-workers resulted in his being dismissed.

Some speakers of English may find the CP subject in (10a) acceptable. They are not relevant here. Speakers who do find (10a) degraded compared to (10b) nevertheless find a CP acceptable as the first member of a coordinate subject, if the second member is an NP:

- (11) a. [That he was late all the time] and [his constant harassment of co-workers] resulted in his being dismissed.
- b. \* [His constant harassment of co-workers] and [that he was late all the time] resulted in his being dismissed.

The same pattern can be found with other predicates that do not permit CP subjects, for instance the passive of *hear*:<sup>3</sup>

- (12) a. [That Quentin was a werewolf] and [twenty other crazy rumors] were heard by all the students in the department.
- b. \* That Quentin was a werewolf was heard by all the students in the department.
- c. Twenty crazy rumors were heard by all the students in the department. (b and c based on Alrenga (2005, 184, footnote 8))

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<sup>3</sup>Active *hear* allows a CP as complement, but passive *hear* seems not to allow a CP as subject. See Alrenga (2005).

Another example is the predicate *be incoherent*, which for many speakers also does not allow a CP subject:

- (13) a. [That images are waterproof] and [many of his other pronouncements] are all incoherent.  
b. \* That images are waterproof is incoherent. (Pollard and Sag 1987, 131)  
c. Many of his other pronouncements are all incoherent.

This pattern can also be found when the selector is a postposition. For instance, a coordinate of an NP and a CP is a possible dependent of *notwithstanding* as long as the *final* conjunct is an NP:

- (14) a. That she got third place and her injury in the final round notwithstanding, she felt good about her performance in the Olympics.  
b. Her injury notwithstanding, . . .  
c. \* That she got third place notwithstanding, . . .

As can be seen from these examples, when the coordinate phrase precedes the selecting head, it is the *final* conjunct that matters for categorial selection, not the initial one. Like agreement, selection is checked by the conjunct that is closest in linear order to the element the coordinate phrase enters into a selectional relation with.

### 2.3 Case 3: [X &Y] ZP

Cases 3 and 4 involve a conjunction of two selecting categories X and Y sharing a selected phrase ZP. In Case 3 (6a), the selected phrase follows the coordinated selectors. If what matters is linear order, we again expect the final conjunct to be what is relevant here.

Examples of this pattern include coordinated verbs and verbs plus prepositions. The following is an attested example:

- (15) So the fox thought about and decided to carry the scorpion across the river, . . .<sup>4</sup>

While *decide* combines grammatically with an infinitive, *thought about* does not:

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<sup>4</sup><http://www.killermovies.com/forums/archive/index.php/t-520314-did-obi-wan-forget-about-leia.html>

- (16) a. So the fox decided to carry the scorpion across the river. . .  
 b. \* The fox thought about to carry the scorpion across the river.

As can be seen, in this case it is again the *final* conjunct that matters for selection. Reversing the conjuncts results in ungrammaticality:

- (17) \* So the fox decided/proposed and thought about to carry the scorpion across the river.

Linear order is also the determining factor in the following example, where *hope* does not select a subjunctive clause, but *recommend* does:

- (18) a. I had hoped and recommended that the school be named in honor of Don Clayton. . .<sup>5</sup>  
 b. \* I had hoped that the school be named in honor of Don Clayton.  
 c. I had recommended that the school be named in honor of Don Clayton.

As can be seen, when the selected element follows the coordinated phrase, it is the final conjunct that matters for selection.<sup>6</sup>

Another possible source of data for this pattern involves adjectives and adverbs. As adjuncts, these categories are not usually thought of as entering into selectional relations. However, while they are typically not selected by other categories, they themselves do select. Typically this is thought of only in semantic terms: a general restriction on adjuncts is that they must be semantically compatible with the category they adjoin to. However, there is also categorial selection: adjectives adjoin to a projection of N, while adverbs adjoin to projections of other categories. This could not be semantic selection, but must be a form of categorial selection. There is little semantic difference between corresponding adverbs and adjectives:

- (19) a. She brilliantly discussed the issue of snake locomotion.

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<sup>5</sup>[http://www.lampasasdispatchrecord.com/news/2009-02-10/PDF/Page\\_06.pdf](http://www.lampasasdispatchrecord.com/news/2009-02-10/PDF/Page_06.pdf)

<sup>6</sup>It is possible and perhaps even likely that these examples involve Right Node Raising rather than simple coordination of selectors. Nevertheless, linear order is still important, as can be seen from the examples. Any analysis of these in terms of Right Node Raising will have to explain why mismatches are allowed, but only with the conjunct that is furthest from the shared material on the right. Note also that none of the other patterns of selectional violations in this paper are amenable to a Right Node Raising analysis.



- b. her brilliant discussion of snake locomotion

We therefore follow Bruening (2010, 2013) in viewing adjuncts as selecting the category of the phrase they adjoin to. APs select projections of N, while AdvPs select projections of other categories. Now, examples like the well-known book title below become relevant to the issue of selection in coordination:

- (20) a. The Once and Future King (T. H. White, published 1958)  
b. \* the once king  
c. the future king

This is an example of pattern (6a): two selecting elements, here an AP and an AdvP, are coordinated, entering into a selectional relation with a nominal phrase that follows them. In this example, only *future* is compatible with *king*. *Once* is not an adjective and may not appear by itself in prenominal position. It is an adverb, appearing in verb phrases, as for instance *he was once king* or *he was king once*. The book title is grammatical (and in fact unremarkable) because only the coordinated element that is closest to the selected phrase needs to select that phrase. Here, the closest element, *future*, is an AP, which selects a nominal constituent.

One might object to the above example as a fixed expression, not representative of a general pattern in the language. However, investigation reveals that it is in fact representative of a larger pattern in the language. The pattern *Det Adv and Adj N*, where *Det Adv N* is ungrammatical, is actually common, with different choices for Adv, Adj, and N (and Det). Some attested examples follow:

- (21) a. ... in the once and future world...<sup>7</sup> (\*the once world)  
b. The Once and Future Library<sup>8</sup> (\*the once library)
- (22) a. the twice and future caesar<sup>9</sup> (\*the twice Caesar)

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<sup>7</sup><https://books.google.com/books>

<sup>8</sup><http://www.hermanmiller.com/research/research-summaries/the-once-and-future-library.html>

<sup>9</sup><http://www.risingshadow.net/library/book/47397-the-twice-and-future-Caesar>

- b. the twice and future president<sup>10</sup> (\*the twice president)
  - c. the twice and future prime minister<sup>11</sup> (\*the twice prime minister)
- (23) a. ...that expression can be applied to the thrice-and-future prime minister of Israel...<sup>12</sup> (\*the thrice prime minister)
- b. ...the thrice and undaunted Lady ...<sup>13</sup> (\*the thrice lady)

Some more examples of *the Adv and Adj* pattern are listed below, with adverbs other than *once*, *twice*, *thrice*. Attested examples are numerous.

- (24) a. ...cataclysmic events were pointing to the soon and coming return of the Lord for His church.<sup>14</sup> (\*the soon return)
- b. The Soon and Coming King<sup>15</sup> (\*the soon king)
  - c. A Soon and Distant Christmas<sup>16</sup> (\*a soon Christmas)
- (25) a. The Now and Future Kingdom (book title)<sup>17</sup>
- b. The Now and Future Caliphate<sup>18</sup>
  - c. The now and future world of restricted work hours for surgeons<sup>19</sup>
  - d. the now and future winners<sup>20</sup>

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<sup>10</sup><http://www.heritage.org/constitution/#!/amendments/22/essays/184/presidential-term-limit>

<sup>11</sup><http://www.csmonitor.com/World/Asia-South-Central/2013/0512/The-twice-and-future-prime-minister-Nawaz-Sharif-garners-big-Pakistan-vote>

<sup>12</sup><http://www.lobelog.com/too-clever-by-half-netanyahu-strengthens-obamas-hand/>

<sup>13</sup>[https://en.wikipedia.org/wiki/Teresia\\_Sampsonia](https://en.wikipedia.org/wiki/Teresia_Sampsonia)

<sup>14</sup><https://books.google.com/books?isbn=1602661790>

<sup>15</sup><https://www.youtube.com/watch?v=mVj7D1Ic3D4>

<sup>16</sup><http://www.nature.com/nature/journal/v504/n7480/full/504476a.html>

<sup>17</sup><http://www.americancatholic.org/Newsletters/JHP/aq0506.asp>

<sup>18</sup><http://townhall.com/columnists/carterandress/2014/12/31/the-now-and-future-caliphate-n1937283/page/full>

<sup>19</sup><http://www.ncbi.nlm.nih.gov/pubmed/12874571>

<sup>20</sup><http://mocoloco.com/a-design-awards-competition-the-now-and-future-winners/>

- e. Hillary: The now and future democrat<sup>21</sup>
- f. \* the now kingdom/caliphate/world/winners/democrat

It therefore appears that examples like *the once and future king* are common. An AdvP can productively be conjoined with an AP in prenominal position, if the AP comes last. (The observant reader will have noticed that all the examples above have adverbs that do not end in *-ly*. Adverbs with *-ly* are not allowed in this pattern, a fact that we return to in section 6.)

## 2.4 Case 4: ZP [X & Y]

The final pattern has a selected phrase before coordinated selectors. Again subjects are relevant in English, but this time with the predicate coordinated rather than the subject:

- (26) a. That images are waterproof cannot be true and is incoherent.
- b. \* That images are waterproof is incoherent.
- (27) a. That Quentin might be a werewolf was discussed by the Scooby Gang last night and was heard by all his classmates the next morning.
- b. \* That Quentin might be a werewolf was heard by all his classmates the next morning.

As can be seen, the first conjunct is now the relevant one, exactly as predicted by the view that linear order is what is important to the satisfaction of selectional requirements in coordination.

## 2.5 Summary

The empirical study reported in this section has found that linear order is what determines whether selectional requirements are satisfied in coordination. It is not always the first conjunct that satisfies selectional requirements; the last conjunct does too. Linear order is the crucial factor: whichever conjunct is *closest* in linear order to the element the coordinate phrase as a whole is in a selectional relation with is the one that matters.

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<sup>21</sup><http://www.chicagotribune.com/news/opinion/commentary/ct-perspec-hillary-0916-20140915-story.html>

### 3 The Syntax Must Include Linear Order

This finding now indicates that, contrary to much recent work on syntax, linear order must be specified in the syntax and not just at the interface with the phonology. Suppose that linear order was absent from syntax, and syntax only dealt in hierarchical relations. At the interface with the phonology (PF), these hierarchical relations are converted into precedence relations. In order to capture the findings from the previous section, selectional information would have to be checked or satisfied at PF.

This is not a plausible approach to selection. What matters for selection is hierarchical relations, not linear order. Consider adverbs versus adjectives again. In the following example, whether an adverb or an adjective is used depends not on linear order, but on hierarchical relations:

- (28) a. a brilliant independent thinker  
b. a brilliantly independent thinker

These two examples do not differ in linear order (precedence relations). They differ only in hierarchical structure. If selection were not checked until PF, after hierarchical relations have been converted into precedence relations, there would be no way to check the correct forms here.

More generally, surface word order is not what matters for selection. Two elements in a selectional relation can be separated by other material and can occur on either side of each other:

- (29) a. # Maria frightens sincerity.  
b. # It's sincerity that Maria frightens.
- (30) a. The Spartans dined on parched corn.  
b. It is only on parched corn that the Spartans dined.  
c. \* The Spartans dined parched corn.  
d. \* It is only parched corn that the Spartans dined.

These examples illustrate semantic selection and categorial selection, respectively. Both have to be checked at some level of representation other than the level of surface word order.

This means that selection must be part of the syntax proper and could not be delayed until PF. Since linear order is crucial to the satisfaction of selection in coordination, it follows that linear order must also be part of the syntax proper and is not available solely at PF.

## 4 Alternative: Clausal Coordination Plus Ellipsis

A possible alternative analysis of our data that may obviate the need for linear order in syntax is an ellipsis analysis. Such an analysis has been proposed for mismatched categories in coordination in general (e.g., Wilder 1994). In this section we show that this analysis cannot account for all of the data introduced above.

### 4.1 The Ellipsis Account

Wilder (1994) proposes that all coordination is either NP coordination or CP coordination. All other types of coordination are derived via ellipsis. For instance, in (31), the category mismatch NP & AP is derived by assuming that two clauses are coordinated, and the subject and the verb of the second conjunct clause are elided.

- (31) a. John is a republican and proud of it. (NP and AP)  
b. [<sub>CP</sub> John is [<sub>NP</sub> a republican ]] and [<sub>CP</sub> ~~John is~~ [<sub>AP</sub> proud of it]] (Wilder 1994, 304, (59))

The underlying assumption here is that only elements of the same syntactic category can be coordinated.

If this analysis were applied to our data, we would get something like:

- (32) [<sub>CP</sub> You can depend on my assistant] and [<sub>CP</sub> ~~you can depend on~~ that he will be on time].

This would have two like categories conjoined rather than two unlike categories, but it still does not solve the selection mismatch: *on* does not permit a CP as a complement.

This analysis would then have to be supplemented with movement followed by ellipsis:

- (33) You can depend on my assistant and [[that he will be on time]<sub>i</sub> ~~you can depend on t<sub>i</sub>~~]

As is well known, CPs are allowed in NP positions just when they have moved (Kuno 1973, among numerous others; for recent discussion, see Alrenga 2005, Takahashi 2010, Moulton 2015). In this analysis, category mismatches in coordination would reduce to the phenomenon of category mismatches in movement. (For recent accounts, see Takahashi 2010 and Moulton 2015.)

Movement plus ellipsis might be fruitfully applied to some of our data. We have already seen examples of pattern 1 accounted for, in (33). Our examples of pattern 2 might also be so accounted for, since movement also seems to help with subjects that are the wrong category (34c) (but see below on agreement and floating quantifiers):

- (34) a. [That images are waterproof] and [many of his other pronouncements] are all incoherent.
- b. \* That images are waterproof is incoherent.
- c. That images are waterproof I am told is incoherent.
- d. [That images are waterproof] ~~*t* is incoherent~~ and many of his other pronouncements are all incoherent.

This would also account for pattern 4:

- (35) a. That images are waterproof cannot be true and is incoherent.
- b. \* That images are waterproof is incoherent.
- c. That images are waterproof I am told is incoherent.
- d. That images are waterproof cannot be true and ~~[that images are waterproof]~~ *t* is incoherent.

Vacuous movement of the CP out of subject position would have to be allowed just when ellipsis applies, as in (34d, 35d), otherwise (34b) and (35b) would be grammatical. This does not seem too unlikely, however, as various types of movement have been claimed to be allowed only when ellipsis also takes place (e.g., Merchant 2004, Arregi 2010, and others).

Unfortunately, the movement plus ellipsis analysis will not work for pattern 3, represented by examples like *the once and future king*. If we attempted the same strategy of conjoining larger categories, either NP or CP, we would get something like the following (putting the NP in a clausal context):

- (36) a. [<sub>NP</sub> the once king] and [<sub>NP</sub> the future king]
- b. [<sub>CP</sub> Arthur is the once king] and [<sub>CP</sub> Arthur is the future king].

No application of ellipsis will result in the right order, even after we move the adverb:

- (37) *leftward movement, left conjunct elided:*
- a. once ~~the  $t$  king~~ and the future king
  - b. once Arthur is ~~the  $t$  king~~ and Arthur is the future king.
- (38) *rightward movement, left conjunct elided:*
- a. ~~the  $t$  king~~ once and the future king
  - b. Arthur is ~~the  $t$  king~~ once and Arthur is the future king.
- (39) *leftward movement, right conjunct elided:*
- a. the once king and future ~~the  $t$  king~~
  - b. Arthur is the once king and future ~~Arthur is the  $t$  king~~.
- (40) *rightward movement, right conjunct elided:*
- a. the once king and ~~the  $t$  king~~ future
  - b. Arthur is the once king and ~~Arthur is the  $t$  king~~ future.

The only way to get the right order is to allow ellipsis to apply to a non-constituent, without movement of the adverb or adjective:

- (41) the once king and ~~the future~~ king

Permitting ellipsis to target a discontinuous string that is not a syntactic constituent would overgenerate massively, and greatly reduces the attractiveness of the ellipsis account. It will also not help to solve the selection problem, since here the adverb has not moved, and in this account moving something is what fixes a selection violation.

Moreover, to the extent that it is possible to tell, it appears that movement plus ellipsis does not permit an adverb to modify an NP. It is possible to move a prenominal modifier in sluicing, as Merchant (2001) shows:

- (42) He wants a detailed list, but I don't know how detailed. (Merchant 2001, 167)

On a movement plus ellipsis account, this is analyzed as follows:

- (43) He wants a detailed list, but I don't know how detailed ~~he wants~~ [~~a  $t$  list~~].

We can try to construct something similar with examples like *the soon and coming return of the Lord* and *a soon and coming event*, only without the second conjunct (*\*the soon return of the Lord*, *\*a soon event*). If an adverb could modify an NP by moving away from it, the result should be grammatical. It does not appear to be:

- (44) a. \* That will be the return of the Lord, but I don't know how soon.  
 (intended: ... I don't know how soon ~~that will be~~ [the  $t_{\text{how soon}}$  return of the Lord])
- b. \* His prophecies describe an event, but we don't know how soon.  
 (intended: ... we don't know how soon ~~his prophecies describe~~ [an  $t_{\text{how soon}}$  event])

The other examples of pattern 3 have the same problem. It appears that movement does not help to remedy a violation of subjunctive or infinitive selection, either:

- (45) a. So the fox thought about and decided to carry the scorpion across the river.  
 b. \* To carry the scorpion across the river, the fox thought about.
- (46) a. I had hoped and recommended that the school be named in honor of Don Clayton.  
 b. \* That the school be named in honor of Don Clayton, I had hoped.

Reducing selection violations in coordination to selection violations in movement therefore does not appear to be a viable strategy for explaining them.

Furthermore, in order to capture our linear order generalization, the ellipsis account would have to say, first, that if the coordinate phrase follows its selector/selectee, ellipsis and movement apply to the second conjunct, as in the following:

- (47) [You can depend on my assistant] and [[that he will be on time] ~~you can depend on  $t$~~ ]

But, if the coordinate phrase precedes its selector/selectee, ellipsis and movement have to apply to the first conjunct, as in the following example:

- (48) [[That images are waterproof]  ~~$t$  is incoherent~~] and [the pronouncement he made yesterday are both incoherent].

As far as we can see, there is no way to derive this difference other than by stipulation. It also fails to remove linear order from the syntax, since the choice of which conjunct to apply movement and ellipsis to depends on linear order. Movement, at least, is a syntactic process.



An additional problem for an ellipsis account is agreement. In the ellipsis account, mismatched categories in conjunction are accounted for by positing larger categories of conjunction. So, if CP and NP appear to be conjoined as arguments, the larger containing CP must actually be what is conjoined, with ellipsis. An example like (49a) would have to have the analysis in (49b):

- (49) a. That he is the king of France and last week's pronouncement are both false.  
b. [<sub>CP</sub> That he is the king of France ~~are both false~~] and [<sub>CP</sub> last week's pronouncement are both false].

The problem is the plural agreement and the floating quantifier, which both require a plural subject. Within each clause, the subject is singular. It is not at all clear how plural agreement and floating quantifiers like *both* can be allowed if what we have is the conjunction of two clauses.

We therefore conclude that movement plus ellipsis with conjunction of larger categories is not a workable analysis for the full range of data considered here. Selectional violations in coordination require a different account.

## 4.2 Coordination Permits Mismatching Categories

Larger coordination plus ellipsis, as mentioned above, was suggested as a means of dealing with the conjunction of different syntactic categories. Since Chomsky (1957), many researchers have assumed that only categories of the same type may be conjoined. However, numerous examples of mismatching categories in conjunction can be found, like our examples. Here, we argue that the syntax must allow mismatching categories in general, as a preface to developing our analysis in the next section.

A very common case of mismatching categories involves predicates. Any two syntactic categories can be combined if they are both predicates, as shown in the examples from Sag *et al.* (1985, 117–118, (2–3)) below.

- (50) a. Pat is a Republican and proud of it. [NP and AP]  
b. Pat is healthy and of sound mind. [AP and PP]  
c. That was a rude remark and in very bad taste. [NP and PP]  
d. Pat has become a banker and very conservative. [NP and AP]

One response to such examples has been to posit a category, *Pred*, that dominates AP, NP, PP, and even VP predicates. All of the above examples then involve coordination of two *PredPs* (Jacobson 1987, Bowers 1993). This will not help to account for conjunctions of different categories in argument position, of which we have already seen many examples. Mismatched categories are also allowed with conjunctions of adverbial modifiers:

- (51) a. We walked [slowly and with great care]. [AdvP and PP] (Sag *et al.* 1985, 140, (57))  
b. They wanted to leave [tomorrow or on Thursday]. [NP and PP] (Sag *et al.* 1985, 143, (69a))

Bayer (1996) proposes a solution to coordination of unlike categories in Lambek Categorical Grammar (LCG), inspired by ideas discussed in Morrill (1990). In (52), *remember* takes a coordinate of an NP and a CP as an argument. Bayer proposes that this is possible because the verb *remember* is listed in the lexicon as taking both NPs and CPs as complements. The verb can take a disjunction of categories as an argument, such that the coordination satisfies the verb's selectional requirements.

- (52) Pat remembered [the appointment and that it was important to be on time]. (Bayer 1996, 958, (8a))

A problem with Bayer's analysis is that it does not capture cases in which selectional restrictions are not actually respected, as in (53) and all the other cases under discussion here.

- (53) a. You can depend on [my assistant] and [that he will be on time].  
b. \* You can depend on [that my assistant will be on time].

As we have shown, a selector may combine with a coordinate in which not all conjuncts are possible dependents of the selector. For Bayer's analysis to work, the preposition *on* would have to be listed as selecting both NP and CP, but this is not correct. Prepositions do not actually permit CP complements (53b).

We conclude that coordination of mismatched categories is allowed by the grammars of many (perhaps all) languages. That is, coordination is not constrained to combining elements of the same syntactic category. However, there are restrictions on combination in coordination. These

restrictions are semantic in nature, though, not syntactic. Following Munn (1993), we suggest that coordinates must match in semantic type. In (54), *healthy* is AP and *of sound mind* is a PP, but both have the same semantic type, namely  $\langle e,t \rangle$ . This is why predicate conjunction is so free: predicates are all the same semantic type, namely  $\langle e,t \rangle$ .

(54) Pat is [ $\langle e,t \rangle$  healthy] and [ $\langle e,t \rangle$  of sound mind].

Similarly, adverbial elements of different syntactic categories can be coordinated, as they serve the same semantic function. They are event modifiers of the same general semantic type (51a–b).

In contrast, categories that are not the same semantic type may not be coordinated, even if they are the same syntactic type:

- (55) a. \* That man is [a republican and John]. (predicate & individual)  
b. \* He lost [carelessly and unfortunately]. (event modifier & proposition taking adverb)  
c. \* a [tall and alleged] thief (intersective adjective & non-intersective adjective)  
d. \* A republican and proud of it was elected President. (individual & predicate; Pullum and Zwicky 1986, 752, (3))

All of this indicates that coordination does not care about syntactic category, only semantic type.<sup>22</sup> Coordination appears to be unusual in not imposing restrictions on what syntactic categories it can combine. So long as the conjuncts can combine semantically with shared material, the combination will be grammatical (but see discussion of an additional morphophonological constraint in section 6).

### 4.3 Summary

We conclude that an ellipsis account will not solve the problem of selection violations in coordination, and there is no alternative to putting linear order in the syntax. The main motivation for the

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<sup>22</sup>Note that this semantic restriction does not apply to asymmetric coordination, where it might be possible for different semantic types to be coordinated. An example is (i), where an imperative is coordinated with a declarative:

- (i) Do that and you will suffer.

In some analyses, these are considered distinct semantic types (e.g., Portner 2007).

ellipsis analysis—accounting for the coordination of mismatched categories—also does not appear to be right: the syntax does not care whether two elements are the same category when it attempts to coordinate them. The only restriction is the semantic combinatorics. The analysis we propose in the next section starts from this point of view.

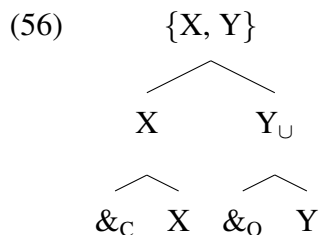
## 5 Analysis of Coordination and Linear Order

We now spell out our analysis of selection in coordination, beginning with some assumptions about coordinate structure.

### 5.1 Background

Building on Dalrymple and Kaplan’s (2000) union algorithm for feature resolution, and Collins’ (2002) Set Merge, Al Khalaf (2015) proposes a binary branching structure for coordination in which the coordinator does not project a special phrase, but adjoins to each conjunct. This coordinator triggers a special sort of labeling, which Al Khalaf calls Set Label. Set Label makes the label of the entire phrase the union of the labels of the conjuncts.

Al Khalaf hypothesizes that coordinators adjoin to every conjunct in coordination, as in (56), but coordinators come in two different types. Coordinate-initial coordinators are closed coordinators ( $&_C$ ) while non-initial ones are open coordinators ( $&_O$ ). Open coordinators endow the conjunct they adjoin to with a union feature (represented as a union subscript), which is necessary to sustain the union algorithm that creates a set label. Once all union features are checked set label stops (see Al Khalaf 2015, pp. 12-23).



If X and Y are both NPs, for example, the label of the whole coordinate phrase will be {NP, NP}. In cases where the label is a set of different categories, these categories will have to be resolved to a single value, as we discuss below. This is similar to feature resolution, where person,

number, and gender features must be resolved. For instance, two singulars resolve as dual or plural (depending on the language), while first and second person resolve as the union of first and second person, which is first person plural inclusive. See Dalrymple and Kaplan 2000.

The role of the closed coordinator is to trigger Set Label in left-to-right structure building. Every closed coordinator must be paired with at least one open coordinator. Closed and open coordinators can be pronounced differently, or the same, depending on the language. In English, closed coordinators are always null. Different combinations of closed and open coordinators will result in sub-constituents within coordination, as in the following example:

(57) [ &<sub>C</sub> [ &<sub>C</sub> chocolate and<sub>O</sub> peanut butter] and<sub>O</sub> [ &<sub>C</sub> cookies and<sub>O</sub> cream] ]

In this case, combining [ &<sub>C</sub> cookies] with [ and<sub>O</sub> cream] results in a single object whose label is {NP, NP}. This is then combined with the first conjunct (*chocolate and peanut butter*), to create a phrase whose label is { {NP, NP}, {NP, NP} }. This label is different from {NP, NP, NP, NP}, which is an unstructured list.

The Set Label condition is stated below in representational terms:

(58) The Set Label Condition (Al Khalaf 2015, 16, (23))

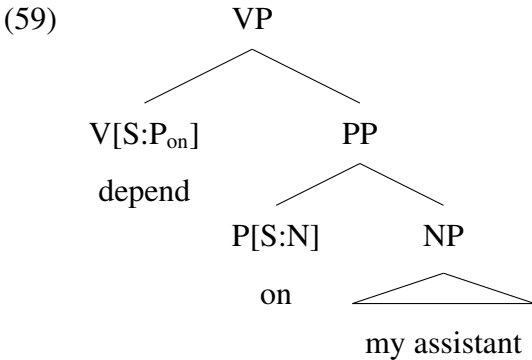
- a. If one of  $\alpha, \beta$  has  $\cup$  then the label of  $K(\alpha, \beta)$  is  $\{\alpha, \beta\}$
- b. If both  $\alpha, \beta$  have  $\cup$ , then the label of  $K(\alpha, \beta)$  is  $\{\alpha, \beta, \cup\}$
- c. If neither  $\alpha$  nor  $\beta$  has  $\cup$ , then the label of  $K(\alpha, \beta)$  is either  $\alpha$  or  $\beta$ .

The condition in (58c) is the normal mode of composition outside of coordination. The condition in (58a) describes a set label that is finished and will combine with further elements by (58c). This happens when one of the conjuncts has the closed coordinator &<sub>C</sub>. If both conjuncts have the open coordinator, (58b) requires an open slot in the set label that will be filled in by another coordinate. Since all of our examples only involve two coordinates, this clause is not relevant here.

Next, in keeping with the view that the syntax includes linear order, we hypothesize that syntactic structures are built left-to-right (Phillips 1996, 2003; Bruening 2014). We spell out how this works below. For now, note that the closed coordinator in left-to-right structure building triggers set label as soon as the first conjunct is encountered or built.

As for selection, we hypothesize that selectional properties are features of syntactic nodes (e.g., Adger 2003). We adopt the version of selectional features proposed in Bruening (2013). In this

system, selectional features are satisfied when they do not project. So, a verb that takes an object of category P has the selectional feature [S:P]. Verbs can also select for particular prepositions, which we notate with a subscript. In (59), *depend* has the selectional feature [S:P<sub>on</sub>]. This feature is checked by merging V with a projection of PP headed by *on*. What it means to check off a selectional feature is for that selectional feature to stop projecting. So, when a projection of V merges with a projection of P, the resulting object no longer has the feature [S:P<sub>on</sub>]:



In turn, the P *on* has the selectional feature [S:N], which is satisfied by merging with a projection of an N.

The following principles govern when selectional features project:

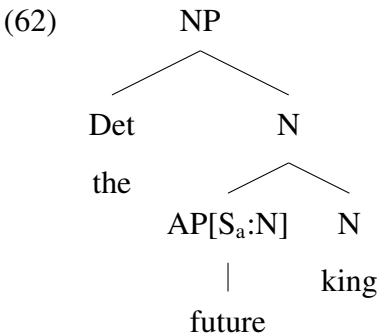
- (60) A selectional feature [S:X] on node Y projects to a dominating node Z unless
- a. The daughters of Z are Y[S:X] and X, or
  - b. The daughters of Z are Y[S:X] and W[S:Y(S:X)].

Clause (60b) allows an item to select an unsaturated projection and satisfy its selectional properties; this is what a valence-reducing head like the Passive does in Bruening (2013). On the other hand, adjuncts may adjoin to an unsaturated projection, and when they do, they do *not* satisfy the selectional properties of what they adjoin to. Bruening (2013) captures this by giving adjuncts a different type of selectional feature, notated [S<sub>a</sub>:X]. The following principle governs how they combine:

- (61) A selectional feature [S:Z] on node X projects to the next dominating node if its sister is Y[S<sub>a</sub>:X(S:Z)].

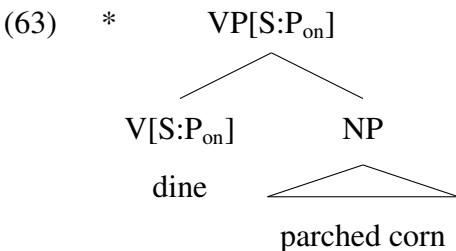
A selectional feature on an adjunct, [S<sub>a</sub>:X], will be checked off by combining with a category of type X, as dictated by clause (60a).

As an example, an adjective selects a nominal constituent:



By merging with a projection of N, the selectional feature of the AP is satisfied (does not project). If the N had selectional features, they would not be satisfied by the AP and would project. (We do not give any account here of determiners and what selects them or what they select.)

In cases of selectional violations like the following, a selectional feature will remain unchecked, meaning that it continues to project to dominating nodes:



We assume that the structure crashes if it reaches a certain point with unchecked selectional features. The points that matter are those identified in Chomsky's Phase Theory as phasal nodes: the maximal VP, CP, NP (Chomsky 2000 and much subsequent literature).

## 5.2 Resolving Mismatching Categories in Coordination

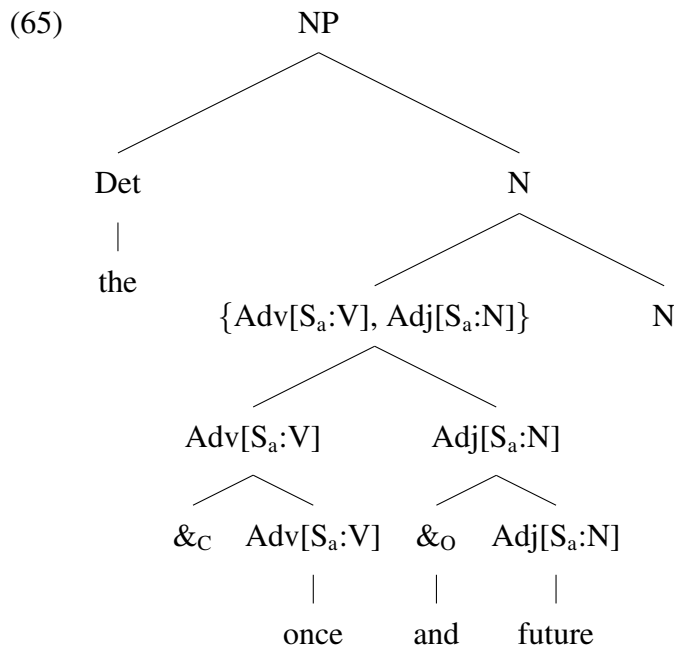
Since coordination does not care about syntactic category features, it will not assign any category to a coordinated phrase as a whole until it is forced to. In a case where an NP and a CP are coordinated, for instance, in order for the label {NP, CP} to be integrated into the surrounding syntax, the category of the label must be resolved, just like phi features. Unlike phi features, however, two syntactic categories cannot be resolved as some third category (e.g., singular plus singular resolve as dual). The syntax has to pick one of the labels in the set as the label of the whole.

As the syntax constructs the entire phrase, it will leave the coordinate set label as it is until it is forced to assign it one of its members' labels. If nothing else forces labeling, we assume that the set label will have to be labeled once the coordinated phrase is complete, because the phrase as a whole must be integrated into the surrounding syntax. In such a case, the label of the set will be the label of the most recently built conjunct (the rightmost one, in left-to-right structure building).

Consider our mismatching Adv-Adj coordination again:

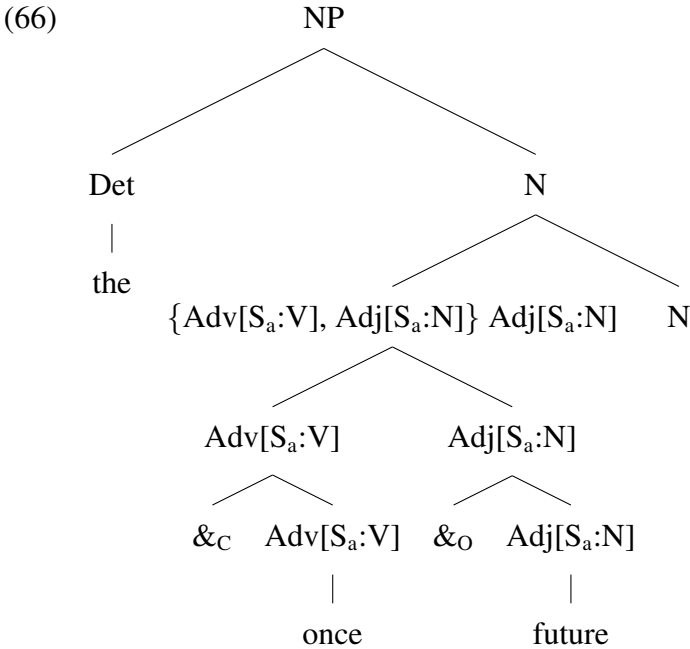
(64) the once and future king

Since the coordinated phrase is an adjunct, there is nothing in the nominal that requires it. The syntax will build the NP as follows:



The topmost node labeled  $\{\text{Adv}[\text{S}_a:\text{V}], \text{Adj}[\text{S}_a:\text{N}]\}$  must be integrated into the syntax, so it is assigned a label. The most recently built conjunct's label is projected as the resolved category. We indicate this by writing the resolved label outside of the curly brackets:



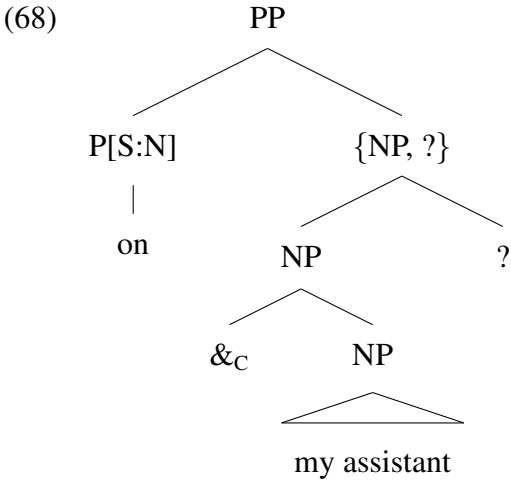


This satisfies all constraints, and the  $[S_a:N]$  feature is checked off (does not project). The  $[S_a:V]$  feature also did not project, so as far as the syntax is concerned, it was also checked off. The only thing that matters now is that the result be interpretable in the semantics. The adverb *once* just requires a predicate to modify, which is provided by the nominal predicate *king* (exactly as in *he was once king*). The structure can combine semantically.

Consider now the following example:

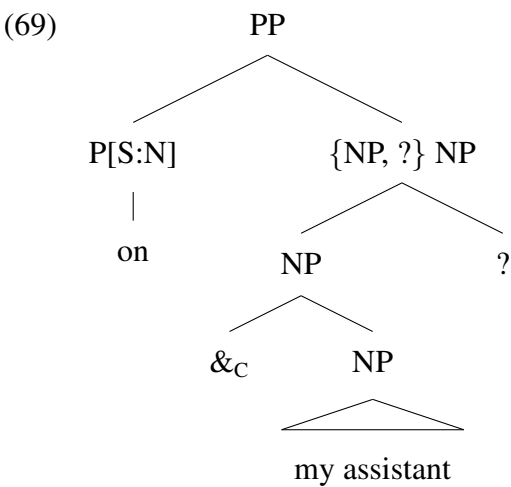
(67) You can depend on my assistant and that he will be on time.

Here the preposition *on* has the label  $P[S:N]$ , with a selectional feature requiring a nominal constituent. The syntax then begins building the coordinate structure, beginning with the first conjunct *my assistant*:

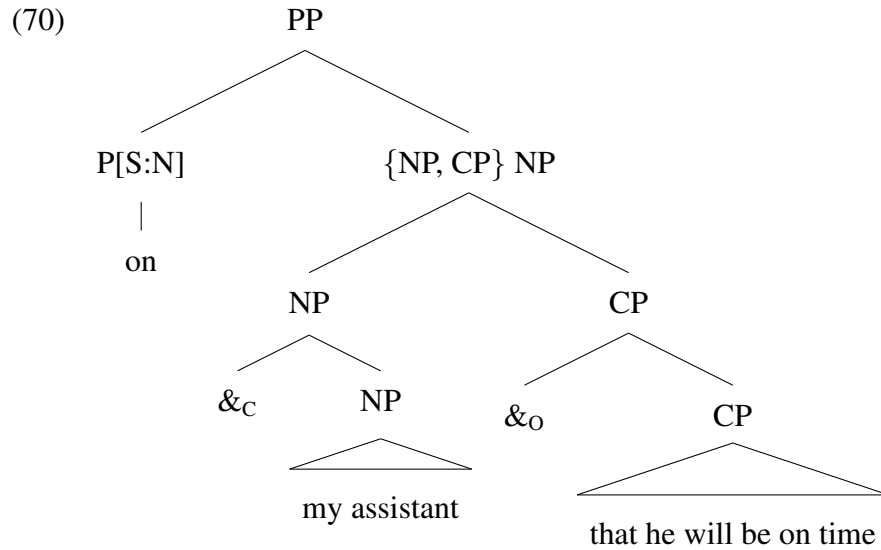


As noted above, the closed coordinator adjoined to the NP triggers set label, and leads to the expectation of further conjuncts (indicated with the question mark as a placeholder).

We have said that resolving the category label of a coordinate is delayed until it is forced. We now propose that selection is something that can force immediate category resolution. In general, selectional features must be satisfied as soon as possible. In the structure above, the preposition requires a phrase of category N. The half-built coordinate phrase includes a conjunct of category N. The syntax therefore immediately resolves to the category N, thereby satisfying the selectional requirements of the preposition:



The CP is then added, after resolution has already taken place:



All syntactic constraints are satisfied. The CP just needs to be the kind of semantic object that can combine with *depend on*. We assume that it denotes a fact, which is a type of individual that can be conjoined with an NP and is an appropriate semantic object for *depend on*. A pronoun that takes such a CP as its antecedent can be the object of *depend on*:

- (71) A: I hope that he will be on time.  
 B: You can depend on it.

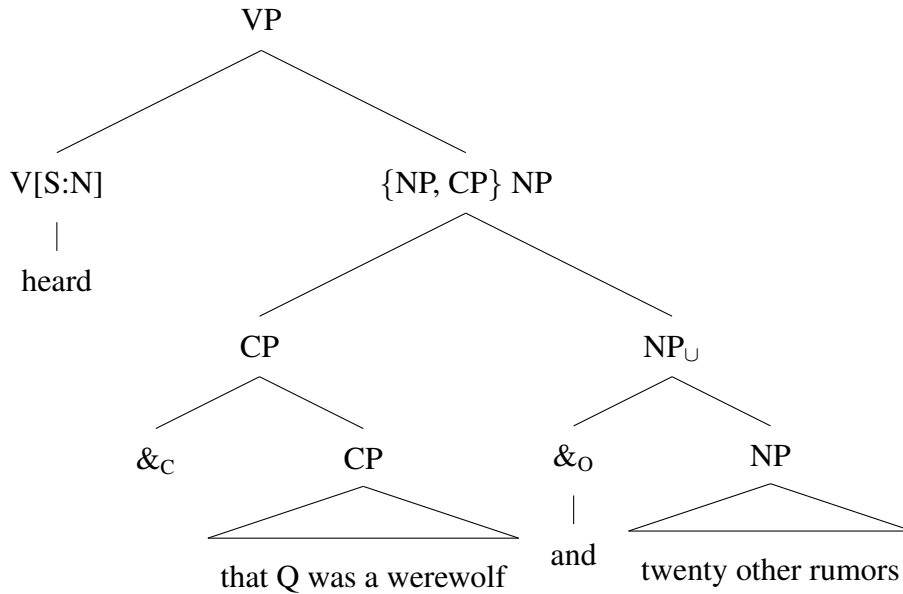
As noted above, a CP can also be the object of *depend on* if it moves. It therefore appears that there is no semantic problem for the composition of *depend on* and a CP; the problem is purely syntactic.

When two dependents are conjoined before the selector is encountered, a label will only be projected when the entire coordination is finished, as described above. In such a case, the label of the coordinate will be the label of the final conjunct again. Consider the following example:

- (72) That Quentin was a werewolf and twenty other crazy rumors were heard by all the students in the department.

The CP will be built and conjoined with the NP *twenty other crazy rumors*. The label of the entire coordinated phrase will be NP, because that is the label of the most recently processed conjunct. When the entire subject phrase is put into its selected position, the selectional feature [S:N] is satisfied. This example is a passive, so an unpronounced copy of the whole phrase will be merged into object position:

(73)

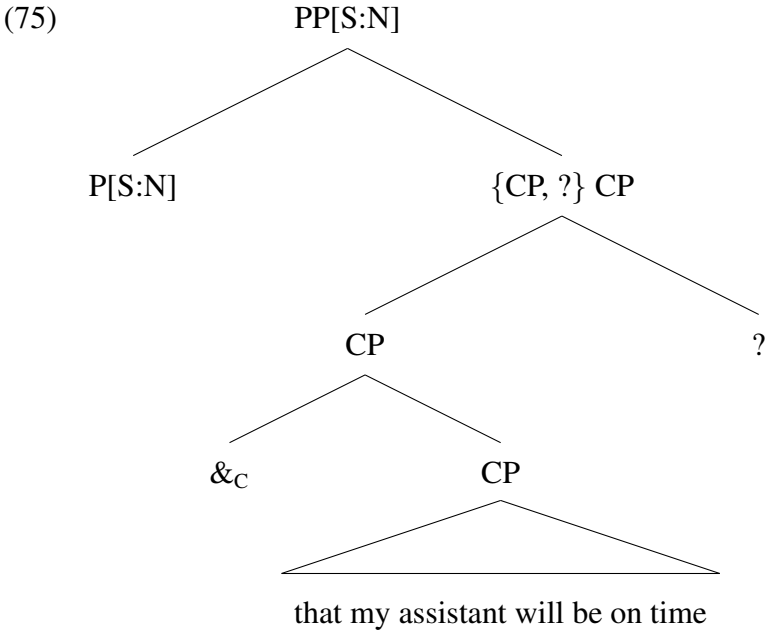


It is at this point that selectional features are checked. However, the category of the coordinate was determined at an earlier stage, when it was first built in the preverbal subject position. This is why it is the surface linear order that matters in coordination, while selection itself is not necessarily checked on the basis of the linear order (as was shown in section 3). (Note that active *hear* permits CPs, but passive *was heard* seems not to. See Alrenga 2005 for some discussion of this phenomenon.)

Now consider a case that is ungrammatical:

(74) \* You can depend on that my assistant will be on time and his discretion.

Once again *on* is P[S:N]. The syntax builds the CP. Selection must be satisfied as soon as possible so category resolution is forced to apply. The label of the conjoined phrase becomes CP, and the selectional feature on P projects to PP and beyond:



Adding an NP as a second conjunct does not enable us to relabel the conjoined phrase or the PP. The derivation will crash, because the selectional feature [S:N] is never checked off.

To wrap up, our account of coordination explains why selectional restrictions can be violated under coordination. It also explains the directional asymmetry in the patterns of violations that are allowed. An important component of the analysis is the fact that it is derivational and takes place left-to-right. Certain operations, such as labeling and checking of selectional features, take place at mid-points in the derivation. Since the derivation is linear, different linear orders lead to different results, even with the same building blocks. This type of outcome would be impossible to derive if linear order were not part of the syntax.

## 6 Morphophonological Parallelism

In section 4, we showed that coordination does not impose syntactic restrictions on what categories may be conjoined. Instead, coordination seems to be constrained only by semantics: only matching semantic types may be coordinated. In this section, we show that not all sorts of category mismatch are allowed, even when semantic parallelism is respected. It appears that there is an additional constraint on morphophonological form.

As it stands, our account predicts, for instance, that any adverb can coordinate with any adjective in prenominal position. Alongside *the once and future king*, examples like the following

should be grammatical:

(76) \* the originally and future king

Conversely, we would expect an adjective to be able to coordinate with an adverb following a verb:

(77) \* He always works [carefully and thorough].

The difference between these ungrammatical examples and the grammatical ones seems to be the morphology. In *the once and future king* and all similar examples, the adverb is not one that is marked with the morpheme *-ly*. Adverbs with *-ly* seem to be ungrammatical in this pattern.

Similarly, if an adjective is conjoined in postverbal position with an adverb that does not end in *-ly*, the result is much better for some English speakers:

(78) ? He always works [hard and thorough]

We should note that there is considerable speaker variation, with many English speakers rejecting these. At the same time, however, web searches turn up numerous examples of *hard and thorough*, but none of *carefully and thorough*. There does appear to be a contrast between them.

We therefore hypothesize that there is a morphophonological parallelism requirement on coordination, in addition to a semantic parallelism requirement. Two categories that are conjoined must not contrast in morphophonological form.

Similar morphophonological effects have been discussed in coordination before. For instance, Zaenen and Karttunen (1984) show that in Icelandic and French, it is only possible to conjoin two verbs that assign distinct cases if the NP that they share takes a form that is compatible with both cases. In (79a), ‘steal’ assigns dative case and ‘eat’ assigns accusative case; neither form of the shared object is grammatical:

(79) (Zaenen and Karttunen 1984, 310, (4); 312, (12))

- a. \* Hann stal           og borðaði kökuna           / kökunni.  
he   stole(Dat) and ate(Acc) the.cookie.Acc / the.cookie.Dat  
‘He stole and ate the cookie.’
- b. Hann stal           og barðaði köku.  
he   stole(Dat) and ate(Acc) cookie.Acc/Dat  
‘He stole and ate a cookie.’

However, in (79b), the indefinite form of the noun is compatible with both dative and accusative, and many speakers now accept the coordination.

The same may also be true in German, according to Pullum and Zwicky (1986). However, other authors dispute these judgments, and there appears to be considerable speaker variation. See Dalrymple and Kaplan (2000).

Zaenen and Karttunen (1984) present a similar case involving English demonstratives. It is ungrammatical to conjoin a singular demonstrative with a plural demonstrative if the singular and plural forms of the shared noun contrast morphologically. But if the noun they modify does not have distinct singular and plural forms, like *sheep*, conjoining singular and plural demonstratives is allowed by some speakers.

- (80) a. \* this and these cow(s)  
b. this and these sheep (Zaenen and Karttunen 1984, 311, (11))

Again, there is speaker variation, with some speakers accepting such examples, and others rejecting them.

Similar effects of morphophonological form can be found in Modern Standard Arabic. The words *al-qawm* ‘folk’ and *an-nisaʔ* ‘women’ are plural but they are morphologically unspecified for plurality. Thus, a conjunction of a plural demonstrative and a singular one is compatible with these nouns.

- (81) Modern Standard Arabic
- a. haða wa haʔulaʔi al-qawm  
this.M.SG and these.M.PL the-folk  
‘this and these folk’
- b. haðiḥ wa ʔulaʔi an-nisaʔ  
this.F.SG and those.F.PL the-women  
‘this and those women’

Compare the examples above to the ones in (82), in which the nouns ‘man/men’ and ‘girl/girls’ are morphologically marked for number. Here a conjunction of a singular demonstrative and a plural one is not acceptable.

- (82) Modern Standard Arabic

- a. \* haða wa haʔulaʔ al-riḏal/al-raḏul  
this.M.SG and these.M.PL the-man.PL/the-man.SG  
'this and these men/man'
- b. \* haðiḥ wa ʔulaʔi al-fatay-at/al-fataḥ  
this.F.SG and those.F.PL the-girl-F.PL/the-girl.F.SG  
'this and those girls/girl'

There is a difference between the cases discussed by Zaenen and Karttunen (1984) and Pullum and Zwicky (1986) and our adverb-adjective cases, however. In the former, some element outside the coordinate constituent [X & Y] has to be non-distinct for the feature values required by X and Y. In contrast, in *the once and future king* versus *\*the originally and future king*, both *once* and *originally* are adverbs, and adverbs in general do not combine with nouns. The two adverbs are equivalent in their syntactic relation with the head noun outside the coordinate phrase. The contrast between them seems to be due to the parallelism or lack thereof between the two members of the coordinate constituent, specifically in their morphological makeup.

It is therefore not clear that a single condition can cover all of the cases of a morphophonological parallelism requirement that we see in coordination. The Resolution Principle proposed by Pullum and Zwicky (1986), for instance, cannot be extended to our adverb cases, and it is not clear that any principle that covers them can also cover the cases that fall under the Resolution Principle. We therefore propose a separate constraint on coordination, which we phrase as a constraint purely internal to coordination, with no reference to elements outside the coordinate constituent:

(83) Conditions on Coordination

X and Y may be coordinated only if

- a. X and Y are the same semantic type, and
- b. X and Y are non-distinct for relevant morphophonological features.

We leave open what “relevant morphophonological features” are. Apparently, the morpheme *-ly* that marks adverbs conveys relevant morphophonological features distinct from the features on an adjective. CPs and NPs in English, however, are not morphophonologically distinct in the relevant sense, nor are PPs and APs (see all the data in section 2). Categories in predicate position also seem to be non-distinct (see section 4).



As for the examples of case assignment and number above, they fall under a different constraint, something like the Resolution Principle proposed by Pullum and Zwicky (1986). We repeat this principle here (a “factor” is an element outside a coordinate phrase that enters into syntactic and semantic relations with the coordinate phrase):<sup>23</sup>

- (84) The Resolution Principle (RP): A syntactic feature conflict on a factor in coordination can be resolved if (a) particular values of the features are syntactically imposed on the factor; and (b) a phonological form is available which is, at the relevant [lexical?] stratum of representation, ambiguous between these values. (Pullum and Zwicky 1986, 766, (43))

For instance, in the Icelandic example above, the indefinite noun is ambiguous between dative and accusative case, and so the syntactic feature conflict created by conjoining a dative-assigning verb with an accusative-assigning verb is resolved.

To summarize this section, we have refined our condition on coordination. We saw before that syntactic category does not constrain what can be coordinated with what, but semantic type does. This section has shown that morphophonological form imposes a further condition on coordination.

## 7 Conclusion

We have shown in the domain of selection that it is not the case that the *first* conjunct enjoys some kind of special prominence in coordination. Selectional violations in coordination actually depend on linear order. This finding requires that linear order be present in the syntax; syntax cannot be purely hierarchical. We have spelled out an analysis of selection and coordination that derives the patterns we have found. The analysis is derivational and linear, with syntactic structures built left-to-right.

As mentioned in the introduction, recent work on closest conjunct agreement (CCA) has proposed that CCA takes place at PF, after hierarchical relations have been converted into precedence relations (e.g., Marušič *et al.* 2007, 2015; van Koppen 2007; Benmamoun *et al.* 2009; Bhatt and Walkow 2013). The basis for this approach has been the assumption that the syntax does not include linear order, and therefore CCA could not take place in the syntax.

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<sup>23</sup>Pullum and Zwicky (1986) revise this principle in their example (51) (page 772), but we present the simpler version here for the sake of exposition.

Our results should lead to a rethinking of CCA. If linear order is indeed part of syntax, then there is no barrier to computing CCA in the syntax. In fact, our left-to-right derivational model ought to lend itself well to an analysis of CCA in the syntax. We do not offer such an analysis here, but suggest that this is a natural direction for future work on CCA. Similarly, other asymmetries that have been noted in the literature on coordination may also be due to the left-to-right order of syntactic derivations. We leave this as a direction for future research. See Al Khalaf (2015, chapter 3) for a proposal along these lines.

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